ALPHA evo EcoDrive TWIN FORCE

Original Instruction book

Instruction book

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www.hardi-fr.com

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

As this instruction book covers all models, including all hydraulic boom versions, please pay attention to the paragraphs dealing with precisely your model.

This book is to be read in conjunction with the "Spray Technique" book.

The original instruction book is in english. The versions in other languages are translated from the original. In the event of contradiction or inaccuracy between the original version and the versions in other languages, the original French version shall prevail.

The instructions book are also available on the website **http://www.agroparts.com**

Illustrations, technical information and data in this book are to the best of our belief correct at the time of printing. As it is HARDI-EVRARD S.A.S. policy permanently to improve our products, we reserve the right to make changes in design, features, accessories, specifications and maintenance instructions at any time and without notice.

HARDI-EVRARD S.A.S. is without any obligation in relation to equipment purchased before or after such changes.

HARDI-EVRARD S.A.S. has made every effort in writing this instruction book to make it as accurate and complete as possible. It may not be held responsible for any omissions or inaccuracies.

As this instruction book covers all models, characteristics or equipment only available in certain countries may be described. Pay special attention to the paragraphs concerning the model that you own.

Published and printed by HARDI EVRARD S.A.S.

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EC Declaration of Conformity

The Manufacturer:

HARDI-EVRARD

43 rue du Cuivre-BP 59

77542 SAVIGNY-LE-TEMPLE CEDEX

FRANCE

declares that the following equipment:

ALPHA 3500 evo EcoDrive and ALPHA 4100 evo EcoDrive self-propelled sprayers

- Conform to all of the relevant provisions of the Machinery Directive 2006/127/EC of 21 October 2009 amending Directive 2006/42/EC with regard to machinery for pesticide application.
- Conform to the provisions of Council Directive 2004/108/EC (EMC).
- Comply with the provisions of Appendix I provided in article R.4312-1 appearing at the end of title 1, book III of the fourth section of the French Labour Code, amended by Decree No. 20011-1480 of 9 November 2011 related to work equipment and personal protective equipment.

Beaurainville 2015/02/01

Managing Director

HARDI-EVRARD S.A.S.

1 - EC Declaration of Conformity

Operator safety

Symbols

These symbols are used throughout this book to draw the reader's attention to certain points. This is the meaning of the four symbols.

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

This symbol means WARNING. Be very aware as your safety may be at risk!

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

This symbol means NOTE.

Guidelines

Before using the sprayer, read the following recommendations and the 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 parts of this instruction book remain unclear after reading it, contact your retailer for further information before using the sprayer.

Local legislation may require operators to have a certificate of competence in the use of the equipment. Respect the applicable local legislation.

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

Wear protective clothing. Clothing may differ according to the plant protection chemicals used. Respect the applicable local legislation.

After spraying, the operator should have a wash and change his clothes. Clean any equipment that may have become soiled.

Do not eat, drink or smoke during the use and maintenance of your sprayer.

In case of poisoning, immediately seek medical advice or call the emergency service indicated on the packaging of the products used.

Filling and application

No persons are allowed in the operational area of the sprayer. Take care not to harm people or surroundings when manoeuvring the sprayer, especially when reversing.

Slow down when driving on uneven terrain as the sprayer may become unbalanced and overturn.

Keep children away from the sprayer.

Do not attempt to enter the tank.

Do not go under the machine unless it is secured. The boom is secure when placed in the transport brackets.

For further information, see the Spray Technique book.

2 - Safety instructions

Usage

Carry out a pressure test with clean water prior to filling with chemicals. Never dismantle the hose while the sprayer is in operation.

DANGER! Do not exceed the maximum recommended rotation speed of the pump.

Rinse and wash the equipment after use and before servicing.

Never service or repair the equipment while it is operating. Always replace all safety devices or shields immediately after servicing or repair.

Disconnect the electrical power before servicing and depressurise the equipment after use and before servicing.

If an arc welder is used and connected to any part of the sprayer, disconnect the power leads from the battery before welding. Remove all inflammable or explosive material from the welding area.

The External Cleaning Device should not be used if important parts of the equipment have been damaged, including safety devices, high pressure hoses etc.

Take all precautions to avoid the risks related to unintentional contact with overhead power lines. A sticker placed near the operator's seat warns of the risk of contact with overhead power lines.

The volume in the tank must never exceed the Gross Vehicle Weight (GVW) allowed.
You must take into consideration the volume in the tank will be adjusted according to the density.

Sprayer usage

This HARDI EVRARD self-propelled sprayer is exclusively intended for use in farming work, i.e. the application of plant protection chemicals and liquid fertilisers.
Any other use is considered contrary to normal usage and is therefore forbidden.

Operator's skill

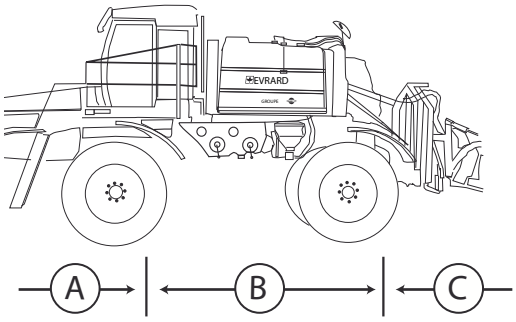
The machine should be used and maintained by people who are aware of its special use and safety characteristics.
Before using your machine, familiarise yourself with all the commands. When working it will be too late to do so.
Ensure that you have the skills required for protecting crops and the environment,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

Definition of the working place

Never leave the operator's seat when the machine is moving.
The following is considered as the working place:

1. the outside area where the valves are located that can be handled during tank filling and liquid preparation operations
2. the operator's seat
3. the access ladder and the footboard for accessing the tank opening

A. Clean Zone	engine cabin access ladder and gangway operator's seat access to main tank
B. Work zone	liquid system valves filling with plant protection chemicals external connectors (filling - transfer)
C. Spraying zone	spraying boom and nozzles boom hydraulic controls



2 - Safety instructions

Responsibilities of the manufacturer and the user

- 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 EVRARD shall not be held liable in any way.
- The modification of technical characteristics of the engine, including the addition of any device which improves the engine performance is strictly prohibited. Similarly, the modification of parameters of electronic systems related to hydraulic transmisssion is not allowed. In these cases, the benefit of the warranty could be not given by the manufacturer in case of damage of the engine and / or components of the hydraulic transmission.
  More generally, the responsibility of the manufacturer can not be held if transformation of the machine or its accessories (mechanical, hydraulic, electrical, electronic or pneumatic) would be made without the written agreement of HARDI EVRARD.

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 EVRARD retailer.

Driving on public roads

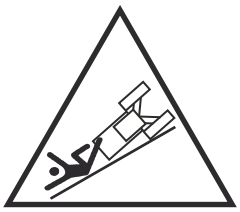
When driving on public roads where the highway code and any other regulations apply, these must be observed, particularly regarding mandatory equipment such as lights, indicators, hazard lights etc.

You should be aware of the vehicle's size and weight, particularly the overall width and height. For more information, see section “Technical specifications” page 117.

ATTENTION! In all circumstances, you should adapt to road driving, particularly by reducing your speed on bends, on meeting or being overtaking by another vehicle, depending on the state of the road surface and how full the tank is.

Driving in fields

It is advisable to pay a lot of attention to the risks of overturning, especially in 4-wheel drive mode and when travelling at speeds of more than 15 km/hr.



ATTENTION! As a general rule:

- Adapt your speed and driving to suit the terrain you are driving on. Be aware and take care!
- In all circumstances and particularly on uneven and sloping terrain, drive the machine at a low speed, especially on bends and avoid sudden changes of direction.
- Do not brake or start up suddenly when going up or down a slope, bearing in mind the variable volume of liquid in the sprayer tank.

WARNING! Boom manoeuvres should be carried out with the engine shut down and on flat ground. Ensure that there are no obstacles nearby (electricity lines, people, poles etc.).

Safety symbols

Safety symbols show the different locations of the sprayer that present risks for your safety. These symbols should be respected by all people working on or near the machine.

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

NOTE! The list of warnings presented below may vary according to the function of the equipment.

Not for drinking !

Fill up the rinse tank only with clean water

Handle!

Use the cabin access ladder!

Service !

Shut off engine an remove ignition key before performing maintenance or repair.

Risk of falling!

Do not ride on platform or ladder during use

Service !

Tighten with torque according to instruction book.

Risk of injury!

Do not put hands while the engine is running

Risk of crushing!

Keep hands away while parts are moving

Risk of burn!

Stay clear of hot surfaces.

Risque de d'électrocution !

Restez à distance suffisante des lignes électriques.

Risk of crushing!

Stay clear of raised unsecured loads.

Handling chemicals!

Carefully read the information about chemical preparation before operating the machine. Observe the instructions and safety instructions when operating.

Risk of death!

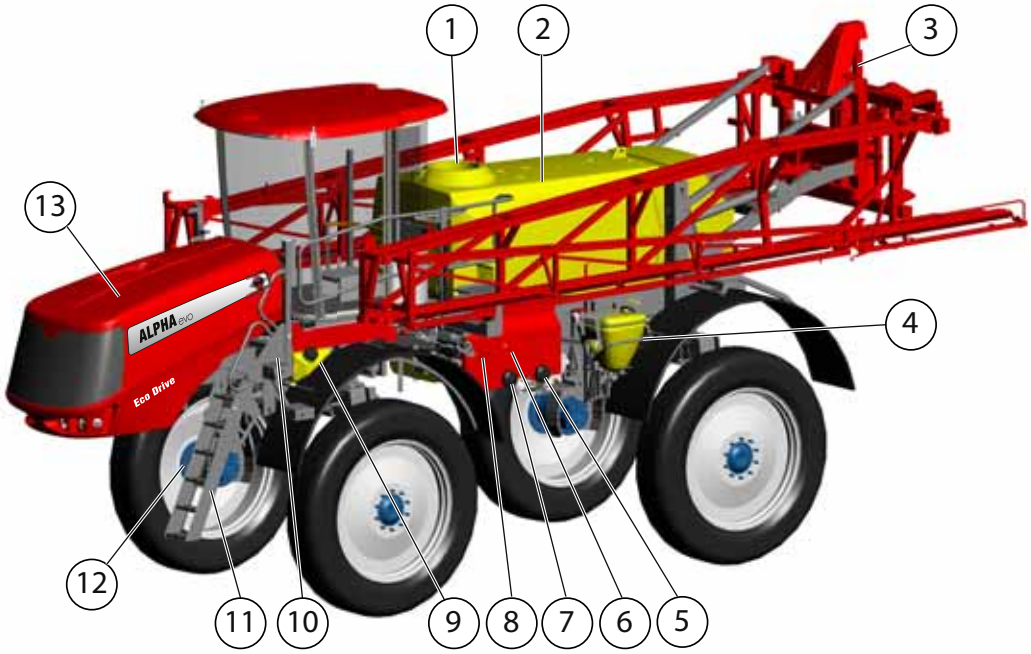
Do not attempt to enter the tank

Regulations on the use of chemical waste

For further information on using waste, see section "Environmental Protection" in the SPRAY TECHNIQUES book.

General Info

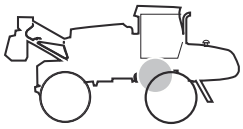
Overview



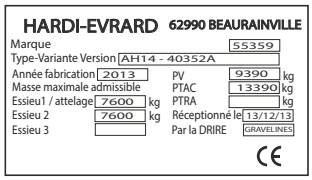
1. Main tank lid	8. External controls
2. Main tank	9. Clean water tank
3. Central boom frame	10. Cabin access gangway
4. TurboFiller	11. Cabin access ladder
5. Pressure Smart-valve	12. Hydraulic motors
6. Agitation valve	13. Engine hood
7. Suction Smart valves	

Sprayer identification plate

A manufacturer's plate is fixed to the right-hand side of the chassis. It indicates the following elements:



- Serial number.
- Type and variant.
- Year of manufacture.
- Empty weight and maximum authorised total weight.
- Axle weight 1 (front axle).
- Axle weight 2 (rear axle).
- Date and place of receipt of sprayer.
- Cold marking on chassis (Serial No. - Type- Variant).



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ATTENTION! The identification plate is regulatory, it should always be in place on the sprayer. For all information about the machine, please quote the serial number of the sprayer.

Other identification plates are attached to the machine components, See“Identification Plates” page 141.

Boom

Boom and terminology

The TWIN FORCE booms have a stable and robust parallelogram lift and are pendulum suspended. There are two versions: HAY and HAZ.

The TWIN blowers are driven by hydraulic transmission integrated into the self-propelled vehicle. The blower speed can be adjusted by increments from the cabin.

The 18-30 m HAY boom is pendulum suspended and has 4 hydraulic rams. The raising/lowering and folding/unfolding functions are operated via the sprayer hydraulics.

The 18-30 m HAZ boom is pendulum suspended and operates hydraulically. All functions are operated by direct acting hydraulics (D.A.H.). The boom is also equipped with an individual slanting boom control and hydraulic locking of the suspended pendulum.

The 32-36 m HAZ boom is pendulum suspended and operates hydraulically. The boom is also equipped with an individual slanting boom control and hydraulic locking of the suspended pendulum.

The end sections of all booms are break-away sections.

The boom can also be used half-folded. Half folded widths are as follows:

Full working width	1/2 folded
18 metres	12 metres
20 metres	12 metres
21 metres	12 metres
24 metres	12 metres
27 metres	14 metres
28 metres	14 metres
30 metres	15 metres
32 metres	17 metres
33 metres	17 metres
36 metres	18 metres

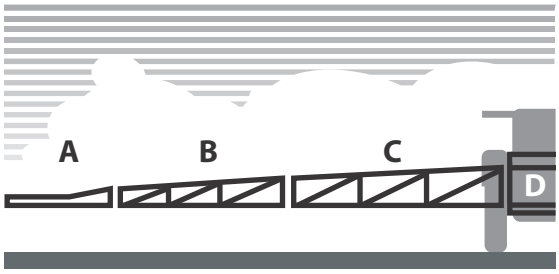
For 2-folded booms the terminology is as follows:

A. Break-away section

B. Outer section

C. Intermediate section

D. Central section



Liquid system

General information - valve system

All of the spray functions are operated via centrally situated valves with colour coded pictorial symbols for easy operation.

Pump

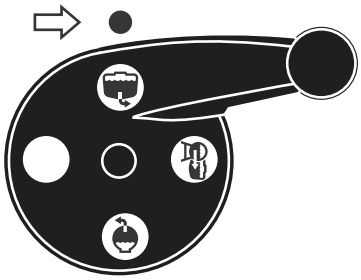
The 6-diaphragm pump has a simple design. The diaphragms and valves are easy to access, they isolate the moving parts from the liquid. The ALPHA Evo self-propelled vehicle may be equipped with the model 463-10 or 463-12 with respective flow rates of 276 l/min and 322 l/min.

Valves and symbols

The valves are identified by coloured 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 = blue symbols

Turn the handle so the symbol for the required function is pointing towards the indicator. The valve is closed when the handle is not pointing towards a symbol.



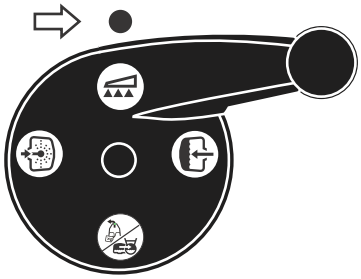
Suction in main tank

Suction in rinse tank

External suction

Pressure valve = green symbols

Turn the handle so the symbol for the required function is pointing towards the indicator.



Fill with chemicals

Spray pressure

Tank rinse

Pressure draining / Turbofiller

DynamicFluid4 pressure regulation

Traditional fluid regulation starts when the nozzles are opened. With DynamicFluid4 the regulation is a continuous process that continues even if the nozzles are closed. Two ceramic discs regulates the pressure and ensures quick reaction and zero leakages. Sprayer speed, pump RPM and number of sections activated are parameters used, and the benefit is more precise application rates from the second the sprayer begins spraying.

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

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

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

The DynamicFluid4 pressure regulation features are:

- Very fast and accurate regulation when all sensors are ok, setup in menus are correct and pump, filters and valves are in good conditions.
- Quick reacting valve when sections are turned ON/OFF and at speed changes.
- Optimized AutoSectionControl feature that predict boom sections to open and nozzle pressure.
- Optimized for different P.T.O. systems.
- Nozzle surveillance. No setup or tuning required for nozzle change.
- Warning in display if failures occur on boom plumbing, such as severe clogging of line or nozzle filters or large leakages on hoses and fittings.
- All functions work though with degraded performance (Limp home modes), if:

  Faults occur in fluid system, e.g. pump defects, clogged filters, leaking valves.

  Sensor failure appear on pressure sensor, flow sensor or RPM sensor.

  There is wrong setup of sprayer data in menus.
- Emergency mode if angle sensor or speed sensor fails.

Screen icons

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

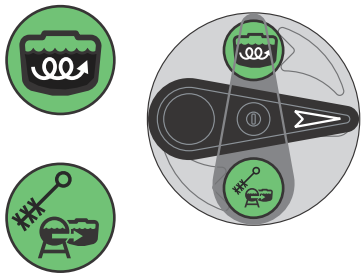
Auto When Automatic Volume Rate button is pressed on the SetBox.	**Manual** When one of the Manual pressure control buttons is pressed on the SetBox.	**Increment steps** When the Volume Rate is changed in steps with %-up or %-down buttons on the Terminal.	
			Calibration jug There is flow to section valves. Nozzle size (L/min at 3 bar) has been calculated.
			Drop There is no flow to section valves. The pump is not started or the pressure SmartValve is set to other function than spraying.
			Question mark There is flow to section valves but pressure and flow has not yet been stable, therefore the nozzle size (L/min at 3 bar) has not been calculated. The system uses the previously stored nozzle size.

Agitation valve = green pictogram

With the adjustable agitation valve it is possible to combine spraying with a low volume rate at high pressure with agitation at the same time. This is continuously controlled by the agitation valve.
The valve is marked with an arrow on the disc, which indicates the amount of liquid that passes through the valve. If the valve handle is turned to the right, there is less agitation in the tank. Conversely if the handle is turned to the left, the volume is higher and there is maximum agitation in the tank.

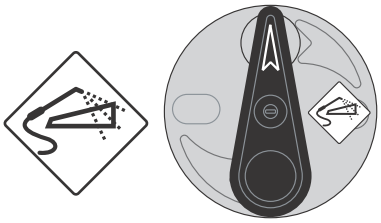
Adjustable agitation

Transfer Cleaning



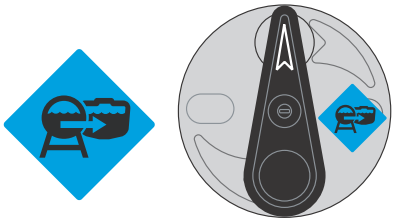
External cleaning valve = white pictogram

External cleaning ON/OFF valve



External fast Filling valve = blue pictogram

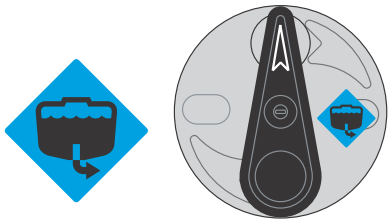
External fast filling ON/OFF valve



Main tank valve= blue pictogram

the main tank valve allows to isolate the contains of the main tank

External fast filling ON/OFF valve



3 - Description Evo EcoDrive

TurboFiller = yellow pictogram

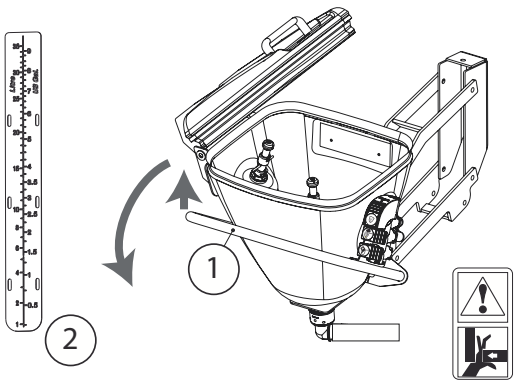
The Turbofiller is situated in the working zone on the sprayer's left side

Before use

- Grap and lift the handle **(1)** and pull it down until the lower position.

After use

- Grap the hande to push Turbofiller back in storing position until it locks



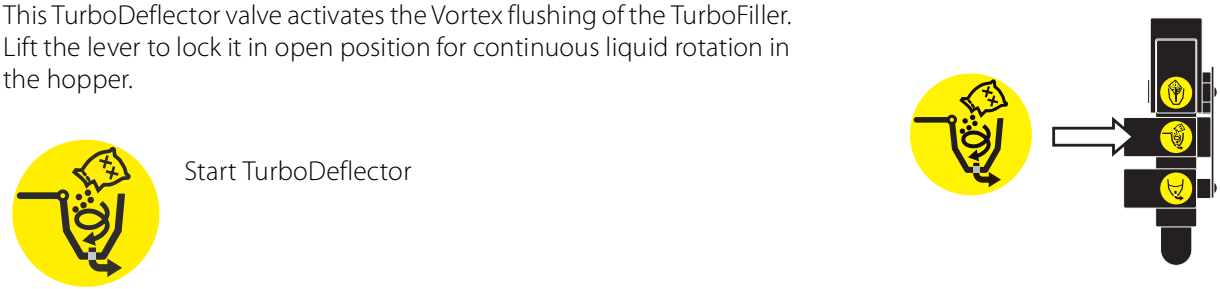
TurboFiller Suction Valve

The valve is used simultaneously with the TurboFiller. The valve has 2 settings: Continuously open or spring loaded normally closed. Open the valve when chemicals are to be filled into the TurboFiller and transferred to main tank.

Suction from TurboFiller

TurboDeflector Valve

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



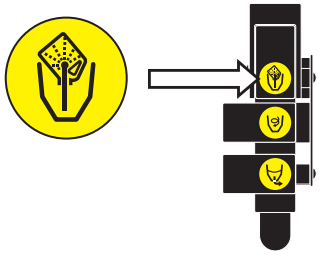
Start TurboDeflector

Chemical Container Rinsing Lever

The upper lever is used for two purposes:

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

When the TurboFiller lid is closed: Use the Chemical Container Rinsing lever to rinse the hopper when the filling of chemicals is completed.



Chemical Container Rinsing

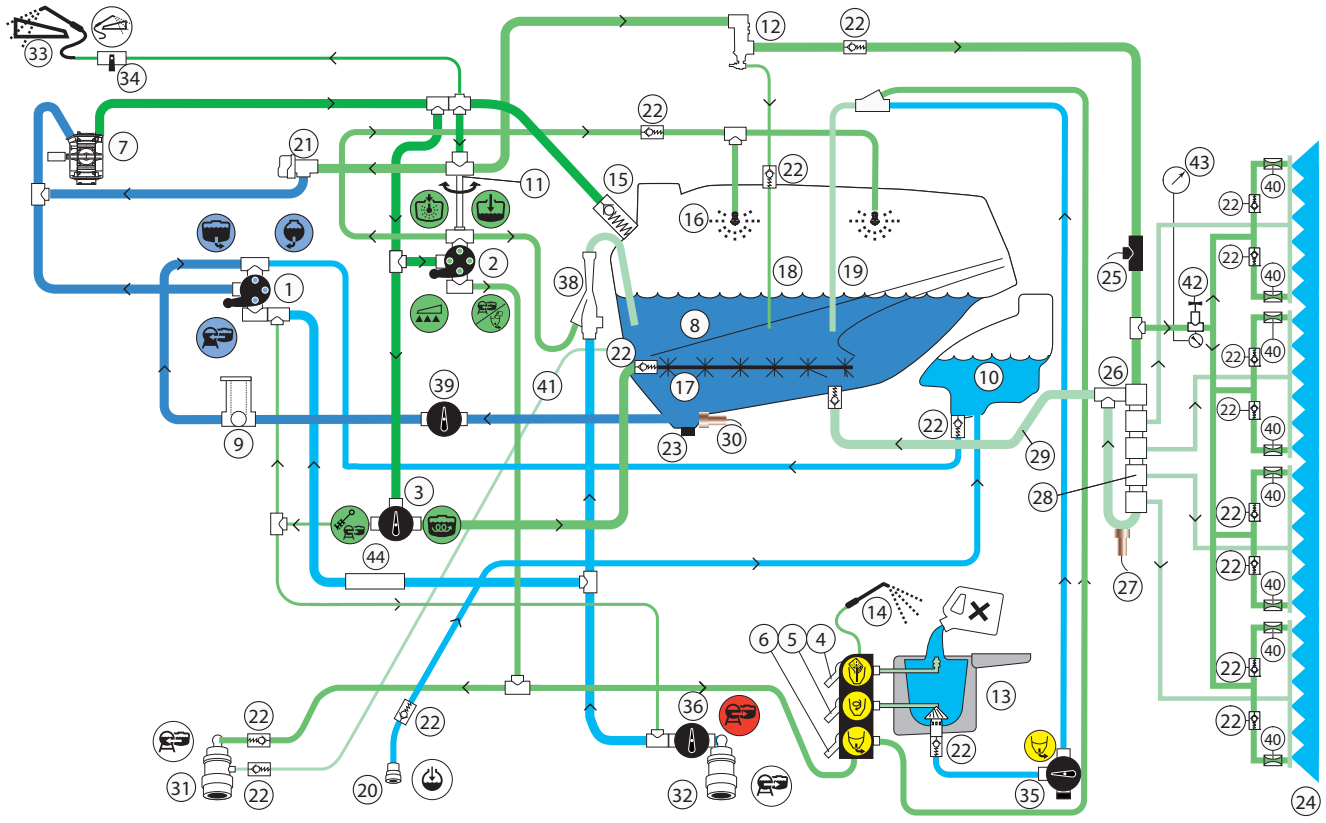
WARNING! The handle should be held all the time while the TurboFiller is being lowered.

DANGER! Do not press the lever unless the multi-hole nozzle is covered by a container as spray liquid may otherwise hit the operator.

Regulation valve function diagram

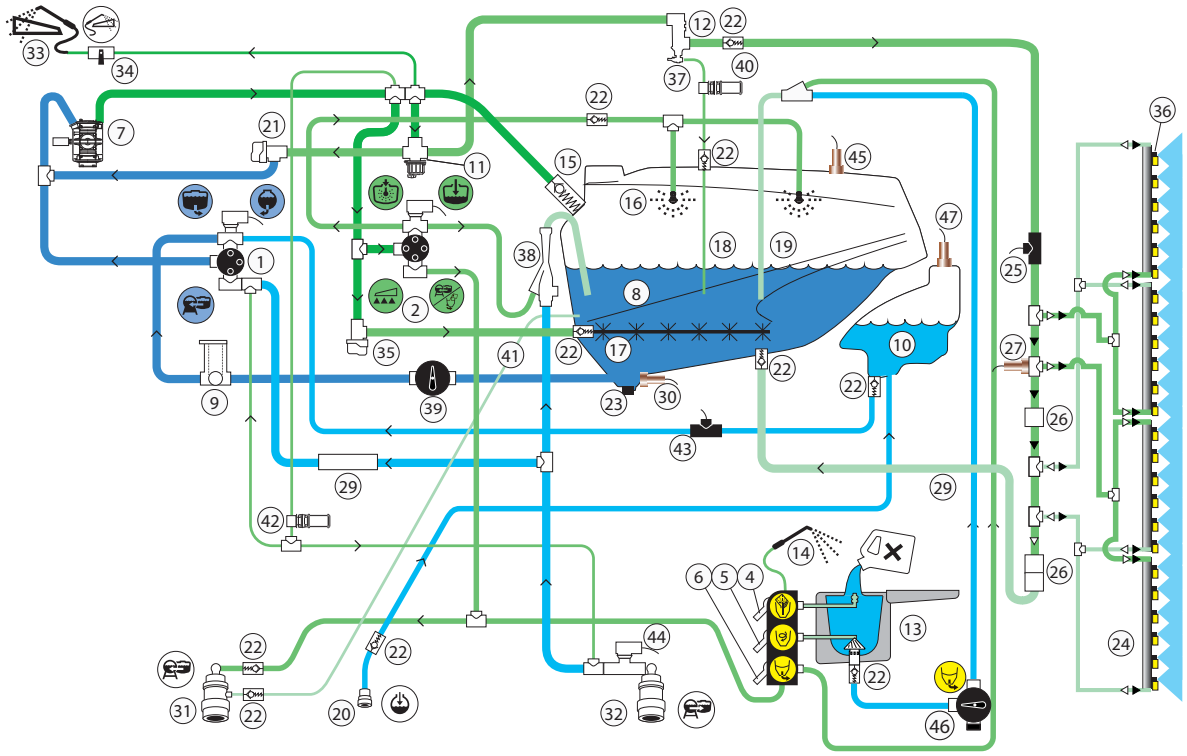
ATTENTION! Auto mode icons shown, but could be Manual or Increment steps icons, depending on driver selection.

Diagram - Liquid system with optional extras



1. Suction SmartValve
2. Pressure SmartValve
3. Agitation/Cleaning valve
4. Chemical container cleaning valve
5. TurboDeflector ON/OFF valve
6. TurboFiller suction ON/OFF valve
7. Pump
8. Main tank
9. EasyClean filter
10. RinseTank
11. Spray valve
12. CycloneFilter
13. TurboFiller
14. Lance for cleaning TurboFiller
15. Safety valve
16. Internal tank cleaning nozzles
17. Agitation tube
18. Return line for boost function
19. TurboFiller to tank tube
20. RinseTank coupler
21. DynamicFluid4 pressure regulation valve
22. One-way valve
23. Drain valve
24. Sprayer boom
25. Flowmeter
26. Bypass valve
27. Sensor for pressure gauge
28. Distribution valves
29. Return from distribution valves
30. Main tank gauge sensor
31. Pressure draining coupler
32. FastFiller coupler
33. External cleaning device (optional)
34. External cleaning ON/OFF valve (optional)
35. TurboFiller vacuum valve ON/OFF
36. External fast filling ON/OFF valve (optional)
37. Boost valve
38. Ejector
39. Main tank suction ON/OFF valve
40. Boom prime restrictor (optional)
41. Pressure relief line
42. Boom prime pressure control valve (optional)
43. Pressure gauge for BoomPrime (optional)
44. Suction In-line filter

Diagram - Intelligent liquid system with optional extras

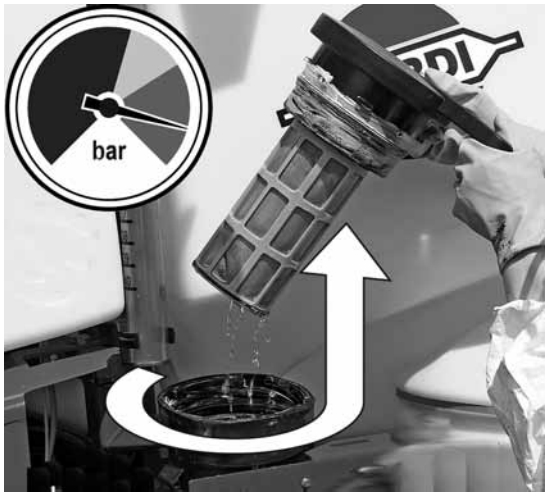


1. Suction SmartValve
2. Pressure SmartValve
3. Agitation/Cleaning valve
4. Chemical container cleaning valve
5. TurboDeflector ON/OFF valve
6. TurboFiller suction ON/OFF valve
7. Pump
8. Main tank
9. EasyClean filter
10. RinseTank
11. Spray valve
12. CycloneFilter
13. TurboFiller
14. Lance for cleaning TurboFiller
15. Safety valve
16. Internal tank cleaning nozzles
17. Agitation tube
18. Return line for boost function
19. TurboFiller to tank tube
20. RinseTank coupler
21. DynamicFluid4 pressure regulation valve
22. One-way valve
23. Drain valve
24. Sprayer boom
25. Flowmeter
26. Distribution valves
27. Sensor for pressure gauge
28. Suction Inline filter
29. Suction In-line filter
30. Main tank gauge sensor
31. Pressure draining coupler
32. FastFiller coupler
33. External cleaning device
34. External cleaning ON/OFF valve
35. AutoAgitation valve
36. PrimeFlow ON/OFF valve (optional)
37. Boost valve
38. Ejector
39. Main tank suction ON/OFF valve
40. Boost line ON/OFF valve
41. Pressure relief line
42. Clean valve
43. RinseTank flowmeter
44. External Fast filling ON/OFF valve
45. Main tank full sensor
46. Turbofiler ON/OFF valve
47. RinseTank full sensor

EasyClean filter

The EasyClean filter is fitted in the working zone. It has a built-in valve that automatically closes when the filter is opened.
To open filter, turn the handle counterclockwise and pull it up, as shown in the picture.

Furthermore a clogging indicator of the EasyClean lter is located at the front of of the cab

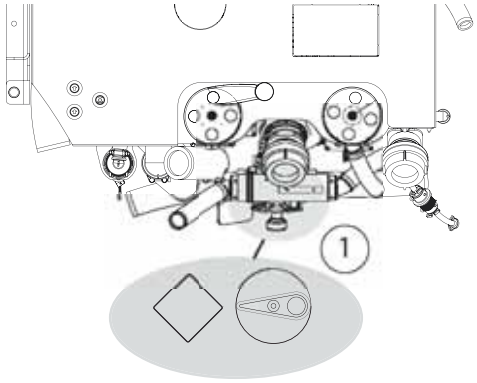


Green indicator = filter clean - no cleaning required

Yellow indicator = cleaning recommended at the end of the spray job

Red indicator = filter clogged - clean immediately

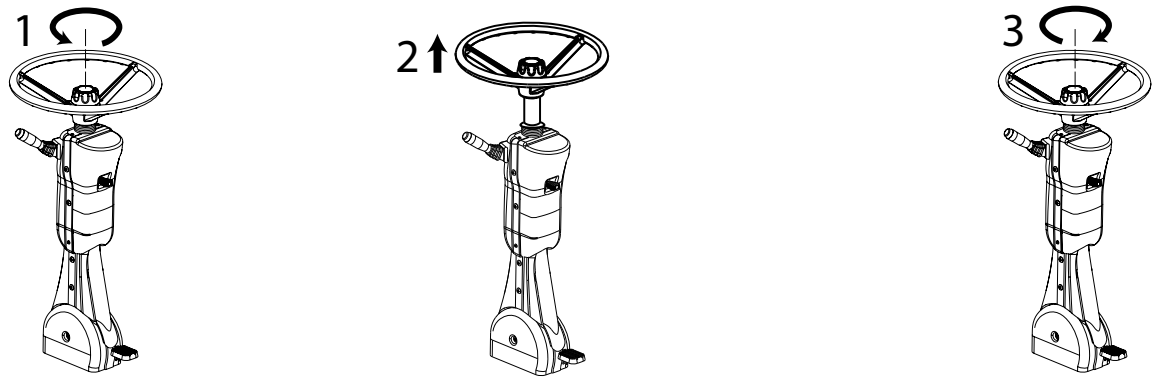
Before opening the easyClean filter it is preferable to close the main tank valve (**1**)



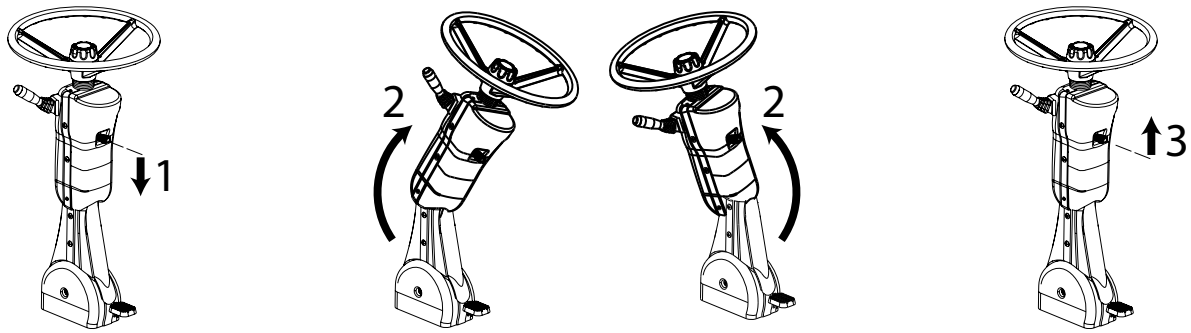
Cab

Steering column adjustment

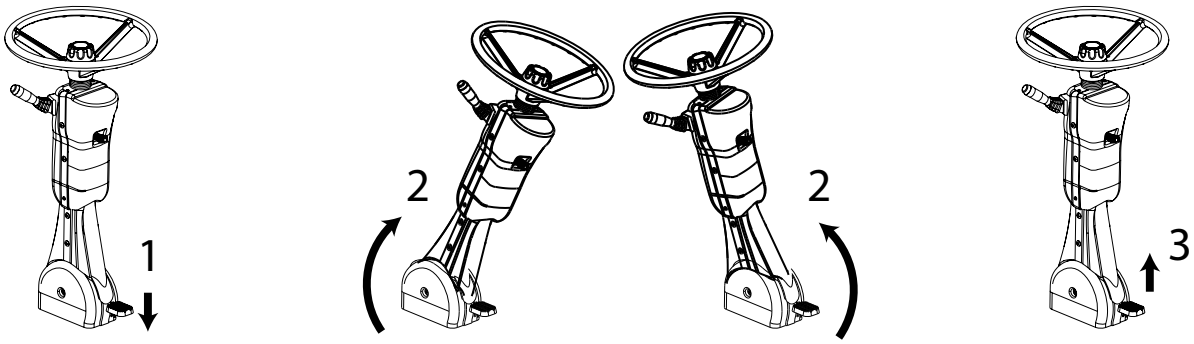
Steering wheel upper adjustment



Steering wheel inclination adjustment

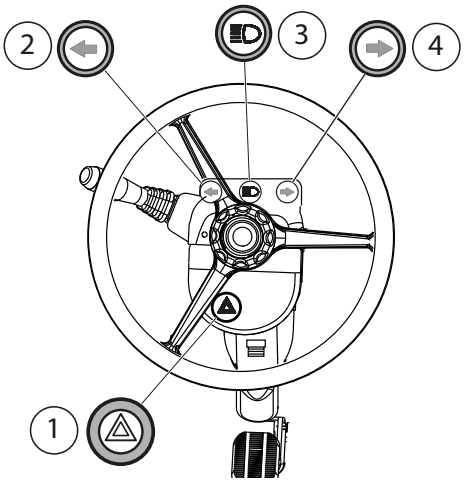


Steering column inclination adjustment

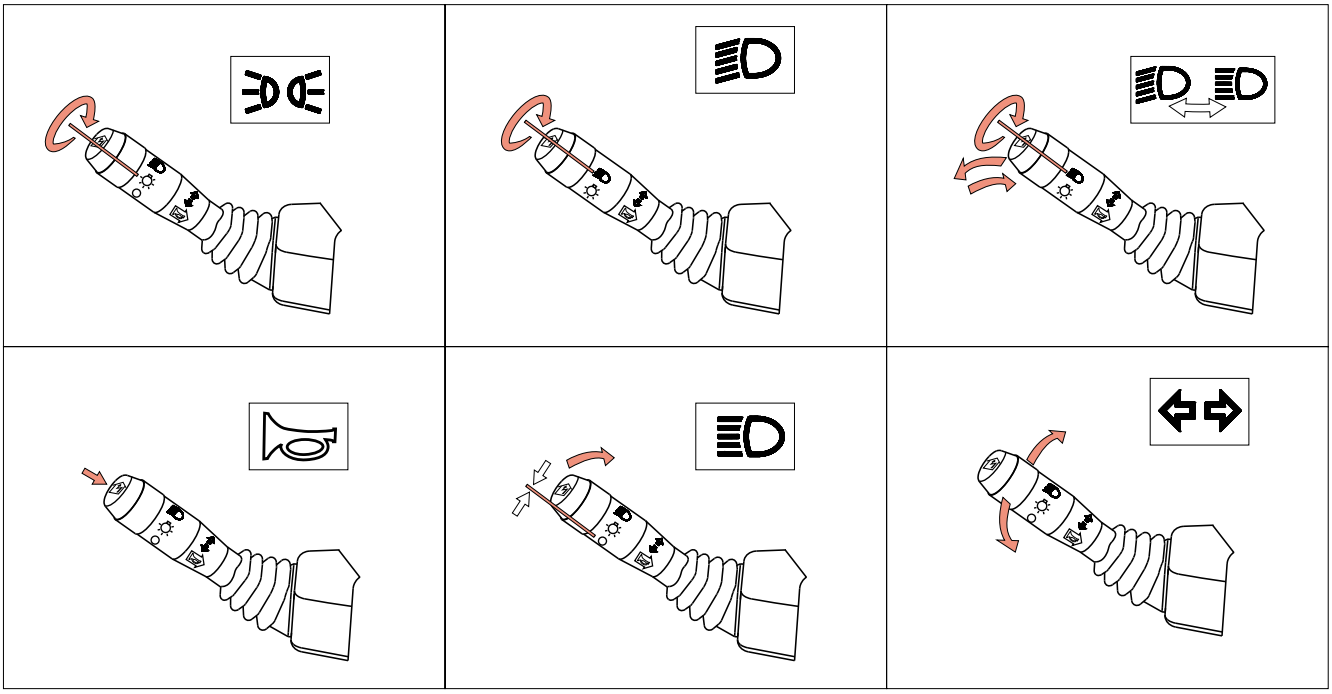


Instruments and steering column lights

1. Hazard light control
2. Left indicator light
3. Main beam light
4. Right indicator light



Lights, indicators and horn controls



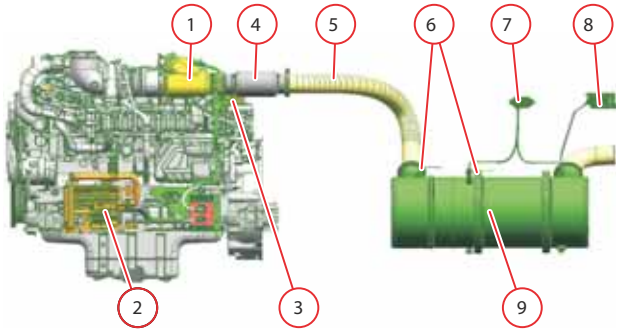
Engine

Diesel Particule Filter (DPF)

Description of the Diesel Particle Filter

Engines DEUTZ TIER 3B. TCD6.1L6 version 160 kw or 180 kw are equipped with a Diesel Particle Filter (DPF). The regeneration of this filter is automatic, without intervention of the user. However regeneration can be inhibited by using an external switch.

