

ALPHA evo

ALU - TWIN FORCE

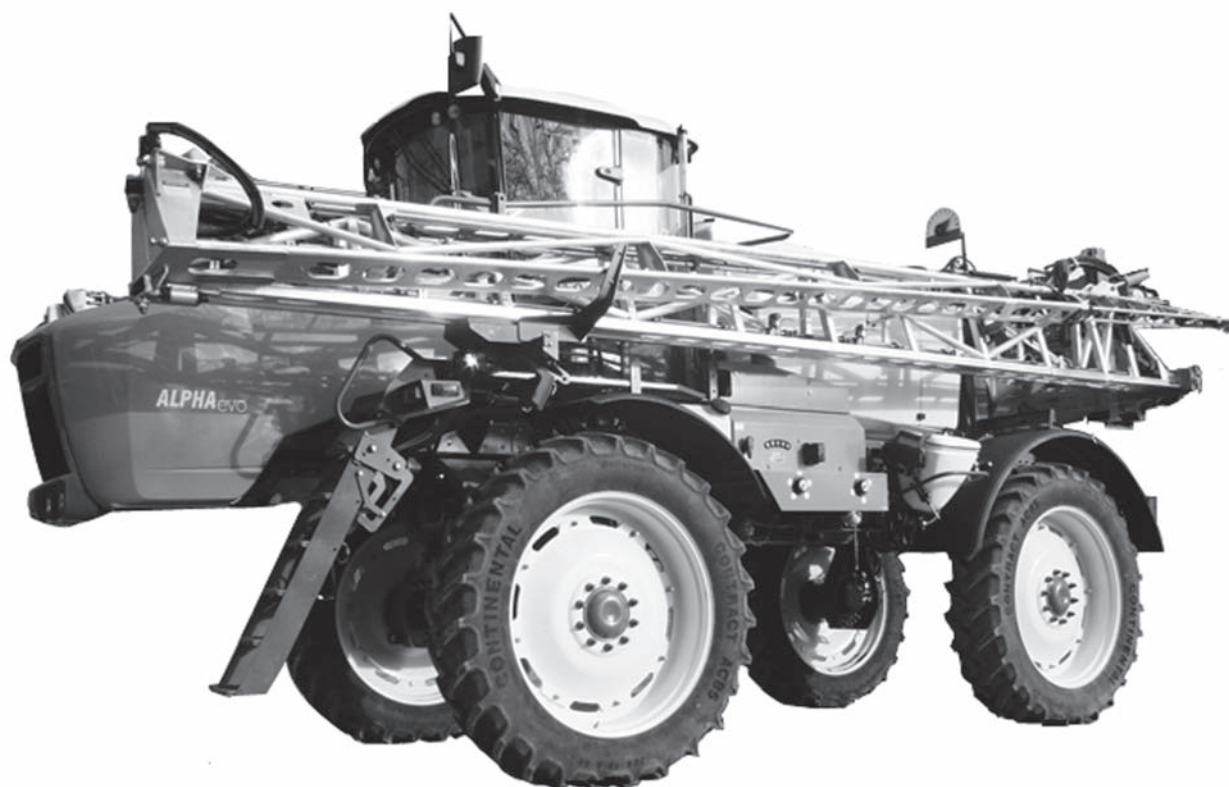


Translation of the original

Instruction book

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GB - 03.2012





We congratulate you for choosing a HARDI 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 French. The versions in other languages are translated from the original. In the event of contradiction or inaccuracy between the original French version and the versions in other languages, the original French version shall prevail.

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 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 is without any obligation in relation to equipment purchased before or after such changes.

HARDI-EVRARD 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

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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 and ALPHA 4100 evo 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, 01.11. 2011


Directeur Général
HARDI-EVRARD

Managing Director

HARDI-EVRARD

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.

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.

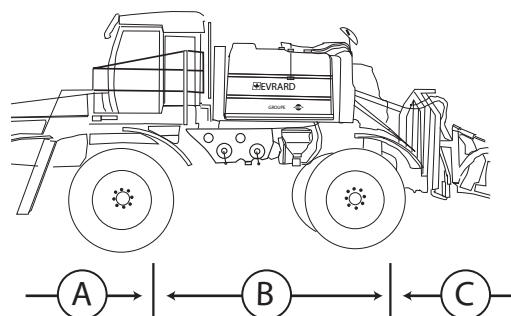
Definition of the working place

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 |



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.

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" on 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.

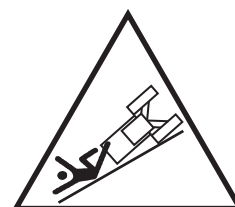
Driving in fields

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.).

2 - Safety instructions

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.



97818100 Tank under pressure!

Beware when opening the lid.



978438 Handle!

Use the cabin access ladder.



978443 Service!

Carefully read the instruction book before handling the machine. Observe the instructions and safety instructions when operating.



978441 Risk of crushing!

Stay clear of raised unsecured loads.



978437 Handling chemicals!

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



97802100 Risk of death!

Do not attempt to enter the tank.



978448 Risk of electrocution!

Keep sufficient distance away from electrical power.



97802300 Water not fit for drinking!

This water may not be used for drinking water.



97802200 Not for drinking!

Water not fit for drinking



978439 Lifting point!



978436 Service!

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



978445 Risk of crushing!

Keep away from the crushing danger area while the parts could still move.



978440 Service!

Tighten with torque according to instruction book.



978442 Risk of falling!

Do not ride on platform or ladder during use.



978435 Risk of injury!

Keep hands away.



978446 Risk of sprayer tipping over!

Be aware when disconnecting the sprayer.



2 - Safety instructions



978444 Risk of injury!
Do not open or remove safety shields while engine is running.



978447 Risk of burn!
Stay clear of hot surfaces.



978434 Risk of crushing!
Keep hands away while parts are moving.



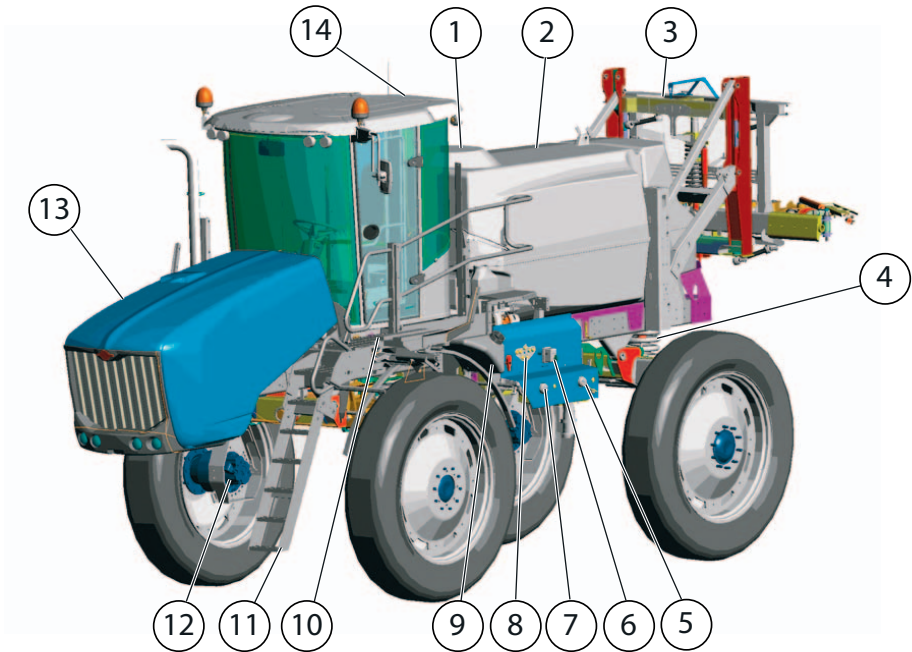
978586 Risk of injury!
Flying objects, keep a safe distance from machine while the engine is running.

Regulations on the use of chemical waste

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

General information

Overview



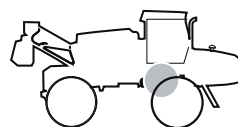
1. Main tank lid	8. External controls
2. Main tank	9. Clean water tank
3. Central boom frame	10. Cabin access gangway
4. Rear damper	11. Cabin access ladder
5. Multi-way suction valve	12. Hydraulic motors
6. Agitation valve	13. Engine cover
7. Multi-way valves - pressure (SmartValve)	14. GPS receiver

3 - Description

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).



HARDI-EVRARD 62990 BEAURAINVILLE			
Marque : EVRARD	N° de série 54200		
Type Variante Version	AH12 - ALP414MS18129		
Année fabrication	2008	PV	8840 kg
Masses maximales admissibles		PTAC	13440 kg
Essieu 1/attelage	6900 kg	PTRA	
Essieu 2	6900 kg	Réceptionné le	28/09/09
Essieu 3		par la DRIRE	OUTREAU
CE			

54200 - AH12 - ALP414MS18129



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 section "Component identification plates" on page 119.

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 hydrostatic 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.

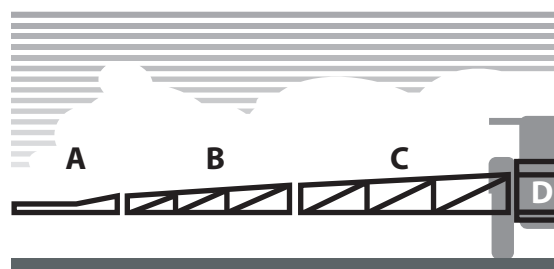
Booms are available in 18, 20, 21, 24, 27, 28 and 30 m widths. For 4400 and 6600-litre sprayers, the boom is also available in 32, 33 and 36 m widths. All booms can be folded away into 2 sections.

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



3 - Description

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

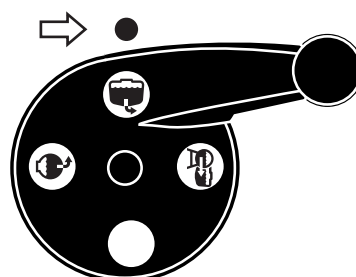
The 6-diaphragm pump has a simple design. The diaphragms and valves are easy to access, they isolate the moving parts from the liquid. The ALPHA Evo self-propelled vehicle may be equipped with the model 463-10 or 463-12 with respective flow rates of 276 l/min and 322 l/min.

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



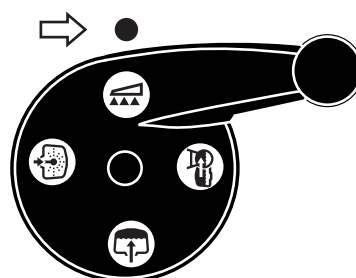
Suction in
rinse tank



External
suction

Pressure valve = green symbols

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



Spray
pressure



Tank rinse



Fill with
chemicals



Direct filling

Agitation valve = green symbols

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.