1. Burnerr
2. Air compressor
3. Fuel metering unit
4. Flexible exhaust pipe
5. Exhaust pipe
6. Exhaust temperature sensor
7. Differential pressure sensor
8. NOx sensor
9. Diesel particle filter



Principle of operating of the DPF filter

When the level of loading of the filter reaches **100**% of the authorized limiting load, a regeneration of the DPF is necessary. A warning message indicates that the process of regeneration is in progress.

A complete regeneration lasts approximately **25** minutes. After a suceesful regeneration the warning message disappears.

If an interruption of regeneration is necessary or that the launching of regeneration must be prohibited (maintenance in a workshop for example), the operator can use the external control of inhibition.

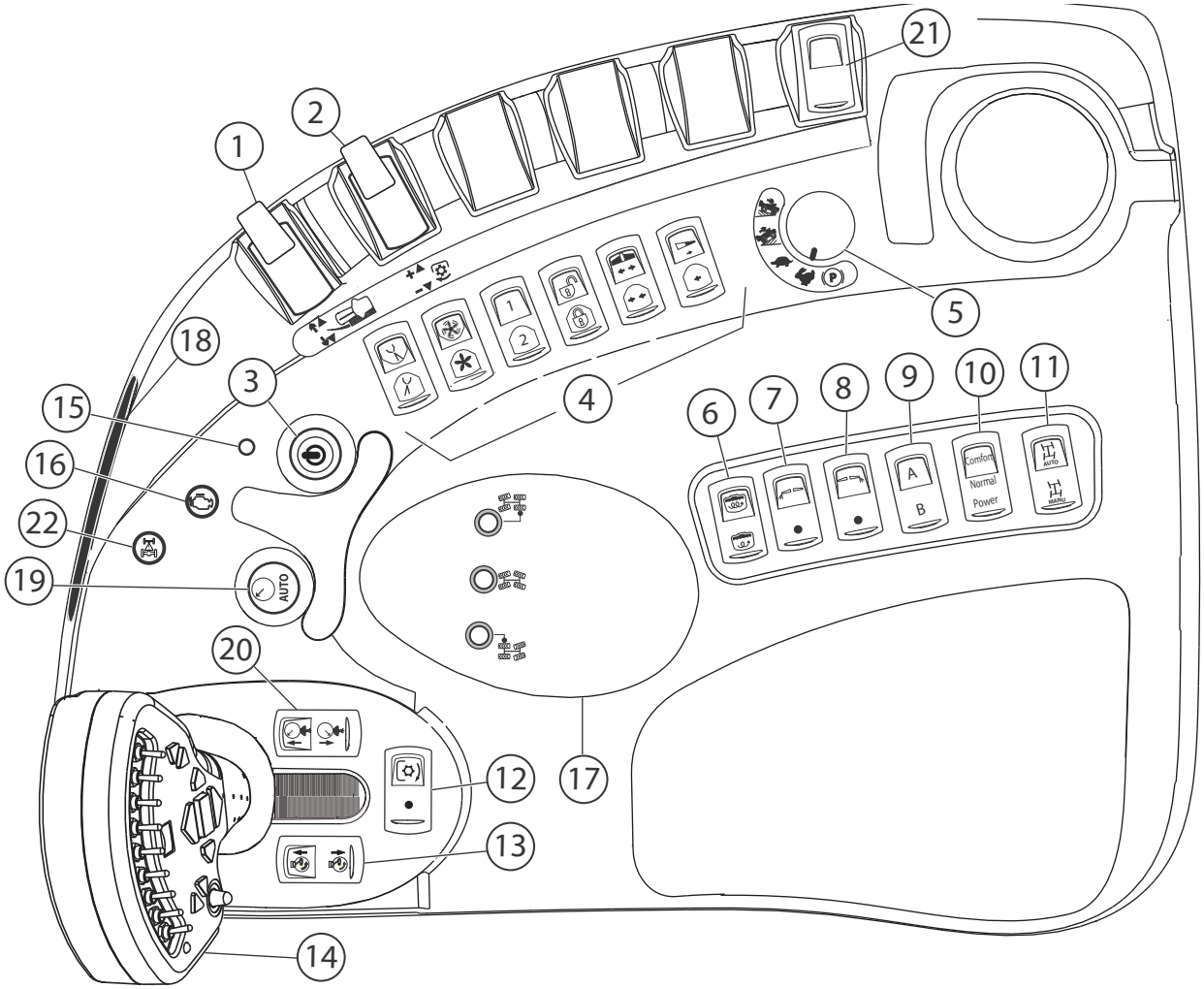
If a regeneration is not completely finished, the request for regeneration is always active and the message of regeneration remains displayed.

As long as the external inhibition switch is activated, the regeneration of the filter is impossible. The warning message appears on the screen.

According to the time of interruption, the next regeneration of the filter will be able required the maximum duration authorized to be complete.

If the external inhibition switch is activated in a permanent way, the loading of the DPF filter continuous to increase. We inform you that will lead to a reduction of the power and possibly of other limitations of performances, such as for example the limitation of the speed engine. This generates a engine faulty which will be recorded in the engine controller.

Instrument panel description

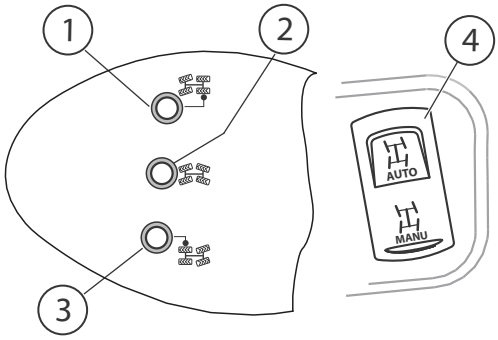


1. Open/Close gangway control
2. Spray pump rotation speed adjustment control
3. HC9500 controller On/Off control
4. Boom hydraulic and TWIN control
5. Speed selector and parking brake
6. Main tank agitation control
7. Left end nozzle control control
8. Right end nozzle control control
9. Guide device On/Off control
10. Driving mode control
11. Automatic 4-wheel drive system On/Off control
12. Spray pump clutch control
13. Engine speed variation control
14. Multi-functional grip
15. Controllers activated indicator
16. Engine fault indicator
17. Control panel for 2/4 wheel steering
18. Ash pan
19. Volume rate adjustment in AUTO mode
20. Volume rate control in MANUAL mode (+/-)
21. Anti-Skid (SAPE) control
22. Anti-Skid (SAPE) indicator

4-wheel steering mode

4-wheel drive with automatic realignment and locking on road. This equipment is optional

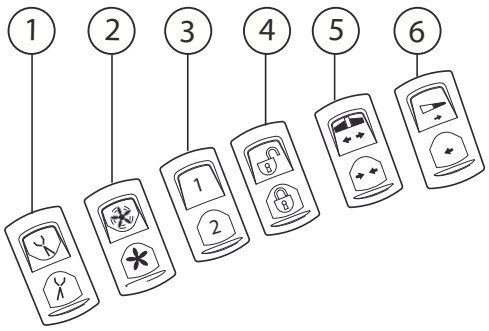
1. Green indicator for rear wheels aligned.
2. Blue indicator for 4-wheel drive in operation.
3. Green indicator for front wheels aligned.

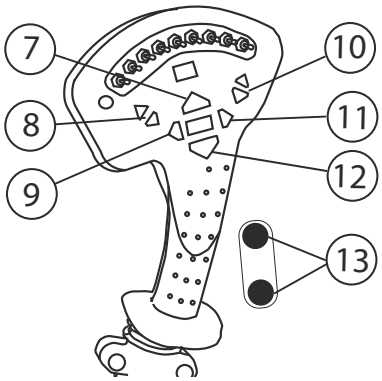


HAZ boom hydraulic function controls

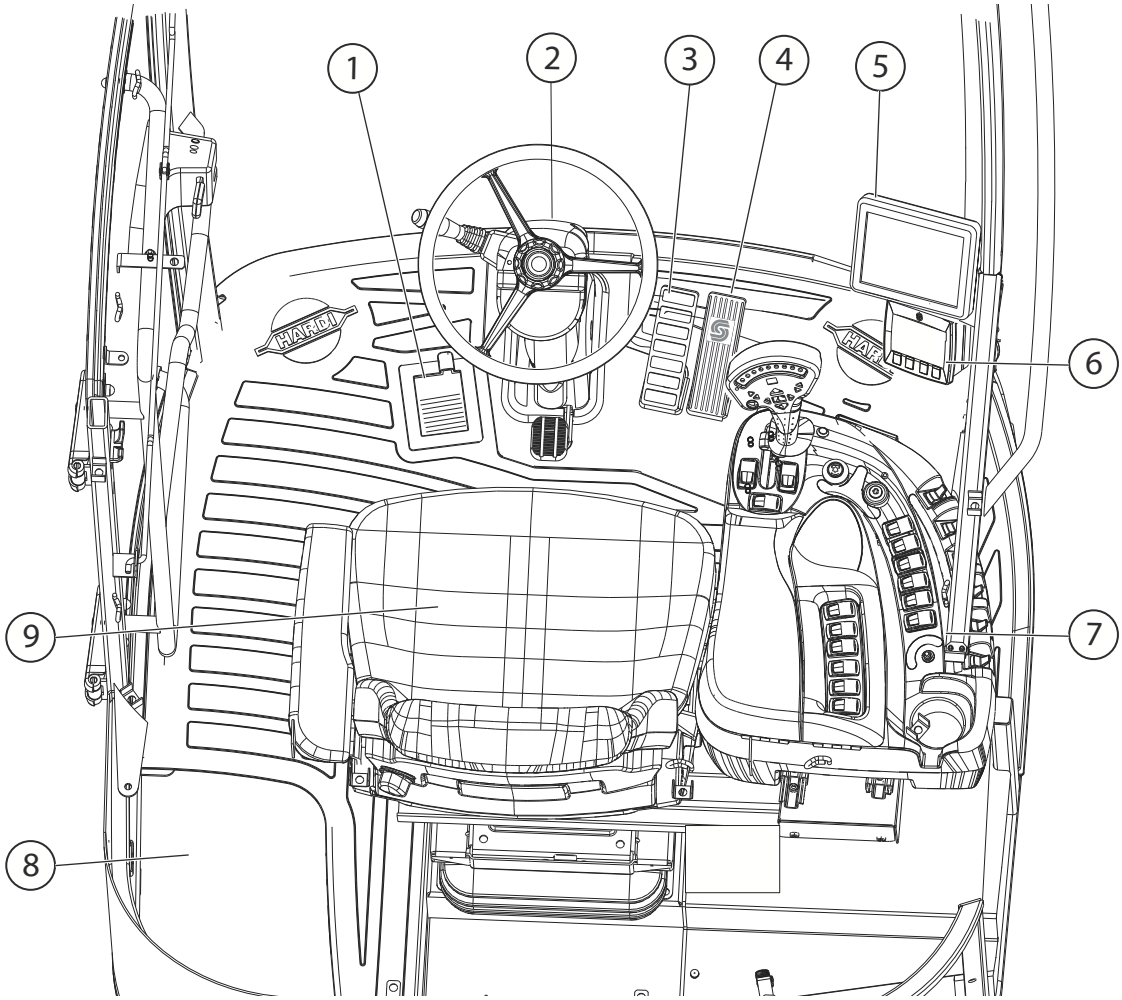
This configuration relates to sprayers equipped with the HAZ central frame with simultaneous control of the inner and outer sections.

1. Air outlets inclination control control
2. Blower speed variation control
3. TWIN memory 1 and 2
4. Pendulum lock control
5. Inner section control
6. Outer section control
7. Boom lift
8. Boom tilt left
9. Left slant
10. Boom tilt right
11. Right slant
12. Boom lower
13. TWIN memory 1 and 2

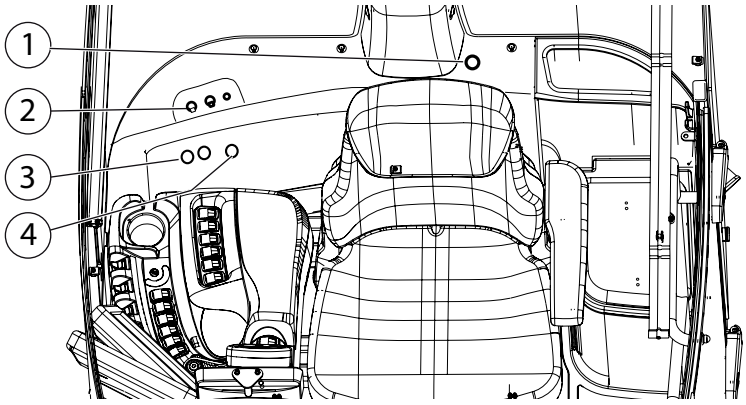




General description of operator's seat

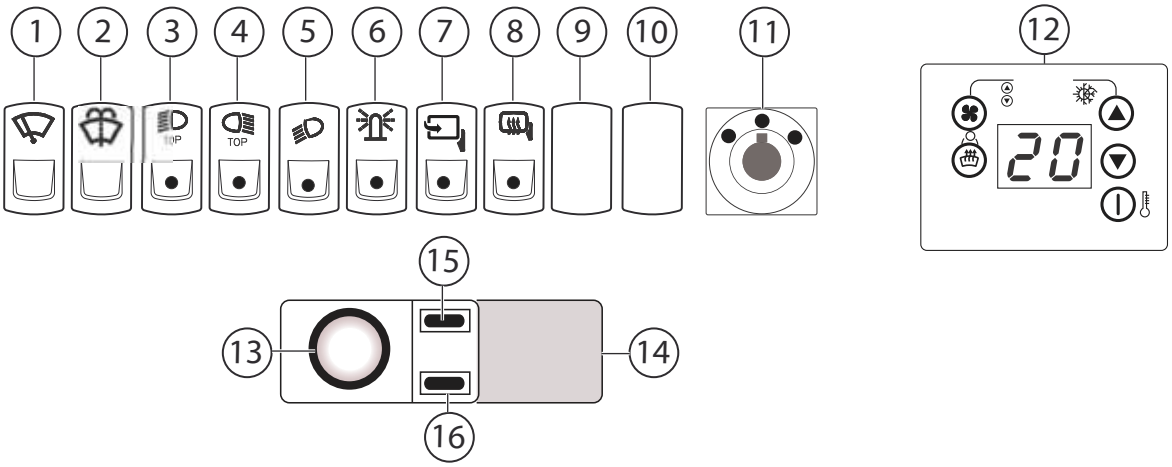


1. 4-wheel drive control pedal
2. Adjustable steering column
3. Brake pedal (optional)
4. Throttle pedal
5. HC9500 ISOBUS console
6. Multi-function display
7. Side console
8. Refrigerated lunch box
9. Adjustable driver's seat



1. Cigarette lighter socket
2. 12 V sockets
3. Diagnostic socket
4. Diagnostic socket

Cab ceiling controls

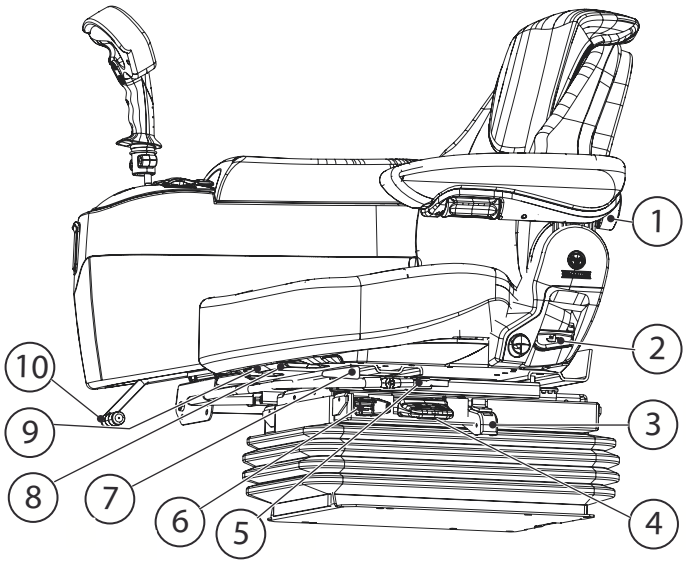


1. 2-position windscreen wiper switch (permanent, intermittent)
2. Windscreen washer switch
3. Front working headlights switch
4. Rear working headlights switch
5. Boom lighting switch
6. Hazard light switch
7. Not used
8. Wing mirror defrost switch
9. Not used
10. Not used
11. Wing mirror adjustment switch
12. Cab air conditioning control panel
13. Swivelling "map light" switch
14. Internal cab lighting
15. 3-position ceiling light switch (on, off, door)
16. "Map light" switch.

3 - Description Evo EcoDrive

Description of driver's seat

ALPHA Evo Ecodrive is fitted with high quality professional seats. A user guide for the seat is supplied separately. You should read it in full before using the vehicle for the first time, and comply with the safety instructions on how the seat operates.



1. Adjusting the backrest
2. Adjusting the inclination of the backrest
3. Seat damping
4. Weight + seat height adjustment
5. Rotation mechanism
6. Horizontal damper
7. Lengthwise adjustment
8. Seat inclination adjustment
9. Seat depth adjustment
10. Lengthwise adjustment of console

NOTE! The numbers in brackets correspond to the description in the GRAMMER seat user manual.

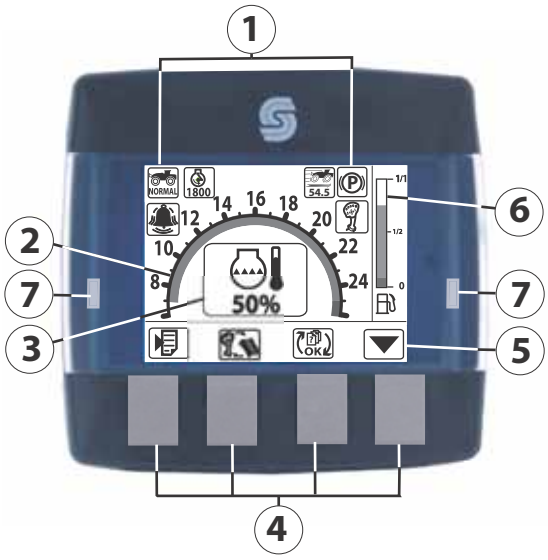
Multi-function display

The multifunction display manages the datas for the engine and the hydraulic transmission of the self-propelled, such tachometer, engine temperature, hydraulic pressure, fuel level, etc ...).

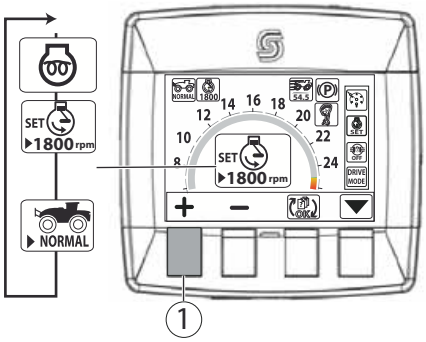
It also allows you to select operating modes (speed limits, traction control, etc ...), and alarms related to the engine and hydraulic transmission.

Displaying the main functions

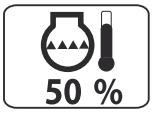
1. Status icons
2. Engine rev counter
3. Display the transmisssion and engine functions
4. Selection and controls buttons
5. Horizontal menu control
6. Vertical menu (Status and fuel gauge)
7. Alarms



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



Icons in normal operating mode

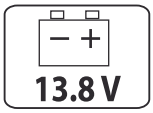


Engine temperature

0 to **100**%.

Travel speed limitation in AUTOMOTIVE mode [ROAD]

Engine oil pressure



Battery charge voltage

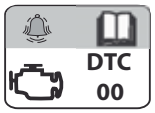
Turbocharger pressure

Engine hourmeter and maintenance periodicity

Fuel consumption

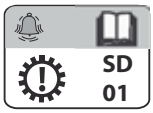
H ydraulic transmission pressure

0 to **450** bar



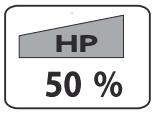
Number of engine toubles

See“Engine faulty” page 131.



Number of transmission troubles

See“Transmission errors” page 129.



Available engine power
0 to **100** %
See“Engine Power” page 69.

Clogging level of the particle filter

See“Diesel Particles Filter (DPF)” page 58.

EcoDrive ON

See“EcoDrive mode” page 68.

EcoDrive mode OFF

See“EcoDrive mode” page 68.

Warning Icons

See“Power Transmission limitation” page 70.

Engine preheating

This icon is displays if the ambient temperature is very low

See“Starting up and shutting down the engine” page 56.

Diesel Particles Filter in operation

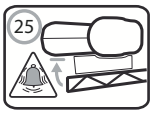
See“Diesel Particles Filter (DPF)” page 58.

First maintenance

See“Maintenance intervals” page 101.

Periodicity maintenance

See“Maintenance intervals” page 101.



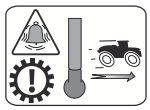
Travel speed limitation to **25** km/h

See“Retracting the gangway” page 64.

Transmission power limitation

Engine Air Filter clogged

See“50 hours – air intake filter” page 110.



Overheating of the hydraulic circuit

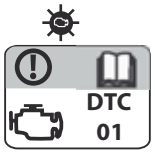
See“Hydraulic circuit overheating” page 70.

Water in the water trap of the fuel pre-filter

See“500 hours – Fuel prefilter” page 110.

Description of engine alarms

This icons are automatically displayed when at least one or more errors occurs on the engine or the Diesel Particules Filter This alarms require a shutdown as soon as the machine to prevent the deterioration of the engine or the Diesel Particules Filter



Engine failure

Regeneration failure

See"Diesel Particles Filter (DPF)" page 58.

Diesel Particules Filter disabled

Driving mode

Travel speed limitation in FIELDS mode

See"Limitation of travel speed in FIELDS mode (Fields-Uphill-Downhill)" page 66.

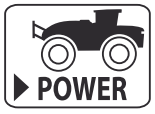
Travel speed limitation in AUTOMOTIVE mode

Engine RPM limitation

See"Limitation of the engine speed" page 68.

Driving in [**FIELDS**] mode

See"'COMFORT - NORMAL - POWER' driving mode" page 65.



Driving in [**POWER**] mode
See"'COMFORT - NORMAL - POWER' driving mode" page 65.

Driving in [**COMFORT**] mode

See"'COMFORT - NORMAL - POWER' driving mode" page 65.

DiffLock or SAPE anti-skid disabled

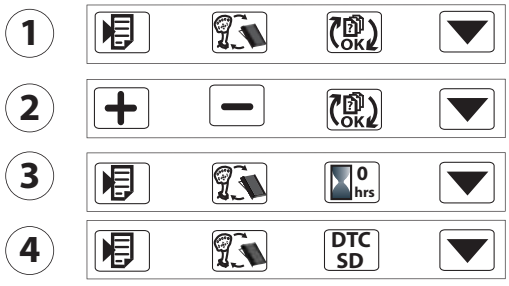
"SAPE Anti-skid (Optional)" page 69

DiffLock or SAPE anti-skid in enabled
"SAPE Anti-skid (Optional)" page 69

Horizontal bar menu description

Press the button to select the menu corresponding to the icon

1. Normal mode in operation
2. Settings bar menu
3. Hourmeter bar menu and drive control
4. Management of engine (**DTC**) and transmission troubles (**SD**)

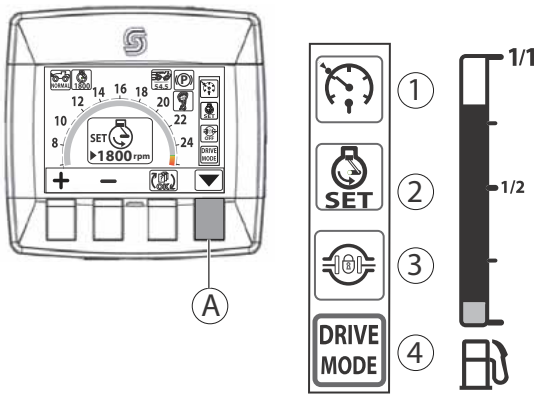


3 - Description Evo EcoDrive

Vertical bar menu description

Press the button **(A)** to display the vertical bar menu :

1. Travel Speed limitation
2. Engine RPM limitation
3. Anti-skid control (SAPE or Diff-lock)
4. Selection of the Drive mode



Differential lock (Diff-Lock)

DiffLock Operating principe

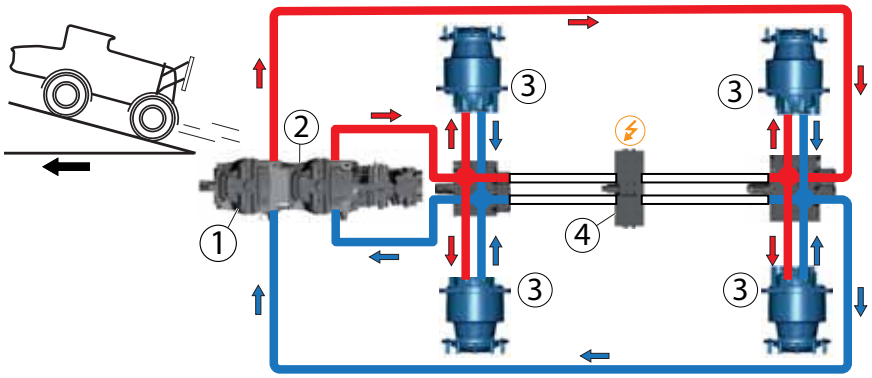
The **Diff-Lock** system is only suitable on ALPHA Evo EcoDrive versions **40** or **50** km/h. The controller drive a hydraulic valve " located between the front and rear hydraulic circuit. When the valve is controlled, the hydraulic circuit of each pump becomes independant. Conversely when the valve is disabled, the flow of 2 pumps is uniformly distributed through the circuit.

The differential lock **Diff-lock** is only engaged in **FIELDS** mode.

When the **AUTOMOTIVE** (Road) or **PARKING** mode is selected, the differential lock is automatically disengaged

The regulation of the differentail lock régulation is automatically disengaged, when the travel speed is more than **15** kph.

1. Hydraulic pump no1
2. Hydraulic pump no2
3. Hydraulic motors
4. Differential lock valve (Diff-lock valve)



SAPE anti-skid

SAPE Operating principe

The **SAPE** is suitable on versions **25** kph, **40** or **50** kph.

The **SAPE** system consists in supervising the number of revolutions of each one of the hydraulic motor, and if necessary, limit the oil flow on the motor of which speed is higher than different (skating). The oil flow is thus distributed on the motors of which the conditions of adherences make it possible to maintain the rate of advance of the motorized one.

To optimize the regulation in the turns, the controller is equipped with angular sensors placed on the front and rear axle of the machine.

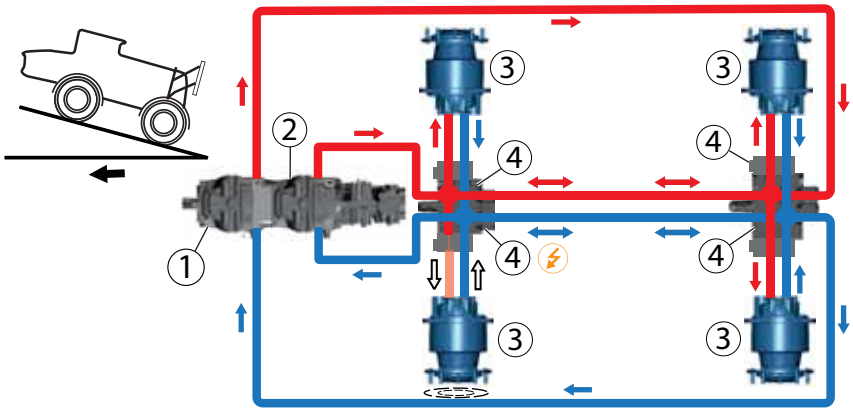
The anti-skid regulation is automatically suspended, but it remains active, when the travel speed is higher than **20** kph.

In the event of faulty operation of the system, the regulation is automatically disabled and an error message is displayed on the screen.

Overview

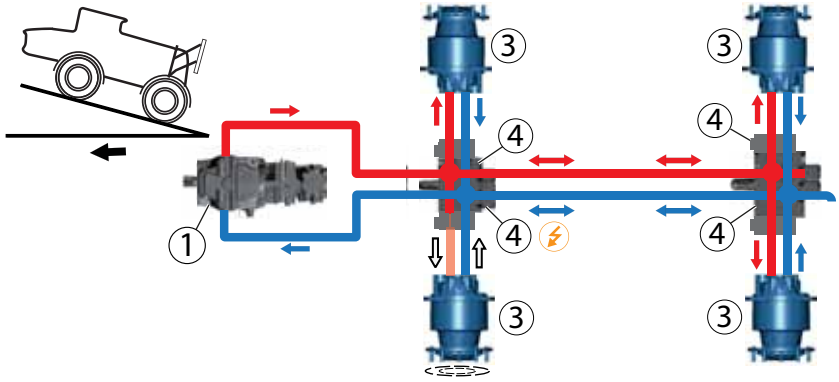
40 or 50 kph

1. Hydraulic pump no**1**
2. Hydraulic pump no**2**
3. Hydraulic motors
4. Regulation valves



25 kph

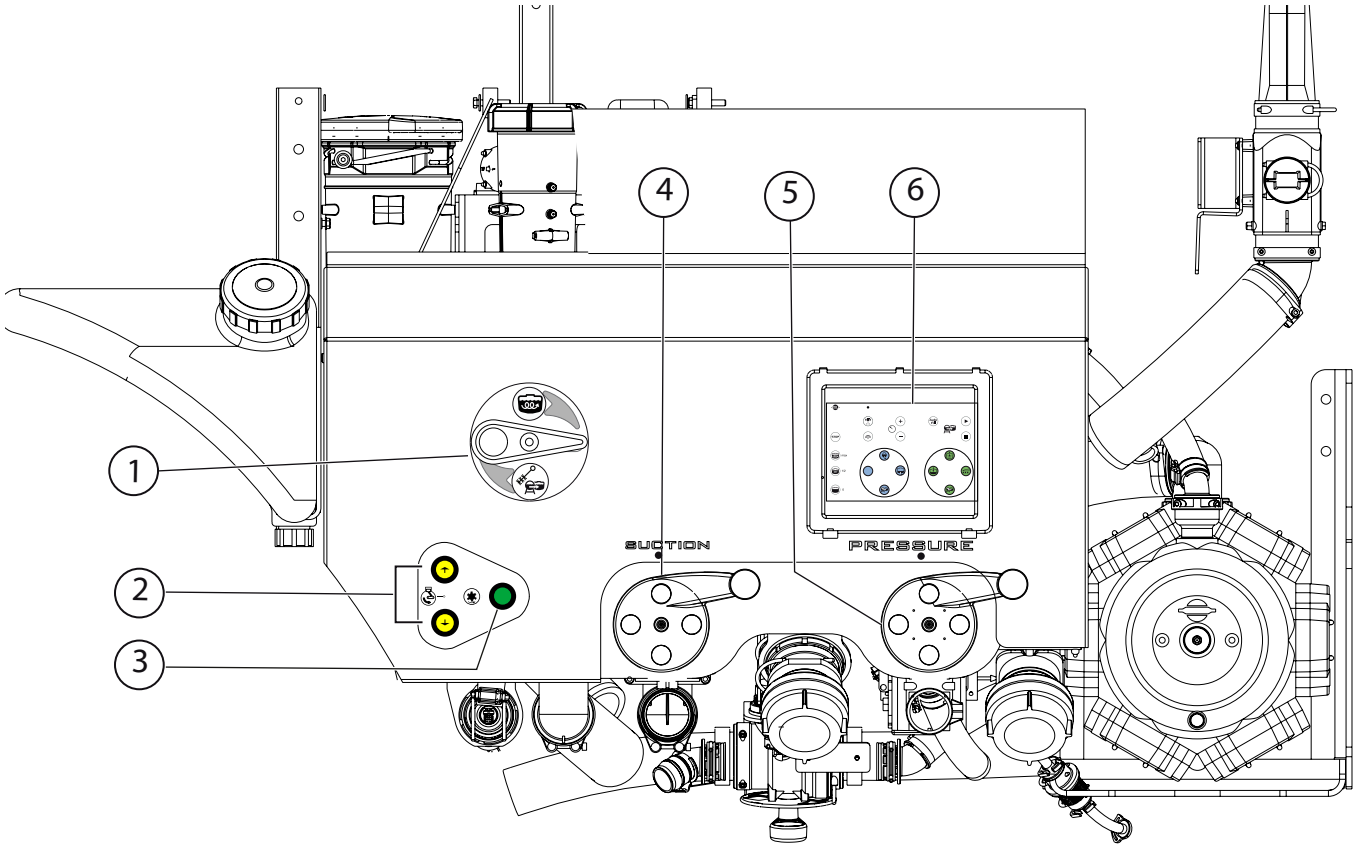
1. Hydraulic pump
2.
3. Hydraulic motors
4. Regulation valves



3 - Description Evo EcoDrive

Sprayer description

External controls



1. Agitation
2. Engine speed external control
3. Spray pump control
4. SmartValve Suction valve
5. Pressure valve
6. Fluid Box

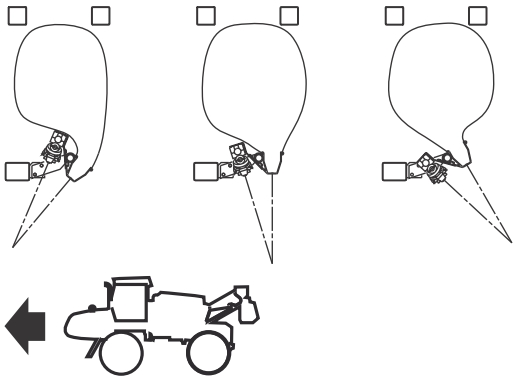
TWIN air assistance

General information

With TWIN air assistance, energy is added to the spray droplets to improve control with the spray liquid. The main purpose of the TWIN angling system is to counteract the negative influence which wind direction and driving speed have on the quality of the spray job. It can also help "open" of dense crops for better penetration.

This way TWIN makes it possible to:

- carry the spray droplets safely to the target and increase plant deposit
- minimise off-target deposit due to wind drift or loss on the ground
- open the crop and obtain good penetration even with a low volume rate
- ensure a high coverage



The TWIN air assistance can be adjusted to any angle from 40° forward to 30° back (defined by the air stream). The air speed is variable and can be adjusted from 0 to 35 m/s along the entire width of the boom. This equal a flow of 0 to 2000 m3 air/m of boom/hour.

General information

Unloading the sprayer from the truck

NOTE! The machine can only be unloaded if the engine is running. It cannot be towed if the engine is not running (parking brake engaged when engine is stopped).

WARNING! Ensure that no one is parked near the unloading area.

WARNING! The machine can only be unloaded if you are familiar with the method described below.

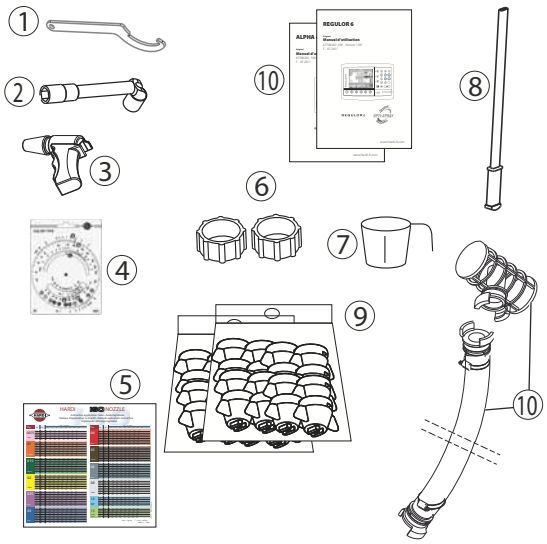
Method

- Turn the battery switch to supply the machine's electrical and electronic circuits.
- Move the grip to neutral and check that the parking brake is on.
- Turn the contact key to start the engine and accelerate to at least 1600 rpm. .
- Turn the speed selector from the [PARKING] position to the [FIELDS] position.
- Push the grip gently forwards or backwards to move the machine in the required direction.

Accessories

Some accessories are supplied separately with the machine. The list varies according to the equipment and options:

1. Key for tightening the external connectors
2. Wrench
3. Multi-jet spray (1)
4. ISO nozzle disc
5. Table of ISO nozzle flow rates
6. Drain plugs (rinse tank-hand wash tank-storage box)
7. Graduated cup
8. Hydraulic pump lever (brake release - open the bonnet)
9. Nozzles (2)
10. Instruction books (3)
11. External suction hose and filter
12. Emergency pushbutton (5)



(1) Optional hose reel
(2) Variable according to nozzle type and quantity ordered
(3) The number of manuals varies according to the equipment

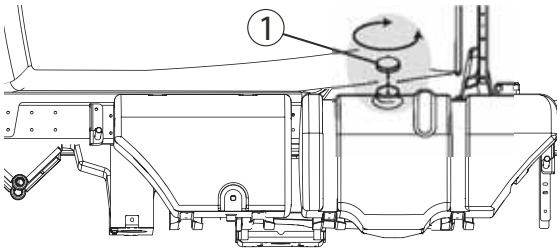
Precautions before putting the sprayer into operation

Your sprayer is protected by a resistant lacquer coat. However, we recommend regular application of a layer of anti-corrosion lubricant on all metal parts to avoid plant protection chemicals and fertilisers damaging the paintwork. If this is done before the sprayer is put into operation for the first time, it will be easier to clean the sprayer and keep the paintwork clean for many years. This treatment should be carried out every time the protection film starts to wash off.

4 - Sprayer setup

Filling the fuel tank

The fuel tank has a 320-litre capacity. Before filling, shut down the engine and do not smoke. Clean the plug **(1)** carefully so that no impurities can enter the tank. Use a funnel if necessary.

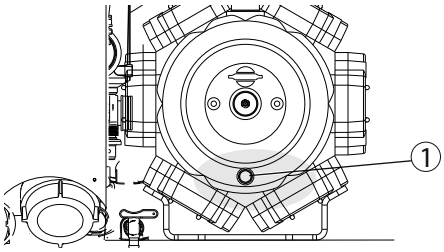


NOTE! Before a prolonged stop, we recommend filling the tank to avoid condensation.

NOTE! The electronic fuel injection engine complies with the TIER3 B standard. Fuel that complies with the standards in force should therefore be used.

Spray pump

- Screw the 2 plugs **(1)** to the diaphragm pump.



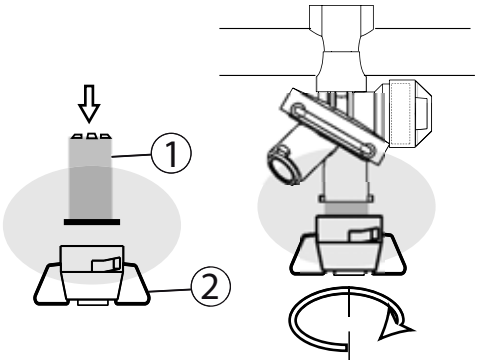
CycloneFilter

The filter is **80** mesh as standard. However, you can use different sized filters, such as **50** or **100** mesh if necessary. Check the condition of the seals, grease and lubricate them if necessary before refitting them.

Fitting the nozzles

To choose the correct nozzle for use and to achieve optimum spray quality according to the restrictions of the application and environment, see the SPRAY TECHNIQUES book and Also see section “Tableau de buses ISO” page 113

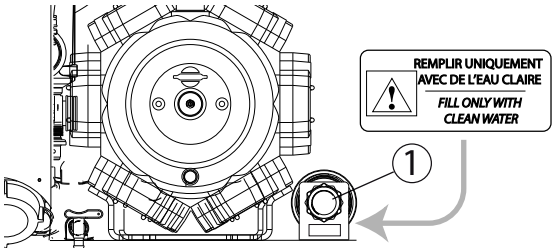
- Place the nozzle filter **(1)** in the nozzle nut **(2)**
- Fit the nozzles equipped with their filters to the nozzle holder, by turning the nut a 1/4 turn.



Filling the rinse tank

The rinse tank may be filled under pressure by connecting a hose directly to a threaded connector (***1" cylindrical gas fitting)*** **(1).**

A one-way valve prevents the tank from draining

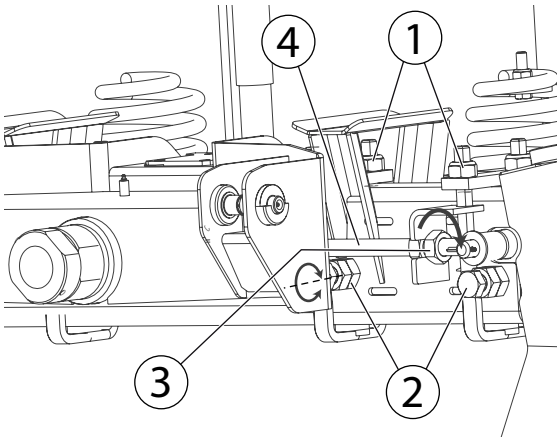


Adjusting the track gauge

The track gauge of the ALPHA Evo self-propelled vehicle can be adjusted by mechanical axle gliding according to the table below

Base axle	Possible track gauge (m) (1)
S	1.80 to 2.20
M	2.00 to 2.40
L	2.25 to 2.70
XL	2.65 to 3.10

(1) with 300/95R46 tyres.



- Loosen the clamp nuts **(1)**
- Loosen the axle locking screws **(2)**.
- Adjust the axle slide by moving the adjustment rod (not shown in picture).
- Loosen the counter-nut **(3)** and adjust the length of the steering rods **(4).**

NOTE! Ensure that the sliding axle adjustment is the same on both sides of the machine.

ATTENTION! If the steering rods are too short, they must be replaced. Consult your dealer.

Tyre pressures

- Check the tire pressures

WARNING! An incorrectly inflated tyre could burst and wears out more quickly.

TWIN air assistance

Adjusting the air assistance

The air flow rate and the air flow direction should always be adjusted individually for each spraying operation and according to weather conditions. It is always a good idea to get used to a new sprayer out in a field with only clean water in the tank, following this procedure:

1. Start with the vertical angle
2. Set the air speed: see section "Adjusting the air speed"
3. Select the best angle: see section "Air flow and nozzle angle"
4. Fine tune the air speed: see section "Adjusting the air speed"

ATTENTION! Fine tuning of air speed and angling will often be necessary all through the spraying job.

ATTENTION! It is easiest to find the best air setting to reduce drift when the sun is low and behind the boom (backlight). These conditions make the drift more visible.

Adjusting the air speed, rules of thumb

Step 1:

Find the range of air speeds that can control drift.

1. Start with the air setting at zero and keep increasing the air speed just to the point where you can see that the drift cloud is minimised - note the minimum setting.
2. Then increase the air flow rate until you see drift again - note the maximum setting.

The range of air flow rates that should make it possible to obtain the least drift is now defined.

Bare ground/low vegetation: The range of air speeds is usually very small.

Taller crops: The taller the crop the wider the range of air speeds that can reduce

drift.

At high wind speeds: the sprayer requires more air flow. It is also recommended to drive more slowly and to lower the boom as far as it will go (**40** cm).

Too high air flow over bare ground/low crop can cause reflection of the spray liquid and leave dust on the leaves of plants, which can again reduce the effect of the plant protection chemicals.

Step 2:

Adjust the optimum air flow rate within the range of possible rates mentioned above.

Air flow rate recommendations:

Bare ground/low vegetation: Define the maximum air flow within the possible range.

Taller crops: A higher air flow rate in the sprayer encourages penetration (if in doubt, check with moisture sensitive paper).

Forward speed: A higher air flow rate is required in the sprayer in the case of higher forward speed.

Application volume: Lower application volumes require more air assistance to prevent drift.

Angling of air and nozzle flow, rules of thumb

To control wind drift the influence of wind speed and wind direction as well as the horizontal air current around the boom due to forward speed must be minimised. Because it is a sum of two forces with variable direction and size that we have to counteract for, the following can only be very rough guidelines.

Wind direction:

Head wind: Angle forward.

Tail wind: Angle back (if the forward speed is higher than the wind speed: angle forward).

Side wind/no wind: Angle vertical or back. Only high forward speeds may require forward angling.

Types of crops:

Bare ground/low vegetation: Low air speed and angling back will often be the best setting to avoid reflection of spray liquid.

Dense crops: The angling feature is ideal to help open the canopy and improve penetration. If you follow the crop movement as you are varying the angling you will find the right setting.

If the wind speed, wind direction or forward speed changes during spraying, the angling must be

changed too. With certain combinations of air flows and angling there is a risk of "closing" or flattening the crop and making penetration impossible - follow the crop movement intensively, especially when adjusting the air assistance and keep an eye on the crop throughout the spraying operation.

- It is essential for the operator to be familiar with the basic rules above before using the TWIN.
- All volume rates, pressures and air adjustments stated in the following tables are given for information purposes. Special conditions regarding climate, crop type, spraying positioning and chemical applied can change this information. The tables show practices in northern Europe, and conditions may be very different in other countries. If you want some local advice, please contact the TWIN application expert in your country.
- As a general rule, the application volume may be half of the application volume used with a conventional sprayer, with a minimum of 50- 60 l/ha at 7-8 km/hr. This does not apply to weedkillers and liquid fertilisers whose selectiveness is based on large droplets that only cling to weeds.
- Drift limitation nozzles can also be used on a TWIN. They contribute to reducing drift.
- Observe all specific instructions about droplet size, operating pressure, application volume etc. that may appear on the label of the product used.

ATTENTION! It will sometimes be necessary to drive with two different anglings, so the angling is changed when making a half turn at the end of the field.

Water sensitive paper

USE PAPER THAT IS SENSITIVE TO WATER TO HELP FIND THE BEST AIR SETTING.

The best way to learn to use the TWIN is to conduct tests with clean water on different crops, checking the application with paper that is sensitive to water. The paper can be cut into smaller pieces and fixed with double sided tape at relevant places in the crop to simulate the target. Then spray with clean water and check the blue spots (droplets) on the paper. This way you can test different application techniques. Moisture-sensitive paper is available at your local HARDI dealer, part No. 893211.

Transport

Transport position

The boom position can be adjusted for transport to obtain the required height.

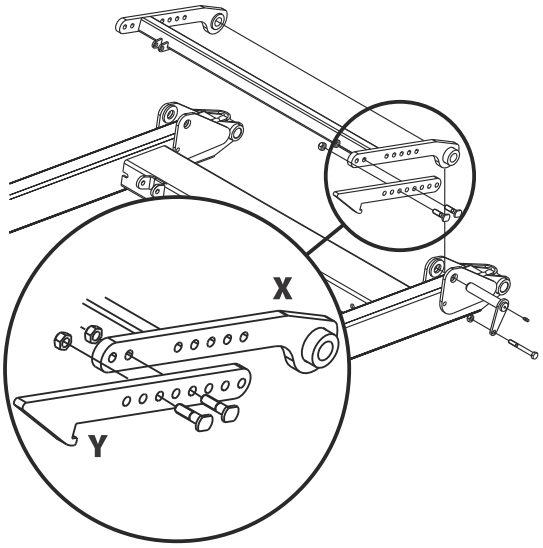
¨To change the position:

Lift the boom and unfold the inner sections until the transport hook is disengaged.

Lower the boom completely.

Loosen and remove the two bolts, which keep the parts (X) and (Y) assembled.

Reassemble parts (X) and (Y) according to the desired position.



ATTENTION! Always put the two bolts back in position. The position must be identical on both sides.

ATTENTION! The settings of the rear brackets must correspond to the settings of the front brackets in such a way that the boom rests properly on the two plates.

WARNING! The maximum transport height must never exceed 4 m. Always measure the actual height and choose settings that do not exceed 4 m.

Boom

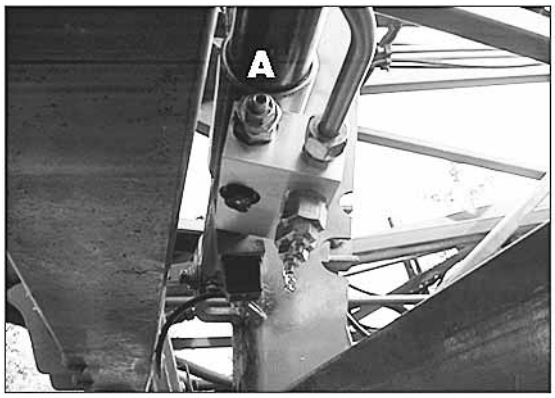
Damping adjustment

When the guide rod setting in "Suspension performance adjustment" is changed, it is possible to carry out more precise adjustment in the field. This adjustment is carried out by using the electric damper control found in the central section of the boom.

The valve (A) is factory set as follows: screwed all the way in, followed by three reverse turns out. With this setting, the suspension immediately responds and the boom movements are independent of the sprayer or the tractor.

For more damping: tighten the valve (A).

For less damping: loosen the valve (A).



Boom folding speed adjustment

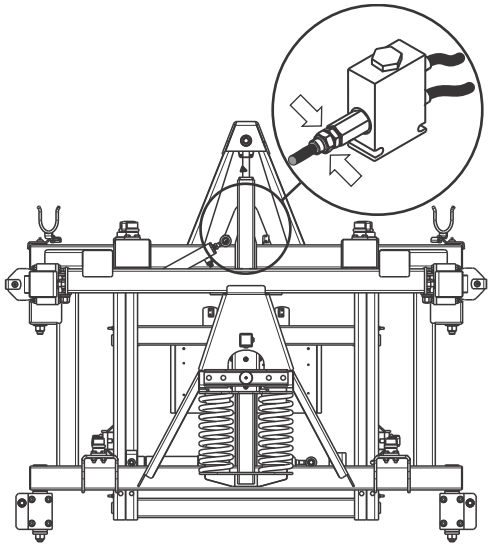
There are two restrictors (one for each boom wing) for adjusting the boom folding speed. The restrictors are located near the suspended pendulum damping cylinder.

The adjusting screw is adjusted as follows:

To reduce the speed: loosen counter-nut (arrowed) and screw the valve (arrowed) inwards. Lock the counter-nut again.

To increase the speed: loosen the counter-nut (arrowed) and screw the valve (arrowed) outwards. Lock the counter-nut again.

ATTENTION ! The hydraulic system must not be pressurized during adjustment.



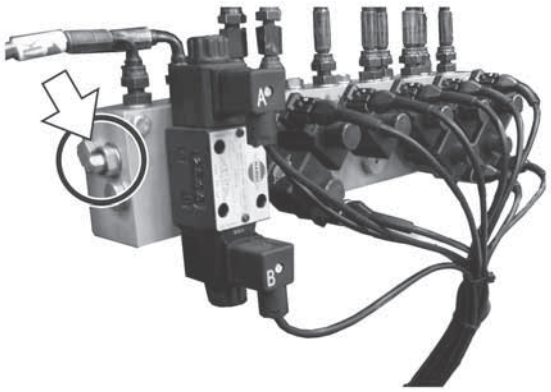
Boom folding speed adjustment - 32-36 m boom only

The restrictor for adjusting the boom folding speed is in the main hydraulics located behind the suspended pendulum springs.

The adjusting screw is adjusted as follows:

To reduce the speed: loosen the counter-nut (arrowed) and screw the valve (arrowed) inwards. Lock the counter-nut again.

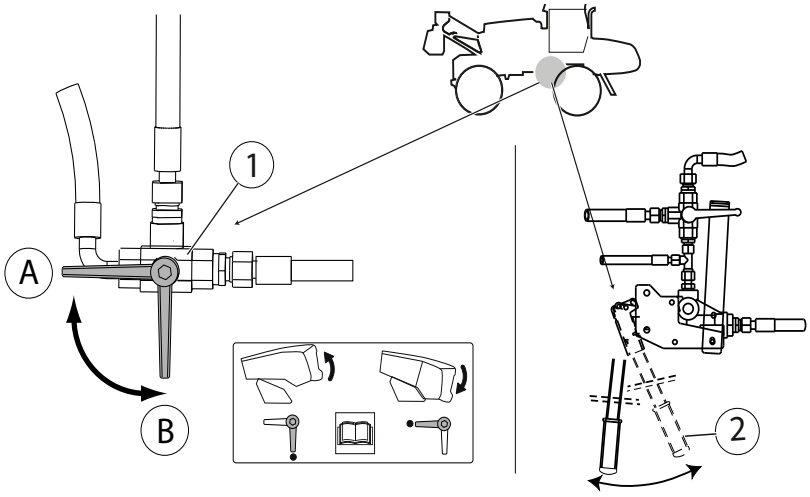
To increase the speed: loosen counter-nut (arrowed) and screw the valve (arrowed) outwards. Lock the counter-nut again.



Driving

General Info

To access to the engine, it is necessary to raise the hood and the side housingr



Opening the hood

Opening the engine bonnet is hydraucally operated as follows

- Check the valve **(1)** is on the position **B**.
- Use the manually operated pump **(2**)to lift and hold open the bonnet to the desired height.

Closing the hood

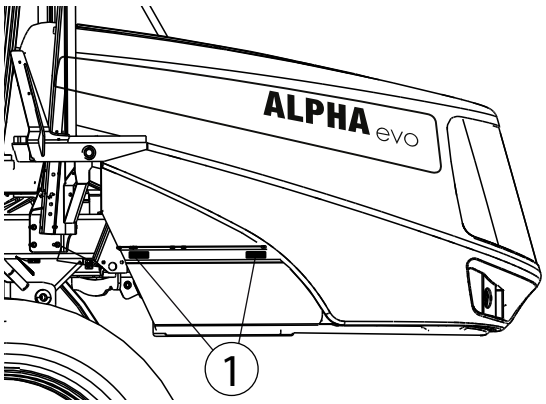
- Gradually turn the handle **(1)** to position **A**

NOTE! The valve must remain in that position when the hood is closed.

Side housing

To remove the side housing first lift the upper housing.

- Pull the handles **(1)** to unlock it.
- Remove the side housing to access to the engine.

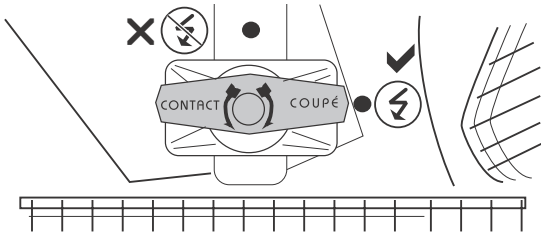


Starting up and shutting down the engine

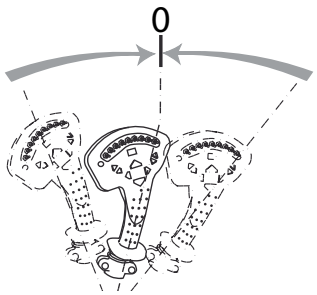
NOTE! Before starting up the engine, check the level of the engine oil, coolant, fuel and hydraulic oil.

Starting up

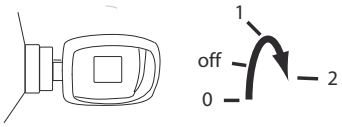
- Turn on the battery switch to [CONTACT] position



- Place the grip in neutral position. A detector ensures safe engine start-up.
- Turn the ignition key to position **[1]** to power the electrical circuits.



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



If errors messages appears on the multifunction display and an audible alarm sounds, you must stop the engine immediately and See "Alarms" page 57.

Always start up engine before starting up HC9500 controller

Shutting down

- Place the grip in neutral position to stop the machine.
- Engage the parking brake.
- Turn the ignition key to position **[0]** to shut down the engine.
- Turn off the electronic controls units.
- Turn the battery switch to cut-off position.

Always turn off HC9500 controller before cutting off the battery switch (risk of damage

Reduce the engine speed for a few seconds to slow down the turbocharger and stabilise the engine temperature.

NOTE! Always extinguish headlights when the engine is no longer running. The battery will quickly run down and the engine will no longer start.

Alarms

Description of priority engine alarms

These alarms indicate serious dysfunction requiring immediate discontinuation of the engine..

Engine overheating

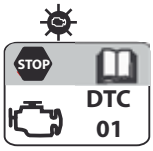
See “Cleaning the radiators” page 109.

Turbocharger pressure

See “Engine faulty” page 131.

Oil engine pressure

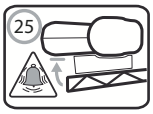
See “10 hours - Lubrificating oil level” page 109.



Internal engine fault

See “Engine faulty” page 131.

Description of others alarms



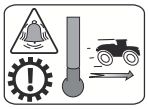
Travel speed limit to 25 km/h
Gangway no retracted

See “Retracting the gangway” page 64.

Regular maintenance

See “Maintenance intervals” page 101.

Limitation of the power transmission
(Hydraulic circuit overheating)



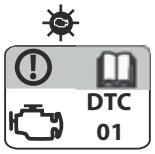
Hydraulic circuit overheating
Limitation of forward speed in ROAD mode

Présence of water in the fuel prefilter

See “500 hours – Fuel prefilter” page 110.

Clogged air filter

See “50 hours – air intake filter” page 110.



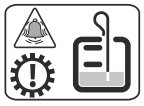
Engine faulty

See “Engine faulty” page 131.

L

Diesel particle filter faulty

See “DPF messages)” page 58.



Hydraulic oil level too low

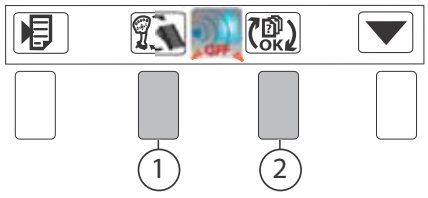
See “Hydraulic oil level” page 104.

L

Canceling the audible alarm

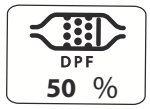
If one or more faults occur, an alarm will sound at the same time as the alarm message. However it is possible to stop the alarm during **15** minutes. It automatically reappear if all defects have not been corrected.

- simultaneously press the 2 buttons to cancel the audible alarm.



Diesel Particles Filter (DPF)

DPF messages)



Less than to **100** %

Information
Clogged level of the DPF in normal operation

Upper 100 %
or every **8** hours

Information !
Regeneration in normal operation

The regeneration lasts : **25** min. on average

Upper 125 %

Service ! !
This message indicates the last stage, where a regeneration can be initiated without service tools. The engine power is reduced by **30**%

Possible causes :

- The regeneration cycle has been interrupted several times
- Release button on **OFF** position
- DPF malfunction (see SPN and FMI engine trouble code)

Upper 143 %

STOP ! !
The DPF is overloaded to an impermissible level. The engine power is reduced by **30** % and limited at **1200** rev/min engine speed.

The filter can only be regenerated via the SERDIA DEUTZ service tool.
Possible causes

- The regeneration cycle has been interrupted several times
- DPF malfunction (see SPN and FMI engine trouble code)
- Active release button

Ash level

Service !
This symbol indicates that the ash loading goes beyond a certain level, the regeneration is not possible.

Please contact your DEUTZ partner.

If a clogged rate of the DPF is higher than **114** % this means it is the first stage failure of the regeneration

Possibles causes :

- Regeneration cycle has been interrupted (engine shut down)
- Release switch on **OFF** position

Regeneration Standstill

If a regeneration is in progress, but that it should be discontinued (maintenance in a workshop for example), you can use the release button located under the hood.

Standstill regeneration

Warning !
No regeneration possible

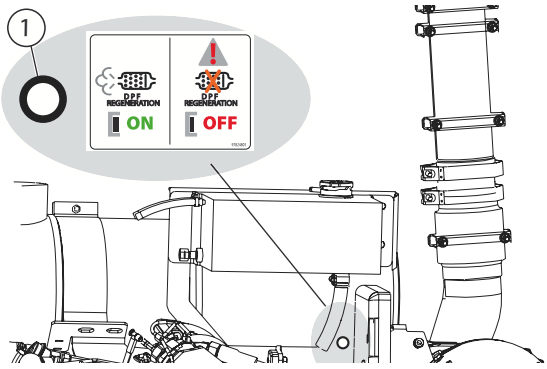
Release button on **OFF** position

Cancellation of the warning message

- Press the button **(1)** to the position **ON**).
  The regereration of the DPF is automatically resume when the conditions of regeneration are combined

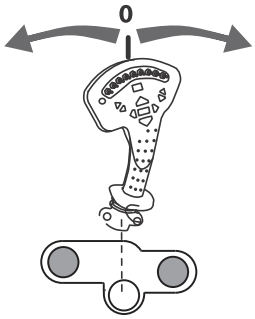
ON = **Active** regeneration

OFF = **Standstill** regeneration



In normal use, the release button should be in the automatic regeneration position **ON**

Travelling and braking



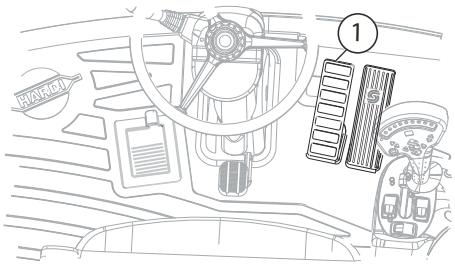
The machine is move forward as follows :

- Fold away the gangway (if equipped).
- Turn the speed selector to exit the parking brake.
- Increase the engine speed if the speed selector is in FIELDS mode (Fields - Fields Uphill or Fields Downhill).
- Push the grip to move ahead or backwards to reverse the machine.

version 25 km/h - hydrostatic brake

- Pull the grip towards neutral to make the machine brake (hydrostatic braking). The machine comes to a complete stop when the grip is in neutral position.

Version 40 or 50 kph, - Dynamic brake :



- Gradually press the brake pedal **(1)**.

The system will respond in order to achieve the best braking performance. If the brake is applied until the machine comes to a complete stop, in order to move again you should pull the grip into neutral, then push it or pull it to start again in forward or reverse gear.

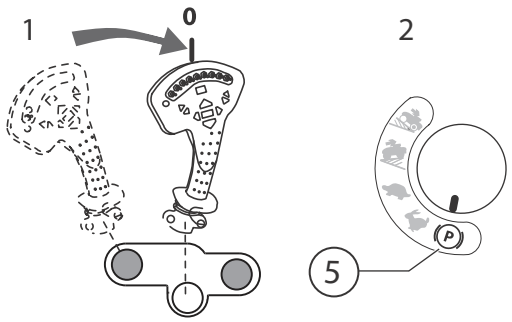
If the brake is applied slightly, i.e. without the machine coming to a complete stop, the speed will be reduced. As soon as the brake pedal is released, the machine will accelerate again to reach the travel speed corresponding to the position of the grip.

Parking brake

The parking brake is used to keep the machine at a standstill. It acts on discs incorporated into the front and rear hydraulic motors. The brakes are activated when the hydraulic pressure reaches zero.:

Engage the parking brake

- Pull the grip to neutral position to make the machine brake (hydrostatic braking).
- Turn the speed selector to the parking brake position **(5)** to immobilise the machine.



When the parking brake is engaged, any action on the grip has no effect of the movement of the machine

Release the parking brake

- Turn the speed selector to release the parking brake
- Make sure that the grip is in neutral position before pushing or pulling it to move the machine. .

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

NOTE! In the event of an emergency stop, the machine will initially stop according to a deceleration rate until the flow from the transmission pump is cancelled, then the parking brake is engaged

Driving in FIELDS mode (Fields - Uphill fields - Downhill fields)

Self-Propelled ALPHA Evo EcoDrive has 3 modes used in the field, according to the constraints of work related to the terrain (flat ground, up or down) to optimize the power of hydraulic motors

In **Fields**, **Uphill** and **Downhill** modes, the engine speed remains constant and does not depend of the positionr of forward grip

The **FIELDS** mode is typically used on flat ground or in small slopes. In this case the front and rear hydraulic motors are in full displacement. However, if the travel speed exceed **15** kph, the front hydraulic motors run on half displacement (UpShift), thus increasing the maximum travel speed of the machine.

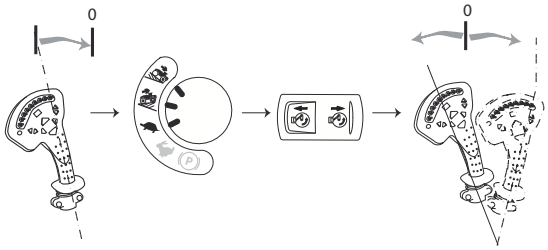
In **Uphill** mode, the front hydraulic motors are in half displacement and the rear hydraulic motors are in full displacement.

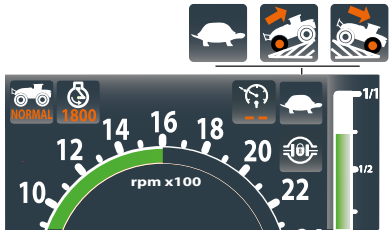
In **Downhill** mode, the front hydraulic motors are in full displacement and the rear hydraulic motors are in half displacement.

ATTENTION! I**Fields, Uphill** or **Downhill** mode require a minimum engine speed of **1500** rpm for te transmission to give enough traction and braking torque.

Sélect Fields, Uphill, Downhill modes

- Place the grip in neutral position
- Turn the speed selector on one of the 3 positions
- Increase the speed engine to a minimum of **1500** rpm
- Push the grip towards to achieved the required travellin speed.





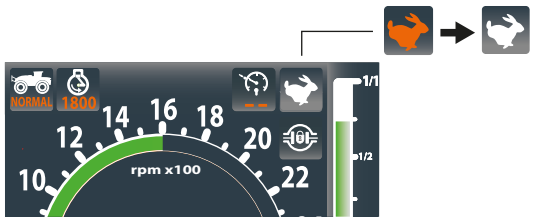
Select the FIELDS mode

the changement from one mode to the other FIELDS mode can be achived while driving.

Exit the FIELDS mode

To exit the **Fields** mode, the machine should be stopped

- Turn the speed selector to **Automotive** position, the icon 'rabitt" appears in orange.
- Pull the grip in neutral position, the **Automotive** mode is then engaged. (the icon becomes in white).



The travelling process in reverse is the same.

Other functions in relation with FIELDS mode

"Parking brake" page 60

"'COMFORT - NORMAL - POWER' driving mode" page 65

"Limitation of travel speed in FIELDS mode (Fields-Uphill-Downhill)" page 66.

"Limitation of the engine speed" page 68

"SAPE Anti-skid (Optional)" page 69

"Engine Anti-stall" page 69.

See "Engine Overspeed" page 69.

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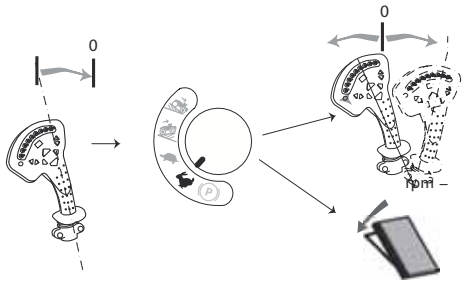
Driving in AUTOMOTIVE mode (Road)

The Self-propelled ALPHA Evo EcoDrive has an AUTOMOTIVE mode, it works only for the Road.

This Automotive mode simplifies the driving of the machine, significantly reducing the noise and fuel consumption. The engine speed is proportional to the position of the grip or the pressure on the throttle pedal, except during the braking phase. In this case the engine speed depend directly of the hydraulic motors displacement (Half displacement of front and rear motors).

Automotive operation

- Place the grip in neutral position
- Turn the speed selector in **Road** (rabbit)
  The engine is idling

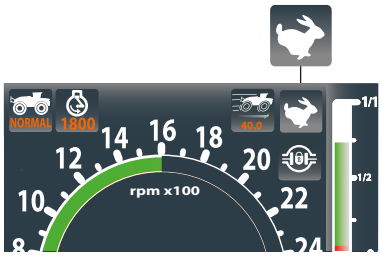


Controlling the speed with the grip

- Gradually push the grip to achieve the required travelling speed.

Controlling the speed with the pedal

- Move the grip forward or backward according to the direction of travel of the machine
- Press the throttle pedal to move the machine.

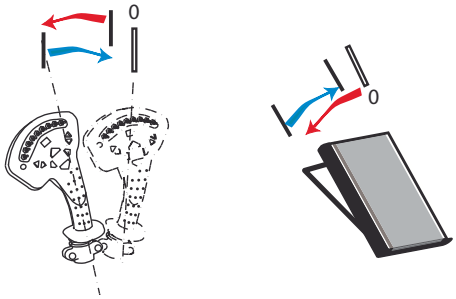


To change the travel control mode, See “Changing the travel speed control” page 62.

The travel process in reverse is exactly the same as described above.

Braking ans stopping in AUTOMOTIVE mode

- To slow down, pull more or less the grip to neutral position or release the throttle pedal, the engine speed automatically adapts to the travel speed of the machine.
- Press the braking pedal to reduce progressively the travel speed of the machine. When the pedal is release, the travel speed stabilizes.
- To accelerate again, pull the grip to neutral position, until the travel speed corresponding to the position of the grip is lower than the forward speed of the machine, or press the trottle pedal.



Changing the travel speed control

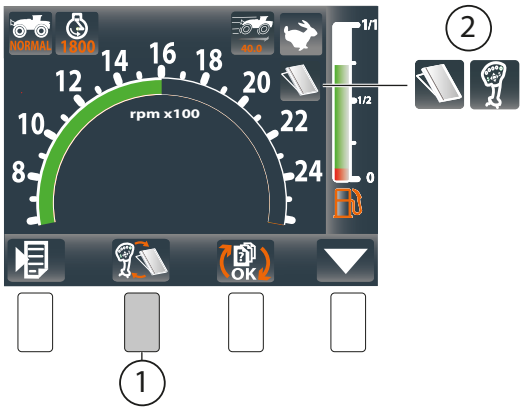
The travel speed of the machine can be controlled by either the grip or by the throttle pedal. Changing the control mode is only possible when the machine is stopped

- Place the grip to the neutral position
- Press the button **(1)** to change the travel speed control

When the travel speed is controlled with pedal :

- Move the grip forward or backward according to the direction of travel of the machine.
- Gradually press the pedal to move the machine

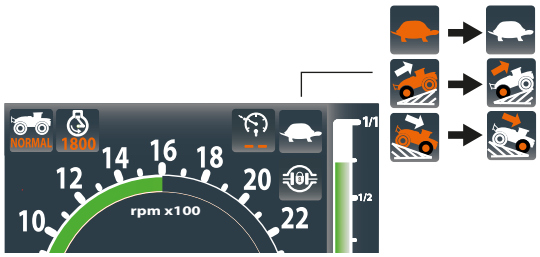
The icon **(2)** indicates the control mode selected



Exit AUTOMOTIVE mode

To exit the **AUTOMOTIVE** is only possible when the machine is stopped

- Turn the speed selector on one of the 3 positions **(Fields, Uphill, Downhill)** . One of three icon appears in orange.
- Pull the grip to the neutral position, to engage one of three functions. The icon appears in white.



Other functions in relations with AUTOMOTIVE mode

"Parking brake" page 60

"'COMFORT - NORMAL - POWER' driving mode" page 65

"EcoDrive mode" page 68

"Limitation of travel speed in AUTOMOTIVE mode (Road)" page 67

"SAPE Anti-skid (Optional)" page 69

"Engine Anti-stall" page 69.

"Retracting the gangway" page 64

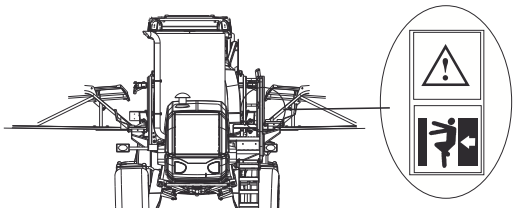
See "Engine Overspeed" page 69.

Retracting the gangway

Some self-prpelled may be fitted with a retractable gangway allowing the boom to be maintained at the authorized road size.

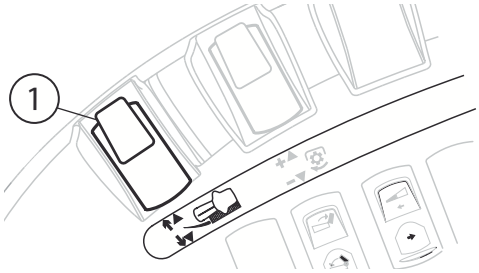
DANGER! Before moving the retractable gangway, ensure that no one is on or near the gangway.

A sticker shows the safety instructions.



To control the retractable gangway:

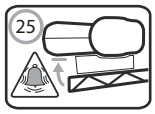
- Press the switch **(1)** to retract or extend the gangway and the boom.



ATTENTION! The retractable gangway automatically moves away from the operator's seat when the engine is shut down. In this case allow the boom to move outwards.

Unretracted gangway

When the gangway is not completely retracted, the travel speed is limited to 25 km / h. A warning message is displayed on the multifunction display.