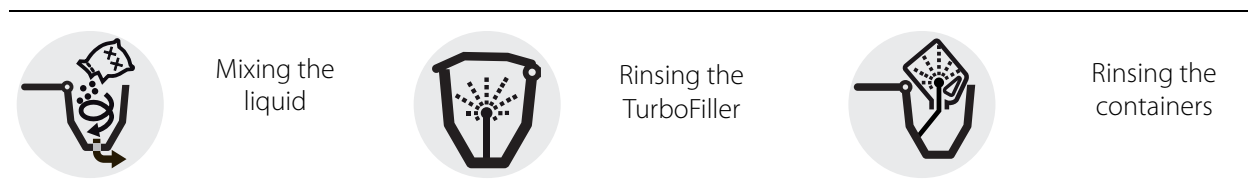
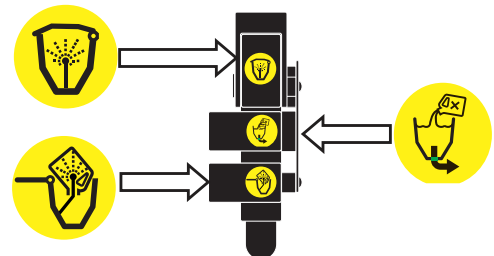
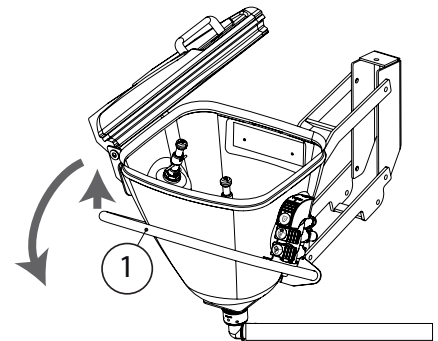
The valve is marked with an arrow on the disc, which indicates the amount of liquid that passes through the valve. If the valve handle is turned to the right, there is less agitation in the tank. Conversely if the handle is turned to the left, the volume is higher and there is maximum agitation in the tank.



TurboFiller = yellow symbols

The filler is situated in the working zone on the sprayer's left side. To use it, lift the handle fig. 1 gently and pull it to drop the TurboFiller to the lower position.

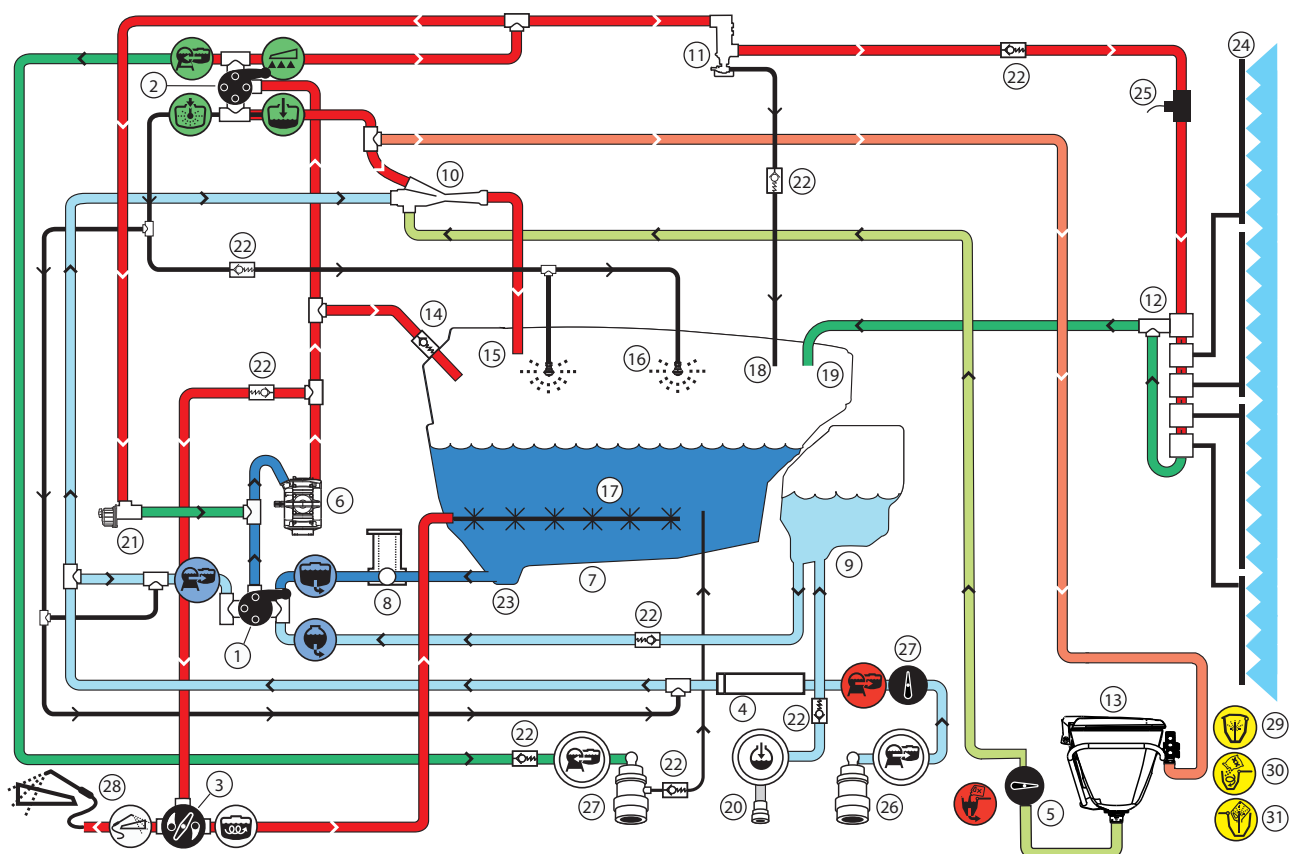
After use, raise the TurboFiller to its high position again, making sure that it locks.



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

3 - Description

Diagram - Liquid system



- | | |
|-----------------------------|------------------------------------|
| 1. Suction SmartValve | 17. Agitation |
| 2. Pressure SmartValve | 18. CycloneFilter return |
| 3. Agitation valve | 19. Spray section valve returns |
| 4. Suction line filter | 20. Rinse tank valve connector |
| 5. Filler valve | 21. Pressure control valve |
| 6. Spray pump | 22. One-way valves |
| 7. Main tank | 23. Drain valve |
| 8. EasyClean suction filter | 24. Drainage connector |
| 9. Rinse tank | 25. Flow transducer |
| 10. Injector | 26. Suction connector |
| 11. CycloneFilter | 27. Transfer connector |
| 12. Section valve | 28. External spray washer |
| 13. Chemical filler | 29. Chemical filler cleaning valve |
| 14. Safety valve | 30. Vortex nozzle valve |
| 15. Tank injection entrance | 31. Container rinsing valve |
| 16. Tank rinsing nozzles | |

EasyClean filter

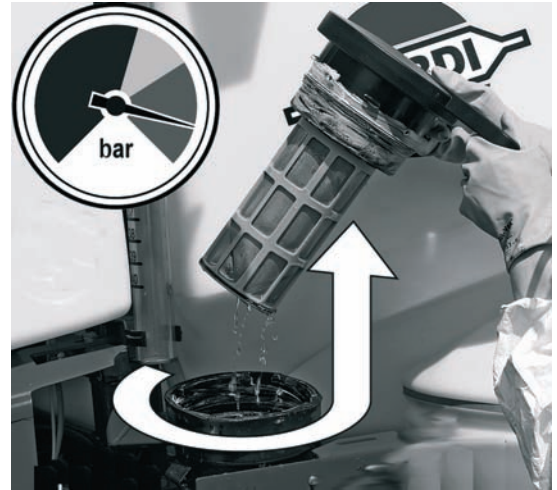
The EasyClean filter is fitted in the working zone. It has a built-in valve that automatically closes when the filter is opened. To open filter, turn the handle counterclockwise and pull it up, as shown in the picture.

A clogging indicator is fitted in the front of the cabin and is visible from the operator's seat.

Green indicator = filter clean - no cleaning required

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

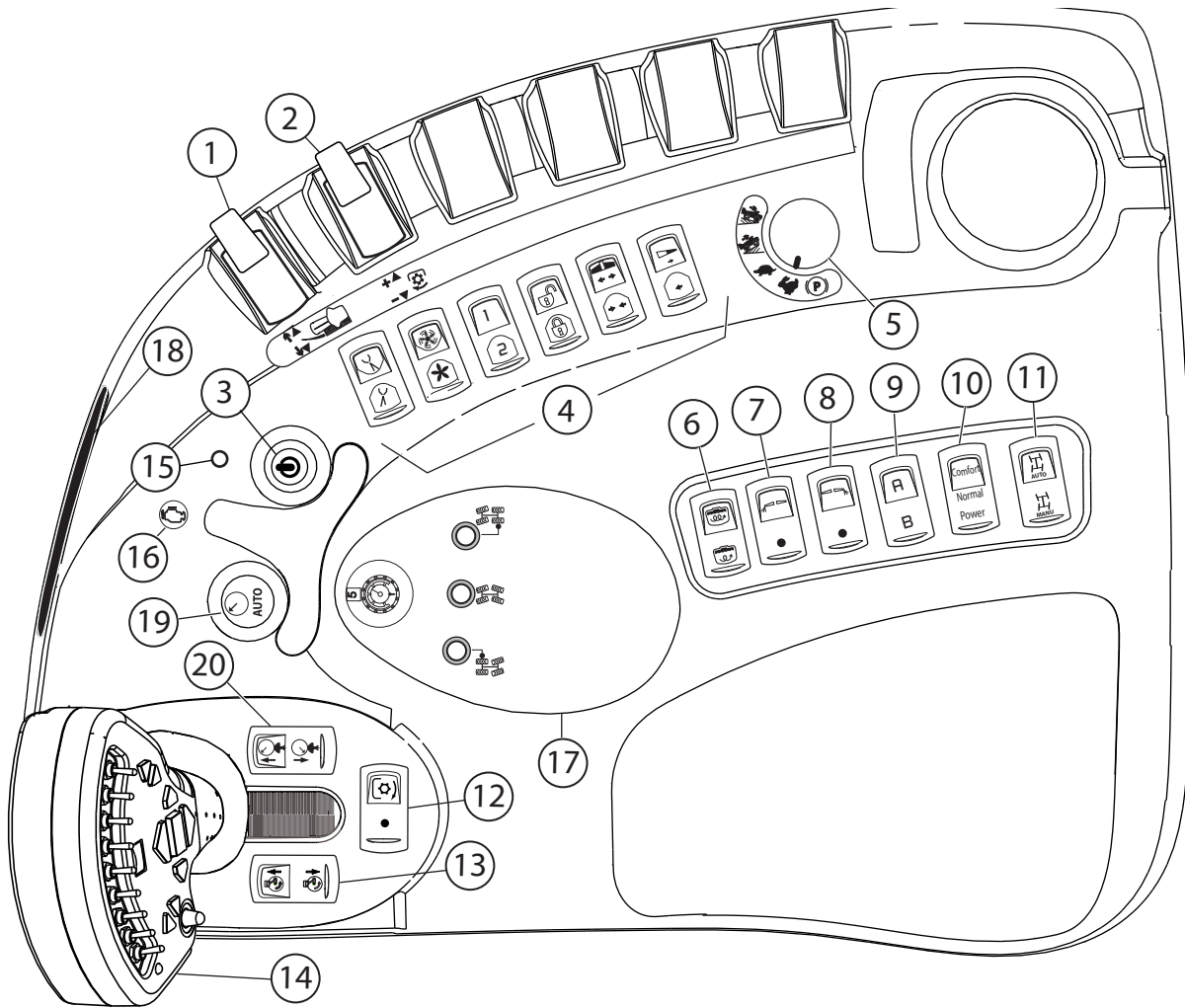
Red indicator = filter clogged - clean immediately