To cancel this message ::

- Press the switch to retract completely the gangaway.
- Pull the grip to the neutral position to reduce the travel speed below **25** km/h, then push again the grip to reach the maximum travel speed.

Manual control of the gangway

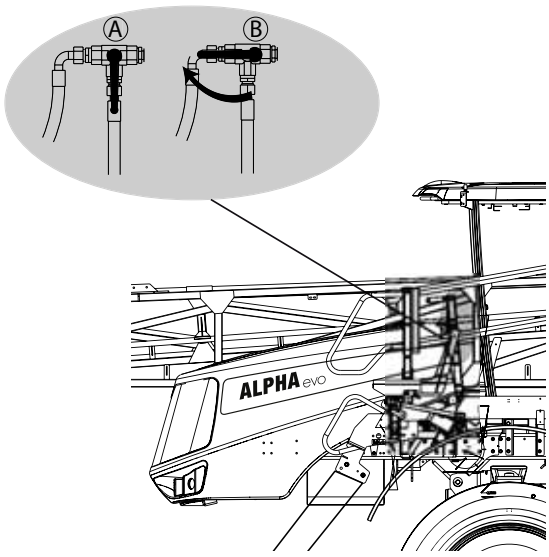
NOTE! The retractable gangway automatically moves away from the operator's seat when the engine is shut down. In this case allow the boom to move outwards.

For self-propelled equipped with a **LPA5** central frame, it may, in case of electrical or hydraulic failure, the retractable bridge does not deviate from the cab. To remedy this, an emergency valve, located outside the cab allow to control manually the retractable gangway.

A. **Normal operating** mode (handle in vertical position **A**)

B. **Emergency** :mode : Use only in case of jamming of the gangawy

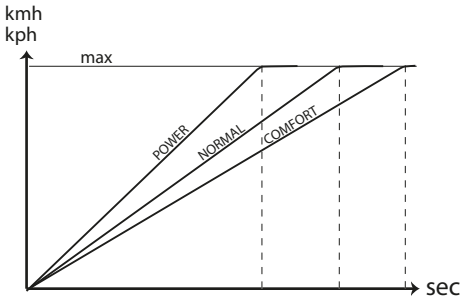
- Turn the handle as indicated on the illustration (handle in horizontal position B)
- Replace the handle vertically immediately after use.



'COMFORT - NORMAL - POWER' driving mode

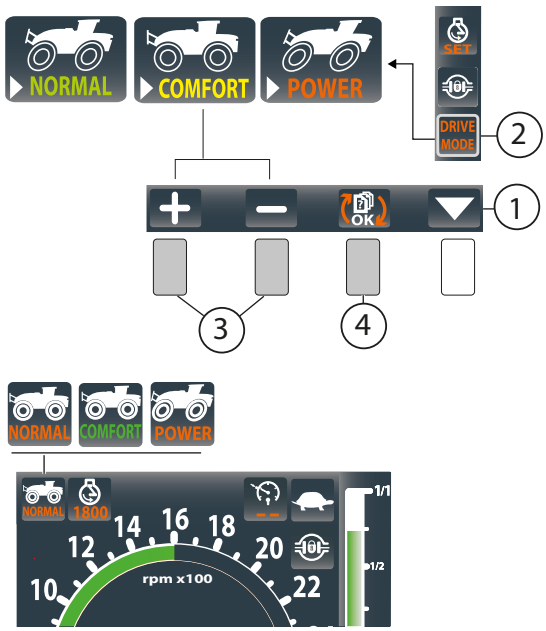
Acceleration and deceleration of the self-propelled are adjustable with 3 modes predefined driving mode.
These driving modes allows to obtain different behaviors of the machine in terms of reactivity. The Acceleration and deceleration ramps are defined by the time required to reach the maximum speed

- **COMFORT** - Progressive acceleration
- **NORMAL** - Intermediate acceleration.
- **POWER** - Reactive driving.



Driving mode selection

- Press the button **(1)** and navigate to display the correct icon **(2)**
- Press the button **(3)** to select the driving mode
- Press the button **(4)** to valid



NOTE! The change of the driving mode can be carried out when the machine is mving

WARNING To keep control of the machine in all circunstances, adapt the driving mode to the conditions of use both the highway and fields,

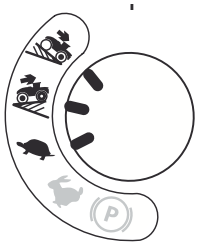
Limitation of travel speed in FIELDS mode (Fields-Uphill-Downhill)

The self-Propelled ALPHA evo EcoDrive are standard equipped with a travel speed limitation. It keeps a constant travel speed when the grip is pushed fully forward

The speed limit is only active in the **FIELDS** mode.

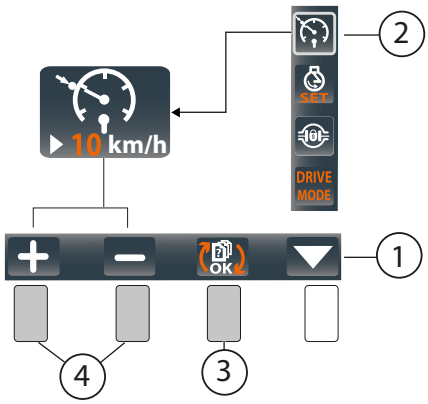
Speed limiter operation

- Place the grip to the neutral position
- Select one of 3 modes



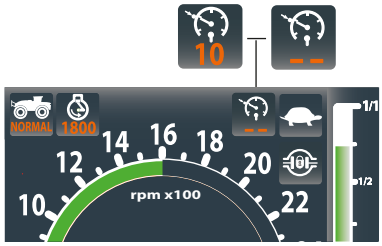
Enable / disable the speed limiter

- Press the button **(1)** and navigate to display the correct icon **(2)**
- Press the button **(3)** to enable or disable the speed limiter.



Setpoint of speed limitation

- Press the button **(1)** and navigate to display the correct icon **(2)**
- Press the buton **(4)** to change the setpoint



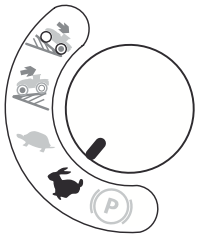
- Push fully forward the grip to travel at the selected speed

Limitation of travel speed in AUTOMOTIVE mode (Road)

Self-Propelled ALPHA evo EcoDrive are standard equipped with a travel speed limitation in Automotive mode. It keeps a constant travel speed when the grip is pushed fully forward

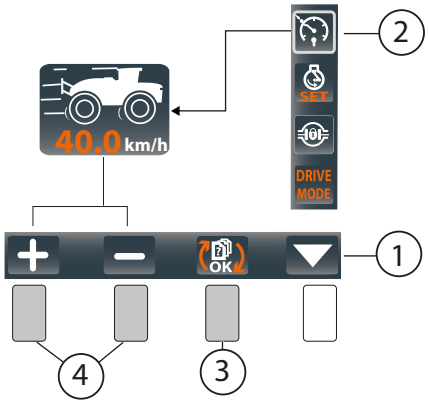
Speed limiter operation :

- Place the grip to the neutral position
- Select the automotive mode



Enable / disable the speed limiter

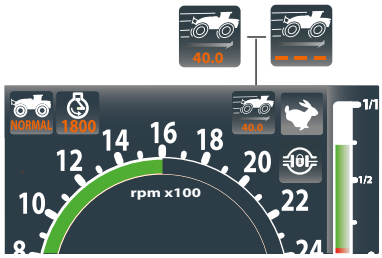
- Press the button **(1)** and navigate to display the correct icon **(2)**
- Press the buton **(3)** to enable or disable the speed limiter



- Push fully forward the grip to travel at the selected speed

Setpoint of speed limitation

- Press the button **(1)** and navigate to display the correct icon **(2)**
- Press the buton **(4)** to change the setpoint



- Push fully forward the grip to travel at the selected speed

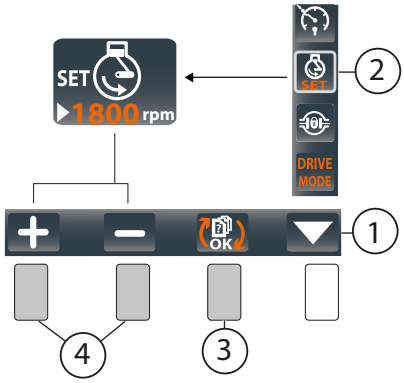
Limitation of the engine speed

Self-Propelled ALPHA evo EcoDrive are standard equipped with a engine speed limitation

The Engine speed limitation is only active in the **FIELDS** mode (Fields-Uphill-Downhill)..

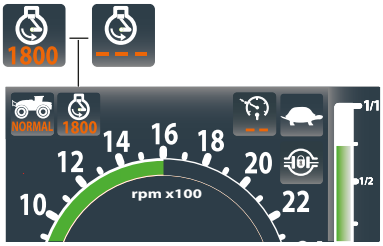
Enable / disable the engine speed limiter

- Press the button **(1)** and navigate to display the correct icon **(2)**
- Press the buton **(3)** to enable or disable the engine speed limiter



Setpoint of engine speed

- Press the button **(1)** and navigate to display the correct icon **(2)**
- Press the buton **(4)** to change the setpoint of the engine speed



If the engine speed limiting function is active, it is recommended to disable the **EcoDrive** (ECO = off) .

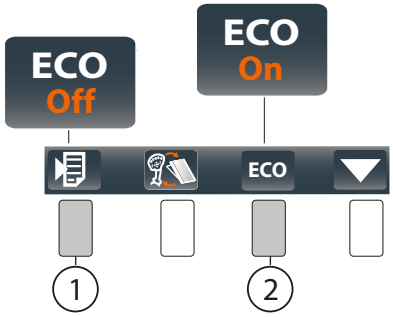
EcoDrive mode

The EcoDrive function optimizes the engine speed and transmission depending on the transmission power required. The EcoDrive mode allows a significant reduction of fuel consumption and noise level of the machine.

Engine speed continuously adapts depending on the power required to drive the machine

Enable / Disable the EcoDrive function

- Press the button **(1)** and navigate to display the EcoDrive function
- Press the buton **(2)** to change to select the EcoDrive function

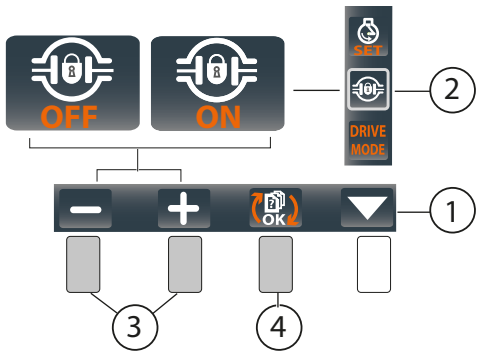


If the EcoDrive function is active (**ECO=on**), it is recommended to disable the engine speed limiter

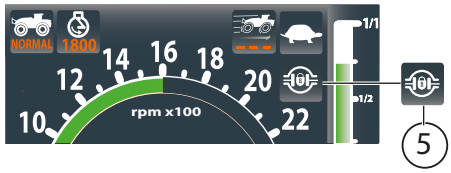
SAPE Anti-skid (Optional)

The Anti-Skid system can be switched at any time, both in **Automotive** mode or **Fields** mode'. However the Anti-Skid system turns off automatically when the speed exceeds **20** kph. If the speed drops below **20** kph, the SAPE system is operational again.

- Press the button **(1)** and navigate to display the SAPE menu **(2)**
- Press the buton **(3)** to enable or disable the anti-skid system.
- Press the button **(4)** to valid



The anti-skid icon **(5)** appears when the machine begins to slip.



In case of malfunction, the anti-skid regulation is stopped and a message apperas on the display. For more information See "Transmission errors" page 129.

Engine Anti-stall

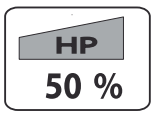
This device avoids engine stalling if the power demanded by the transmission is higher than that supplied by the engine. This can happen, for example, on steep hills in fields or on the road. In this case, the capacity of the transmission pump is automatically reduced, which will significantly reduce the travel speed.

This function ensures that the engine speed will not fall below a defined threshold. This results in automatic reduction of the travel speed.

Engine Overspeed

Management of engine overspeed is only available in ALPHA Evo EcoDrive that have a brake pedal.
This function avoids the transmission making the engine accelerate beyond a maximum acceptable speed on braking caused by the grip (hydrostatic braking). This results in slower deceleration of the machine, so that the engine speed does not exceed a maximum acceptable value.

Engine Power



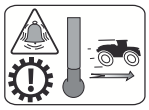
This icon indicates the available power, which is expressed in % of the maximum engine power.. When the value is close to **100** %, you should as far as possible:

- Increase engine speed
- Reduce the travel speed

Power Transmission limitation

To preserve the life of the transmission, the power transmission limitation will ensure that the power used is in conformity, and limit it if necessary by reducing the displacement of the hydraulic pump

Hydraulic circuit overheating



To preserve the life of the transmission, the hydraulic overheating system check that the temperature in the transmission does not exceed a certain threshold temperature. If the temperature of the oil exceeds this threshold, the travel speed decrease following a reduction coefficient of the displacement of the pump.

When the temperature has lowered, the system return to the normal operation.

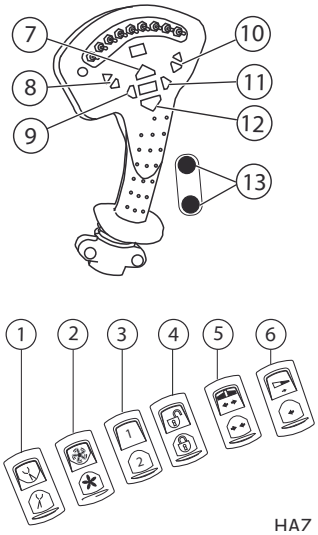
Boom

HAZ (TWIN) boom folding and unfolding

To unfold the boom do the following:

1. Press the switch **(4)** to lock the suspension.
2. Press the button **(7)** to raise and release the boom from the transport brackets.
3. Press the button **(5)** to unfold the inner sections. The rear transport hooks disengage automatically.
4. Press the buttons **(8)** and **(10)** to reset the tilt adjustment.
5. Push the switch **(6)** to the left to unfold the outer sections.
6. Press the button **(9)** and **(11)** to correct the slant angle.
7. Press the switch **(12)** to adjust the operating height.
8. Press the switch **(4)** to unlock the suspension.

The folding procedure is the reverse of the unfolding procedure.



WARNING! Ensure that the pendulum suspension is locked before using the fold functions.

WARNING! Before unfolding the boom, ensure that transport safety chains are removed (certain countries only) and the boom is clear from the transport brackets.

WARNING! The folding/unfolding functions (switches **(3)** and **(4)** must only be operated when the vehicle is stationary. Otherwise the boom could be damaged.

Hydraulic slanting control

The hydraulic slanting control **(9)** and **(11)** is used to incline the entire boom. This function is particularly useful when spraying on slopes.

Always reset position to neutral (middle) before folding the boom.

Alternative boom widths

The boom can also be used half-folded. If applicable, only unfold the inner sections using the switch **(5).** In the EFC control unit, also deactivate the sprayer sections on the outer sections.

Boom tilt function

The tilt adjustment (switches **(8)** and **(10)** can change the inclination of the boom individually on the left or right.

Boom support wheels

The boom is equipped with two support wheels. When spraying with low boom heights on bare ground or plants in the first growth stage it is recommended to fold down the support wheels. In later growth stages the wheels should remain folded up.

ATTENTION! On public roads the support wheels should be folded up and secured in order to keep the sprayer's overall width according to the regulations!

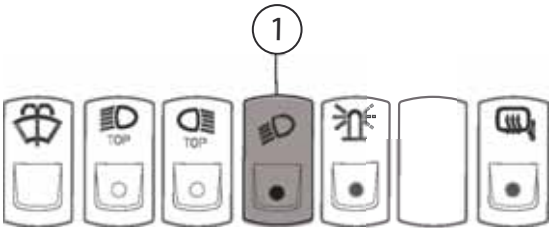
Hydraulic break-away function

The boom includes a hydraulic break-away function to avoid damage, e.g. on hitting the ground. If this function is activated after clogging, an alarm is displayed on the controller. This alarm remains active until the boom is folded to its maximum position and the switch **(6)** is pressed again.

Boom lighting

The boom light control switch is located on the cab ceiling.

- Press the switch **(1)** to lit the boom lights.



To avoid any risk of dazzle and to save battery, we recommend switching off the boom lights on leaving the field.

End nozzles (optional)

The boom can be fitted with end nozzles.

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

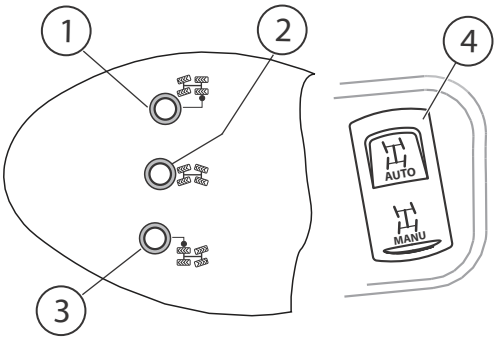
Steering - automatic 4-wheel steering version (standard)

General information

The steering is hydrostatic. As a safety measure, in the event of malfunction of the system, the steering acts as a pump, thus allowing steering control. The hydraulic steering pump also controls the hydraulic systems of the boom through a priority valve.

The automatic 4-wheel steering is made up of two position sensors fitted on the front and rear rods, a 4-wheel steering activation pedal, a switch and indicators on the control panel.

1. Green indicator: rear wheels aligned.
2. Blue indicator: 4-WHEEL STEERING in operation.
3. Green indicator: front wheels aligned.
4. On/Off steering switch



NOTE! As a safety measure, before travelling on the road, ensure that the rear wheels are aligned. The indicator **(1)** lights up to indicate that the rear wheels are aligned.

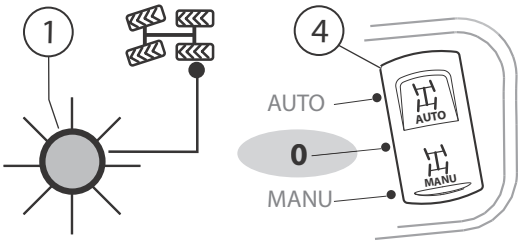
Start

- Press the switch **(4)** to [**AUTO**] or [**MANU**] according to the operating mode

Shutdown

NOTE! As a safety measure, before travelling on the road, ensure that the rear wheels are aligned.

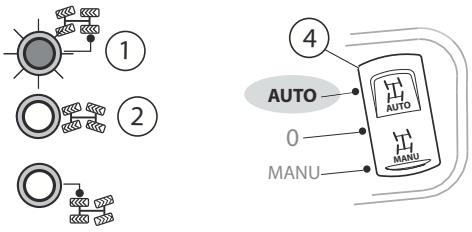
- Put the system in 2-Wheel steering. The indicator **(1)** lights up indicating that the rear wheels are aligned.
- Press the switch to position **O**



Driving in 2-wheel steering

In this mode, only the front wheels turn and the rear wheels remain in a straight line.

- Press the switch **(4)** to activate **[AUTO]** mode.



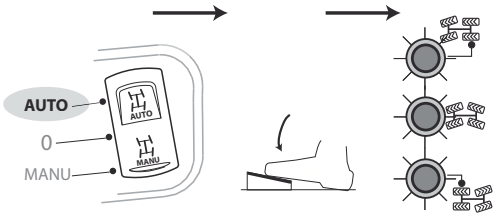
If the rear wheels are not in a straight line, the indicator **(1)** remains lit up:

- Turn the steering wheel until the rear wheels are aligned, the indicator **(2)** is switched off.

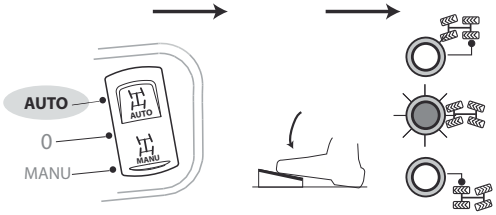
Driving in 4-wheel steering

In this mode, the front and rear wheels turn in opposite directions

- Press the switch to activate **[AUTO]** mode
- Press the pedal and turn the steering wheel until the front wheels are in a straight line.
  The 3 indicators light up to indicate that the operating conditions for 4-WHEEL STEERING are met



- Keep the pedal press ad turn he steering wheel until the front wheels are in a straight line.



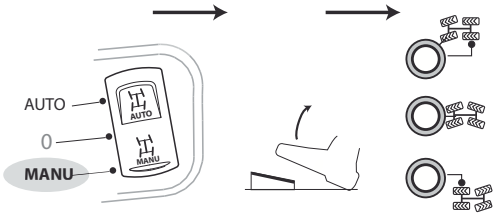
To exit the 4-wheel steering mode:

- Release the pedal and turn the steering wheel to put the rear wheels in straight line.

Driving in offset 2-wheel steering

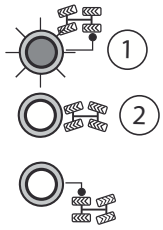
In this mode, only the front wheels can turn, while the rear wheels can be slightly inclined to the left or right. To use this mode:

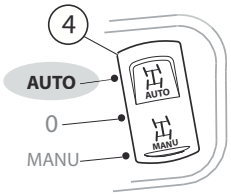
- Press the switch to activate [**MANU**] mode.
- Press the pedal and turn the steering wheel so that the front and rear wheels are in a straight line. The indicators **(1)**and **(3)** light up to indicate that the operating conditions in offset rear wheel steering have been met.
- Keep the pedal press ad turn he steering wheel until the front wheels are in a straight line.
- urn the wheel slightly while holding the pedal down to offset the rear wheels as required..



To exit offset rear wheel steering:

- Press the switch to [**AUTO**] position to activate 4-WHEEL STEERING mode.
- Turn the steering wheel until the indicator **(1)** lights up, 2-WHEEL STEERING mode is automatically activated.

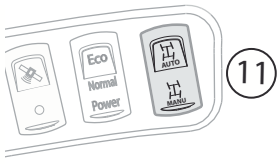




- Turn the wheel slightly while holding the pedal down to offset the rear wheels as required.
- Release the pedal to keep the rear wheels in position. All indicators are switched off.

To exit offset rear wheel steering:

- Turn the switch to the [**AUTO**] position to activate 4-WHEEL STEERING mode.
- Turn the steering wheel until the indicator **(1)** lights up, 2-WHEEL STEERING mode is automatically activated.



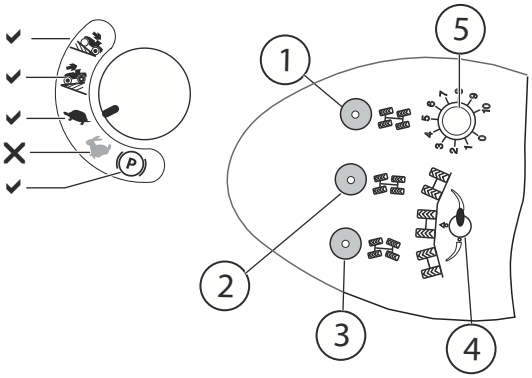
Steering - 4-wheel steering version with 'CRAB' steering (optional)

General information

The steering is hydrostatic. As a safety measure, in the event of malfunction of the system, the steering acts as a pump, thus allowing steering control. The hydraulic steering pump also controls the hydraulic systems of the boom through a priority valve.

As an option, the ALPHA EVO EcoDrive can be equipped with an electronic 4-wheel steering mechanism with automatic alignment and "**CRAB**" steering.

1. 'CRAB" mode control.
2. 2-WHEEL STEERING mode control.
3. 4-WHEEL STEERING mode control.
4. Right and left SLANTING mode selection.
5. Rear wheel inclination control in SLANTING mode.



NOTE! The 4-WHEEL STEERING mechanism with CRAB steering is deactivated in ROAD mode.

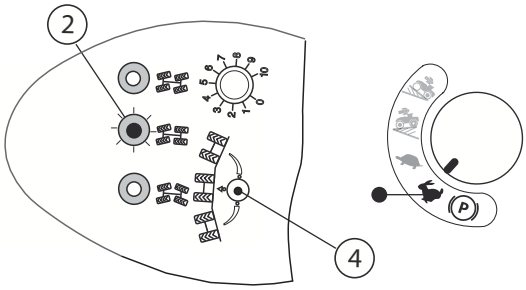
NOTE! As a safety measure, when AUTOMOTIVE mode is selected, the rear wheels are automatically aligned in a straight line and the system is deactivated after a few seconds.

On start-up, 2-WHEEL STEERING is selected by default. However, make sure that the switch **(4)** is in the middle position so that the rear axle remains in a straight line.

2-wheel steering mode

In this mode the rear wheels turn automatically to return to a straight line position. To activate this mode:

- Ensure that the switch **(4)** is in the central position.
- Press the pushbutton **(2)**; the corresponding indicator lights up.

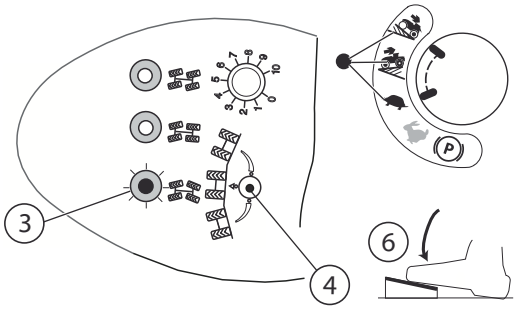


4-wheel steering mode

In this mode, the 4 wheels, front and rear turn simultaneously in opposite directions. To activate this mode:

- Ensure that the switch **(4)** is in the central position.
- Press the pushbutton **(3)**.

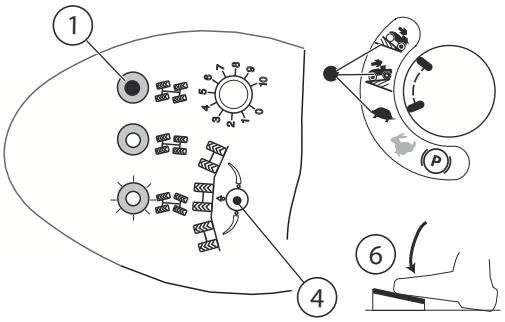
Briefly press the pedal **(6)** to activate 4-wheel steering mode; the corresponding indicator **(3)** lights up.



"CRAB" mode

In this operating mode, the front and rear wheels turn simultaneously in the same direction and remain parallel. To activate this mode:

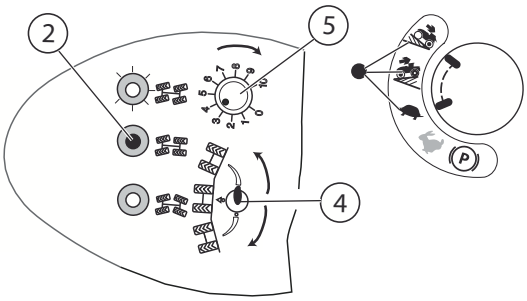
- Ensure that the switch **(4)** is in the middle position.
- Press the pushbutton **(1)**; the corresponding indicator lights up.
- To leave this mode, press one of the button **(2)** for 2-wheel steering mode or **(3)** for 4-wheel steering mode.



Driving in "SLANTING" mode

In this mode, the front and rear wheels are offset following an angle in proportion to the rotating button index. The direction of the slant of the rear wheels is obtained by moving the switch **(5)** right or left. To use this mode:

- Ensure that the machine is in 2-wheel steering mode.
- Turn the switch **(4)** to select the wheel inclination direction
- Turn the knob **(5)** slightly to obtain the required wheel inclination. Position **10** corresponds to the maximum wheel turning angle.



To exit the slanting mode:

- Position the switch **(4)** in the middle position; this will cancel SLANTING mode and activate 2-WHEEL STEERING mode.

TWIN air assistance

General information

The air flow rate and the air stream direction should always be adjusted individually for each spraying operation and according to weather conditions.

TWIN operation

The switches on the control panel console control the following TWIN functions:

1. TWIN air stream direction.
2. Blower speed
3. TWIN preset.
4. Customisation of A-B functions.

By pressing the switch **(1)** the air stream and nozzles are steps of 4-5% (totally 19 steps between 5 and 100ù), which corresponds to approx. **30**° backwards and **40**° forwards compared to vertical position.

The air flow rate can be adjusted in steps from **0** to **10** by pressing the switch (**2**). The blower rotation speed is displayed on the HC9500 controller screen. The max. revolutions for the fan are **3100** rpm, which equates to full air flow speed of approx. **40** m/s When the boom sections are half-folded, reduce the rotation speed or spray pressure by **25**% to obtain the same air speed in the nozzles as in the total width of the boom.

We do not recommend to turn on air assistance in case of half folded boom - danger of damage of the air bags

5 - Operation

Spraying

Safety information

WARNING! Always be careful when working with plant protection chemicals. Protective clothing and equipment should be worn when handling chemicals, preparing the liquid and when spraying and cleaning the sprayer. For further information, see the [SPRAY TECHNIQUE] book.

WARNING! To fill the main tank, follow the rules for using the filling devices. Ensure that you can fill from open water (lakes, rivers etc.). For further information, see the [SPRAY TECHNIQUE] book.

WARNING! Ensure that the hand wash tank is always full and ready for use. It is always advisable to have clean water available, especially during the liquid preparation phase.

WARNING! Always clean and wash the sprayer after use.

WARNING! Only mix chemicals in the tank after having checked their compatibility and always according to the directions given by the manufacturer.

WARNING! Rinse the various liquid systems carefully before using a new chemical.

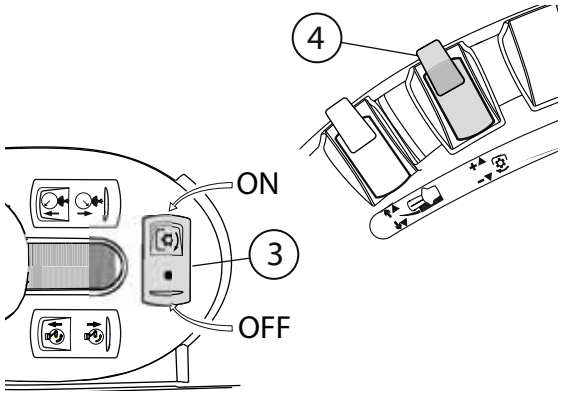
The following sections describe the procedures to follow to get the best out of your equipment, particularly when filling the main tank, rinse tank and hand wash tank, filling with chemicals, spraying and rinsing the liquid systems.

Starting and adjusting the speed of the spray pump

The spray pump can be engaged in the cab or by a swich located outside **(2)**.

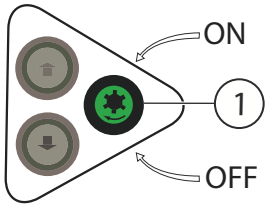
Engage and adjustment the spraying pump

- Press the button **(1)** or **(3)** to engage the spray pump. Its speed can be adjusted using the control **(4)**.



Desengage the spraying pump pump

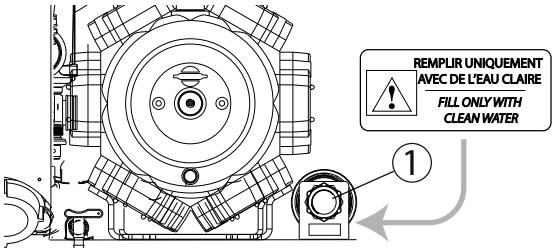
Press the button **(1)** or **(3)** to desengage the spray pump.



Filling the rinse tank

The rinse tank may be filled under pressure. Its **1**" filling connector **(1)** is located near the valves and spray pump.

A one-way valve prevents any leak from the rinse tank filling connector.



DANGER! A safety sticker placed near the rinse tank indicate that the tank should always be filled with clean water. You must never put any chemicals into it.

To avoid alga developing always, drain the tank if the sprayer is not in use for a longer period of time.

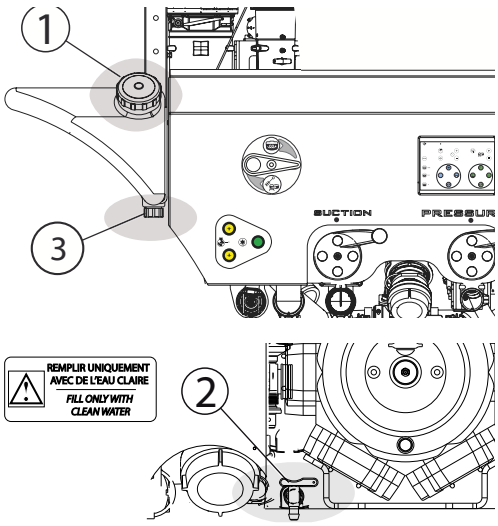
Filling and use of hand wash tank

The hand wash tank has a **15**-litre capacity. The location of the tank is different depending on the equipment

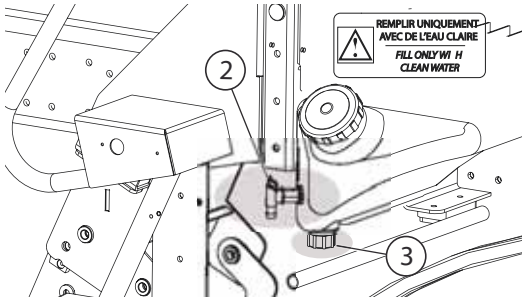
WARNING! For your own safety, ensure that this tank is always kept filled with clean water and ensure that no chemicals are ever put into it. This water is reserved for washing the hands, and never be used for drinking.

Variant no1

1. Filler cap
2. Tap to use the water
3. Drain the hand wash tank



Variant no2

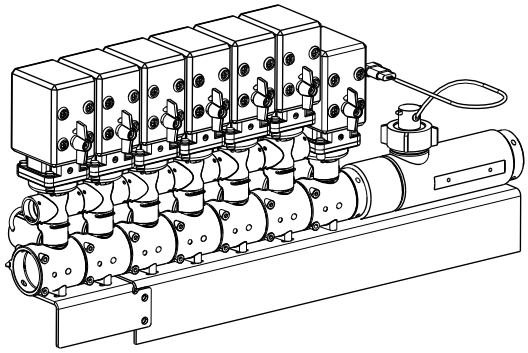


5 - Operation

EFC operating unit adjustment

Before spraying, the EFC operating unit is adjusted using clean water

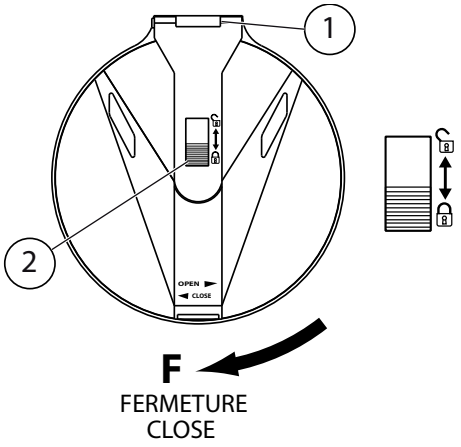
(without chemicals).

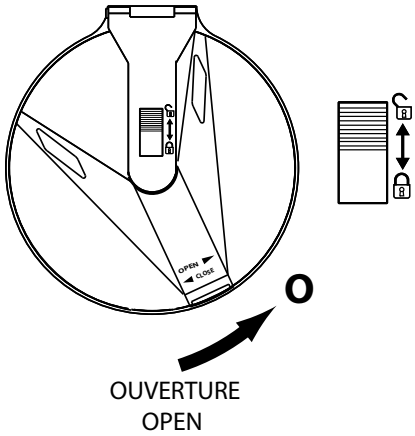


- Choose the nozzle size according to the spraying. Turn the Quadrilet nozzle holders to select the nozzles. Make sure that all nozzles are the same type and capacity. See the "Spray Techniques" book.
- Activate the on-off switch of the spraying control unit.
- Switch the general valve and all section switches to the spraying position.
- Activate the pressure regulation switch until regulation valve stops rotating (minimum pressure).
- Stop the vehicle and run the engine at the forward speed that you will use. The speed revolution. must be kept between 300 and 600 rpm.
- Press the pressure regulation switch until the required pressure is shown on the pressure gauge.

Filling through tank lid

The tank lid has a hinge **(1)** so it can be lifted. A locking mechanism **(2)** prevents it from being opened.





Opening:

- Unlock and turn the lid anticlockwise then lift.

Closing:

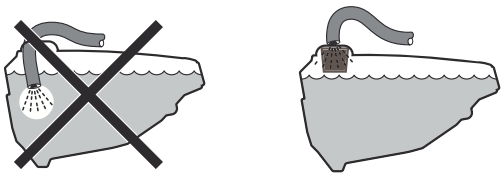
- Put the lid down and turn it clockwise, then lock it.

NOTE! The lid filter should always remain in place to avoid impureties falling into the tank.

NOTE! The tank lid should always be locked before moving the vehicle.

Water is filled into the tank by removing the tank lid, which is located at the top of the sprayer tank near the front, which is accessible from the platformtop of the tank on the sprayer's left side. Always fill water through the strainer basket to prevent foreign particles from entering the tank. An overhead tank can be used in order to obtain high filling capacity.

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



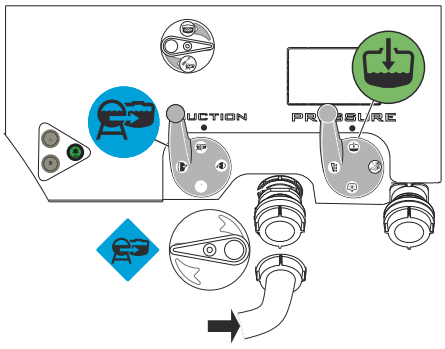
WARNING! The water supply line should be provided with a check valve as additional safety precaution. Follow local legislation in force at any time.

WARNING! The water supply should be provided with a water meter to avoid spillage by over-filling. Follow local legislation in force at any time.

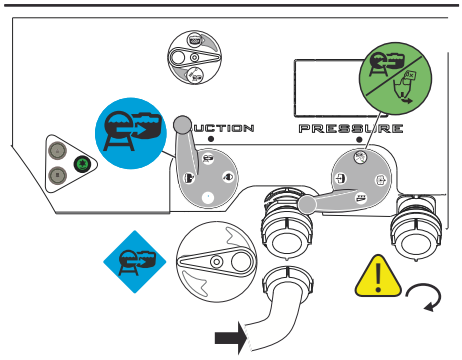
External Filling device

The External Filling Device is operated as follows:

- Remove cover and connect suction hose to Suction Manifold.
- Turn handle on External Filling Device valve towards Filling Device.



- Turn pressure Smart valve to "Main tank" or "Spraying / Turbofiller" and close the suction valve.
- Engage the diaphragm pump and set PTO revolutions.
- The tank is now filled with water. Keep an eye on the liquid level indicator.
- Turn handle on Suction Manifold away from Filling Device to discontinue filling process. Then disengage pump.



- Disconnect suction hose and replace cover
- Turn the suction valve to "Main tank".

DANGER! Avoid contamination or personal injury. Do not open suction valve towards Suction Filling Device, unless the pump is running and the filling hose is connected. If this valve is opened without the pump running, liquid will stream out of the coupler.

WARNING! Do not leave the sprayer whilst filling the tank, and keep an eye on the level indicator in order NOT to overfill the tank.

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

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

5 - Operation

Safety Precautions - Crop Protection Chemicals

Always be careful when working with crop protection chemicals!

WARNING! Always wear proper protective clothing before handling chemicals!

Personal protection

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

- Gloves
- Waterproof boots
- Headgear
- Respirator
- Safety goggles
- Coverall with chemical resistance

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 and/or local legislation.

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

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

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

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

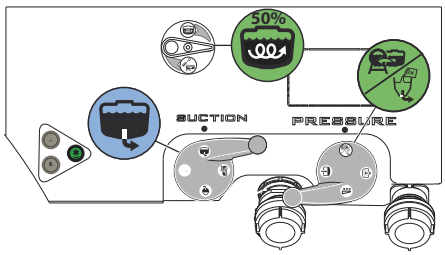
Filling chemicals through tank lid

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

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

ATTENTION! Due to risk of spillage and spot contamination, several countries do not allow to fill chemicals directly through the tank lid. Use the TurboFiller for all filling of chemicals instead.

- Make sure the spray control unit is switched off.
- Set suction valve towards "Suction from main tank", Agitation valve towards "Agitation". Turn pressure SmartValve towards "Spraying"Other valves should be closed or turned to unused function.
- Engage the diaphragm pump and set PTO revolutions.



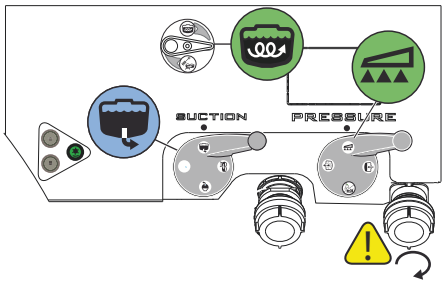
- Add the chemicals through the tank opening.

4. Keep PTO engaged, so that the spray liquid is continuously agitated, until it has been sprayed on the crop.

- When the spray liquid is well mixed, turn the SmartValves as shown in the picture.
- Keep the pump working to continue agitation in the tank.

DANGER! Before turning Pressure SmartValve past "Pressure draining/TurboFiller", it is very important to ensure that the quick coupler lid is correctly and completely mounted to the filling stud in its locked position. Failure to do so

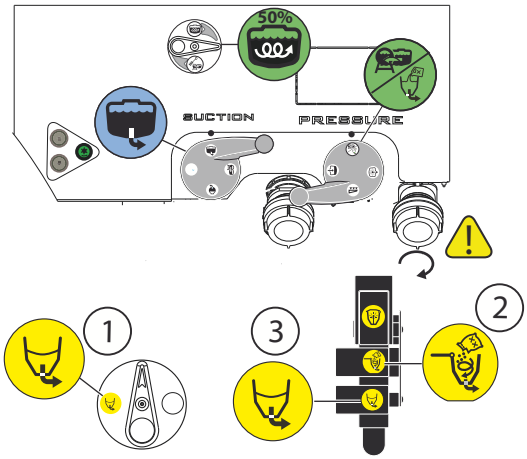
causes a risk of contamination and injury from the quick coupler lid being "shot" off when pressurized! If it is not possible to mount the lid completely, lubricate the rubber seal and the grip hooks.



NOTE! Local legislation may not allow filling through the tank lid, but will require use of the chemical inductor instead.

Filling liquid chemicals by using TurboFiller

- Fill the main tank at least 1/3 with water (unless otherwise stated on the chemical container label).
- Turn the handle of the suction valve towards "suction from Main tank". Turn pressure Smart valve towards "Pressure draining/Turbofiller".



NOTE! If filling water from an external tank, this can be continued while doing the next steps.

DANGER! Before turning Pressure SmartValve to "Pressure draining/TurboFiller" it is very important to be sure that the quick coupler lid is correct and completely mounted to the filling stud into its locked position. Failure to do so may cause risk of contamination and injury from quick coupler lid being "shot" off when pressurized! If not possible to mount lid completely, lubricate the rubber seal and the grip hooks.

- Engage the diaphragm pump and set PTO revolutions.
- Open TurboFiller lid. Measure the correct quantity of chemical and fill it into the hopper.

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

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

- Open the vortex valve **(2)**
- Engage the hopper transfer device by opening the TurboFiller suction valve **(3)** then the valve **(1)** to transfer chemicals to the main tank. The TurboFiller suction valve must be open for at least 20 seconds after the chemical is no longer visible in the hopper, in order to empty the transfer hoses completely into the main tank.

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

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

5 - Operation

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

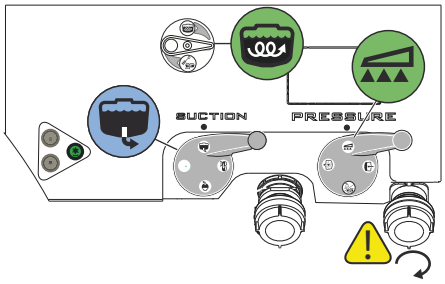
ATTENTION! The rinsing device uses spray liquid to rinse containers for concentrated chemicals. Before disposal, always rinse the chemical containers with clean water several times, until they are clean.

- Flush the TurboFiller with clean water from the rinsing tank. The TurboFiller suction valve must be open for at least 20 seconds after the rinse water is no longer visible in the hopper, in order to empty the transfer hoses completely into the main tank.

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

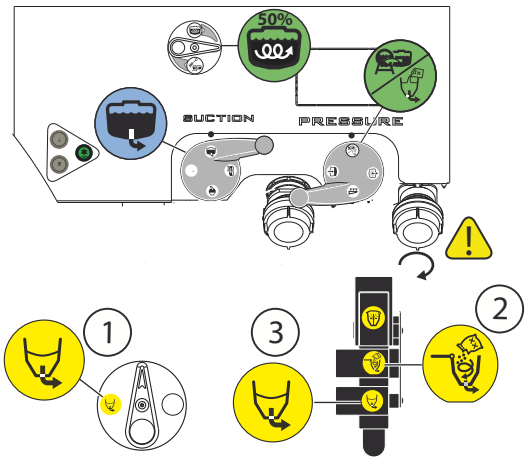
- Close the TurboFiller suction valve, when the hopper has been rinsed. Close the lid.

Turn the AgitationValve towards “Agitation”.



Filling powder chemicals by using TurboFiller

- Fill the main tank at least 1/2 with water (unless otherwise stated on the chemical container label).
- Turn the handle of the suction valve towards “suction from Main tank”. Turn pressure Smart valve towards ”Pressure draining/Turbofiller”. Turn the Agitation Valve towards ”Agitation” if required. Close remaining valves



ATTENTION! For increased suction from Turbofiler the Agitation Valve can be kept closed

NOTE! If filling water from an external tank, this can be continued while doing the next steps.

DANGER! Before turning Pressure SmartValve to “Pressure draining/TurboFiller” it is very important to be sure that the quick coupler lid is correct and completely mounted to the filling stud into its locked position. Failure to do so may cause risk of contamination and injury from quick coupler lid being “shot” off when pressurized! If not possible to mount lid completely, lubricate the rubber seal and the grip hooks.

- Engage the diaphragm pump and set PTO revolutions.
- Open TurboFiller lid. Measure the correct quantity of chemical and fill it into the hopper.
- Measure the correct amount of powdered chemical and sprinkle it into the hopper as fast as the transfer device can flush it down. The TurboFiller suction valve must be open for at least 20 seconds after the chemical is no longer visible in the hopper in order to completely empty the transfer hoses into the main tank.

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

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

- Open the vortex valve **(2)**
- Engage the hopper transfer device by opening the TurboFiller suction valve **(3)** then the valve **(1)** to transfer chemicals to the main tank. The TurboFiller suction valve must be open for at least 20 seconds after the chemical is no longer visible in the hopper, in order to empty the transfer hoses completely into the main tank.

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

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

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

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

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

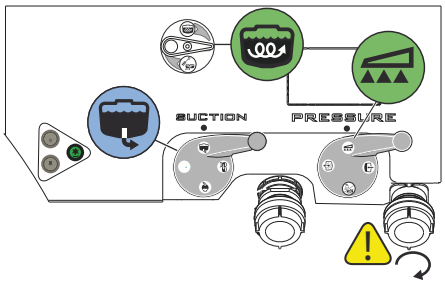
- Flush the TurboFiller with clean water from the rinsing tank. The TurboFiller suction valve must be open for at least 20 seconds after the rinse water is no longer visible in the hopper, in order to empty the transfer hoses completely into the main tank.

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

- Close the TurboFiller suction valve, when the hopper has been rinsed. Close the lid.

- If closed, turn the AgitationValve towards “Agitation”.

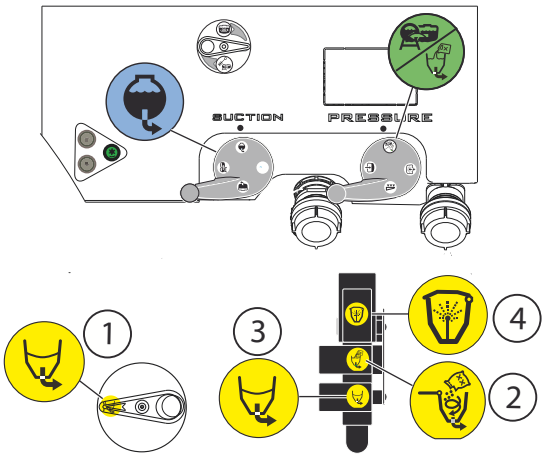
5. When the spray liquid is well agitated, turn handle of the pressure SmartVvalve towards “Spraying” position. Keep PTO engaged, so that the spray liquid is continuously agitated, until it has been sprayed on the crop.



5 - Operation

TurboFiller rinsing

Rinsing the TurboFiller and chemical containers are done as follows:



Cleaning empty containers - Turbofiller lid is open

- Turn the suction SmartValve towards “Rinsing tank” (or “External Filling Device”, if clean water is available here).
- Put container over the rotating flushing nozzle in the middle of the TurboFiller, so that the nozzle is inside the container.
- Simultaneously press the Chemical container Cleaning lever **(4)** and the TurboFiller suction valve **(3) (1).** This rinses the chemical container with the flushing nozzle, while the rinsing liquid is emptied out of the TurboFiller

Turbofiller rinsing - TurboFiller lid is closed

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

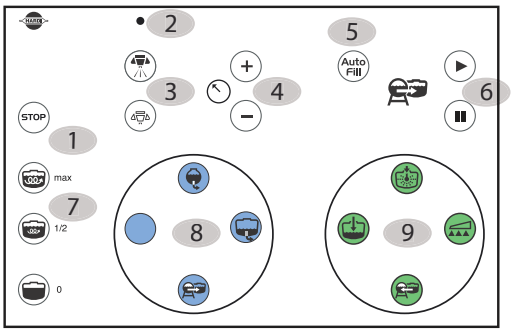
ATTENTION! The TurboFiller needs to be cleaned thoroughly after finishing spraying. This is to ensure that it is clean, before spraying other crops that may be sensitive to the chemicals just used. See section “Cleaning” on page 91 for details.

Operating the control units while spraying

The FluidBox is used in conjunction with AutoAgitation, AutoFill and AutoWash functions. It is a remote control of the liquid system and is logically placed at the filling area (storage locker).

- All stationary spraying operations can be performed without entering the tractor cabin.
- Operations like activation of the main ON/OFF, can also be done; a neat feature when checking nozzles.

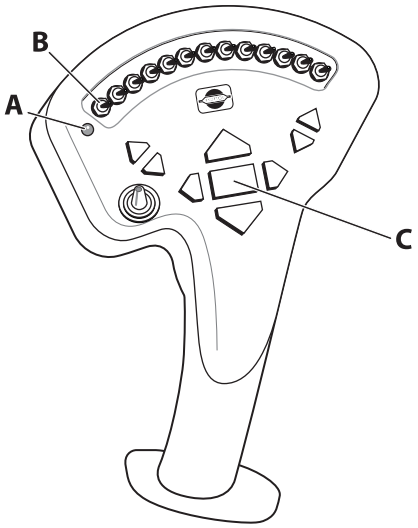
1. Emergency STOP of all functions
2. Status LED.
3. Main ON/OFF
4. Spary pressure increase/decrease
5. AutoFill start
6. AutoFill manual open of valve and AutoFill pause
7. AutoAgitation override control
8. Suction SmartValve override control
9. Pressure SmartValve override control



A. Power ON/OFF/satus LED

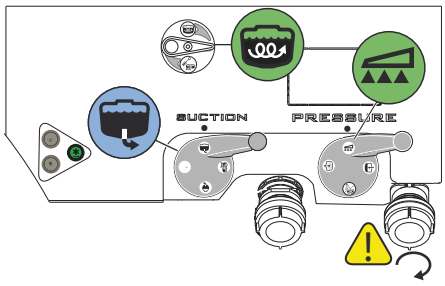
B. Section valves.Turns single sections ON or OFF Lever up is OFF ans down is ON

C. Main valve ON/OFF



Use when spraying

- On the sprayer, turn the suction valve toward “Suction from Main tank” and the pressure SmartValve toward “Spraying”. Turn the agitation valve to “Agitation” if necessary.
- In order to close the entire boom, switch main ON/OFF (C) to OFF position. This returns the pump output to the tank through the return system. The diaphragm Non-drip valves ensure instantaneous closing of all nozzles.
- In order to close one or more sections of the boom, switch the relevant distribution valve (B) to OFF position (upwards). The pressure equalisation ensures that the pressure does not rise in the sections that remain open.



NOTE! For checking the volume application rate, please refer to the spray controller instruction book.

Before returning to refill the sprayer

If the sprayer is to be refilled at the farm or at a fixed filling place without a filling space with hard surface and drain to closed reservoir, the sprayer should be rinsed before returning to refill.

Dilute the residues of the spraying circuit, and spray it on the crop. Then rinse the sprayer on the outside with the External Cleaning Device before returning to the farm.

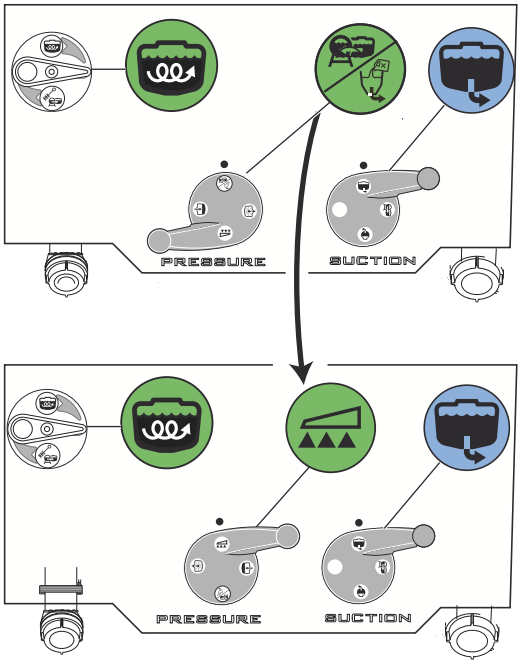
WARNING! Always follow local legislation in force at any time

Agitation before Resuming a Spray Job

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

- Turn the handle at the suction valve towards “Suction from main tank”. Turn the pressure vSmartVvalve towards “Pressure draining/TurboFiller”an unused function closed position and turn the Agitation valve towards “Agitation”. Other valves closed.
- Engage the pump and set the speed
- Agitation has started and should be continued for at least 10 minutes

4. The spray job can now be resumed. Turn pressure SmartVvvalve towards “Spraying” and start spraying.

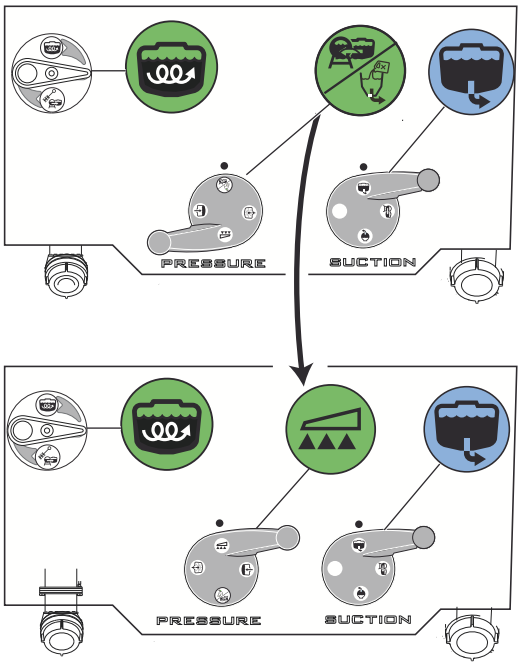


DANGER! Before turning Pressure SmartValve to “Pressure draining/TurboFiller” it is very important to be sure that the quick coupler lid is correct and completely mounted to the filling stud into its locked position. Failure to do so may cause risk of contamination and injury from quick coupler lid being “shot” off when pressurized! If not possible to mount lid completely, lubricate the rubber seal and the grip hooks.

Agitation before re-starting spraying / Spraying

If a spraying job has to be interrupted for a while, some sedimentation may occur depending on the chemicals being used. When re-starting a spray job it might be necessary to homogenise the liquid.

- Turn the SmartValve suction and pressure vales and the agitation valve as shown in the picture. The other valves are closed.
- Start the sprayer pump by rotating it at its nominal speed.
- Agitation has started and should be continued for at least 10 minutes.
- Spraying can begin again. Turn the SmartValve pressure valve as shown in the picture and start the application.



- Press the switch **(1)** to modulate the agitation of the liquid in the main tank.

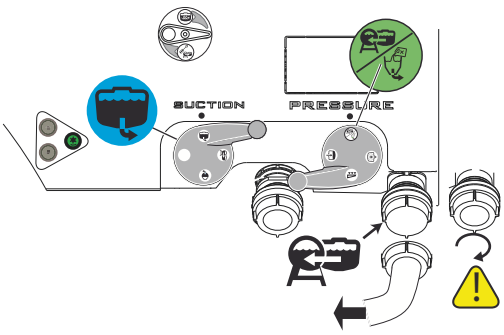
Too much agitation may cause foam to form in the tank. Agitation should be adapted according to the volume of liquid remaining in the tank.

Before positioning the SmartValve pressure pump in the [TRANSFER] position, it is important to check that the transfer connector plug has been screwed in correctly and is completely closed. If this is not the case, there is a risk of contamination and injury from the effect of the pressure if the plug is not correctly in place. If the plug is not completely tight, lubricate the seal and the thread.

Pressure draining

It is possible to drain to an external tank. This done the following way:

- Connect à hose from an external to the pressure quick coupler on the sprayer
- Turn the Pressure SmartValve towards "External tank"
- Close the "Agitation" Valve
- Turn the suction valve towards "Main tank"
- Engage the spraying pump
- Turn off the pump again, when tank is drained
- Disconnect hose and refit the quick coupler lid



Before turning Pressure SmartValve to "Pressure draining/TurboFiller" it is very important to be sure that the quick coupler is correct and completely mounted to the filling stud into its locked position. Failure to do so may cause risk of contamination and injury from quick coupler "shot" off when pressurized! if not possible to mount coupler completely, lubricate the rubber seal and the grip hooks.

5 - Operation

Parking the sprayer

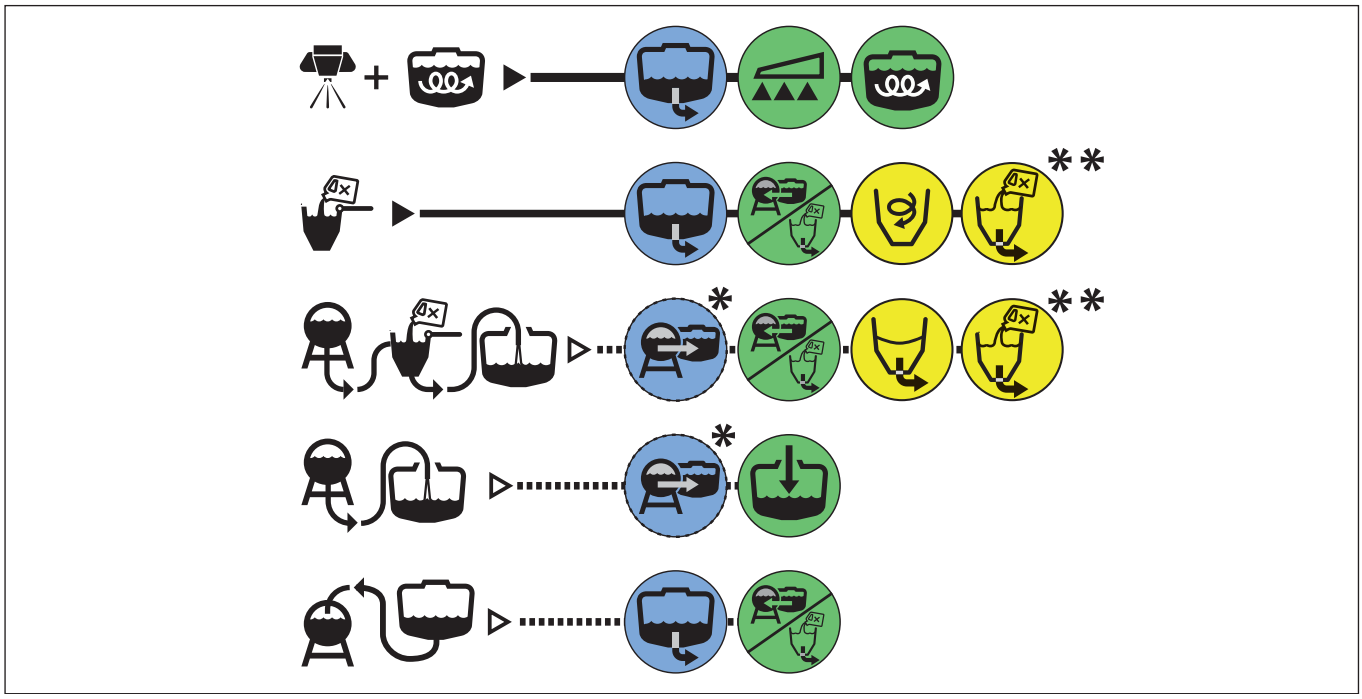
To avoid spot contamination, the sprayer should always be parked at either the washing/filling location or under roof.

This prevents rainfall from washing down chemical residues from the sprayer's surfaces.

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

Quick reference - Operation

The following diagrams describe the SmartValve positions according to different operations.



A. Full agitation

B. Wait 3 seconds before changing valve position

C. Min. 45 seconds with nozzles.

D. Spray until air comes out of nozzleq OFF.

E. Min. 45 seconds with nozzles OFF

F. Spray until air comes out of nozzles

Cleaning

General Info

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

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

ATTENTION!

Clean sprayers are safe sprayers.

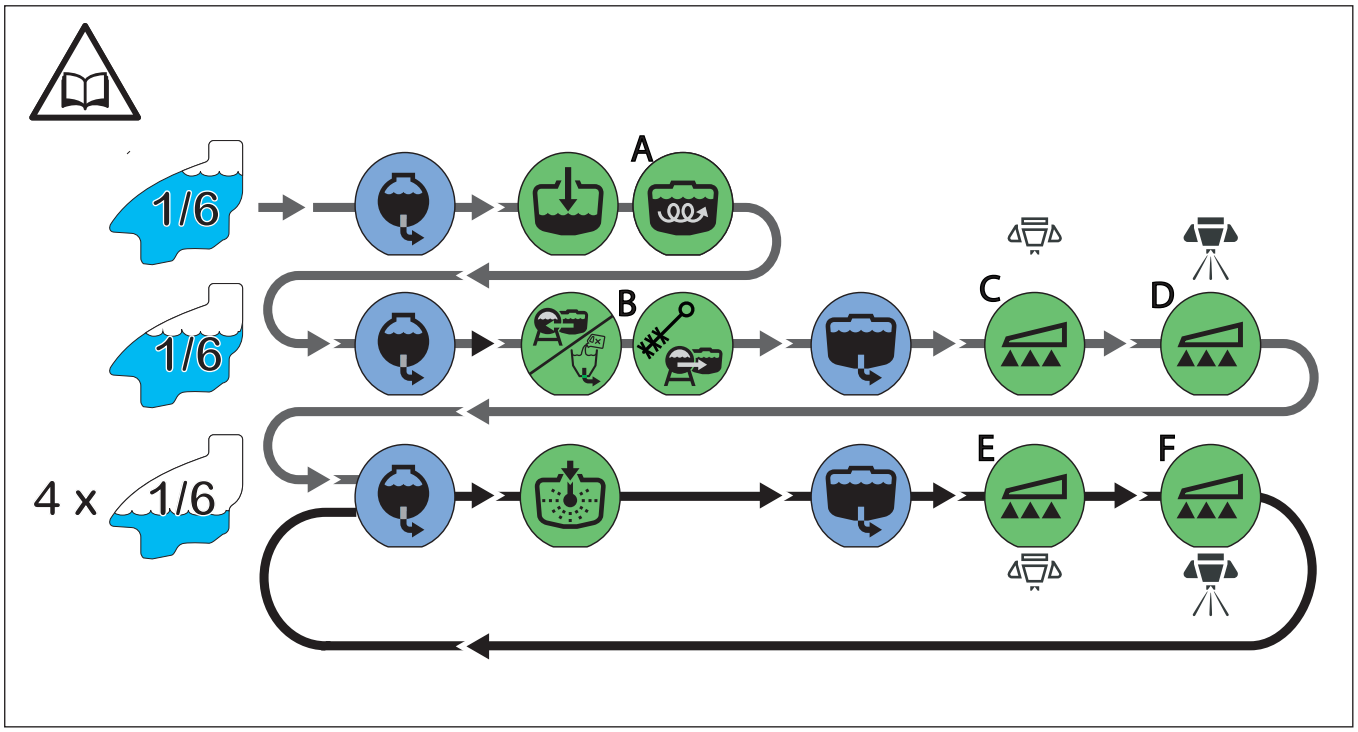
Clean sprayers are ready for action.

Clean sprayers cannot be damaged by pesticides and their solvents.

Guidelines

- Read the whole chemical label. Take note of any particular instructions regarding recommended protective clothing, deactivating agents, etc. Read the detergent and deactivating agent labels. If cleaning procedures are given, follow them closely.
- Be familiar with local legislation regarding disposal of pesticides washings, mandatory decontamination methods, etc. Contact the appropriate authority if you are in doubt.
- Pesticide washings can usually be sprayed out on the field just sprayed or at a suitable cultivated area. Avoid emptying the washings at the same spot every time and keep sufficient distance to the water environment. You must prevent seepage or runoff of residue into streams, watercourses, ditches, wells, springs, etc. The washings from the cleaning area must not enter sewers. Alternatively the washings can be retained in an appropriate receptacle, diluted and distributed over a larger cultivated area
- Cleaning starts with the calibration, as a well calibrated sprayer will ensure the minimal amount of remaining spray liquid.
- It is good practice to clean the sprayer immediately after use, and thereby rendering the sprayer safe and ready for the next pesticide application. This also prolongs the life of the components. It is strongly advised to perform an internal cleaning of the sprayer, when high concentrations of acids or chloride are present in the active ingredients, or if the spray liquid is corrosive. For the best result, use a cleaning agent recommended by HARDI, e.g. AllClearExtra.
- 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, children and animals must not have access to the sprayer under these circumstances.
- If the product applied is corrosive, it is recommended to coat all metal parts of the sprayer before and after use with a suitable rust inhibitor.
- The sprayer must always be parked under roof to avoid rain washing off pesticides as well as build-up of spot contamination in the soil. If parked outside, the sprayer should be parked on the filling/washing location in order to retain possible pesticides.

Quick reference - Cleaning



A. Full agitation.

B. Wait 3 seconds before changing valve position.

C. Min. 45 seconds with nozzles OFF.

D. Spray until air comes out of nozzles.

E. Min. 45 seconds with nozzles OFF.

F. Spray until air comes out of nozzles

Cleaning and Maintenance of Filters

Clean filters ensure:

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

Use of rinsing tank and rinsing nozzles

The incorporated rinsing tank can be used for three different purposes:

A. Full internal rinsing or cleaning.

B. External cleaning (can only be carried out on completion of "A").

C. Rinsing spray circuit without diluting main tank content.

ATTENTION! The cleaning procedures stated requires the TurboFiller to be cleaned on beforehand (directly after the last chemical filling). If the TurboFiller for some reason is not cleaned please carry out this cleaning before attempting the cleaning procedures A, B or C - see "TurboFiller rinsing" on page 86.
Note that this cleaning will then use water from the rinsing tank reducing the available quantity for cleaning procedures A, B or C.

ATTENTION! Do NOT fill any cleaning detergents into the rinsing tank. If cleaning agents are to be used this should be added the main tank.

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 by cross contamination and subsequent crop damages).

WARNING! If the next crop to be sprayed is sensitive to the latest chemical used a full cleaning should be carried out. See "Full internal cleaning (Soak wash)" on page 96.

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 blind cap is securely fitted and tightened on the PressureEmpty quick-coupler! 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. Empty the sprayer as much as possible. Close the agitation valve (no agitation). Allow the pump to run for at least 1 minute after the liquid fan from the nozzles has collapsed to ensure that all relevant liquid has been expelled.
2. Turn suction SmartValve towards "Rinsing tank" and pressure SmartValve towards "Main tank". Set agitation valve to "Full agitation".
3. Engage and set the pump at approximately 300 rpm.
4. Use 1/6 (approximately 75 l) of the rinsing tank content at this valve setting.
5. Turn the pressure SmartValve towards "Pressure Empty/TurboFiller" for minimum 3 seconds to burst and flush the safety valve. The TurboFiller is not flushed by this operation.
6. Turn the agitation valve towards "FastFiller flushing" and use another 1/6 (approximately 75 l) of the rinsing tank content for flushing the FastFiller lines.

7. Shut off all nozzles by the main ON/OFF button on the grip.
8. Turn suction SmartValve towards “Main tank” and the pressure SmartValve towards “Spraying”. Engage the pump and set the spraying pressure at 3-5 bar. If the pressure is set outside this range the rinsing result may be insufficient.
9. Allow the rinsing water in the main tank to circulate for minimum 45 seconds with the nozzles shut to flush the return lines from boom to tank.
10. Open all nozzles and spray the rinsing water from the main tank through the nozzles while driving in the field. Choose a different location each time to distribute the rinsing water over larger areas. Continue until all fluid is expelled from the boom tubes and nozzle - this may take several minutes after the spray fan has collapsed.
11. Shut off all nozzles by the main ON/OFF switch.
12. Turn the suction SmartValve towards “Rinsing tank” and the pressure SmartValve on “Tank rinsing”. Use another 1/6 (approximately 75 l) for this. The tank strainer should be removed to avoid shading for the rinsing nozzle.
13. Turn the suction SmartValve towards “Main tank” and the pressure SmartValve towards “Spraying”. With the nozzles shut allow the liquid to circulate for minimum 30 seconds to flush the return lines from boom to tank.
14. Open all nozzles by the main ON/OFF switch and spray the rinsing water from the main tank through the nozzles until all liquid is expelled from the boom tubes/nozzles.
15. Repeat step 11-14 another 3 times using 1/6 (approximately 75 l) of the rinsing tank content in each of the 3 sequences until the rinsing tank is empty.
16. Shut off the nozzles at the main ON/OFF button once the rinsing process is complete.

B. External cleaning

This procedure is used to rinse the sprayer on the outside in the field as required with the External Cleaning Device.

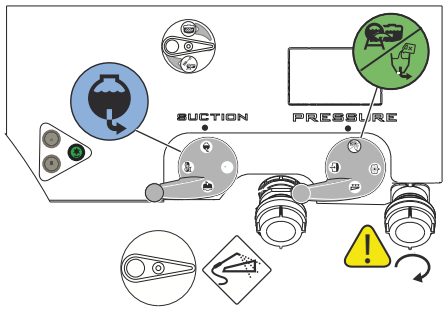
NOTE! Before attempting an external rinsing, make sure the main tank is rinsed (see “A. Full internal rinsing” on page 93) and empty! Any liquid left in the main tank will be mixed with the clean water for external rinsing!

NOTE! Approximately 100 l of clean water in the rinsing tank will allow approximately 15 minutes of rinsing (Cleaning nozzle consumption is 6 l/min at 10 bar pressure).

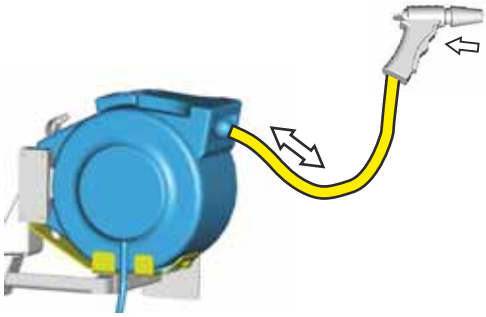
WARNING! Never clean the sprayer if there are risks of contamination of surface or underground water! Choose a different spot for cleaning every time to avoid spot contamination to build up.

- Engage pump at approximately 300 r.p.m.
- Turn suction SmartValve towards “Rinsing tank” and pressure SmartValve towards ”Pressure draining/Turbofiller”. Close the agitation valve

DANGER! Before turning Pressure SmartValve to “Pressure draining/TurboFiller” it is very important to be sure that the quick coupler lid is correct and completely mounted to the filling stud into its locked position. Failure to do so may cause risk of contamination and injury from quick coupler lid being “shot” off when pressurized! If not possible to mount lid completely, lubricate the rubber seal and the grip hooks.



- Pull out the hose from the reel.
- Turn the ball valve to position to open.
- Adjust he pressuremanually to approximately 10 bar.
- Wash the sprayer with the cleaning gun.
- Disengage the pump and close the ball valve again by turning it to position (B).
- Retract the hose and place the cleaning gun in the holder (C)



NOTE! Do not let go of the hose. Gently restrict the roll-in of the hose.

C. Rinsing spraying circuit without diluting main tank content

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

Rinsing of the liquid system

1. Turn Suction SmartValve towards “Rinsing tank”. (Keep pressure SmartValve in “Spraying”-position).

- NOTE! The main ON/OFF on the Grip must be ON. Closing the main ON/OFF will transfer the rinse water back to the main tank!
- Close agitation valve (no agitation).
- Turn off the Cyclone Filter Boost Valve to avoid dilution of main tank content.
- Engage the pump and spray water from rinsing tank in the field until all nozzle tubes/nozzles are flushed with clean water.
- Disengage the pump again.

ATTENTION! It is advisable to increase the forward speed (double if possible) and reduce the pressure to 1.5 bar (20 psi) 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.

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

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

1. Rinse the sprayer in the field (See chapter "Use of rinsing tank and rinsing nozzles" subchapter A).
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 (respectively 330 litres, 450 litres, 550 litres and 700 litres). Fill the rinsing tank completely. This water is used later for rinsing.
4. Turn suction SmartValve towards "Main tank" and pressure SmartValve towards "Main tank". Set agitation valve to "Full agitation".
5. Engage and set the pump at approximately 300 r.p.m..
6. Allow the liquid to circulate for 3 minutes.
7. Turn the pressure SmartValve towards "Pressure Empty/TurboFiller" for minimum 10 seconds without activating the TurboFiller in order to burst and flush the safety valve.
8. Open the TurboFiller transfer valve and the deflector valve and allow liquid to circulate for 3 minutes.
9. Close the lid and activate the container rinsing valve to clean the hopper inside.
10. Shut off all three valves on the TurboFiller again.
11. Turn the agitation valve towards "FastFiller flushing" for 3 minutes to clean the FastFiller lines.
12. Verify that all nozzles are shut at the main ON/OFF button on the grip.
13. Turn the pressure SmartValve towards "Spraying".
14. Allow the liquid in the main tank to circulate for minimum 3 minutes with the nozzles shut to clean the return lines from boom to tank.
15. Turn the pressure SmartValve towards "Tank cleaning nozzles" and circulate liquid for further 3 minutes.
16. Spray out water with cleaning agent and chemical residue. Set the spray pressure at 3-5 bar. Note that the washing water still contains active chemical and choose an appropriate area to spray out this. Alternatively the washings can be dumped at the Filling/washing location and retained in an appropriate receptacle (E.g. slurry tank or similar) - see section "Filling/washing location requirements". Spot contamination and accumulation must be avoided. Continue to spray until all liquid is expelled from the boom tubes and nozzles.
17. Shut off all nozzles by the main ON/OFF switch.
18. Rinse the sprayer again with clean water to rinse out all remains of the cleaning agent. See section "Use of rinsing tank and rinsing nozzles" subchapter A. "Full internal rinsing" This to avoid that the cleaning agent remains in the fluid system. Remains could damage the next spray chemical filled into the main tank.
19. Include rinsing of the TurboFiller in step 17. Operate all 3 valves during this process.
20. Dismantle 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. Clean manually with a high pressure cleaner 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.

PrimeFlow - manual cleaning

in the event of a AutoWash failure machines equipped with PrimeFlow can follow the same manual washing procedure as described in this manual when the following detail is observed:

- Open all nozzles before flushing the boom spray lines to avoid chemical residues from the boom lines are returned into the main tank.

Use of detergents

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

- The cleaning detergents which contains a suitable lube or conditioner is recommended.
- If for some reasons 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

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

This technical residue is defined as the remaining amount of liquid in the system, when the first clear pressure drop appears on the pressure gauge. See “Technical Residue” on page 142 for specific technical residues.