3 - Description

Cabin

Description of console

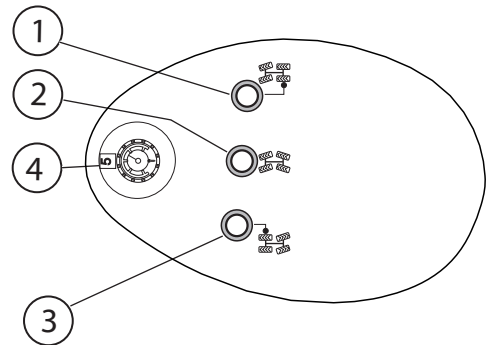


- | | |
|--|--|
| 1. Open/Close gangway switch | 11. Automatic 4-wheel drive system Start/Stop switch |
| 2. Spray pump rotation speed adjustment switch | 12. Spray pump clutch switch |
| 3. HC9500 computer Start/Stop switch | 13. Engine speed variation switch |
| 4. Boom hydraulic function switches | 14. Multi-functional forward handle |
| 5. Gear selector and parking brake | 15. Computers activated indicator |
| 6. Main tank agitation switch | 16. Engine fault indicator |
| 7. Left end nozzle control switch | 17. Control panel for 2/4 wheel drive mode and forward speed limiter |
| 8. Right end nozzle control switch | 18. Ash pan |
| 9. Guide device on/off switch | 19. Volume rate adjustment in AUTO mode |
| 10. Driving mode selector switch | 20. Volume rate control in MANUAL mode (+/-) |

Description of console - 4-wheel drive/speed limiter

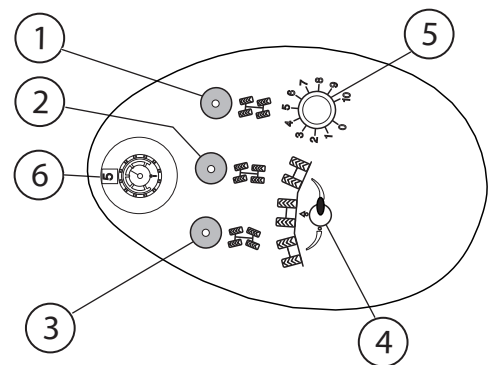
4-wheel drive with automatic realignment and locking on road. This equipment is optional

1. Green indicator for rear wheels aligned.
2. Orange indicator for 4-wheel drive in operation.
3. Green indicator for front wheels aligned.
4. Forward speed limitation adjustment.



4-wheel drive with crab steering. (Optional equipment)

1. "CRAB " mode control
2. 2-WHEEL DRIVE mode control.
3. 4-WHEEL DRIVE mode control.
4. Right and left SLANTING mode selection.
5. Rear wheel inclination control in SLANTING mode.
6. Forward speed limitation adjustment.

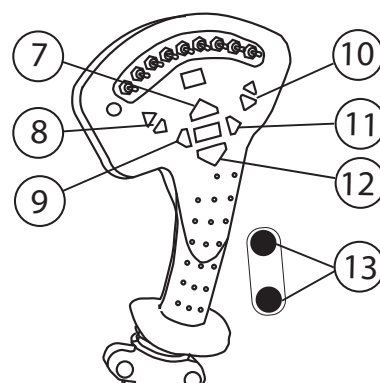
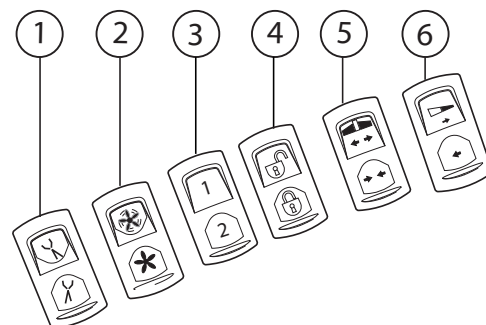


3 - Description

HAZ boom hydraulic function controls

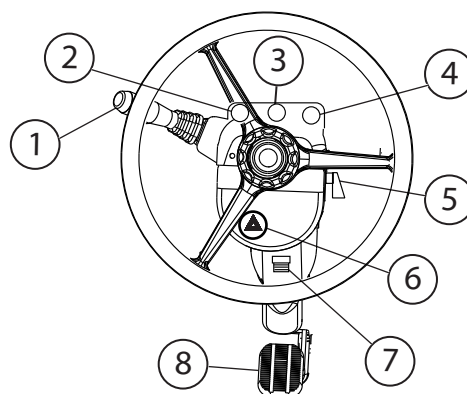
This configuration relates to sprayers equipped with the HAZ central frame with simultaneous control of the inner and outer sections.

1. Air outlets inclination control switch
2. Blower speed variation switch
3. Outer sections simultaneous unfolding and folding switch
4. Inner sections simultaneous unfolding and folding switch
5. Not used
6. Not used
7. Boom lift
8. Boom tilt left
9. Left slant
10. Boom tilt right
11. Right slant
12. Boom lower
13. Auto steering engagement/disengagement (optional)

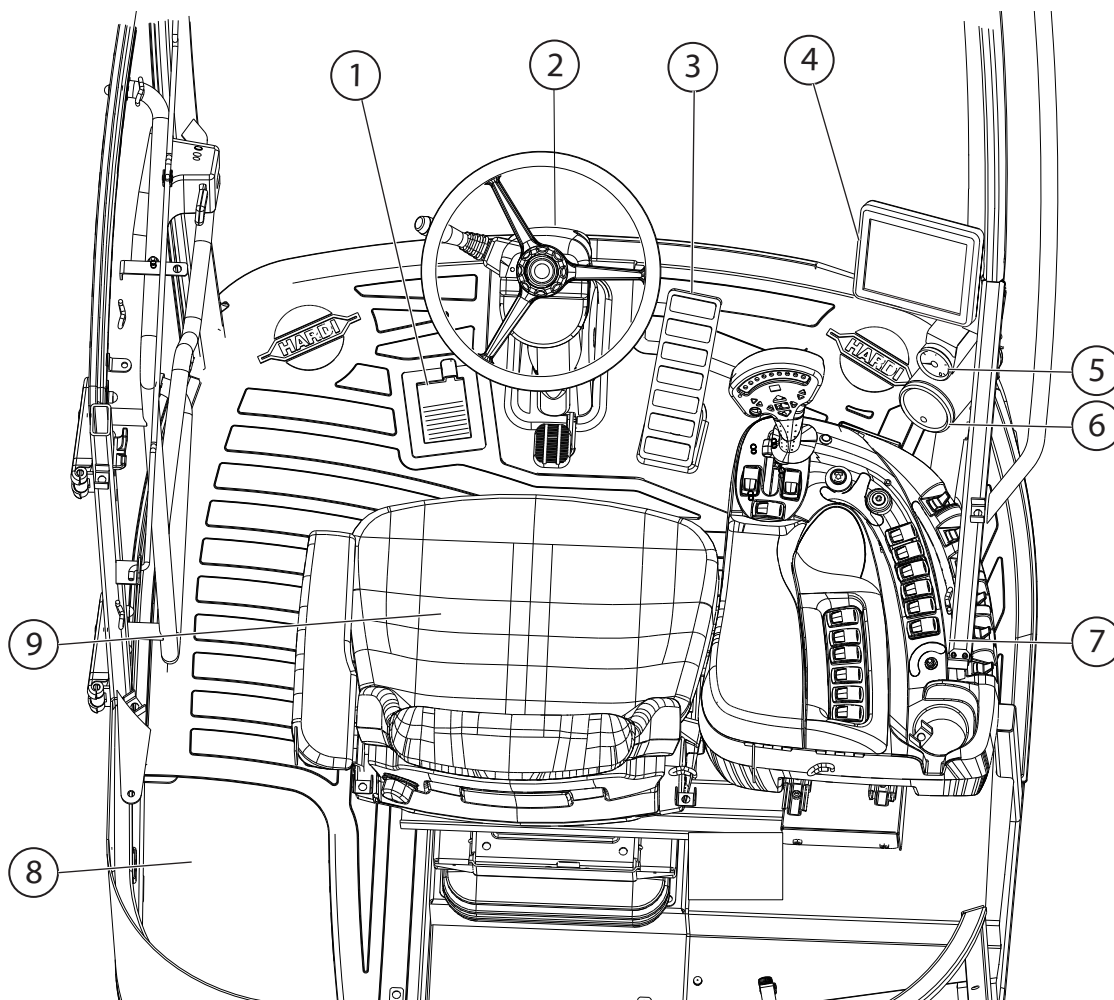


Steering column

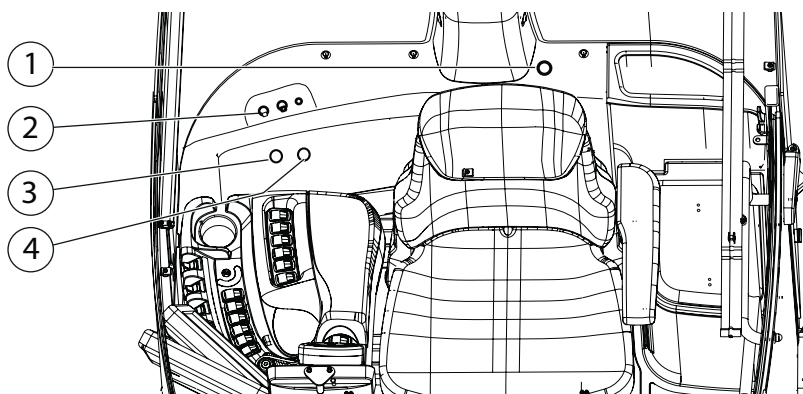
1. Lights, indicators and horn controls
2. Green light for left indicator
3. Blue light for main beam headlights
4. Green light for right indicator
5. Ignition key
6. Pushbutton hazard light control
7. Steering column upper inclination adjustment
8. Steering column inclination adjustment