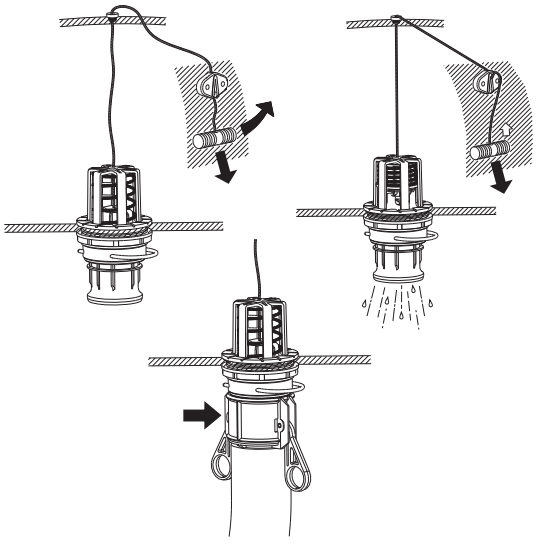
The residues in the tank should be diluted immediately in a ratio of 1:10 with clean water. Afterwards it should be sprayed on the crop just sprayed with increased driving speed. In addition, also pump, linkage and armature can be separately rinsed with water from the rinsing tank. However, it must be ensured that the liquid in the spray lines are in unchanged concentration. Therefore there should be an untreated field area available to spray this liquid out.

Using the Drain Valve

The drain valve is operated from the back of main tank of the sprayer.

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

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



5 - Operation

Air conditioning

General information

The air conditioning installed in the cabin gives the required temperature very quickly and maintains it irrespective of the outside conditions (vehicle speed, variation in sunshine level or outdoor temperature).

The comfort temperature is maintained in the cabin when the outdoor temperature is between -20 °C and +45°C.

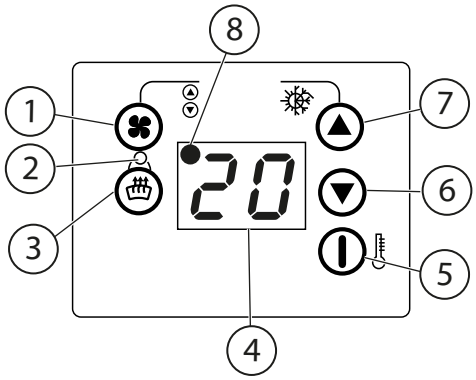
The temperature regulation system is automatic (microprocessor technology), which makes it possible to offer maximum comfort without modification of the manual temperature control.

WARNING! To maintain good air quality in the cabin, it is essential to keep the cabin door firmly shut and to ensure that the air conditioning is permanently working.

Description of air conditioning control unit

The electronic module of air conditioning equipment is designed to control air conditioning, defrost and cabin ventilation in order to maintain a comfortable temperature in the cab.---

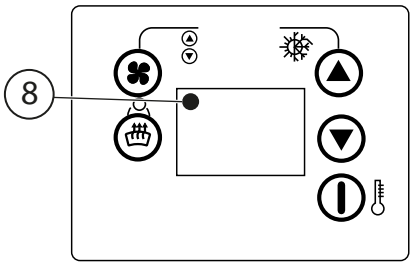
1. 1st ventilation speed indicator.
2. Defrost indicator.
3. Defrost control.
4. Programmed temperature display and exterior temperature
5. On/Off the control unit
6. Decrease the interior temperature.
7. Increase the interior température.
8. Standby indicator.



Operation of air conditioning unit

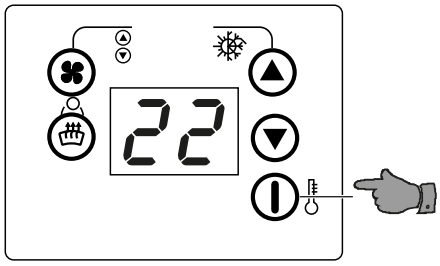
On/Off the control unit

When the control unit is powered, the decimal point (**8**) indicates that the control unit is in STAND BY mode.



- Press the key ⏻ to power on the control unit.

The control unit indicates the set point température



- Press the key ⏻ again to power off the control unit.

Temperature SetPoint

The température **Setpoint** is the desired temperature in the cab. To adjust the temperature :

- Press the keys ▼ or ▲ to enter in the setup menu. The temperature SetPoint is flashing
- Press the keys ▼ ▲ again to display the desired temperature in the cab.
- Wait a few moments to exit the temperature settings .

Adjust the ventilation

Ventilation runs regardless of the air conditioning system The ventilation has 6 speeds controlled manually u1 à u6 and an automatic mode Au that is controlled according to the temperature setpoint. To change the speed:

- Press the key ❋ pour entrer dans le menu de réglage de la ventilation
- Press the keys ▼ or ▲ to select the desired speed ventilation from. u1 to u6 or the automatic control of the ventilation Au

ℹ The ventilation starts always in the automatique mode Au

Air conditioning and heating controls

Principle of operation of the air conditioning :

- If the outer temperature is below 5 ° C, the cooling of the cabin will not be running.
- If the outer temperature is higher than 5 ° C, refrigeration will engage automatically when the ambient temperature becomes higher than the setpoint temperature. Refrigeration will stop automatically when the ambient temperature drops below the set temperature, or the outer temperature drops below **5** ° C.

ℹ A timer prevents the restart or shutdown of the air conditioning compressor too frequently between two cycles.

Principle of operation of the heating

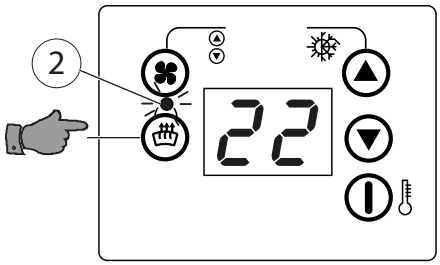
The heater will turn on when the ambient temperature drops below the setpoint temperature and stop when the ambient temperature reaches the setpoint temperature.

Demisting control

Demisting is operated manually and stopped automatically after a time defined by the parameter td

- Press the key ⛆ to enter in the demisting control menu. The air conditioning and the heating are drived simultaneously and the ventilation is maximum in the cab.
- Press the key ❋ , then ▼ or ▲ to adjust the desired speed ventilation from. u1 to u6

The indicator (**2**) remains light up during the demisting cycling of the cab. It flashes 2 times at the end of the cycling demisting of the windscreens



ℹ If an another demisting cycle must be operated, within 6 seconds is required between 2 demisting cycles

ℹ In case of malfunction, see the section “Air conditioning and heating control unit” page 114

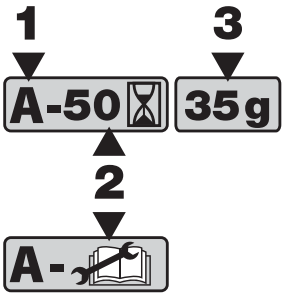
Lubrication

General information

Always store lubricants in a clean, dry and cool place - preferably at a constant temperature. Keep the containers and funnels.
Clean lubrication points before applying the lubricants.
Always follow the recommendations concerning quantity. If no recommended quantity is given, feed lubricator until new grease becomes visible.

Pictogrammes de lubrication

1. Lubricant to be used (see table below)
2. Lubrication interval (in hours for occasional maintenance).
3. Quantity to be used, if necessary (see table below).



ATTENTION! If the sprayer is clean with a pressure washer, it is recommended to fully lubricate the machine.

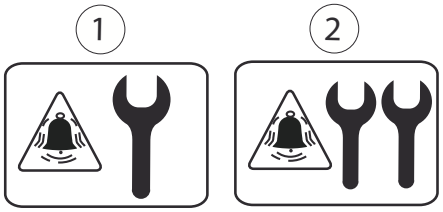
Table of recommended lubricants

Parts	Capacity (litres)	Recommended lubricants - TOTAL	
DEUTZ TCD2012 L06 engine engine crankcase + filter	**15.5**	TRACTAGRI HDZ FE 10W30 DEUTZ - DQC- III- LA	**A**
Hydrostatic transmission Hydraulic system	**90**	EQUIVIS ZS46 AFNOR NF E 48-603HV ISO 6743/4HV	**B**
General lubrication		Multi EP2 ISO-L-XBCFB 2	**C**
464 pump lubrication	**35** grams	TOTAL Multis Complex SHD 460	**D**
Coolant	**20**	COOLELF AUTO SUPRA -37°C COOLELF AUTO SUPRA -37°CAFNOR NFR 15-601 - BS 6580	**E**

ATTENTION! The values given are for information. Only the level indicated by the gauge should be taken into consideration.

Maintenance intervals

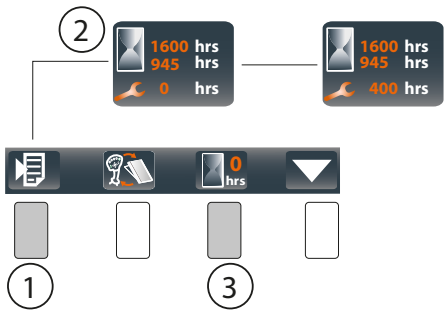
1. Maintenance for the first time **150** hours.
2. Regular maintenance every **500** hours.



Resetting the maintenance intervals

After each maintenance operation, you can reset the counter

- Press the button **(1)** and navigate to display the icon **(2)**
- Simultaneously press **5** seconds the 2 buttons **(1)** and **(3)** for ressetting. The display indicates the next period of maintenance



When the maintenance period is reach, it is not possible to reset the partial hour counter

Service intervals

	Daily	x1 10	x1 150	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
				Interval +500 hours										
Hydraulic														
Hydraulic oil level	●													
Hydraulic oil			❑		❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Check hydraulic filters clogged				●	●	●	●	●		●	●		●	●
Hydraulic filters			❑		❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Drain the hydraulic tank			❑							❑				
Cabin														
Windshield washer fluid level	●													
Active carbon filter		❑ (Every 6 months)												
Air conditioning gas		❑ (Every 5 years)												
Clean air conditioning condenser			●		●	●	●	●	●	●	●	●	●	●
Air conditioning belt			●		●	●	●	●	●	●	●	●	●	●
Engine[1]														
Clean cooler	●													
Check oil level	●													
Check coolant level	●		●	●	●	●	●	●	●	●	●	●	●	●
Replace engine coolant		❑ (Every 2 years)												
Clean air filter	●													
Replace air filter						❑		❑		❑		❑		❑
Replace safety air filter						❑		❑		❑		❑		❑
Drain lubricating oil			●		❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Empty water fuel prefilter				❑										
Replace fuel prefilter					❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Replace fuel filter					❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Filling the fuel tank	●													
Clean fuel tank									❑					❑
Compressed air tank	●													
Inspect compressed air filter and lubricator			●											
Compressed air pressure				●	●	●	●	●	●	●	●	●	●	●
Inspect V-belts roller		● (Every 2 years)												
Battery (maintenance + terminals)					●	●	●	●	●	●	●	●	●	●
Chassis and booms			●											
Tighten lug nuts		●		●										
Lubricate chassis and axles				●										
Check inflation pressure				●										
Inspect tires				●										
Dynamic brake accumulator		● (5 years)												
Spraying														
Check the boom		●		●										
Inspect spraying circuits			●	●	●	●	●	●	●	●	●	●	●	●
Lubricate 464 diaghrams pump				●										
Inspect line filters	●													
Remove and inspect the pressure gauge				●	●	●	●	●	●	●	●	●	●	●
Check the compressed air pressure				●	●	●	●	●	●	●	●	●	●	●
	Daily	10	150	250	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
		x1		Interval +500 hours										

● Check ❑ Replacement (1) See DEUTZ manual

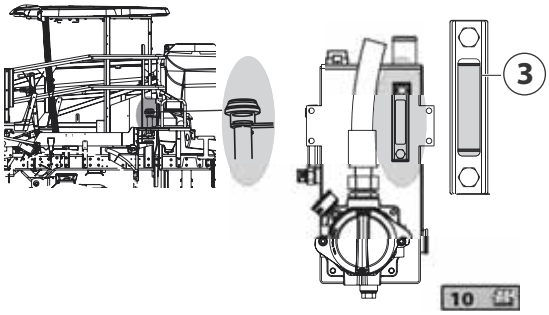
Maintenance of the hydraulic transmission

Hydraulic oil level

1. Filler cap of the hydraulic tank
2. Level gauge

After reassembling the filters elements

- Fill hydraulic tank until the maximum level **(3)**.
- Start the engine at idle speed, then stop it few seconds. This allows to evacuates the air contained in he hydraulc circuit.
- Start the engine again at idle speed then gradually increase the engine speed
- Top up again until the maximum level **(3)**



Auxilliary filters

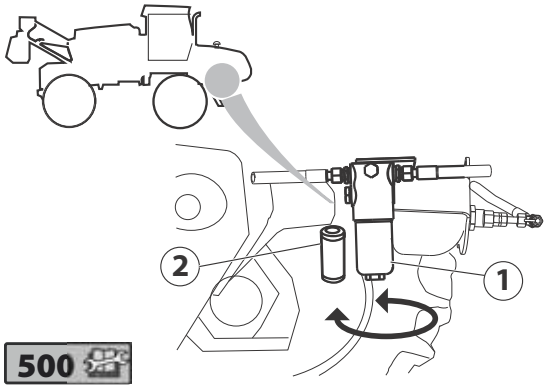
WARNING! It is essential to use an original filter.

Brake system (optional)

To replace he filter cartridge :

- Unscrew the filter housing **(1)**.
- Remove the filter **(2)** and replace it with a new one.

Part Number **782856**

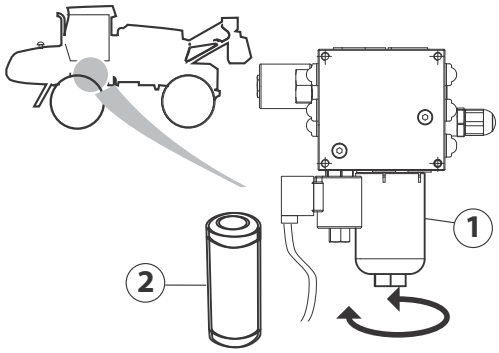


Steering priority valve

To replace he filter cartridge :

- Unscrew the filter housing **(1)**.
- Remove the filter **(2)** and replace it with a new one.

Part Number **78628301**

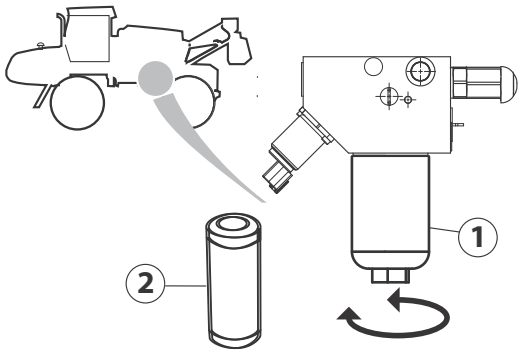


Flow regulation valve

To replace he filter cartridge :

- Unscrew the filter housing **(1)**.
- Remove the filter **(2)** and replace it with a new one.

Part Number **78628301**

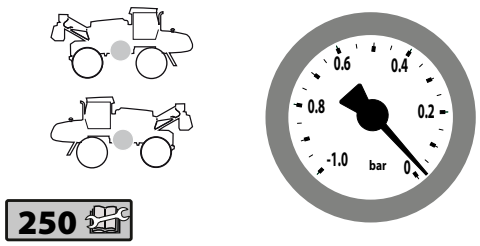


Tank hydraulic filters

Hydraulic suction filters are fitted with clogging indicators

NOTE! Reading the clogging indicator occurs when the hydraulic oil is at normal operating temperature.

- Regularly check the filters clogging level.



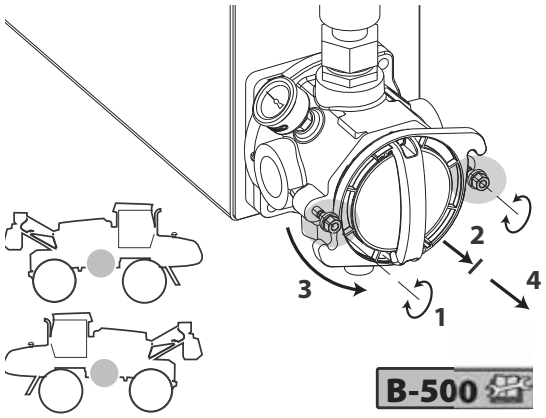
less than **0.5** bar = filters in good working order.

greater than **0.5** bar = filters to replace.

WARNING! Before replacing the filters, wear protective gloves to avoid the oil making any contact with the skin.

DANGER! Hot oil can cause serious burns.

WARNING! It is essential to use original filters elements.



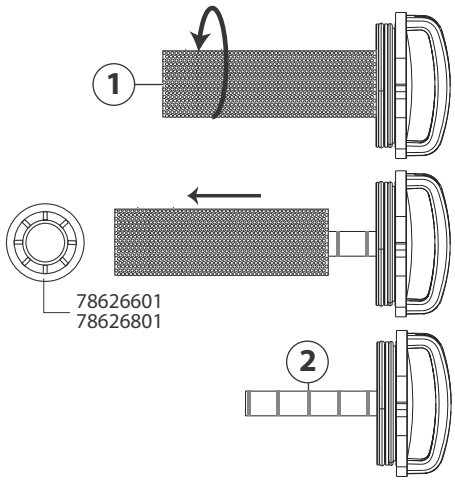
The filters elements should be fitted on either side of the tank. They should always be replaced at the same time.

A 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 from the tank.

The right and left filter element is different
Left : **78626601** - Right : **78626801**

Remove the filter cap

- Unscrew the 2 nuts, without disassemble
- Pull out the cover up to the limit stop of the nuts. A one-way valve at the end of the filter housing retains the oil from the tank
- Turn the cover and completely pull the assembly

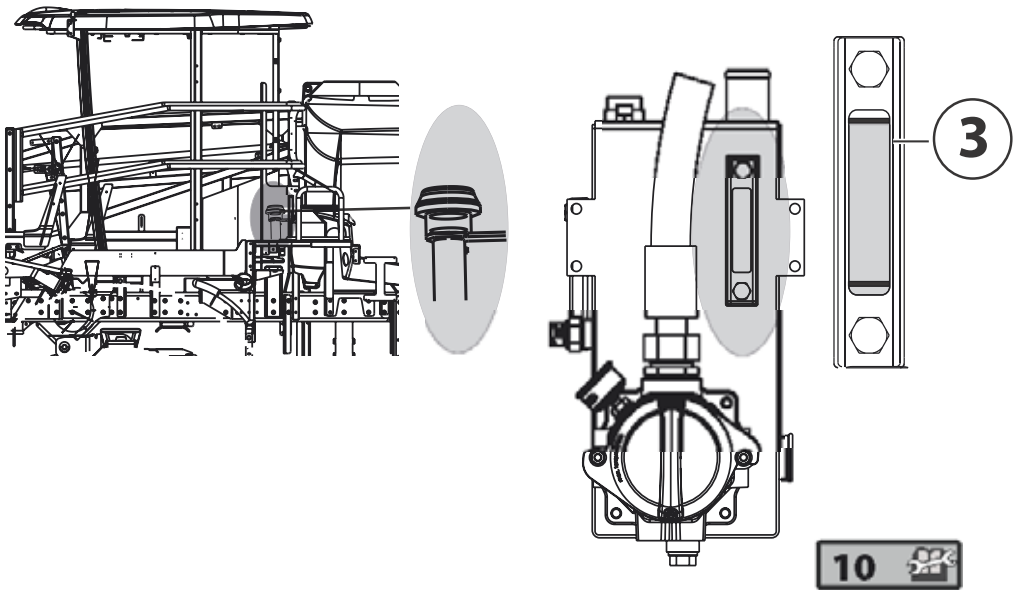


Remove the filter element

- Unscrew the ilter element **(1)**
- Clean carefully the magnetic core **(2)** with a cloth
- Replace the filter element.

NOTE! The oil running from the filters must never be re-used as it may damage the hydraulic system components.

After reassembling the filters elements

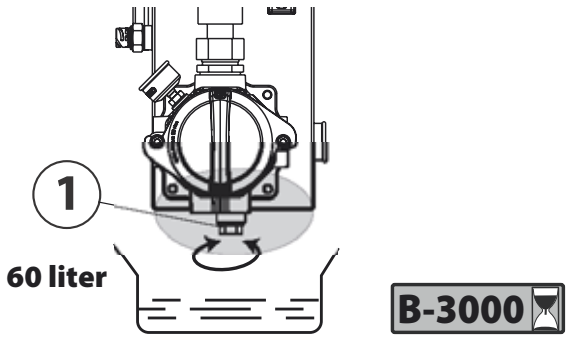


- To up to the maximum level **(1)**
- Start the engine on idle then stop it after a few seconds. This evacuates the air contained in the hydraulic system.
- Start the engine again on idle and then gradually increase the engine speed.
- Top up again with oil to the maximum level **(1)**.

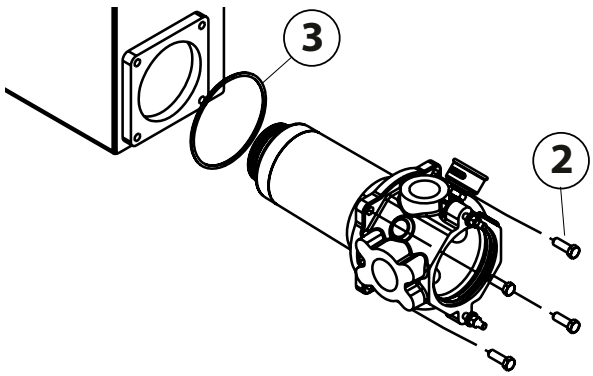
Drain the hydraulic tank

The hydraulic tank is draining after 150 hours, then every 3000 hours of use. The drain of the tank should also carriied out after intervention on the hydraulic system (hydraulic components replacement).

- Place a collecting container xith a minimum capacity of 60 liter underneath the tank.
- Unscrew the drain plug (**1**) and let drain



- Loosen screws(**2**) and pull out the filter bodythe filter body
- Thoroughly clean the tank
- Reassembly the filter body, change if necessary the O-ring (**3**) and use a new plug seal

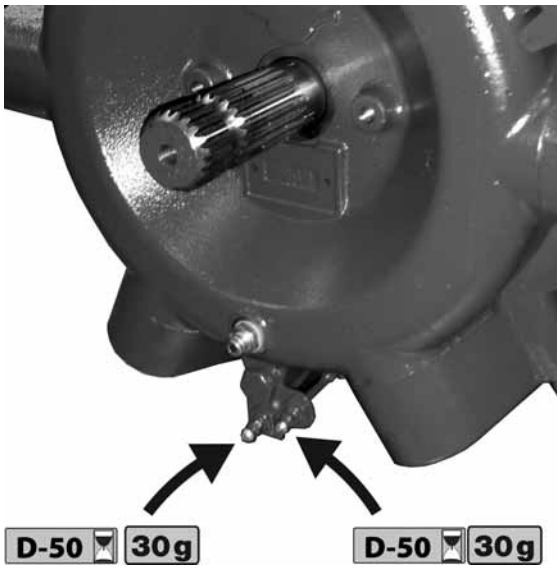


Use the recommended hydraulic oil . Refer to “Table of recommended lubricants” on page 101.

Maintenance of the spraying pump - Chassis - Wheels

Greasing the Pump

When operating the pump, it MUST be greased every 50 hours with **30 gram** grease into each lubrication point.

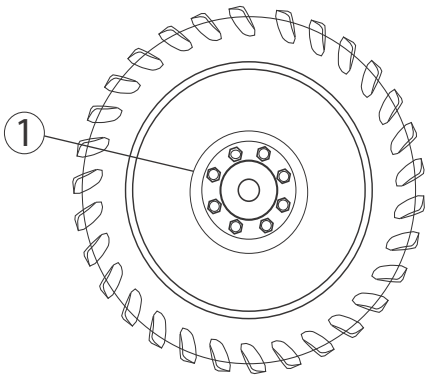


ATTENTION! In order to avoid excessive wear it is important to use a recommended lubricant! See "Table of recommended lubricants" on page 101.

ATTENTION! The pump MUST be stopped during greasing!

Wheel nuts

Thighten if necessary studs (**1**) to following torque **105 daN.m** (775 lb.ft).

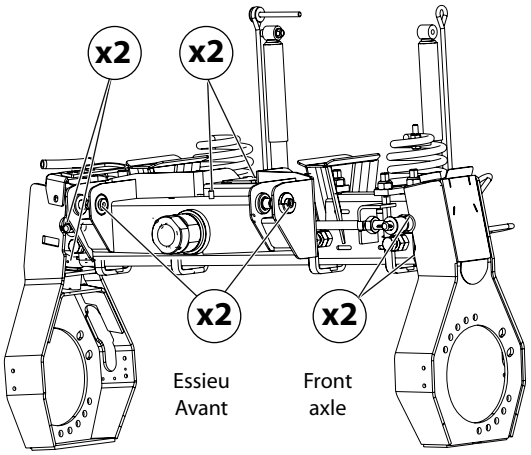


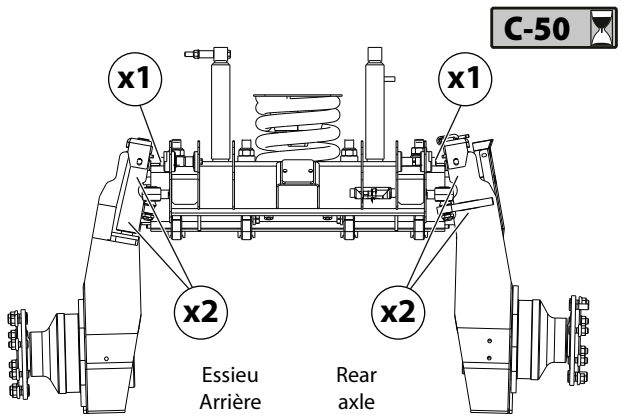
ALERT! Never lubricate or grease studs.

Studs : Metric 22x150 class 12.9.

Front and rear axle greasing

Grease the front and rear axle following the illustration below.





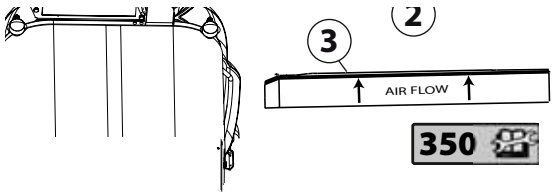
Cab

500 hours - active carbon filter

The cab is equipped with active carbon filter that purifies the air entering in the cab interior. It is fitted outside the cab at the rear.

ATTENTION! Wearing a mask and protective goggles is recommended to avoid inhaling the dust and protecting the eyes from it.

- Partially loosen the knurled screw on the right of the cab and completely loosen the screw on the left side **(1)**.
- Remove the housing and active carbon filter assembly.
- Remove the filter from its housing by removing the 2 screws **(2)** using a Philips screwdriver.
- Fit the new active carbon filter respecting the direction of assembly. (The foam **(3)** is visible).
- Refit the assembly to the cab.

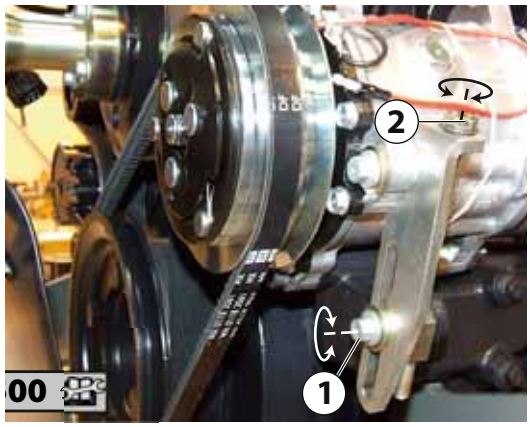


WARNING! The frequency of replacement is given for information purposes. However, if odours appear in the cockpit, this means that it is no longer completely effective, and it must be replaced as soon as possible.

500 hours - Air conditioning compressor belt

The wear and tension of the compressor drive should be checked regulary.

- Loosen the nut **(1)**.
- Screw the nut **(2)** to retain the belt, then tighten the counter nut **(1)**.

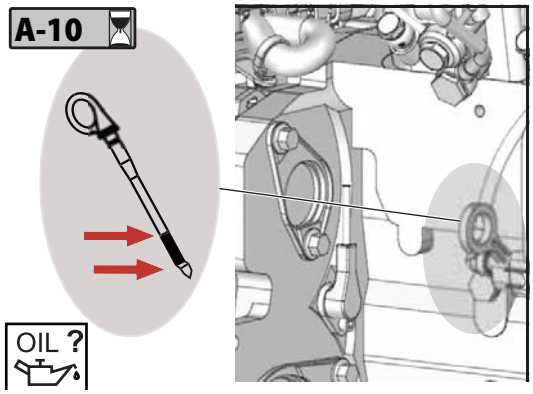


Engine maintenance

10 hours - Lubrificating oil level

- Check the lube oil

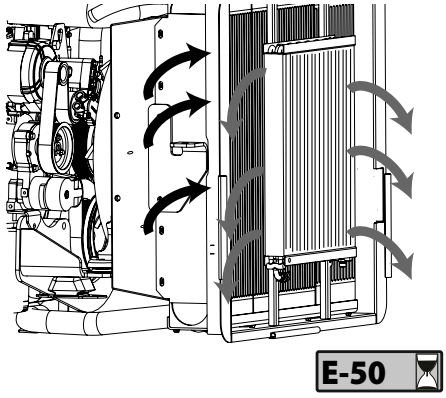
Use the recommend lube oil. Voir “Table of recommended lubricants” page 101.



50 hours – Engine radiators

Cleaning the radiators

- Raise the hood to access the radiators..
- Clean the radiators preferably with compressed air



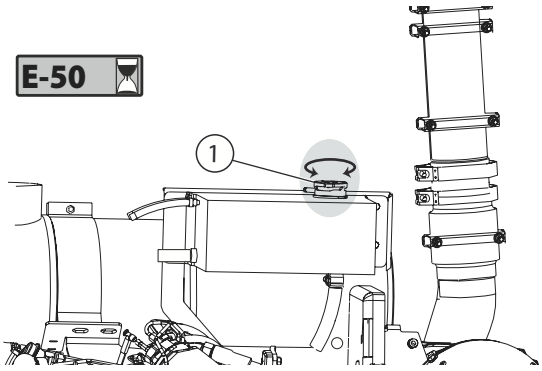
NOTE! Take care not to damage the radiators fins during cleaning operations.

ATTENTION! When the machine is operating in areas with a lot of dust or pollenn, the cleaning intervals can be shortened.

WARNING! Oil and fuel residue increase the risk of clogging. This is why it is advisable to carefully check the sealing, particularly when the machine is working in a dusty environment.

50 hours - Coolant

- Check preferably the coolant level when the engine is cold
- Remove the cap **(1** to add coolant.
- Fill up the expansion tank to **3/4** of capacity



The excess of coolant is automatically elimined through the outlet pipe

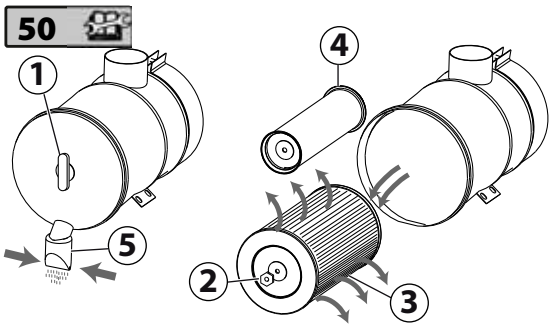
ATTENTION! Only use the recommended coolant. Never mix with other coolants. If in doubt, drain the cooling circuit completely.

50 hours – air intake filter

- Regulary check the air intake filter and the safety cartridge according to the sheduled service.

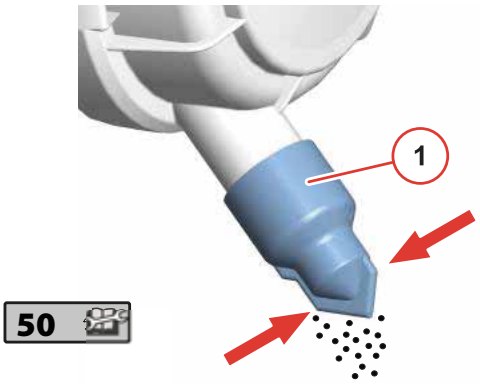
Air intake cartridge

- Loosen the wing nut **(1)** and pull out the air filter cap.
- Loosen the nut **(2)** and pull out the air filter.
- Dust the filter **(3)** with compressed air from inside to outside.



Dust discharge valve

- Empty the dust discharge valve **(1)** by pressing together the discharge slit



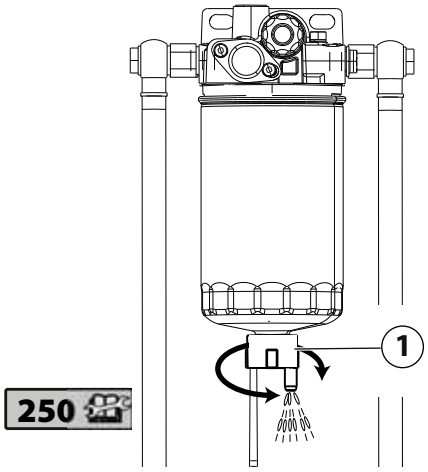
The intervals of verification and cleaning can be reduced depending on the usage environment of the machine

For more information, see the DEUTZ TCD 6.1 L6 manual in chapter **Suction System**

500 hours – Fuel prefilter

Traces of humidity may be contained in the fuel. This may be due to condensation and this is why the prefilter is equipped with a water separator device.

- Loosen the sensor **(1)** of **2** turns to drain fluid until pure fuel runs out
- Retighten after draining.



WARNING! The fuel must be collected and disposed of according to the environmental regulations in force.

For more information, see the DEUTZ TCD 6.1 L6 manual in chapter **Fuel System**

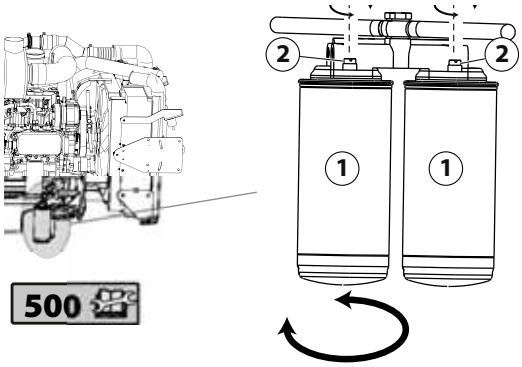
500 hours – Fuel Filters

To guarantee optimum engine performance, you should regularly replace the 2 fuel filters.

Replacing the filters

NOTE! It is essential to use original filter cartridges.

- Loosen the filter elements.
- Refit the new filters and check they are correctly sealed.



Vent the fuel system

After reassembling the fuel filters, you should vent the fuel system

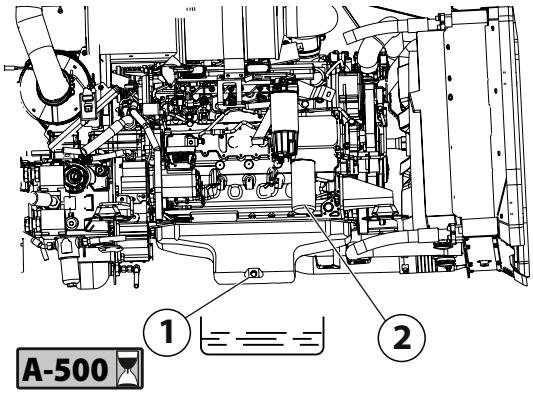
WARNING! The fuel must be collected and disposed of according to the environmental regulations in force.

- Loosen the 2 vent screws **(2)**.
- Unlock the hand pump by pushing and turning the pushbutton.
- Pump until the fuel runs over the vent screws
- Tighten the vent screws
- Start the engine while continuing to operate the pump

For more information, see the DEUTZ TCD 6.1 L6 manual in chapter **Fuel System**

500 hours – Draining lube oil and replacing the Oil filter

- Warm up the engine (lubricating oil temperature > 80 °C).
- Ensure that the engine is in a level position
- Place a collecting receptacle underneath the lube oil drain screw



For the characteistics of lube oil and filing volume, see “Table of recommended lubricants” page 101.

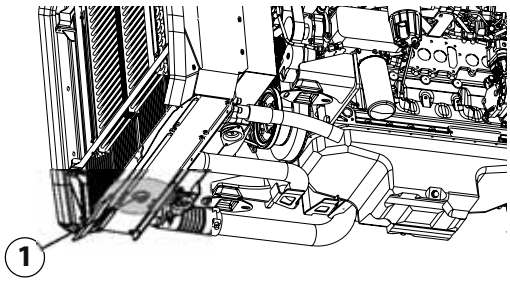
NOTE! It is essential to use original filter cartridges.

For more information, see the DEUTZ TCD 6.1 L6 manual in chapter **Lubrificating oil system**

2 years - Coolant replacement

The cooling system should be drained every **5** years.

- Loosen the drainage screw **(1)** to completely drain the cooling system.
- Fill the system with recommended coolant.

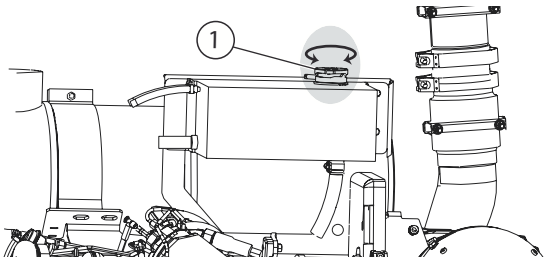


E-2 years

For more information of coolant see “Table of recommended lubricants” page 101

Coolant level

For more infomation see “50 hours - Coolant” page 109



For more information, see the DEUTZ TCD 6.1 L6 manual in chapter **Cooling System**

1000 heures - Air conditioning

Checking of the **R134a** gas charge should be carried out by a specialist. The dryer filter should be replaced every **5** years.

1000 heures - Battery

The battery does not require any special maintenance. It has optimum starting power even in low temperatures or intense heat.

WARNING! The electrical and electronic equipment requires a battery in good working order. A damaged battery could cause damage to the electronic equipment.

WARNING! Never disconnect the battery when the engine is running.

WARNING! Always disconnect the terminals before recharging the battery or performing welding operations.

WARNING! To avoid any risk of the battery exploding, it should be recharged in a ventilated area where no smoking is allowed. Never short circuit the terminals.

WARNING! Never reverse the polarity.