General description of operator's seat



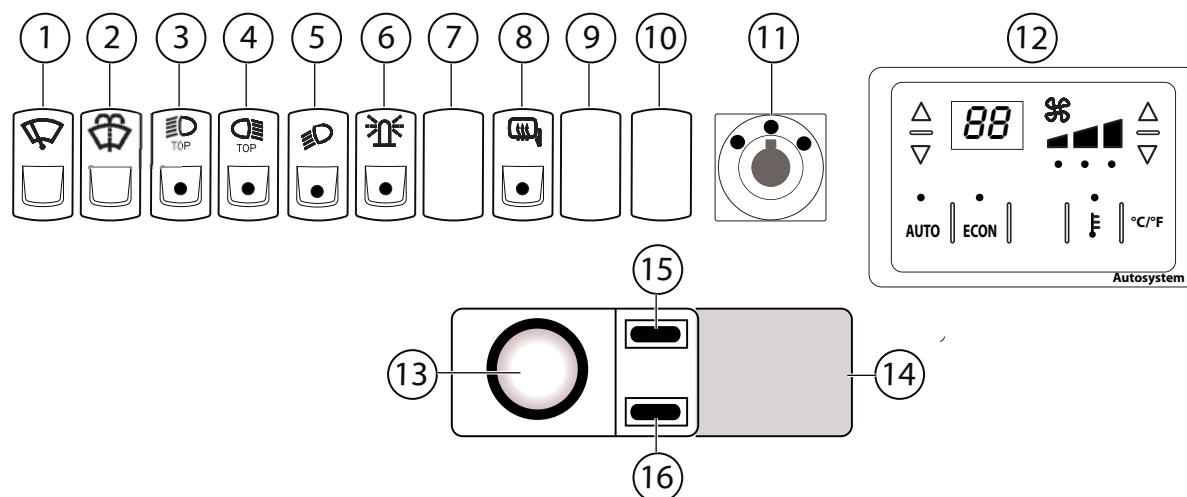
- | | |
|--------------------------------|-----------------------------|
| 1. 4-wheel drive control pedal | 6. CANcockpit rev counter |
| 2. Adjustable steering column | 7. Side console |
| 3. Brake pedal (optional) | 8. Storage box |
| 4. HC9500 ISOBUS console | 9. Adjustable driver's seat |
| 5. Fuel gauge | |



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

3 - Description

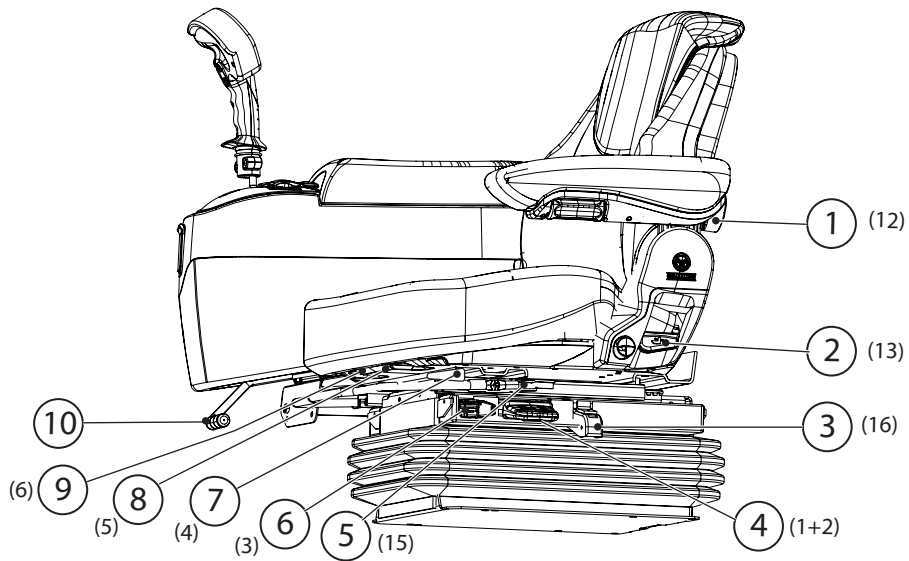
Cabin ceiling controls



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

Description of driver's seat

ALPHA evo self-propelled vehicles are 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 | 6. Horizontal damper |
| 2. Adjusting the inclination of the backrest | 7. Lengthwise adjustment |
| 3. Seat damping | 8. Seat inclination adjustment |
| 4. Weight + seat height adjustment | 9. Seat depth adjustment |
| 5. Rotation mechanism | 10. Lengthwise adjustment of console |

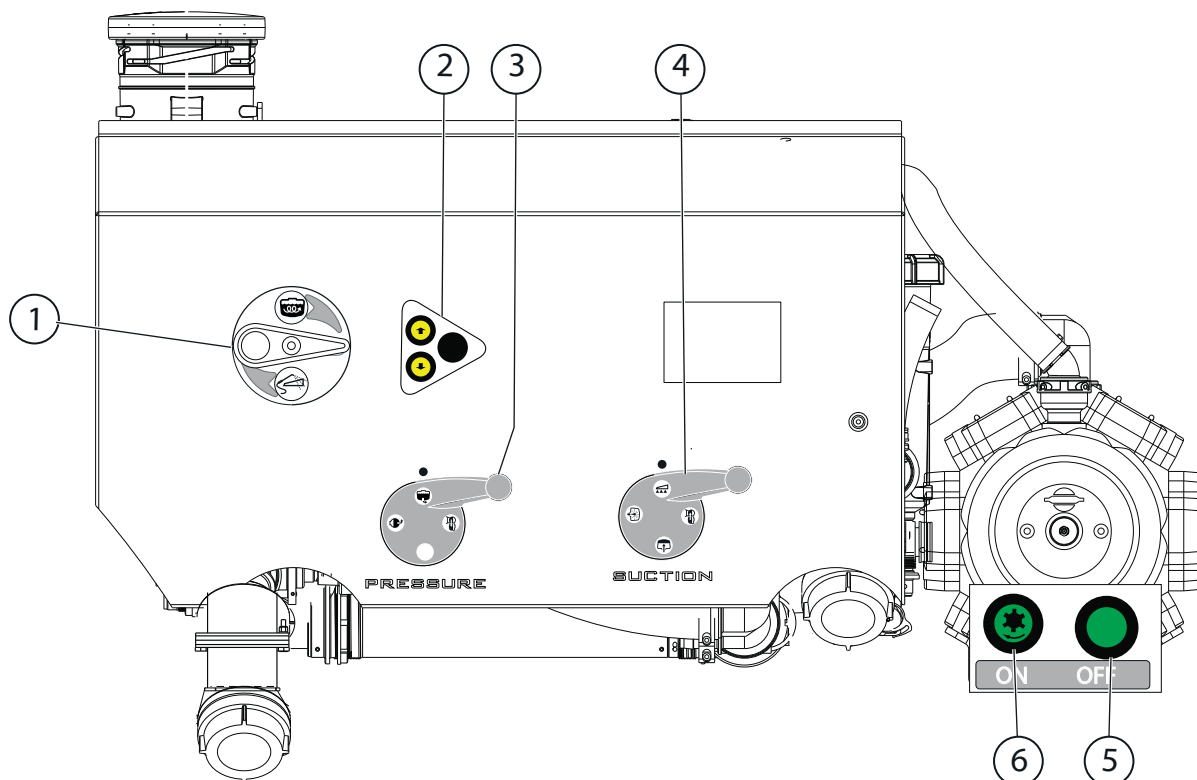


NOTE! The numbers in brackets correspond to the description in the GRAMMER seat user manual.

3 - Description

Sprayer description

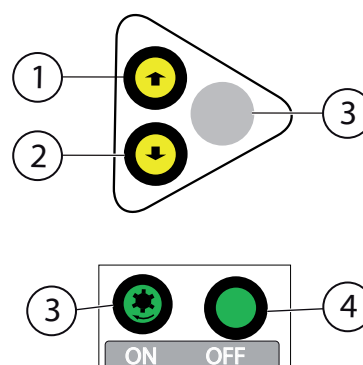
External controls



1. Agitation/External Cleaning Device valve
2. Engine speed external control
3. SmartValve pressure valve
4. SmartValve suction valve
5. Spray pump control

External electrical controls

1. Pushbutton for increasing engine speed
2. Pushbutton for decreasing engine speed
3. Not used
4. Sprayer pump ON switch
5. Sprayer pump OFF switch



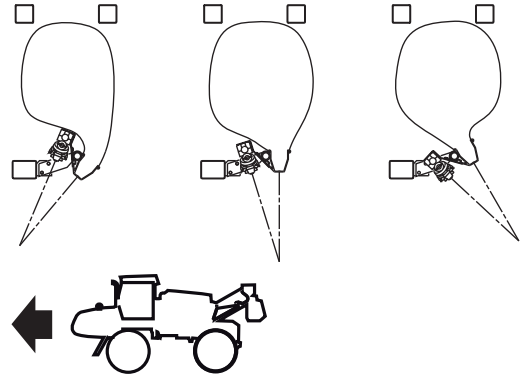
TWIN air assistance

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.

3 - Description

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.

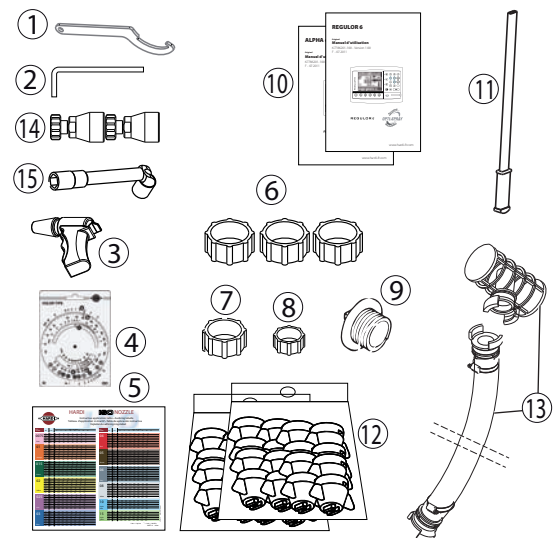
Method

- Turn the battery switch to supply the machine's electrical and electronic circuits.
- Move the forward handle 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 [SLOW] position.
- Push the forward lever 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. Hexagonal key
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. Distribution feed cover placed on central frame
8. Spray pump drain plug
9. Instruction books ⁽²⁾
10. Nozzles ⁽³⁾
11. Hydraulic pump lever (brake release - bonnet open)
12. Hexagonal key ⁽⁴⁾
13. External suction hose and filter
14. Emergency pushbutton ⁽⁵⁾
15. Socket spanner



- ⁽¹⁾ Optional hose reel
⁽²⁾ Variable according to nozzle type and quantity ordered
⁽³⁾ The number of manuals varies according to the equipment
⁽⁴⁾ Only available for REGULOR 6
⁽⁵⁾ Only available for compatible solenoid valves.

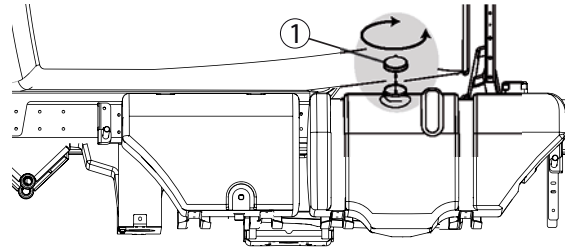
Precautions before putting the sprayer into operation

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 fig.1 carefully so that no impurities can enter the tank. Use a funnel if necessary.



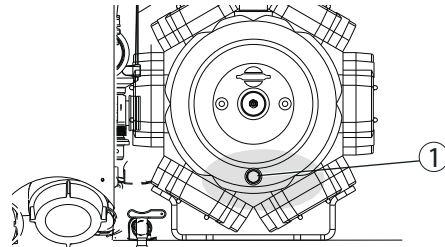
NOTE! Before a prolonged stoppage, we recommend filling the tank to avoid condensation.



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

Spray pump

- Screw the 2 plugs fig.1 to the diaphragm pump.



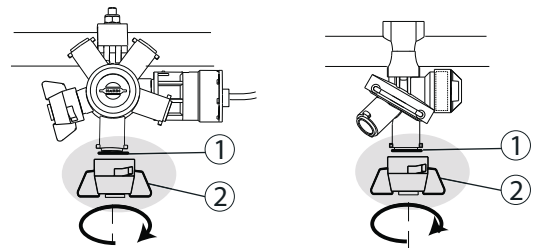
CycloneFilter

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

- Place the seal fig.1 in the nozzle nut fig.2.
- Fit the nozzles equipped with their seal to the nozzle holder, by turning the nut a 1/4 turn.

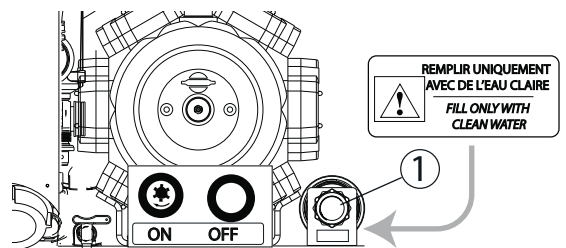


Filling the rinse tank

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



A one-way valve prevents the tank from draining



Altering 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

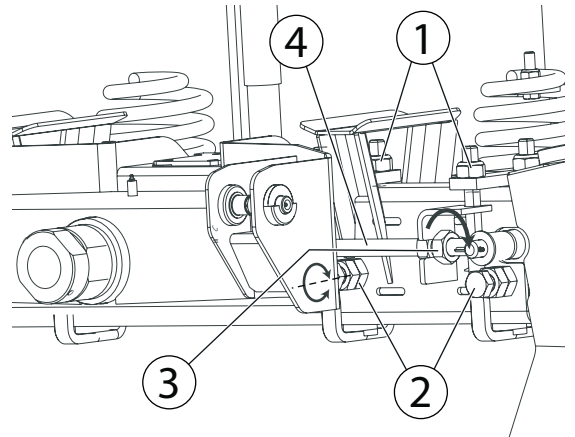
Base axle	Possible track gauge (m) ⁽¹⁾
S	1.80 to 2.20
M	2.00 to 2.40
L	2.25 to 2.70
XL	2.65 to 3.10

⁽¹⁾ with 300/95R46 tyres.

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

i 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 tyre pressures.

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

4 - Sprayer setup

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.

4 - Sprayer setup

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.



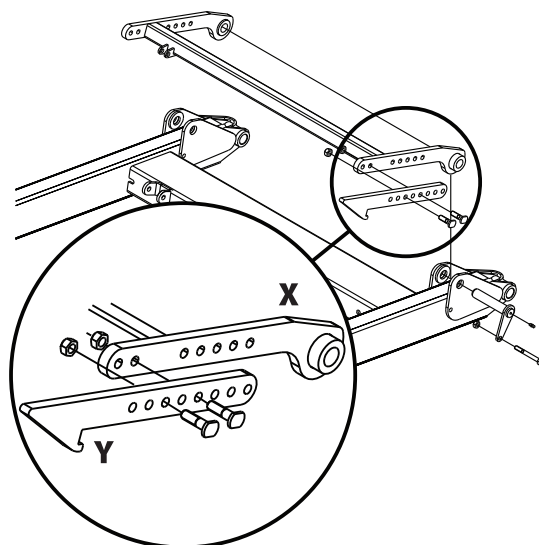
ATTENTION! Always put the two bolts back in position. The position must be identical on both sides.



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

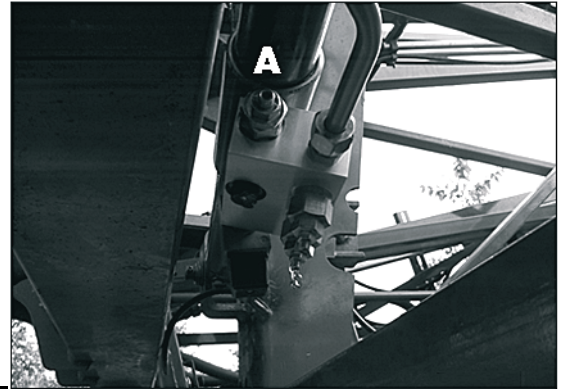
Damping adjustment

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

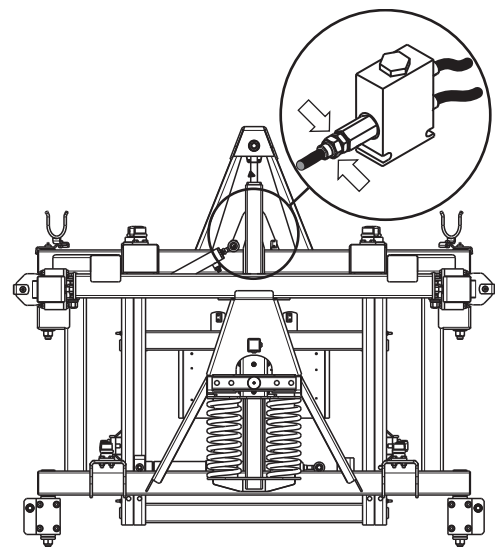
There are two restrictors (one for each boom wing) for adjusting the boom folding speed. The restrictors are located near the suspended pendulum damping cylinder.

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.



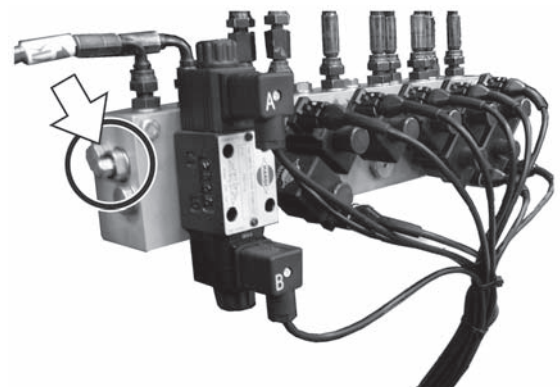
Boom folding speed adjustment - 32-36 m boom only

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.



4 - Sprayer setup

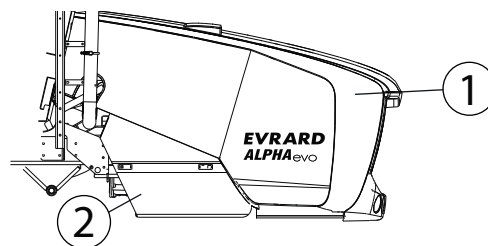
Engine cover

General information

The engine compartment is accessed by opening the upper cover and removing the right and left side covers.

DESCRIPTION

1. Upper cover
2. Side housing



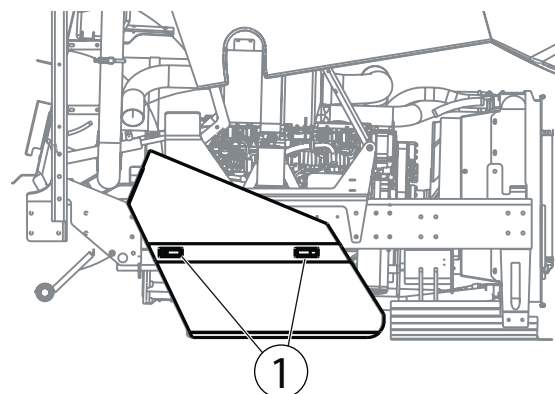
Side housing

To remove the side housing, first lift the upper cover, see above.

- Pull the handles to unlock it.
- Remove the side housing to access the engine.



NOTE! Do the same actions in reverse to replace the side housing.



5- Operation

Driving

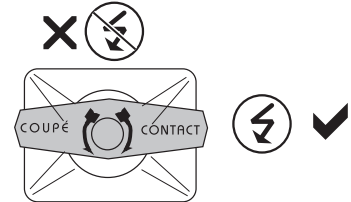
Starting up and shutting down the engine



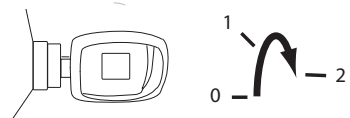
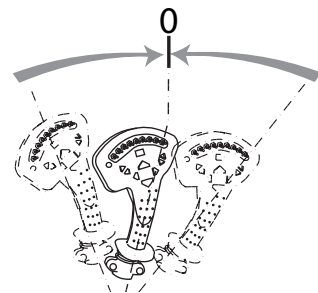
NOTE! Before starting the engine, check the level of the engine oil, coolant, fuel and hydraulic oil. Check that the engine radiator air filter is clean.

Starting up

- Turn the battery switch to the [CONTACT] position (horizontal handle).