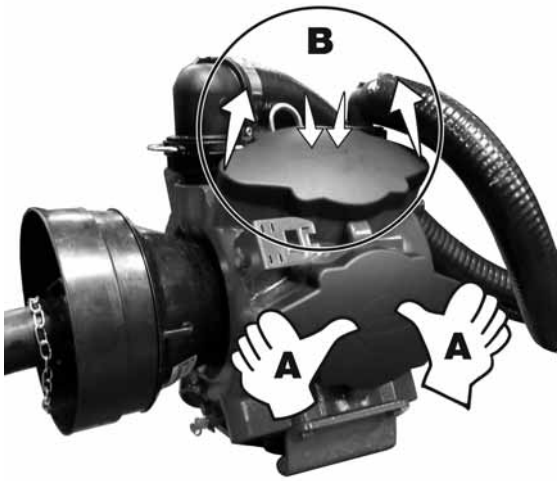
Occasional maintenance

General information

The servicing and maintenance intervals mainly depend on the conditions of use of the sprayer and, as a result, the maintenance intervals may not be stated.

Pump Valves and Diaphragms Renewal

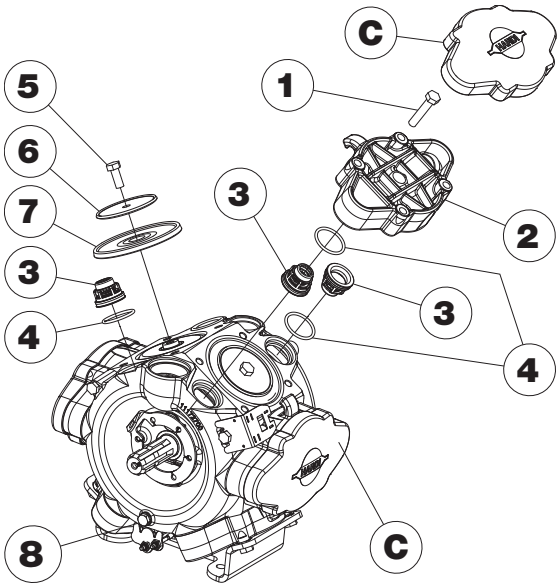
1. Lift off the plastic covers (**C**) with your hands (**A**) by pulling with the finger tips while pushing with the thumbs in the centre, as shown in (**B**).



Valves

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

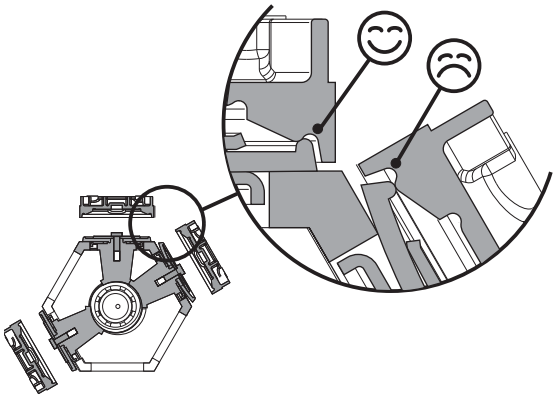
ATTENTION! It is recommended to use new gaskets (4), when changing or checking the valves.



Diaphragms

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

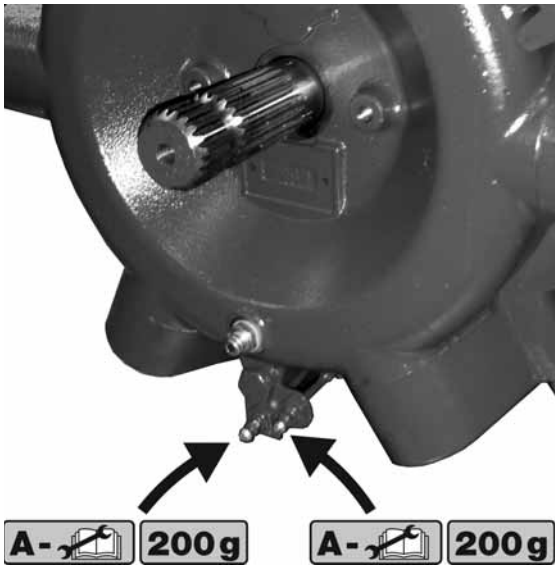
ATTENTION! Before tightening the 4 bolts for the head (**2**), the diaphragm must be positioned between centre and top to ensure correct sealing between diaphragm pump housing and diaphragm cover. Turn the crank shaft if necessary.



Re-lubrication after assembly

After disassembling the pump (diaphragm renewal, etc.) the pump MUST be lubricated with 200 g grease into each lubrication point.

Hardi pump grease cartridge (400g): Item no. 28164600



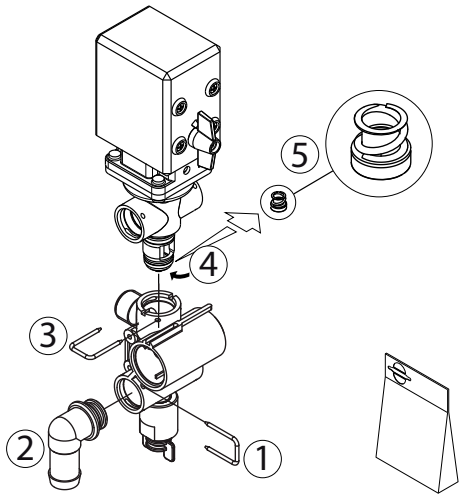
Overhaul Kit

Diaphragm pump overhaul kit (valves, seals, diaphragms etc.) can be ordered. Detect the pump model - the overhaul kit can be ordered by your local dealer.

Model 464 : item no. 75586000

Distribution valve seal check/replacement

Regularly check the tightness of distribution valves with clean water.



Check

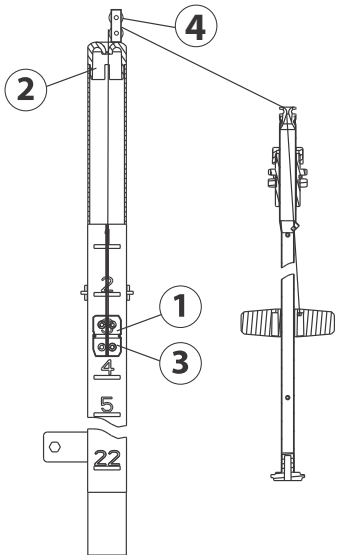
- Open all distribution valves (open spraying).
- Remove the pin **(1)** and remove the connector **(2)** When the housing is drained, there should be no liquid flow through the return line. If a leak is found, the seal **(5)** must be replaced .

Replacement

- Gently lift the pin **(3)** and remove the motorised valve from its housing.
- Loosen the screw **(4)** and replace the seal **(5)**
- Reassemble in reverse order.

External gauge adjustment

The gauge reading should be checked regularly. The machine should be parked on flat horizontal ground.



- Fill the tank with a known volume of water, the bushing marker should correspond with the graduation of the gauge. If this is not the case:
- Remove the cord guide.
- Loosen the screw **(3)** and adjust the position of the indicator **(2)** with respect to the indications on the pole.
- Check that the wheels **(4)** turn freely.

Gauge cord replacement

If the cord on the gauge has to be changed, the float guide pole is removed from the tank:

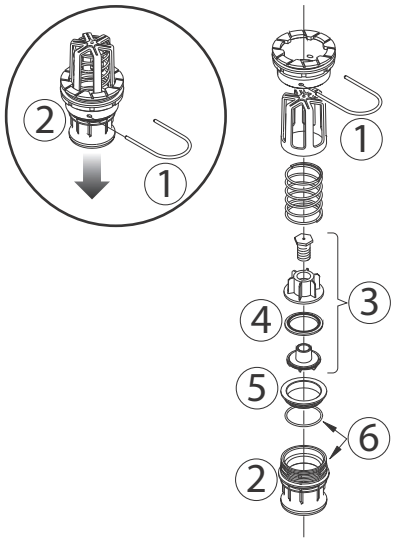
- Remove the drain valve (see below "Drain valve seal replacement") and loosen the fitting holding the pole in position.
- Pull the pole down through the drain valve hole till it is free in the top of the tank.
- The pole can now be taken out of the tank through the filling hole.

⚠ DANGER Do not enter in the tank - the parts can be changed from the outside.

6 - Maintenance

Drain valve seal replacement

If you find a leak in the drain valve, check that the valve is clean. If the leak persists the valve seal should be replaced.



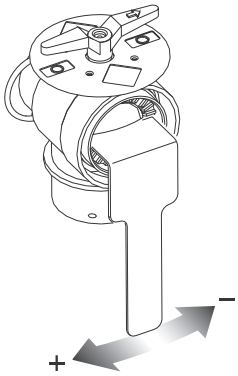
DANGER! Do not enter in the tank - the parts can be changed from the outside.

WARNING! Use a face protection mask and goggles when dismantling the drain valve.

- Ensure that the tank is completely empty.
- Close the drain valve and release the control cord.
- Remove the pin **(1)** and pull on the part **(2)** The drain valve assembly can be removed downwards.
- Check the wear on the cord and the valve assembly **(3)**, replace the seal **(4)**, then reassemble.
- Reassemble the drain valve assembly, replace the housing **(5)**. Lubricate the O-ring on reassembly.
- Reassemble the pin **(1)** and check the tightness of the drain valve.

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.

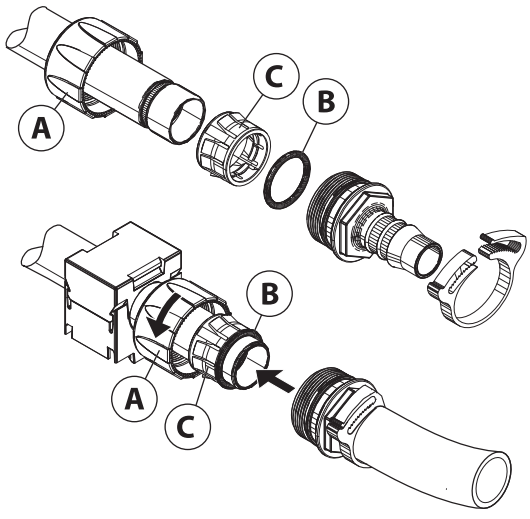
Feed pipe snap-lock assembly

Disassembly

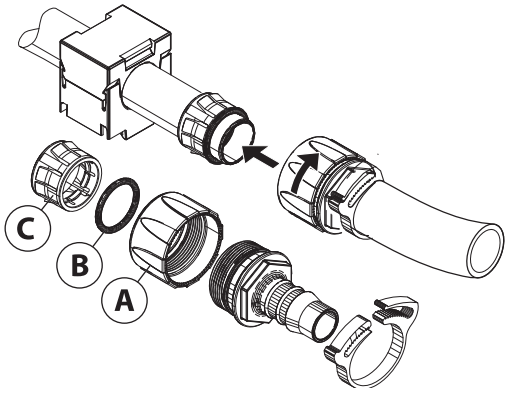
1. Screw the union nut (A) completely off.
2. Pull the feed piping and hose barb apart.
3. Take out the O-ring (B).
4. Inspect and oil O-ring (B). Change the O-ring (B) if worn, before reassembly.

Reassembly

1. Check that the barbed lock ring (C) is fitted to the feed pipe with barb pointing away from pipe opening.
2. Fit the oiled O-ring (B) on top of the lock ring (C).
3. Push the feed pipe and hose barb together.
4. Screw the union nut (A) on the hose barb and tighten union nut (A) by hand.



Initial fitting of fittings

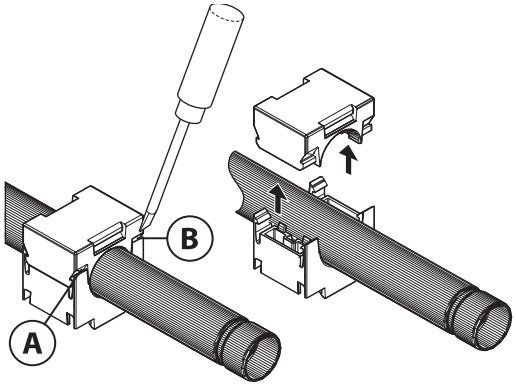


ATTENTION! This method can only be used for pipes not fitted into pipe clamps.

1. Fit the barbed lock ring (C) to the feed pipe with barb pointing away from pipe opening.
2. Fit the oiled O-ring (B) on top of the lock ring.
3. Screw the union nut (A) partly on the hose barb.
4. Press the feed pipe and hose barb together.
5. Tighten the union nut (A) by hand.

Feed pipe clamp assembly

A feed pipe can be removed from the pipe clamps the following way:



1. Use a flat bladed screwdriver to prize the cover off the first corner (A).
2. Hold the clamp top with your hand and prize off the opposite corner (B) with the screwdriver.
3. Prize off the other side of the pipe clamp with the screwdriver.
4. Take out the feed pipe.

Boom adjustment - general information

Before commencing adjustment jobs, please check the following points:

1. The sprayer must be correctly lubricated.
2. Place sprayer on level ground
3. The boom must be unfolded and horizontal (slant corrector in neutral position).

The adjustment of the hydraulic rams must take place when there is no pressure in the system.

WARNING! Nobody is allowed to be under the boom whilst adjustment is being carried out.

Readjustment of Boom - General Info

Before commencing adjustment jobs, please go through this check list.

1. The sprayer must be well lubricated (see the section "Lubrication").
2. Place the sprayer on level ground (horizontal).
3. Unfold the boom.
4. Set slanting angle to neutral position (horizontal).

WARNING! No one is allowed under the boom, while the adjustment is carried out.

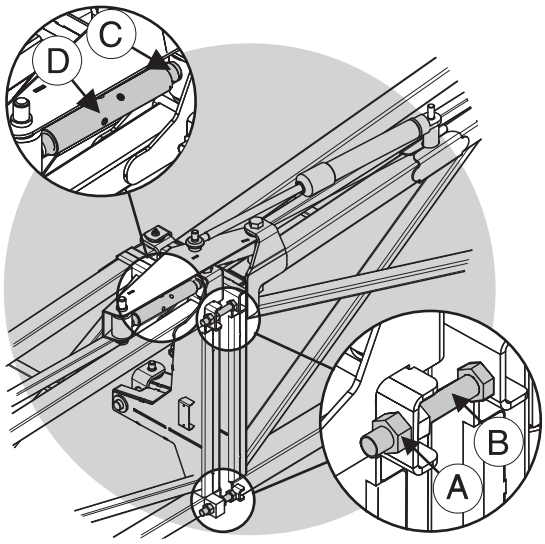
ATTENTION! For information on boom terminology.

ATTENTION! Adjustment of hydraulic cylinders is to be carried out without pressure in the system.

Alignment of inner and 1st outer wings

The inner wing sections must be aligned with the 1st outer wing sections. If necessary adjust the inner wing sections as follows:

1. Depressurize the folding cylinders.
2. Loosen counter nuts (A) and (C).
3. Loosen the screws (B).
4. Adjust the rigging screw (D) until the correct setting is reached.
5. Adjust the stop screws (B) up against the inner section.
6. Tighten counter nuts again.
7. Check the alignment. If needed, redo the adjustment described above.

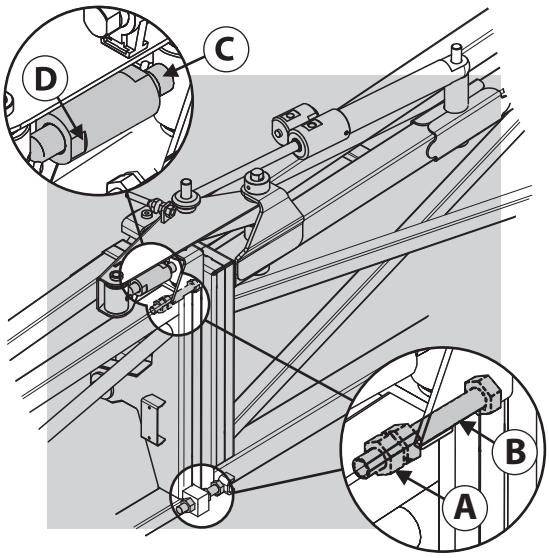


ATTENTION! The rigging screw (D) must be slightly over tightened/adjusted to insure a firm and fixed outer section.

Alignment of 1st outer and 2nd outer wings

The 2nd outer wings must be aligned with the 1st outer wings. If necessary adjust the 2nd outer wings as follows:

1. Depressurize the folding cylinders.
2. Loosen counter nuts (A) and (C).
3. Loosen the screws (B).
4. Adjust the rigging screw (D), until the nozzle sections are aligned with each other.
5. Adjust the stop screws (B) up against the inner section.
6. Tighten counter nuts again.
7. Check the alignment. If needed, redo the adjustment described above.

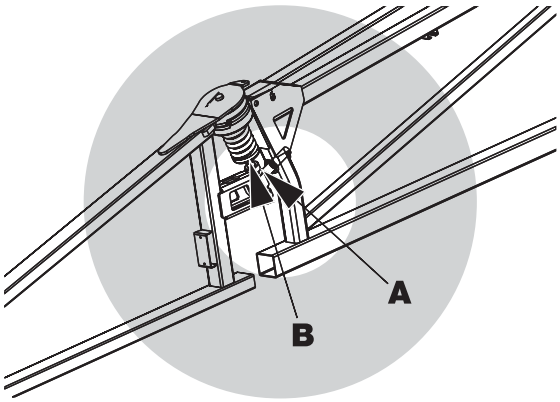


ATTENTION! The rigging screw (D) must be slightly over tightened/adjusted to insure a firm and fixed outer section.

Breakaway section adjustment

The breakaway section must release when a force of approximately 150 N (15 kg) is applied to the extremity of the breakaway section. If necessary, the release force is adjusted as follows:

1. Make sure that claw coupling is correctly lubricated.
2. Loosen the counter nut (A).
3. Adjust the nut (B), until the breakaway will release at a force of 150 N (15 kg) applied at the extremity of the section.
4. Tighten the counter nut again.



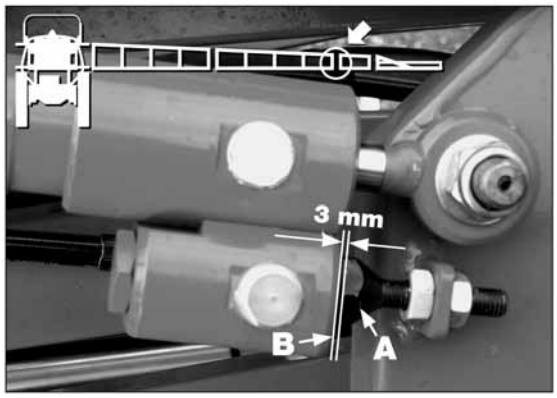
DANGER! Never place fingers into open breakaway clutch! You may be injured, if the clutch snap closes by accident!

WARNING! Do not tighten the breakaway clutch more than necessary. Over-tightening can cause damage to the boom.

End stop valves

The end stop valve activates/disables the folding/unfolding of the boom.

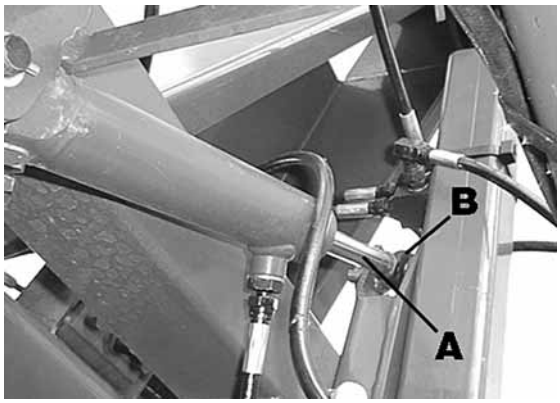
Inspect with the 1st and 2nd outer wings in folded position, and with the 1st outer and inner wing sections in folded position. The distance between the bolt head (A) and the surface (B) of the cylinder is 3 mm. Adjust position of bolt (A) if necessary.



Hydraulic slanting control adjustment

Alignment of neutral position for the entire boom.

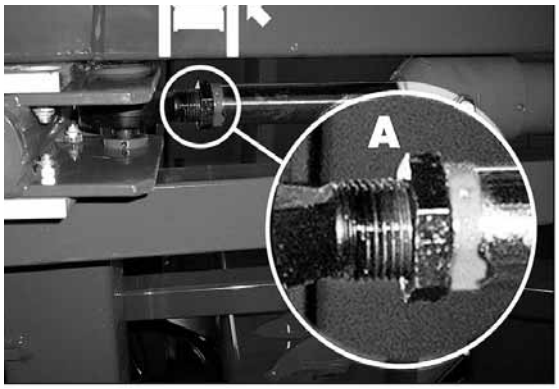
1. Place the sprayer on even, flat ground.
2. Unfold the boom.
3. Slanting cylinder: Expose piston rod (A) 90 mm.
4. Adjust hinge ring (B) in/out till boom is horizontal.



Wing tilt adjustment

The horizontal adjustment of the wings is carried out by the retracted tilt cylinder. The boom must be straight and horizontal. If necessary, adjust the wing as follows:

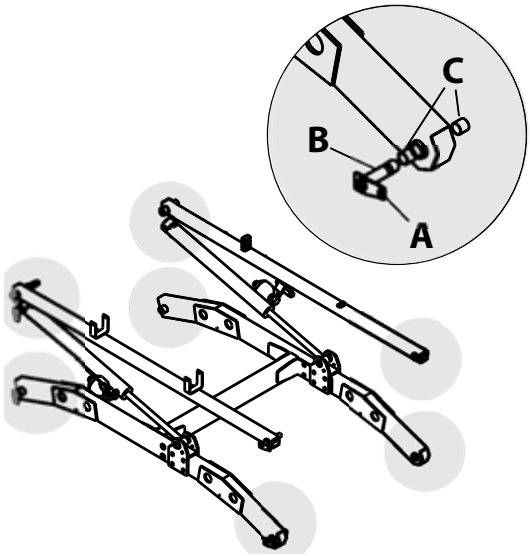
1. Support the boom to relieve the load from the hydraulic cylinder.
2. Loosen counter nut (A), which is positioned by the hinge ring on the cylinder's piston rod.
3. With a wrench (on two flat spots on end of the ram), adjust the cylinder ram inwards or outwards to get the desired wing level.
4. Repeat the steps for the other side.



Wear bushing renewal on boom lift

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

1. Unfold the booms to working position.
2. Lift the boom centre frame with a lifting device and support it until the load is taken off the parallelogram arms.
3. Remove the screws (A), pull out the pins (B) at one of the upper parallelogram arms and replace the wear bushes (C).
4. Refit the arm.
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 again.



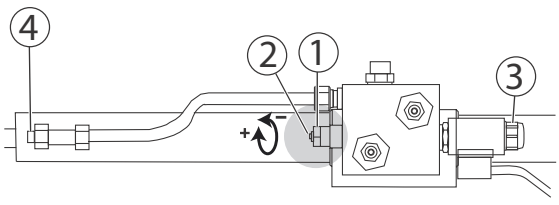
Boom hydraulic damper

The hydraulic damper is a device that has two functions. It allows the boom to be locked (blocking function), and it also cushions from shocks while maintaining the boom parallel to the ground, compensating for any uneven terrain.

The boom suspension will normally suit most conditions and does not require any adjustment. However, you can check the boom movements and change the damper settings if necessary.

Damper performance adjustment

- Place the blocking switch in the unlocked position.
- Hold down the end of the boom to tilt it and then release it.
- Ensure that the boom returns to its initial position in one oscillation. Otherwise the damper performance should be adjusted.
- Loosen the counter-nut **(1)**.
- Turn the pressure limiter screw **(2)** clockwise to increase the damper performance, which will lead to a reduction in the number of oscillations. Conversely, if the screw is turned anticlockwise, the damper performance decreases, which will lead to increase oscillation of the boom.



NOTE! The basic setting is obtained by completely tightening the pressure limiter screw **(1)**, then loosening it by **3** to **4** turns depending on the boom model.

Damper maintenance

The damper may lose effectiveness if the rod has a short run. Beyond **5** mm, oil should be added.

- Completely dismantle the damper.
- Loosen the pressure adjustment screw **(2)** to cancel the damper function
- Press the manual control **(3)** and push back the damper rod completely.
- Remove the filler screw **(4**.
- Pour in the oil and replace the filler screw.
- While holding down the manual control, move the rod in and out several times.
- Repeat the previous operations until the damper is completely filled.
- Adjust the damper performance.

Change of bulbs

9. Switch off the headlights.

A. Loosen the holding screw to access the bulb.

A. Remove the bulb and replace it.

ATTENTION! The bulbs used are halogen bulbs, which means that they should not be handled directly with the fingers, which could damage them.
Always use a dry clean cloth to handle halogen bulbs.

Safety Valve Activation

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

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

Before turning pressure valve to 'Pressure draining', it is very important to be sure that the quick coupler lid is correctly and copletely mounted to the filling stud in its locked position. failure to do so causes a risk of contamination and injury from the quick coupler id being "shot" off when pressurized! If it is not posible to mount lid completely, lubricate the rubber seal and the grip hooks. Both the suction valve ans presure valve must always be closed before opening the Cyclone filter! If they are not closed, spraying liquid can hit you, when openeing the filter and the main tank content will be drained!

6 - Maintenance

Off-season storage

Off-season storage program

When the spraying season is over, you should devote some extra time to the sprayer. Chemical residue can cause damage to the machine components and could harm the safety of people, animals and the environment. To guarantee a long life for the machine components and guarantee environmental safety, follow the procedure below.

- 1. Fully clean the sprayer inside and outside as indicated in the section "Cleaning the sprayer". Make sure that all pipes, 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.
- Renew possible damaged seals and repair possible leaks.
- Empty the sprayer completely and let the pump run for a few minutes. Manually operate all valves, handles and levers to drain as much water off the liquid system as possible. Let the pump run until only air is coming out of any of the nozzles. Remember to drain the rinse tank too.
- Pour approx. 50 l anti-freeze mixture consisting of 1/3 anti-freeze and 2/3 water into the tank.
- Engage the pump and operate all valves so that the solution is distributed around the entire system.
- Open all sprayer sections until the solution reaches the nozzles. Anti-freeze prevents the seals, bushings and diaphragms from drying out Never use liquid fertilisers instead of anti-freeze.
- Lubricate all lubricating points according to the "Lubrication" section regardless of intervals stated.
- When the sprayer is dry, remove rust from possible scratches or damage to the paint and touch up the paint.
- Bleed and remove the pressure gauges and store them in a frost-free place in a vertical position.
- Apply a thin layer of anti-corrosion product on all metal parts, avoiding rubber parts, hoses and tyres.
- Apply grease to all ram rods that are not fully retracted in the barrel to protect against corrosion.
- Isolate the wheels from the ground to avoid them becoming warped. Protect them from damp and direct sunlight.
- Drain the compressed air tank to avoid condensation.
- To protect against dust the sprayer can be covered by a tarpaulin. Provide ventilation to prevent condensation.

Preparing the sprayer for use after storage

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

- Check the tyre pressure.
- Wipe the grease from the ram rods and drain the tank of any remaining antifreeze.
- Fit the pressure gauges again.
- Check all hydraulic and electric functions.
- Rinse the entire liquid system with clean water.
- Fill the tank with clean water and check all functions.
- Check the function of brakes. Please note that brake power will be reduced until the rust has been removed from the drums. Always brake lightly initially.
- Drain the engine and hydraulic system if necessary according to the instructions.
- Check the air conditioning and carry out maintenance of the active carbon filter in the cabin.

Operational problems

General Info

Operational incidents are often due to the same reasons:

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

Therefore ALWAYS check that

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

7 - Troubleshooting

Spraying

FAULT	POSSIBLE CAUSES	SOLUTION
No spray from boom	Air leak on suction line	Check tightness of suction filter
		Check external hose connection
		Check diaphragm pump (diaphragms, valves, valve covers)
	Air being sucked into system	Start the sprayer pump
	Suction/pressure filter clogged	Clean the filters
Lack of pressure	Faulty fitting	Faulty safety valve (if fitted)
	Faulty pump valves (463 pump)	Check that valves are not obstructed
	Incorrect pressure reading	Check that pressure gauge is not obstructed
Pressure dropping	Filters clogged	Clean the filters and fill with clean water. If liquid is powdery, check that agitation is activated.
	Nozzles worn	Check flow rate of nozzles and replace if necessary if the difference in flow is greater than 10%
	Tank under negative pressure	Check vent is working correctly
	Sucking air towards end of tank load	Reduce pump speed
Increase in pressure	Nozzles not suitable for flow rate	Use a nozzle with a higher flow rate
Formation of foam	Air is being sucked into system	Check connectors
	Excessive agitation	Reduce pump speed
		Check safety valve (if fitted)
		Ensure returns inside tank are present
		Use foam damping additive
Liquid leaks from bottom of pump	Pump diaphragms damaged	Replace diaphragms
Motorised valve not working or malfunctioning	Blown fuse(s)	Check operation of limit switches. Use a rust removing agent for contacts if necessary.
		Check electrical current absorbed by vacuum motor: 450-500 milli-Amperes max.
	Polarity inversion	Brown - pos. (+). Blue - neg. (-).
	Valve does not close completely	Check valve seals (obstruction)
		Check position of microswitch brackets. Loosen flange screws by 1/2 turn
	No power	Wrong polarity. Check brown wire = pos. (+), blue= neg. (-).
		Check printed circuit welds or loose connections.
		Check tightening of fuse holder and fuse.

Hydraulic functions

FAULT	POSSIBLE CAUSES	SOLUTION
No boom movements when activated	Insufficient hydraulic pressure	Check that solenoid valve is operating correctly
		Check/adjust hydraulic pressure
	Insufficient oil supply	Check hydraulic pump concerned
	Faulty fuse	Check/replace fuse
	Faulty distributor or by-pass	Check solenoid and connector
		Check distribution valve tray. Replace distribution valve if necessary.
Ram not functioning	Jet clogged	Dismantle connector and clean jet
	Faulty distribution valve	Check solenoid Check distribution valve tray
	Power supply	Check control (handle or REGULOR6). Check multi-function handle Check REGULOR6 configuration Check printed circuits and connections

Transmission

FAULT	POSSIBLE CAUSES	SOLUTION
Vehicle does move forward	Incorrect use	Check that the parking brake is disengaged. Lever in neutral.
	Electronic failure	Read the error code SD or DTC and contact technical support Check electrical circuits (connections, cables etc.)
	Hydraulic failure	Check feed pressure of transmission pump (28 bar) Check operating pressure (max 450 bar)
Travel speed too low	Incorrect use	Speed limiter positioned at 10 Speed selector positioned at fast position Gangway folded away (40 km/hr version)
	Operating faults	Read the error code(s) and contact technical support
	Electrical faults	Check retractable gangway is working correctly (position sensor)

7 - Troubleshooting

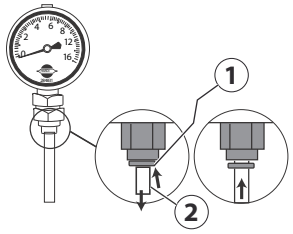
Mechanical incidents

Spray pressure gauge

If the reading on the spray pressure gauge is incorrect, it may be because the pressure gauge hose is clogged. In this case you can bleed the circuit as follows:

WARNING! Wear protective goggles because liquid may be splashed on dismantling.

- Push the bushing **(1)**, then remove the hose **(2)**.
- Spray with clean water until the clean water runs normally from the hose.



NOTE! If the result is not satisfactory the pressure gauge should be replaced.

Hydraulic incidents

General info

Before any towing of the machine following a failure in the engine or the hydraulic transmission, it is essential to check the hydraulic motors and the transmission pump.

NOTE! To avoid any risk of damage to the transmission components (pump, motors etc.), the machine should be towed over a short distance and at low speed.

Before moving the machine, you should:

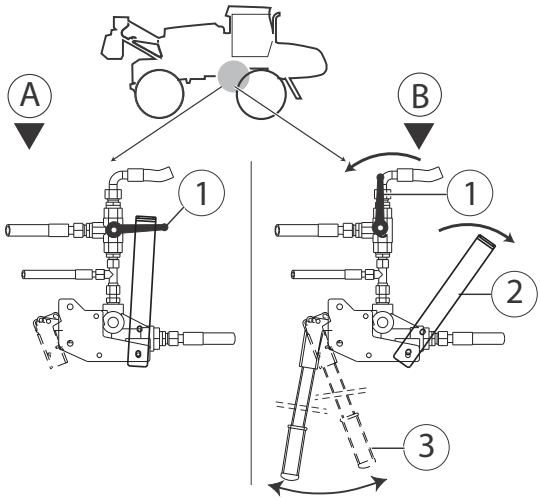
1. Release the hydraulic motor brakes. See following chapter “Releasing the hydraulic motor brakes”.
2. Release the high pressure valves on the transmission pump. See following chapter “Transmission pump high pressure valves”.

To carry out all of these operations safely, it is essential to activate the parking brake.

Releasing the hydraulic motor brakes

A. Valve in NORMAL operating mode.

B. Valve in BRAKE RELEASE mode.



For releasing the brakes of the hydraulic motors, apply the following procedure:

- Move the safety bar **(2)** and put the valve handles into a vertical position.
- Fit the handle **(3)** to the hand pump.
- Work the pump until the brakes on both motors are fully released.

NOTE! The hand pump handle **(3)** is stored in the cab.

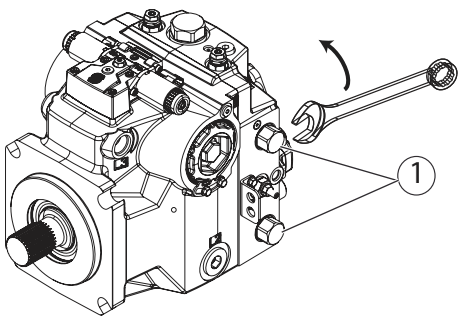
NOTE! Do not continue to work the hand pump after the brakes have been fully released. Excessive pressure could damage the motor braking mechanism.

After towing or before starting the machine again, always engage the parking brake by turning the valve handle to a horizontal potion and placing the safety bar **(2)** in position, as indicated in the picture **(A)**.

Transmission pump high pressure valves

This operation consists of releasing the 2 high pressure valves **(1)**located on the transmission pump to allow free circulation of oil in the system when towing the machine.

- Loosen the 2 valves **(3)** by a **maximum of 3 turns** to allow free circulation of the oil in the hydraulic transmission.



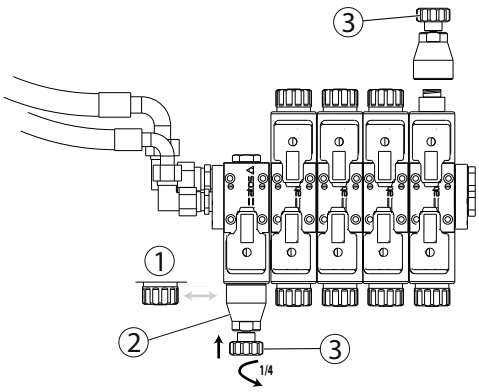
The high pressure valves should be tightened before starting up the machine again.

7 - Troubleshooting

Hydraulic block - manual control and pressure adjustment

A. Manual control:

If the electrical control of the hydraulic distribution valves is faulty, it is possible for the rams can be controlled manually by using the emergency pushbutton.



Fitting the emergency pushbutton

- Loosen the screw from the bypass solenoid **(1)** and the screw on the faulty distribution valve.
- Screw the emergency pushbutton **(2)**in place and fit the previously removed nuts.

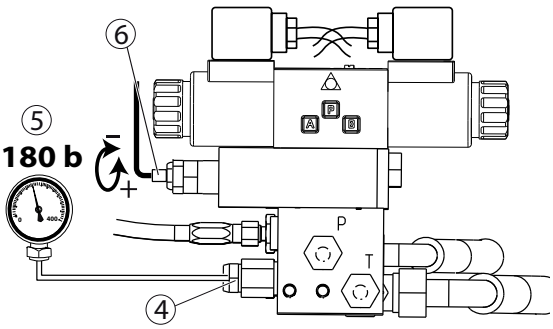
Using the emergency pushbutton

Push the knob **(3)** and rotate it for a **1/4** turn to control the corresponding ram.

B. Spray pressure regulation.

- Connect a pressure gauge **(4)** to the pressure socket **(5)**.
- Remove the protective cover from the pressure limiter.
- Activate the hydraulic function as far as it will go to activate the pressure limiter.
- Turn the adjustment screw **(6)** to obtain the operating pressure.

Maximum pressure = **180** bar.

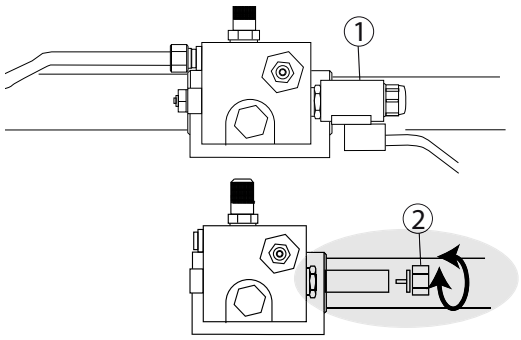


Boom damper control - manual unlocking

The damper is unlocked by applying 12 VCC to the solenoid coil terminals.

In the event of failure of the solenoid coil, the damper can be unlocked manually:

- Remove the solenoid coil.
- Tighten the screw **(2)** to unlock it.