- Place the forward handle in neutral. A position detector ensures safe engine start-up.
- Turn the contact key to position [1] to power the electrical and electronic circuits.
- Turn the contact key to position [2] to start the engine. Release it after start-up and the key will automatically return to position [1].



WARNING! If the engine fault light remains lit after starting the engine or if the CANcockpit rev counter emits an acoustic signal, shut down the engine immediately and correct the fault.

Shutting down

- Place the forward handle in neutral to shut down the machine.
- Engage the parking brake.
- Turn the contact key to position [0] to shut down the engine.
- Disconnect the electronic control units (HC9500, INTEGRA etc.).
- Turn the battery switch to the [CUT-OFF] position (handle vertical).



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

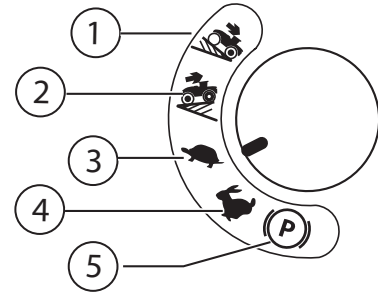


NOTE! Do not leave the headlights on when the engine is no longer running. The battery will quickly run down and the engine will no longer start.

Forward speed selection

This chapter describes the different driving modes in fields and on the road. A 5-position rotary selector switch gives the following speeds: road, field, uphill and downhill. The last position is for the parking brake.

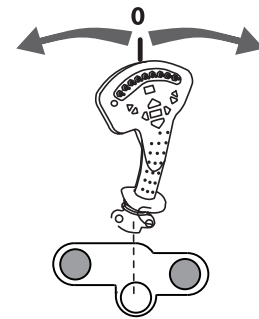
1. "DOWNHILL" mode.
2. "UPHILL" mode.
3. "FIELD" mode.
4. "ROAD" mode.
5. PARKING brake.



Forward movement and braking

The machine is made to move forward as follows:

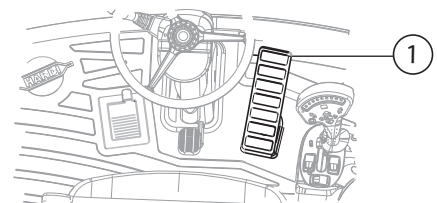
- Fold away the gangway only on ALPHA self-propelled vehicles 40 km/hr version, which come with a retractable gangway.
- Turn the speed selector to move out of the parking brake position fig.5.
- Increase the engine speed if the selector is in FIELD, UPHILL or DOWNHILL position.
- Push the forward handle forwards to move ahead or backwards to reverse the machine.



For self-propelled vehicles 25km/hr version, the braking is hydrostatic; it is achieved as follows:

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

For self-propelled vehicles 40 km/hr version, the braking is dynamic; it is achieved as follows:



- Gradually press the brake pedal fig.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 forward handle into neutral then push it or pull it to start again in forward or reverse gear.

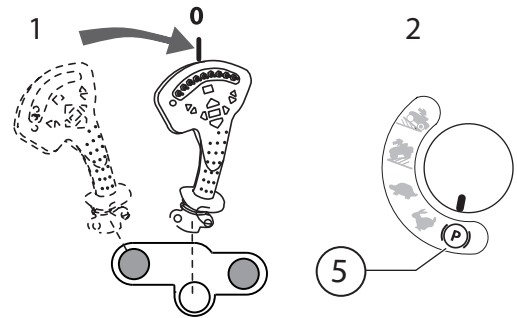
If the brake is applied slightly, i.e. without the machine coming to a complete stop, the speed will be reduced. As soon as the brake pedal is released, the machine will accelerate again to reach the travelling speed corresponding to the position of the forward handle.

5- Operation

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. To engage the parking brake:

- Pull the forward handle into neutral to make the machine brake (hydrostatic braking).
- Turn the speed selector to the parking brake position fig.5 to immobilise the machine.



When the parking brake is on, any action on the forward handle will not make the machine move.

To disengage the parking brake:

- Turn the speed selector to move out of the parking brake position.
- First make sure that the forward handle is in neutral 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 and the parking brake is then engaged.

Travelling in "ROAD" mode

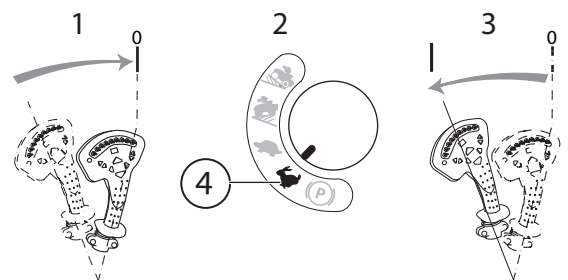
ROAD mode is associated with the combustion engine automotive mode. In this case, the engine speed is directly proportional to the forward handle position, except during the braking phase where the engine speed depends directly on the capacity of the hydraulic motors. (1/2 displacement front and rear).



NOTE! The change from FIELD position to ROAD position is taken into account and the engine speed is slowed down when the forward handle returns to neutral. The change from ROAD position to FIELD, UPHILL or DOWNHILL position is taken into account when the forward handle returns to neutral and the engine has already been slowed down.

Travelling in ROAD mode:

- Place the forward handle in neutral.
- Turn the switch to ROAD mode fig.4.
- Gradually push the forward handle forwards to achieve the required travelling speed. The engine speed varies according to the position of the forward handle.



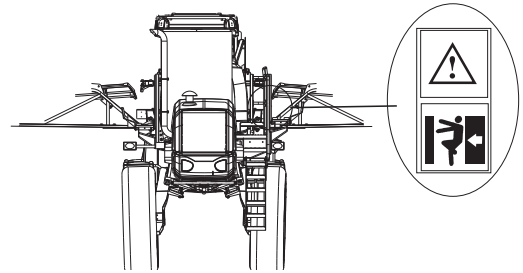
NOTE! The travelling process in reverse gear is exactly the same as described above.

Depending on the country, ALPHA Evo self-propelled vehicles version 40 km/h may be fitted with a retractable gangway allowing the boom to be maintained at the authorised road size.



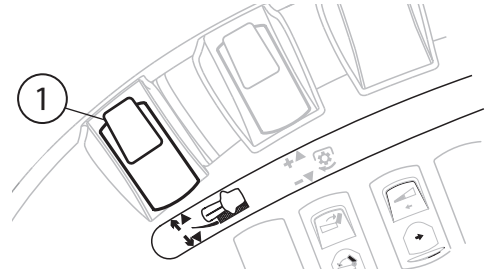
DANGER! Before moving the retractable gangway, ensure that no one is on or near the gangway.

A sticker shows the safety instructions.



To control the retractable gangway:

- Press the switch fig.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.

COMFORT - NORMAL - POWER driving mode

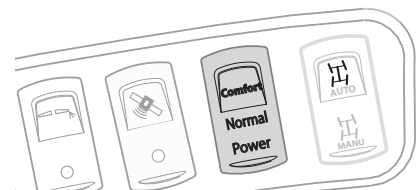
ALPHA evo 25 ad 40 km/hr self-propelled vehicles are fitted with EASY DRIVE transmission. This optimises the overall performance of the transmission (Speed/Torque, gradual acceleration and braking) according to the variations in the conditions of use of the machine. The driving mode can be modulated.

3 driving modes:

1. COMFORT: Gradual acceleration of machine.
2. NORMAL: Higher acceleration than in COMFORT mode.
3. POWER: More responsive driving.

To change the machine driving mode:

- Press the 3-position switch to select one of the modes [COMFORT-NORMAL-POWER].



NOTE! The mode can be changed while driving.



NOTE! To keep control of the machine in all circumstances, adapt the driving mode to the conditions of use both on the road and in the field.

"FIELD - UPHILL - DOWNHILL" mode

ALPHA Evo 25 and 40 km/hr self-propelled vehicles have 3 user modes. Each of these modes has a direct effect on the travelling speed of the machine and the transmission torque.

In FIELD, UPHILL and DOWNHILL modes, the engine speed remains constant and does not depend on the position of the forward handle.



NOTE! The change to one of these 3 modes (FIELD - UPHILL - DOWNHILL) can take place while the machine is moving.

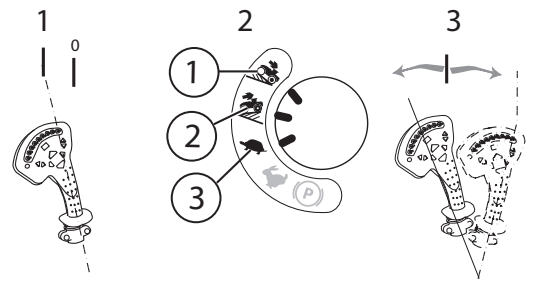
5- Operation



ATTENTION! FIELD, UPHILL or DOWNHILL modes require a minimum engine speed of 1500 rpm for the transmission to give enough traction and braking torque.

To select FIELD, UPHILL or DOWNHILL mode:

- Accelerate the engine to a minimum speed of 1500 rpm
- Turn the switch to one of the three modes fig.1, fig.2, fig.3.
- Move the forward handle to achieve the required speed. The engine speed remains constant.



FIELD mode has 2 gears that switch over automatically when the speed varies between 15 and 20 km/h, which corresponds to the maximum flow rate of the transmission pump. For first gear, the front and rear hydraulic motors are at full displacement. When second gear is engaged, only the front hydraulic motors change to 1/2 displacement, which allows the speed rate in FIELD mode to be increased.

In UPHILL mode, the front hydraulic motors are at 1/2 displacement and the rear motors are at full displacement.

In DOWNHILL mode, the front hydraulic motors are at full displacement and the rear motors are at 1/2 displacement.



NOTE! The travelling process in reverse gear is exactly the same as described above.

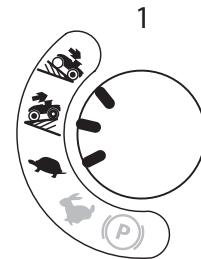
Forward speed limitation

ALPHA evo self-propelled vehicles are equipped with a forward speed limitation device. It allows a constant forward speed to be maintained when the forward handle is pushed forward as far as it will go.

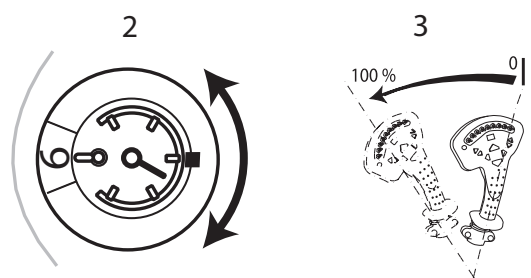
The speed limitation is only active in FIELD, UPHILL and DOWNHILL modes.

To use the speed limiter:

- Place the forward handle in neutral and select one of the modes: FIELD-UPHILL-DOWNHILL



- Turn the speed selector to achieve the required forward speed.
- Push the forward lever as far as it will go to travel at the selected speed.



To deactivate the speed limiter:

- Turn the speed selector to position [10] to deactivate the speed limitation device.



NOTE! If the speed limiter is in position [0], the machine will not move.



NOTE! The speed limitation does not work in reverse gear.

Anti-stall device

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 forward speed.

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

Engine overspeed

Management of engine overspeed is only available in ALPHA Evo self-propelled vehicles version 40 km/hr that have a brake pedal.

This function avoids the transmission making the engine accelerate beyond a maximum acceptable speed on braking caused by the forward handle (hydrostatic braking). This results in slower deceleration of the machine, so that the engine speed does not exceed a maximum acceptable value.

5- Operation

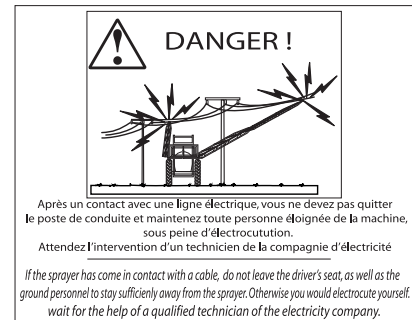
Boom

Safety information



WARNING! Working near overhead power lines can be dangerous and special precautions should be taken. You are considered as working near overhead power lines when the sprayer or the booms can reach minimum "priming" distances. This distance can be up to 2 metres for low voltage lines and up to 8 metres for very high voltage lines. When you unfold or fold away the booms, warn any personnel on the ground to keep a sufficient distance away from the sprayer.

If the machine comes into contact with a power line, above all you must not leave the seat of the vehicle. Otherwise, you could be electrocuted by placing your foot on the ground. Wait for help from the electricity company and keep everyone away from the machine. A sticker placed on the windscreen contains the safety instructions.



NOTE! Before folding or unfolding the boom, make sure that no one is in the operating area of the boom.

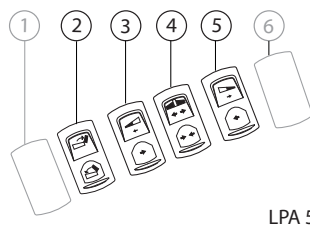
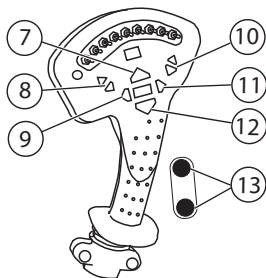


NOTE! If maintenance work has to be carried out on the boom hydraulic system, ensure that it is completely unfolded and placed on steady axle stands.

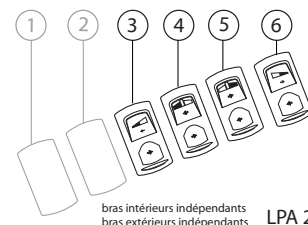


NOTE! The boom must always be folded and unfolded with the machine shut down. If this rule is not observed you risk damaging the booms.

Folding and unfolding the LPA2 and LPA5 boom



LPA 5



bras intérieurs indépendants
bras extérieurs indépendants LPA 2

The hydraulic controls are operated by:

1. switches located on the console
2. pushbuttons grouped on the multi-functional handle

Unfolding the boom

- Press the pushbutton fig.7 to raise the central frame and release the booms from the plates.
- Press the console switches to unfold the boom. This may be simultaneous or independent, depending on the central frame. For more information, please refer to the REGULOR 6 instruction book, section "HAZ boom hydraulic function controls" on page 24, or "HAZ boom hydraulic function controls" on page 24.
- Press the pushbuttons fig.13 to unlock the central frame. The REGULOR 6 indicates whether the boom is locked or unlocked.
- Press the tilt adjustment pushbuttons fig.8 and fig.10 to lower the left or right side boom.
- Press the pushbuttons fig.9 and fig.11 to correct any slanting of the boom.
- Press the pushbuttons fig.12 to lower or fig. 7 to raise the boom.
- Press the pushbuttons fig.13 to unlock the central frame.



NOTE! Before any movement in the field, when the boom has been unfolded, make sure that the central frame is unlocked.

Folding the boom



ATTENTION! The boom should always be folded on flat ground and with the machine at standstill.



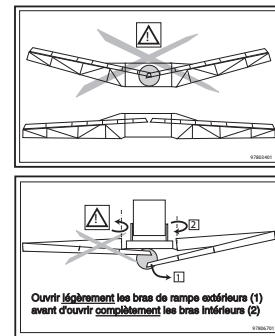
NOTE! To avoid any violent impact that could damage certain parts of the boom, always control movements, especially at the end of the folding operation.

- Press the pushbuttons fig.9 and fig.11 of the slant corrector to place the boom in a horizontal position.
- Press the pushbutton fig.13 to lock the central frame and prevent any risk of the boom tipping over.
- Press the pushbutton fig. 7 to raise the central frame.
- Press the tilt adjustment pushbuttons fig.8 and fig.10 to raise the left or right side boom.
- First fold the outer sections then the inner sections. They can sometimes be folded simultaneously. When the inner sections are completely folded the locking ratchets on the parallelogram arms fall into place to lock the central frame at the top for when it comes down.
- Press the pushbutton fig.12 to lower the boom onto the plates and place the parallelogram arms on the locking ratchets.

Alternative boom widths

Some boom models, such as for example 18/36 metres, require a special procedure for folding and unfolding the sections. In this case a sticker is placed in the cabin.

- Release the boom from the plates
- Gently unfold the outer sections (1), before completely unfolding the inner sections (2).
- Ensure that you gently fold the inner sections before completely folding the outer sections.



Folding the outer sections

You may need to fold one of the outer sections to pass an obstacle (fence, pole etc.).



NOTE! Take care when working with one of the outer sections folded. In fact, locking of the central frame should be activated to compensate the imbalance of the boom as a whole. Only use this position temporarily to avoid any damage.



NOTE! Outer section folding operations should always be carried out with the machine at standstill and preferably on flat ground.

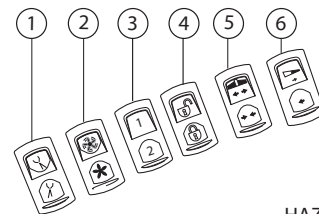
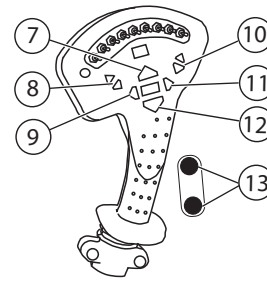
- Press the slant corrector switch fig. 9 and fig.11 to place the boom in a horizontal position.
- Press the pushbutton fig.13 to lock the central frame
- Press the switch of the outer section to be folded.

5- Operation

HAZ (TWIN) boom folding and unfolding

To unfold the boom do the following:

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



HAZ



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 fig.3 and fig.4) must only be operated when the vehicle is stationary. Otherwise the boom could be damaged.

Hydraulic slanting control

The hydraulic slanting control fig.9 and fig.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 fig.5. In the EFC control unit, also deactivate the sprayer sections on the outer sections.

Boom tilt function

The tilt adjustment (switches fig.8 and fig.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!

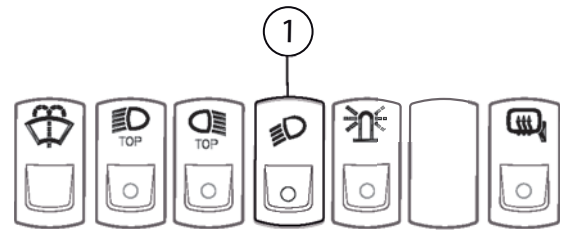
Hydraulic break-away function

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 fig.6 is pressed again.

Boom lighting

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

- Press the switch fig.1 to switch on the boom lights.

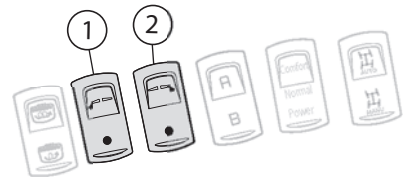


To avoid any risk of dazzle and to save battery, we recommend switching off the boom lights on leaving the field.

Electrically controlled end nozzles (optional)

The boom can be fitted with end nozzles.

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



5- Operation

TWIN air assistance

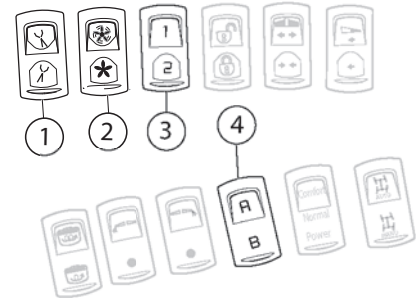
General information

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 angled in steps 0 to 4 backwards and from 0 to 6 forwards, which corresponds to approx. 30° backwards and 40° forwards compared to vertical position. For settings, see section "TWIN air assistance" on page 29 and page 34.

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.

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

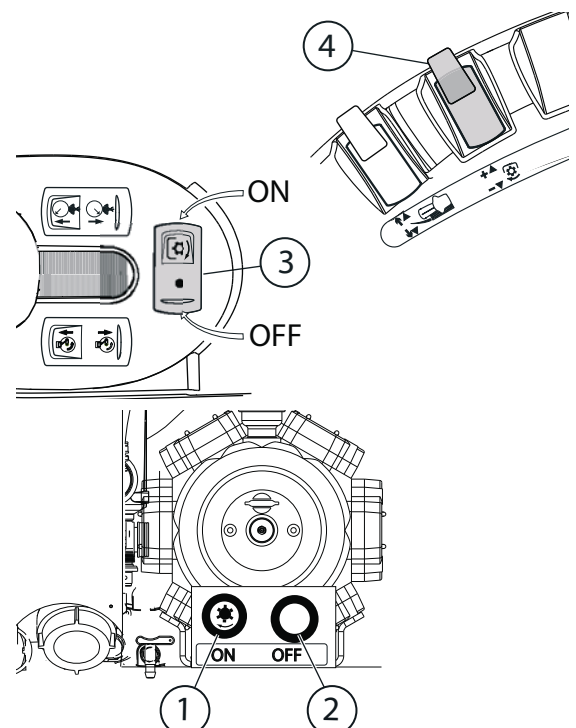
The spray pump clutch can be activated in the cabin or by a control located outside fig.2.

System start-up

- Press the pushbutton fig.3 or fig.1 to start the spray pump. Its speed can be adjusted using the control fig.4.

Shutting down the pump

Press the pushbutton fig.2 or fig.3 to shut down the spray pump.