Error Messages

Transmission errors

When an operating error appears in the hydraulic transmission the an icon is displayed on the screen

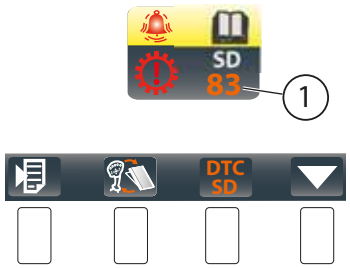


Table of SD error code

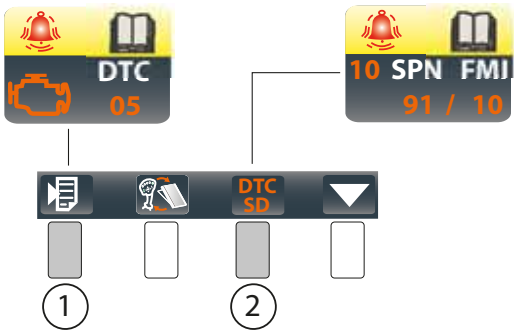
Error Codes	Description	Error Codes	Description
001	Low battery voltage		
002	Low battery voltage		
003	12V sensor low supply voltage		
004	12V sensor high supply voltage		
005	5V sensor low supply voltage		
006	5V sensor high supply voltage	**200**	SAPE SD: high battery voltage
007	Stack overflow	**201**	SAPE SD: low battery voltage
008	E2prom memory error	**202**	SAPE SD: 12V supply voltage sensor out of range
009	FLASH memory error	**203**	SAPE SD: 5V supply voltage sensor out of range
010	RS232 memory error	**204**	SD SAPE : E2prom
011	CAN bus connection error		
012	Current return protection	**200**	SmartDrive Auto Slave error - Regulation PWM 1
020 to 045	Internal system error	**201**	SmartDrive Auto Slave error - Régulation PWM 2
051	MAF loading error	**202**	SmartDrive Auto Slave error - Régulation PWM 3
052	Inconsistent key	**203**	SmartDrive Auto Slave error - Régulation PWM 4
053	Inconsistent MAF	**206**	SmartDrive Auto Slave error - Voltage battery too low
054	Inconsistent input/output	**207**	Erreur sur le SmartDrive Auto Esclave - Voltage battery too high
055	Error in sensitive parameter	**156**	Selector mode error. 2 modes engaged simultaneously
056	SDPHASE code error	**172**	Transfer function error : non-increasing curve
057	Checksum error	**184**	Steering CAN bus error
058	Min/Max error in parameter	**197**	Configuration error of the system
59	Unit not compatible	**204**	SmartDrive Auto Slave error - Régulation PWM 5
61	Différence between entre RAM and EEPROM	**205**	SmartDrive Auto Slave error - Régulation PWM 6
070	Loop error	**208**	SmartDrive Auto Slave error - Voltage battery too low
071	PWM2 current loop error	**209**	SmartDrive Auto Slave error - Voltage battery too high
72	PWM3 current loop error	**210**	SmartDrive Auto Slave error - 5 VDC sensor too low
73	PWM4 current loop error	**211**	SmartDrive Auto Save error -T5 VDC sensor too high
080	Brake pressure sensor signal out of range	**212**	SmartDrive Auto Slave error- Current return protection
083	CAN bus communication error: signal not received	**235**	SD SAPE : communication CAN bus
084	High pressure sensor signal out of range	**236**	SD SAPE : battery voltage too high
85	SmarDrive Auto error "slave"" : Configuration	**237**	SD SAPE : battery voltage too low
91	Pédal error signal - Translation	**238**	SD SAPE : 12 V supply voltage sensor out of range
92	Joystick sensor error	**239**	SD SAPE : 5 V supply voltage sensor out of range
97	Selector mode error	**240**	SD SAPE : memory error
102	Tranmission overheating error	**241**	SD SAPE : DAC valve error
115	Communication CAN bus with the engine error	**242**	SD SAPE : I2C bus error
124	CAN error from the display. Missing signal	**243**	SD SAPE : CAN bus communication error

Error Codes	Description	Error Codes	Description
133	CAN bus error- from SmartDrive Auto "slave'. Missing signal	**244**	SD SAPE : checksum parameter error
136	Speed sensor error (overspeed	**245**	SD SAPE : Min/Max parameter error
153	Supply voltage error between the machine ans software	**246**	SD SAPE : Front left speed sensor erro
247	SD SAPE : Front left speed sensor error	**252**	SD SAPE : Rear left valve error
248	SD SAPE : Rear left speed sensor error	**253**	SD SAPE : Rear right valve error
249	SD SAPE : Rear right speed sensor error	**254**	SD SAPE : Front curve sensor error
250	SD SAPE : Front left valve error	**255**	SD SAPE : Rear curve sensor error
251	SD SAPE : Front right valve error		

Engine faulty

When an operating fault appears, the error code is displayed on the screen

- Press the button **(1)** and navigate until the **DTC** menu
  An icon indicates the number of errors.
- Press the button **(2)** to display the SPN and FMI error code of the engine



1. Number of errors.
2. SPN and FMI code (see table below).

Engine codes errors

SPN	Component / Location	Description (Error location)	FMI
29	Hand throttle	Cable break or short circuit, signal implausible compared to signal or ilde 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

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 break (internal)	Internal engine brake: Cable break or short circuit	3, 4, 5, 11
1074	Engine break 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

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"EngPrt" = 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 abote target range (message "DecV1" = pseudo pedal)	2, 12
523240	CAN message	Missing (message "FunModCtl" = 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 sended message	11, 12

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	Aove 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 occured which is stored as protected	11, 14
523612	ECU internal hardware monitoring	A recovery occured which is not stored	11, 14
523612	ECU internal hardware monitoring	A recovery occured 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 (tempereature 1)	2, 11

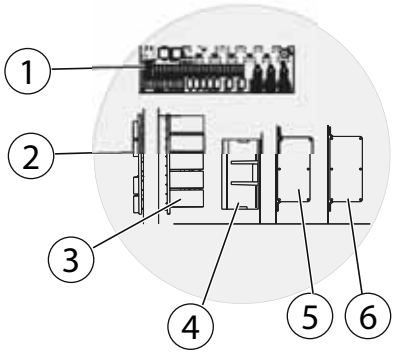
7 - Troubleshooting

Electrical incidents

Location of main components

The main control unit are located in the cab under the driver'seat.

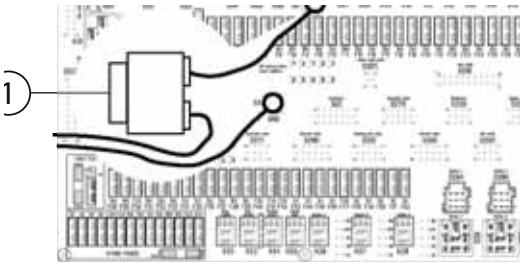
1. Main circuit fuses and relays.
2. Retractable gangway control system.
3. 4-wheel drive control system (4RD version).
4. Flashing indicator unit.
5. Hydraulic controller (master).
6. Hydraulic controller (extended).



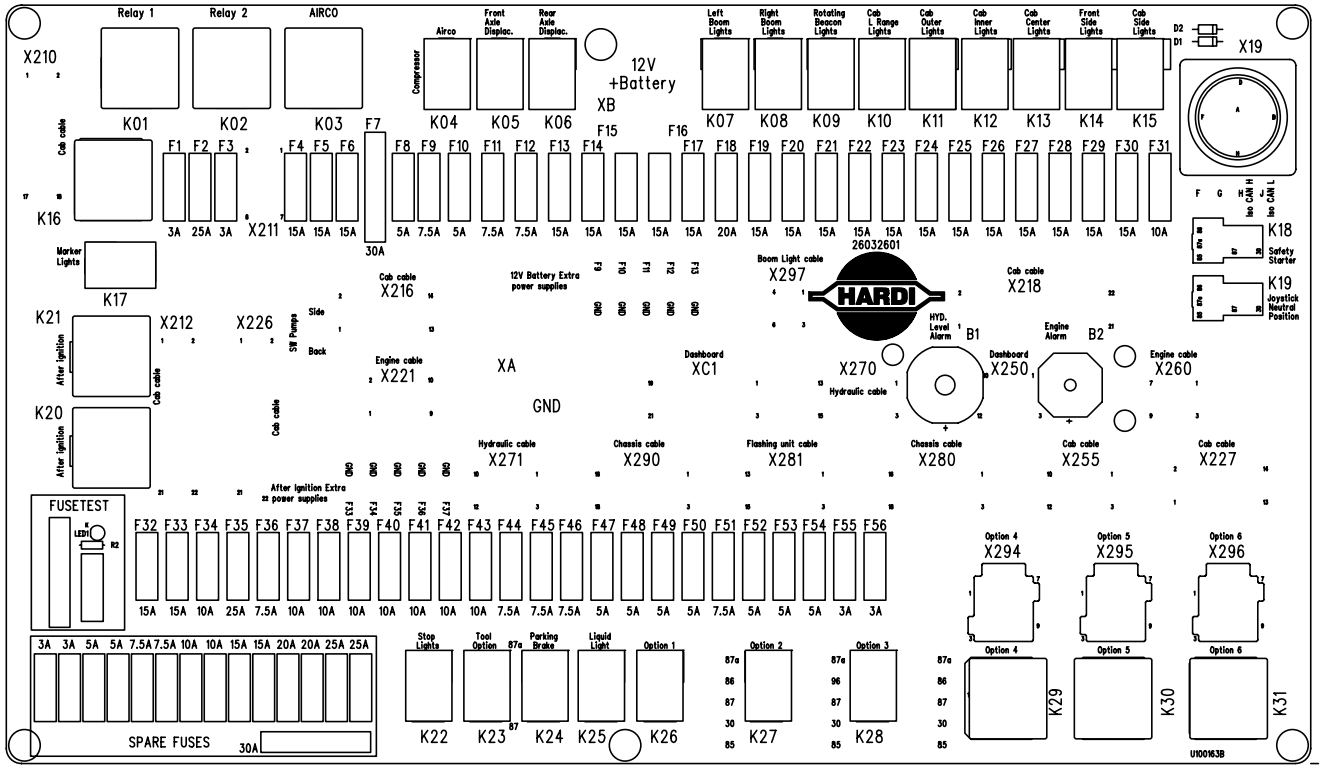
HC 9500 controller fuse

The HC9500 controller fuse is located behind the main circuit.

1. Maxifuse = 30 A
   - Switch main circuit over to access the fuse
   - Check and replace if necessary



Main circuit fuses and relays.



U100163B

Code		Description	Code	Amp. (A)	Description
F1	3.0	not used	**F29**	15.A	front side cabin lights
F2	10 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 BAT - air conditionning	**F35**	25 A	windscreen washer pump - windscreen wipers
F8	5 A	12V BAT - 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	front hydraulic motor capacity	**F39**	10 A	12 V after ignition - optional
F12	15 A	rear hydraulic motor capacity	**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 - Off-Road unit
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 ligts 1 and 2 (HC9500 only)	**F47**	5 A	not used
F20	15 A	boom ligts 3 and 4 (HC9500 only)	**F48**	5 A	Footbridge control
F21	15 A	hazard lights	**F49**	5 A	brake pressure - hydraulic level - alarms
F22	15 A	cigarette lighter - 12V sockets	**F50**	5 A	hydraulic oil level alarm
F23	15 A	seat compressor unit	**F51**	7.5 A	12 V after ignition - engine error reversing buzzer
F24	15 A	not used	**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

Always use the appropriate fuse listed in this table

Relays	Description	Relays	Description
K01	not used (F5)	**K16**	not used
K02	not used (F6)	**K17**	backlighting - side lights
K03	air conditioning power	**K18**	engine starter control
K04	air conditioning compressor	**K19**	forward handle neutral position
K05	front hydraulic motor capacity	**K20**	after ignition control circuit
K06	rear hydraulic motor capacity	**K21**	after ignition control circuit
K07	boom ligts 3 and 4 (HC9500 only)	**K22**	BRAKE lights
K08	boom ligts 1 and 2 (HC9500 only)	**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**	Diff-Lock control (optional)
K14	front cabin lights		
K15	front cabin side lights		

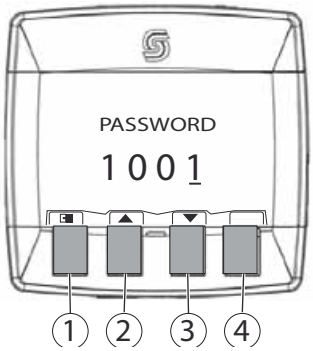
7 - Troubleshooting

Multifonction display

To access to the diagnosis menu :

- Press simultaneously during **3 sec** the buttons **(1)** and **(2)**
- Enter the password by pressing the buttons **(1)** and/or **(4) :**

Password : **1 0 0 1**



CAN_O Engine CAN bus

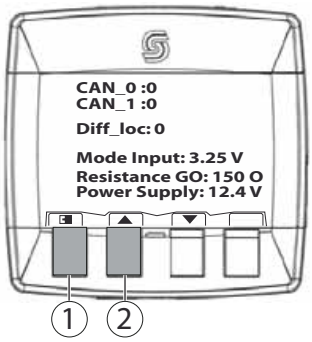
CAN_1 Smart Drive CAN bus

DiffLock

0 pedal released
1 pedal pressed

Input mode : Analog signal of the speed selector

Parking **0.25** v - **1.15**V



function	Typical signal (V)	Rangel (V)
Short-circuit5 V	0.7	0.25 -1.15
Parking	0.7	0.25 -1.15
Dowhill	1.6	1.15 - 2.00
Uphill	2.50	2.00 - 2.95
Field	3.40	2.95 - 3.85
Automotive	4.30	3.85 - 4.75
Short-circuit 0V		0.00 - 0.25

Resistance GO : Fuel gauge resistance

0 short-cicuit
1 - 200 operating range
65535 cable break

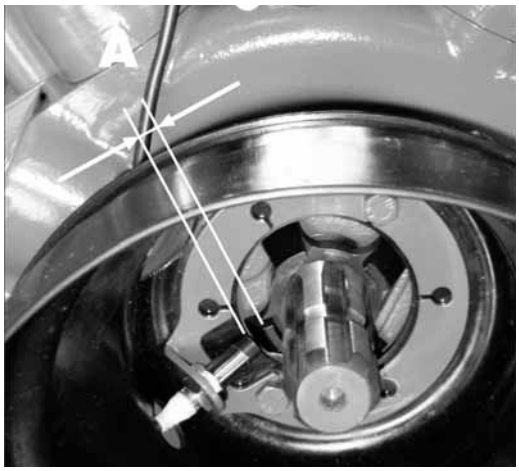
R.P.M. Transducer for 464 pump

The R.P.M. transducer is located at the inner side of the P.T.O. shield. The sensor is an inductive type that requires metallic protrusions to pass by it to trigger a signal.

Adjustment

1. Adjust air gap (**A**) to **4 mm** (+/-0.5 mm). Use a feeler gauge or similar tool.
2. After adjustment then spin up the shaft. Verify air gap variation less than +/-0.5 mm. Check this at the entire circumference.
3. Verify transducer function (HC 6500/ISOBUS VT):

   Monitor the menu [4.5.4.9.6 PTO pump frequency].

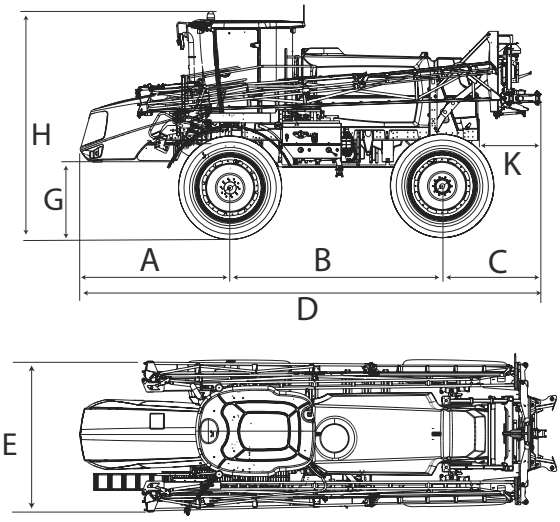


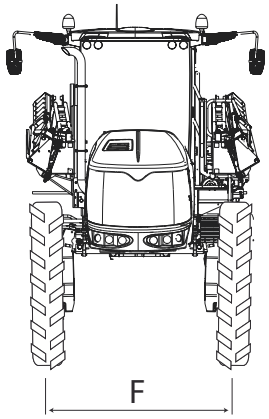
Characteristics

General specifications

Tank (litres)	**3500** or **4100**
Pumps	**Diaghrams**
Boom	**HAZ**
Regulation type	**HC9500**
Engine	DEUTZ 6 cyl. turbo (TIER3B) -Particules filter - **217** hp (**160**KW) at 2300 tr/min -alternator **150** A) DEUTZ 6 cyl. turbo (TIER3B) -Particules filter - **245** hp (**180**KW) at 2300 tr/min -alternator **150** A
Transmission	**1** SAUER pump (1x165 cc on 25 & 29 km/h version **2** SAUER pumps (2x115 cc) on 40 km/h version
Suspension	Front axle suspensed by helical spring with hydraulic shock absorber Rear axle suspensed by central helical spring
Steering	**2** / **4**-wheel steering
Track gauge adjustment	Mechanical adjustable **1.90**/**2.35** m (depending of wheel width)
Turning radius (track: 200 cm)	**462**
Overall width	**2.55** to **3.875** m
Axle (with standard whel and standard offset)	**'S' 182/206 - 'M' 200/237 - 'L' 225/270 - 'XL' 266/315 - 'XXL' 278/327**
Wheel base (E)	**375** cm (Axle **S**)
Ground clearance (Depending on the size of tires) cm	**1,20**m (base) **1,50** m base (not for axle **S** 182/206 - **1,65** m base (not for axle **S** 182/206
Rinse tank (litres)	**410**
Hand wash reservoir (litre)	**15**
Tools box (litres)	**180**
Fuel tank (litres)	**320**

Overall dimensions





Booms (m)	A	B	C	D	E	F	G	H	I	K	L maxi
12/24 HAZ	2780 à 3260 (1)	3700	3000	9480 à 9960	3070 à 3875	1800 à 3330	1060 à 1520	3660 à 4300	6050	1850	403
14/27-28 HAZ									7050		
15/30 HAZ									7550		
17/32-33 HAZ			2560	9040 à 9520	3340 à 3875				8700	1390	268
18/36 HAZ									9200		

1. with hood deflector

8 - Technical Spécifications

Weight

Tank : **4100** litres - Axle : **L** - 4 hyd. motors **MS18**- Ground Clearance : **1.50** m - Engine **TCD 6.1 180 KW**

variant	25413				25414				
Boom	24 HAZ	27/28 HAZ	30 HAZ		30 HAZ	32/33 HAZ	36HAZ		
Empty Weight PTC	9500 / 14100	9560 / 14160	9590 / 14190		9590 / 13760	9930 / 14530	9960 / 14560		
Front Empty Weight/ Front Total Weight	5240 / 6710	5320 / 6790	5350 / 6820		5350 / 6820	5950 / 7420	5980 / 7450		
Rear Empty Weight/ Rear Total Weight	4260 / 7390	4240 / 7370	4240 / 7370		4240 / 7370	3980 / 7110	3980 / 7110		

Tires

Tire pressure

Tires size	Pressure (bar)	Manufacturer	Load Index
300/95R52	**4.8**	ALLIANCE	TL156D
300/95R52	**3.6**	ALLIANCE	TL148D
380/90R46	**3.6**	ALLIANCE	TL156D
380/90R46	**3.6**	MICHELIN AGRIBIB	TL157B
420/80R46	**2.6**	ALLIANCE	TL170A2/159D
480/80R42	**3.5**	MICHELIN	TL156A8/156B
650/65R38	**1.6**	ALLIANCE	TL178A8/175B
340R85R48	**4.4**	ALLIANCE	TL159A8/156D
380/90R46	**2.4**	MICHELIN SPRAYBIB	TL173D
420/80R46	**2.6**	ALLIANCE	TL170A2/159D
460/85R38	**2.4**	ALLIANCE A356	167A8/164B
300/95R52	**4.8**	ALLIANCE	T56D
380/90R50	**4.8**	GOOD YEAR DT800	TL166A8/B

NOTE! The pressure indicated in the table must be set. In the event o oubt about te echnical features o the tires, consult a speciaist.

Other optional tyre

NOTE! When replacing tires, check that the new tires have the correct load index

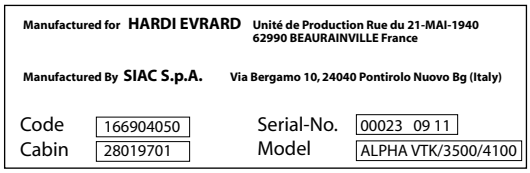
Other optional tires arre possible, provided that the following points

- Minimum permissible load : **3750** kg at **40** kph
- Maximum tire load radius : **0,895** m
- Maximum offset rim : **- 150** mm
- The width of the tire must be less than **550** mm. However optional tires whose width is between **550** mm and **800** mm are possible, but it causes more rapid wearing of the bearing support of hydraulic motors and steering wheel hard to turn 4-wheel steering at low speed

Identification Plates

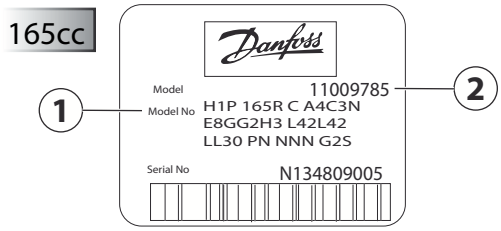
Cabin

An identification plate is fitted below the driver's seat.



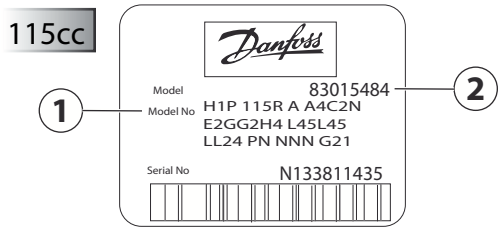
Hydrostatic Transmission pump (1 pump 165cc)

An identification plate is fitted to the hydrostatic pump, which shows the model and the Serial Number



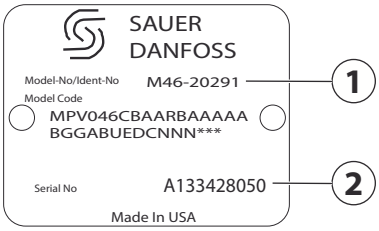
Hydrostatic Transmission pump (2 pumps 115cc)

An identification plate is fitted to the hydrostatic pump, which shows the model and the Serial Number



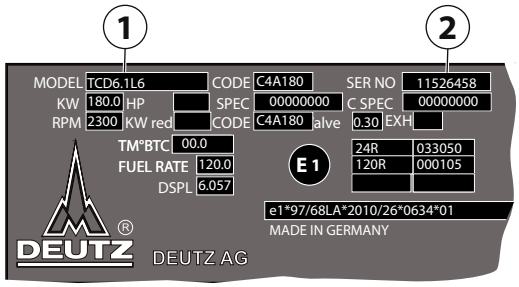
TWIN FORCE Hydraulic pump

An identification plate is fitted to the hydrostatic pump, which shows the model and the Serial Number



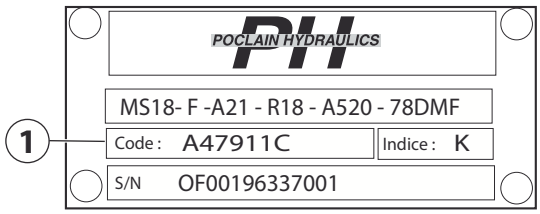
DEUTZ Engine

An identification plate is fitted on the engine which shows the model **(1)** and the Serial Number **(2)**



Hydraulic Motors

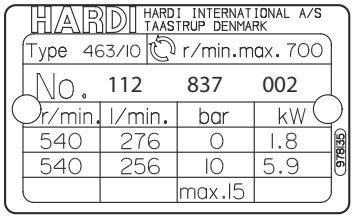
An identification plate is fitted on each motor. To request information, indicates the Code **(1)**



Spraying Pump

An identification plate is fitted on the pump, which is shows the Type and the Serial Number

Type : 463-10 et 463-12.

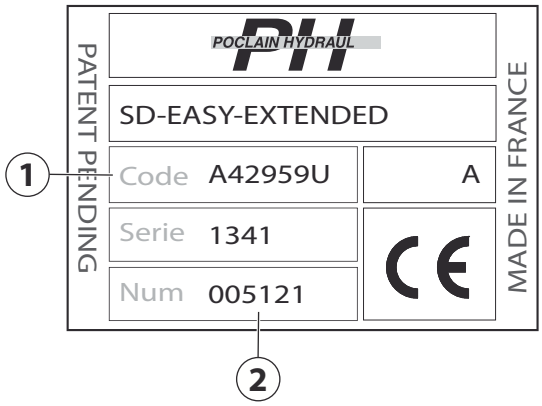


8 - Technical Spécifications

Controller Unit SD-EASY EXTENDED

An identification plate is fitted on the controller unit.

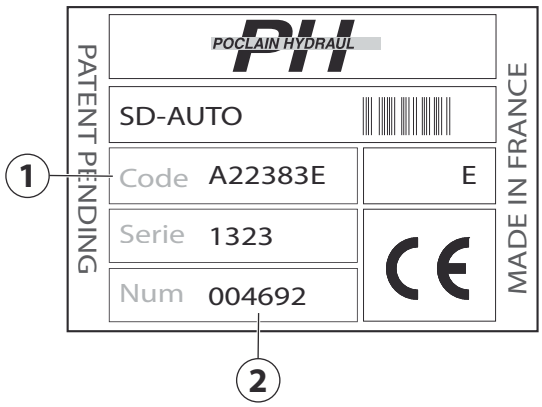
To request information, note the Code **(1)** and the Num **(2)**



Controller Unit SD-AUTO

An identification plate is fitted on the controller unit.

To request information, note the Code **(1)** and the Num **(2)**



Technical Residue

Residue in the dilutable volume is mentionned in the table below

The non-dilutable volume varies depending on the boom width and instaled options in the fluid system

Sprayer combination	Dilutable volume for tank and fluid system
Main tank: 4100 litres Boom width: 36 meters	52 litres

Hydraulic Pressure

Hydraulic Circuit	Pressure (bar)
Transmssion	450
Auxiliary	180
Feed	28
Dynamic brake	180

Air conditioning gas

Refrigerant Gas = **R134a**

Pressure = **17,41** psi - 1,200 bar

HARDI ISO NOZZLE

Instructive application table • Ausbringtabelle
Tableau d'application instructif • Tabla de aplicación instructiva
Vejledende udbringningstabel

ISO nozzle	Bar	l/min	l/ha at km/h							
			6	7	8	10	12	15	20	25
0075 Pink	1.5	0.21	42	36	32	25	21	17	13	10
	2.0	0.24	49	42	37	29	24	20	15	12
	2.5	0.27	55	47	41	33	27	22	16	13
	3.0	0.30	60	51	45	36	30	24	18	14
	4.0	0.35	69	59	52	42	35	28	21	17
	5.0	0.39	77	66	58	46	39	31	23	19
01 Orange	1.5	0.28	57	48	42	34	28	23	17	14
	2.0	0.33	65	56	49	39	33	26	20	16
	2.5	0.37	73	63	55	44	37	29	22	18
	3.0	0.40	80	69	60	48	40	32	24	19
	4.0	0.46	92	79	69	55	46	37	28	22
	5.0	0.52	103	89	77	62	52	41	31	25
	6.0	0.57	113	97	85	68	57	45	34	27
	7.0	0.61	122	105	92	73	61	49	37	29
	8.0	0.65	131	112	98	78	65	52	39	31
015 Green	1.5	0.42	85	73	64	51	42	34	25	20
	2.0	0.49	98	84	73	59	49	39	29	24
	2.5	0.55	110	94	82	66	55	44	33	26
	3.0	0.60	120	103	90	72	60	48	36	29
	4.0	0.69	139	119	104	83	69	55	42	33
	5.0	0.77	155	133	116	93	77	62	46	37
	6.0	0.85	170	145	127	102	85	68	51	41
	7.0	0.92	183	157	137	110	92	73	55	44
	8.0	0.98	196	168	147	118	98	78	59	47
02 Yellow	1.5	0.57	113	97	85	68	57	45	34	27
	2.0	0.65	131	112	98	78	65	52	39	31
	2.5	0.73	146	125	110	88	73	58	44	35
	3.0	0.80	160	137	120	96	80	64	48	38
	4.0	0.92	185	158	139	111	92	74	55	44
	5.0	1.03	207	177	155	124	103	83	62	50
	6.0	1.13	226	194	170	136	113	91	68	54
	7.0	1.22	244	209	183	147	122	98	73	59
	8.0	1.31	261	224	196	157	131	105	78	63
025 Lilac	1.5	0.71	141	121	106	85	71	57	42	34
	2.0	0.82	143	140	122	98	82	65	49	39
	2.5	0.91	183	156	137	110	91	73	55	44
	3.0	1.00	200	171	150	120	100	80	60	48
	4.0	1.15	231	198	173	139	115	92	69	55
	5.0	1.29	258	221	194	155	129	103	77	62
	6.0	1.41	283	242	212	170	141	113	85	68
	7.0	1.53	306	262	229	183	153	122	92	73
	8.0	1.63	327	280	245	196	163	131	98	78
03 Blue	1.5	0.85	170	145	127	102	85	68	51	41
	2.0	0.98	196	168	147	118	98	78	59	47
	2.5	1.10	219	188	164	131	110	88	66	53
	3.0	1.20	240	206	180	144	120	96	72	58
	4.0	1.39	277	238	208	166	139	111	83	67
	5.0	1.55	310	266	232	186	155	124	93	74
	6.0	1.70	339	291	255	204	170	136	102	81
	7.0	1.83	367	314	275	220	183	147	110	88
	8.0	1.96	392	336	294	235	196	157	118	94

ISO nozzle	Bar	l/min	l/ha at km/h							
			6	7	8	10	12	15	20	25
04 Red	1.5	1.13	226	194	170	136	113	91	68	54
	2.0	1.31	261	224	196	157	131	105	78	63
	2.5	1.46	292	250	219	175	146	117	88	70
	3.0	1.60	320	274	240	192	160	128	96	77
	4.0	1.85	370	317	277	222	185	148	111	89
	5.0	2.07	413	354	310	248	207	165	124	99
	6.0	2.26	453	388	339	272	226	181	136	109
	7.0	2.44	489	419	367	293	244	196	147	117
	8.0	2.61	523	448	392	314	261	209	157	125
05 Brown	1.5	1.41	283	242	212	170	141	113	85	68
	2.0	1.63	327	280	245	196	163	131	98	78
	2.5	1.83	365	313	274	219	183	146	110	88
	3.0	2.00	400	343	300	240	200	160	120	96
	4.0	2.31	462	396	346	277	231	185	139	111
	5.0	2.58	516	443	387	310	258	207	155	124
	6.0	2.83	566	485	424	339	283	226	170	136
	7.0	3.06	611	524	458	367	306	244	183	147
	8.0	3.27	653	560	490	392	327	261	196	157
06 Grey	1.5	1.70	339	291	255	204	170	136	102	81
	2.0	1.96	392	336	294	235	196	157	118	94
	2.5	2.19	438	376	329	263	219	175	131	105
	3.0	2.40	480	411	360	288	240	192	144	115
	4.0	2.77	554	475	416	333	277	222	166	133
	5.0	3.10	620	531	465	372	310	248	186	149
	6.0	3.39	679	582	509	407	339	272	204	163
	7.0	3.67	733	628	550	440	367	293	220	176
	8.0	3.92	784	672	588	470	392	314	235	188
08 White	1.5	2.26	453	388	339	272	226	181	136	109
	2.0	2.61	523	448	392	314	261	209	157	125
	2.5	2.92	584	501	438	351	292	234	175	140
	3.0	3.20	640	549	480	384	320	256	192	154
	4.0	3.70	739	633	554	443	370	296	222	177
	5.0	4.13	826	708	620	496	413	330	248	198
	6.0	4.53	905	776	679	643	453	362	272	217
	7.0	4.89	978	838	733	587	489	391	293	235
	8.0	5.23	1045	896	784	627	523	418	314	251
10 Light blue	1.5	2.83	566	485	424	339	283	226	170	136
	2.0	3.27	653	560	490	392	327	261	196	157
	2.5	3.65	730	626	548	438	365	292	219	175
	3.0	4.00	800	686	600	480	400	320	240	192
	4.0	4.62	924	792	693	554	462	370	277	222
	5.0	5.16	1033	885	775	620	512	413	310	248
15 Light green	1.5	4.24	849	727	636	509	424	339	255	204
	2.0	4.90	980	840	735	588	490	392	294	235
	2.5	5.48	1095	939	822	657	548	438	329	263
	3.0	6.00	1200	1029	900	720	600	480	360	288
	4.0	6.93	1386	1188	1039	831	693	554	416	333
	5.0	7.75	1549	1328	1162	930	775	620	465	372

1 bar = 1 kp/cm² = 1 atü = 100 kPa
INJET= 3-8 bar

HIA-MARKETING 978 | 2500 2004

8 - Technical Spécifications

Colour coded filter

- 50 mesh (Blue)
- 80 mesh (Red)
- 100 mesh (Yellow)

Materials and recycling

Recycling

When the sprayer reaches the end of its life, it must be cleaned carefully before it is destroyed. The different components should be carefully sorted for the purpose of destruction. The metal parts can be scrapped. As a general rule, comply with the regulations in force on waste disposal.

Tank: HDPE

Chassis: Steel

Pump: Iron and steel

Diaphragms: PUR

Hoses: PVC and EPDM

Valves and connectors: Glass reinforced PA

Filters: PP

Nozzles: Free POM

Boom hydraulic systems

Boom hydraulic - Z

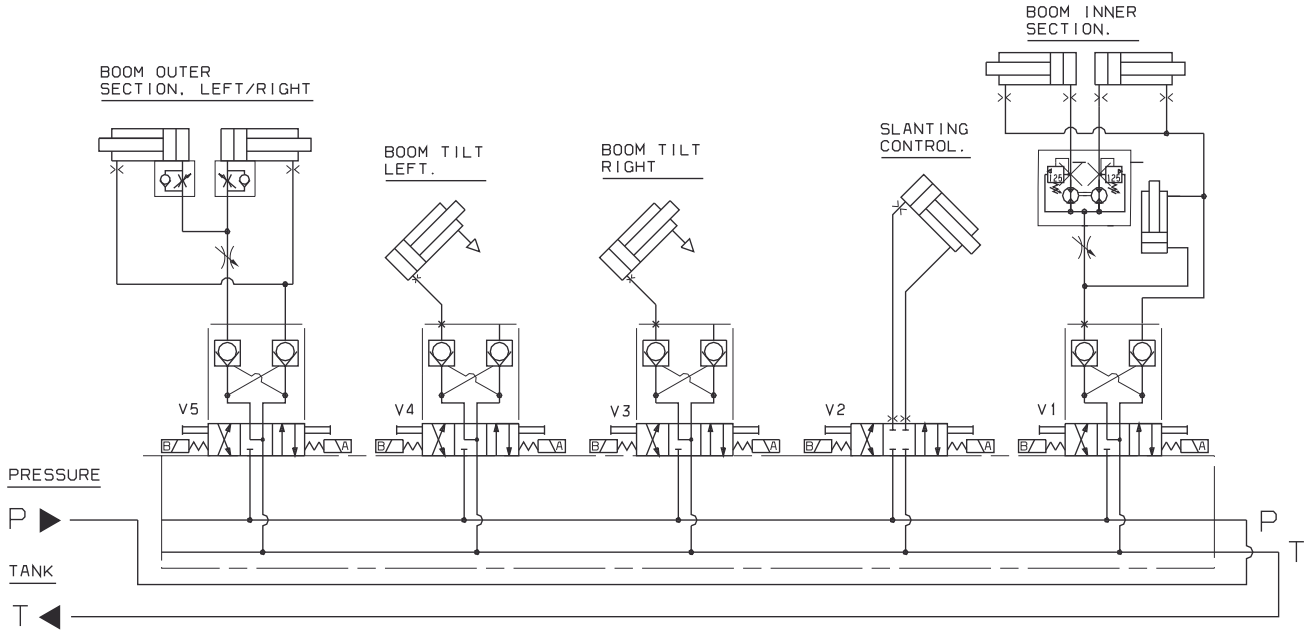
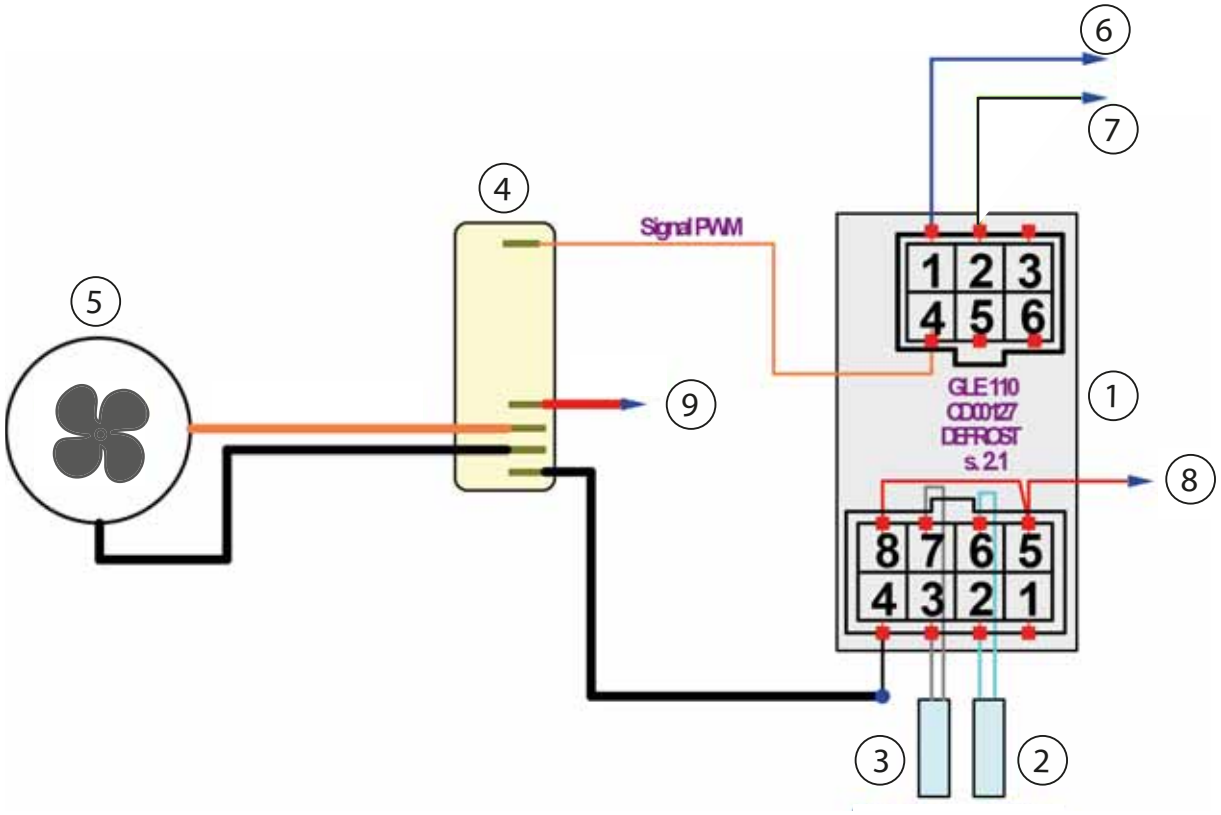


Diagram of air conditioning and heating control unit



1. Control unit	6. To the heating valve
2. Interior température sensor	7. To the air conditioning compressor
3. Outer temperature sensor	8. 12V after ignition
4. Ventilation PWM controler	9. To the battery
5. Evaporator Blower Motor	

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Spare parts

For information about spare parts, you can visit **www.agroparts.com** after registering your details on the home page.

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