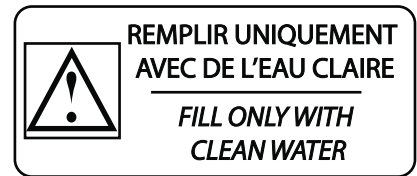
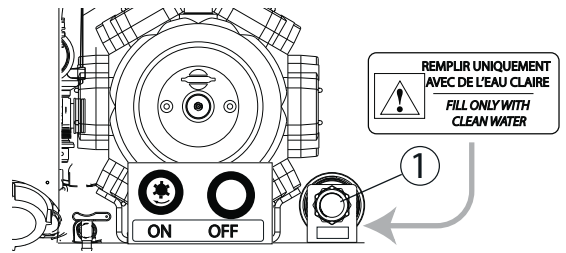
5- Operation

Filling the rinse tank

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



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



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



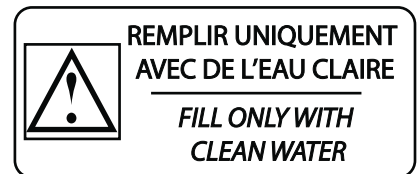
To avoid algae developing always drain the tank if the sprayer is not in use for a longer period of time.

Filling and use of hand wash tank

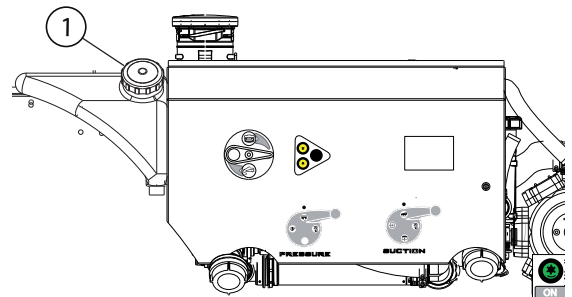
The hand wash tank has a 15-litre capacity.



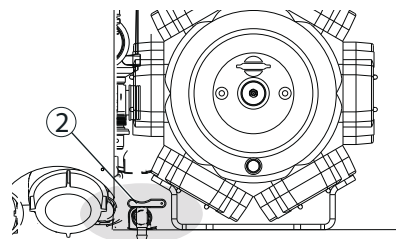
WARNING! For your own safety, ensure that this tank is always kept filled with clean water and ensure that no chemicals are ever put into it. This water is reserved for washing the hands.



- Unscrew the plug and fill the tank with clean water.



- Open the valve fig.2 to use the water from the hand wash tank.

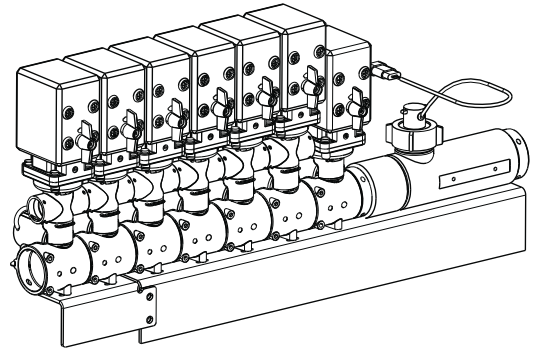


WARNING! Although the clean water tank is only filled with clean water, this water must never be used for drinking.

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 P.T.O. must be kept between 300 and 600 rpm (pump 540 rpm) or between 650 and 1100 rpm (pump 1000 rpm).
- Press the pressure regulation switch until the required pressure is shown on the pressure gauge.



Filling chemicals through the tank opening

Chemicals can be poured directly into the sprayer tank. In this case, check the method on the chemical label.



DANGER! To prevent any risk of splashing or spillage, take precautions by lifting the chemicals up to the tank opening.

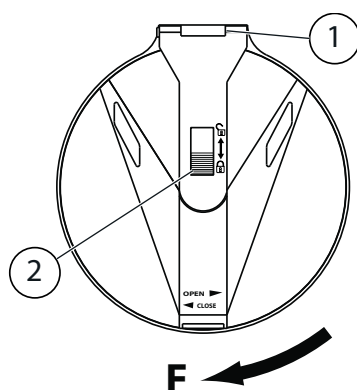
- Check that the general spraying is closed.
- Position the multi-way valves as shown in the picture.
- Start the sprayer pump.



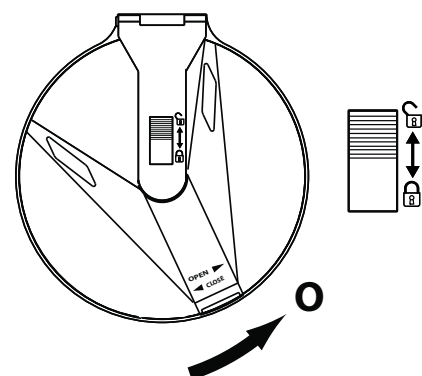
NOTE! For further information, see the [SPRAY TECHNIQUE] book.

Filling the tank through the main tank lid

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



FERMETURE



OUVERTURE

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 foreign bodies falling into the tank.

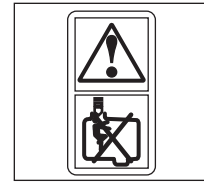
5- Operation



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

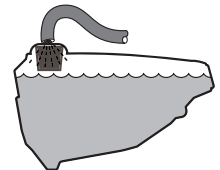


DANGER! Do not attempt to enter the tank.



ATTENTION! Before filling the tank ensure that none of the multi-way valves are in the [SUCTION] and [TRANSFER] position. The filling and transfer connectors should be fitted with their plugs.

- Fill the tank at least 1/3 full with water before adding chemicals. Always follow the instructions given on the plant protection chemical container. Take care not to introduce impurities into the tank by always leaving the filter in place.
- Take care not to put the filling pipe in the tank by holding it at the level of the opening. Otherwise, you would risk the liquid returning in the event of a drop in pressure during the filling operation, thus contaminating the water channelling point.



Filling the main tank by external suction

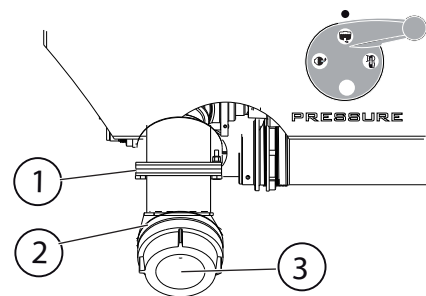


ATTENTION! To fill the main tank, follow the rules for using filling devices. Ensure that you can fill from open water (lakes, rivers etc.).



NOTE! For further information, see the [SPRAY TECHNIQUE] book.

1. One-way valve
2. Filling connector
3. Plug



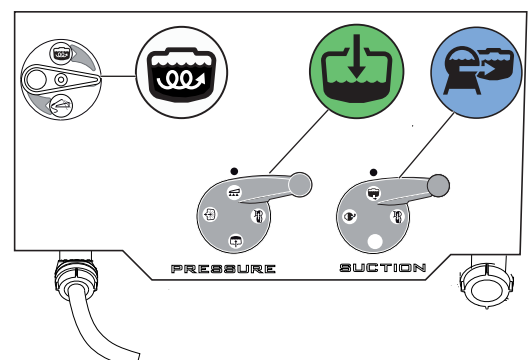
ATTENTION! The sprayer is fitted with a one-way valve fig.1 on the external filling connector fig.2. It forms an integral part of the filling device and should not be modified or removed. Check regularly to see that it is working correctly.



ATTENTION! After use always replace the plug fig.3 on the connector.

External filling works as follows:

- Remove the plug from the connector and connect the water hose.
- Turn the Smartvalve pressure valve as shown in the picture.
- Start the sprayer pump by rotating it at its nominal speed.
- Turn the Smartvalve suction valve as shown in the picture.
- Check the main tank gauge.
- At the end of filling, turn the suction valve to stop the filling process.
- Disconnect the water hose and put the plug back in the connector.



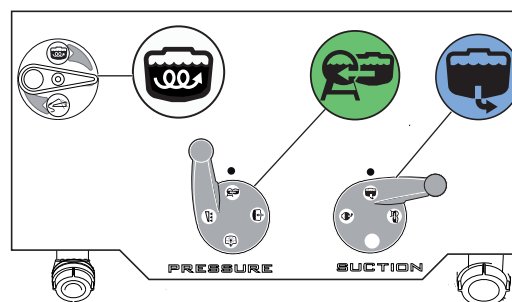
Filling chemicals through the tank opening

Before pouring chemicals directly through the tank opening, read the chemical label carefully.

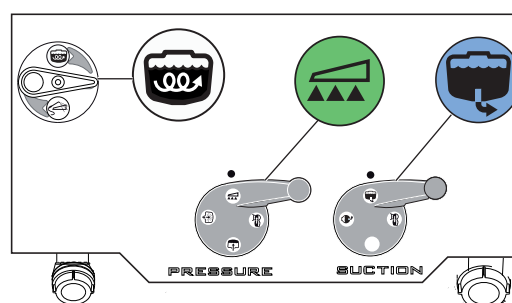


Take precautions by lifting the chemicals up to the tank opening to prevent any risk of spillage or splashing.

- Check that the sprayer is in the closed position.
- Place the SmartValves in the correct position as shown in the picture.
- Start the sprayer pump.
- Add the chemicals through the tank opening.



- 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.



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.

Filling with chemicals

Safety information

Before using the TurboFiller, follow the safety instructions, see page 46.



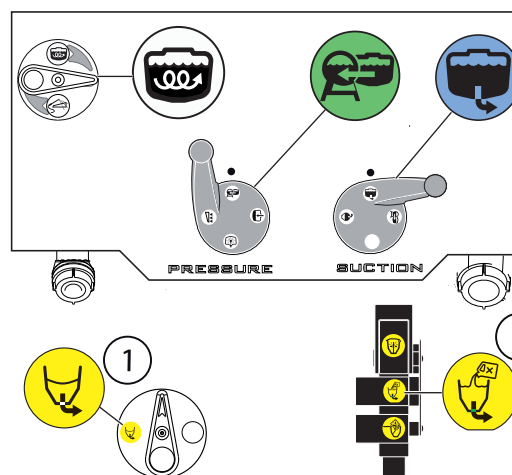
DANGER! Possible risk of splatters and splashes! In the event of accidental spraying, use clean water from the hand wash tank. This tank's tap is near the TurboFiller.

Preparation

- Fill the tank at least 1/3 full with water (unless something else is stated on the chemical container label).
- Set the Smartvalve suction valve to [in the main tank], the SmartValve pressure valve to [TRANSFER] or to another function not in use. The agitation valve to the position as indicated in the picture
- Start the sprayer pump by rotating it at its nominal speed.

Usage

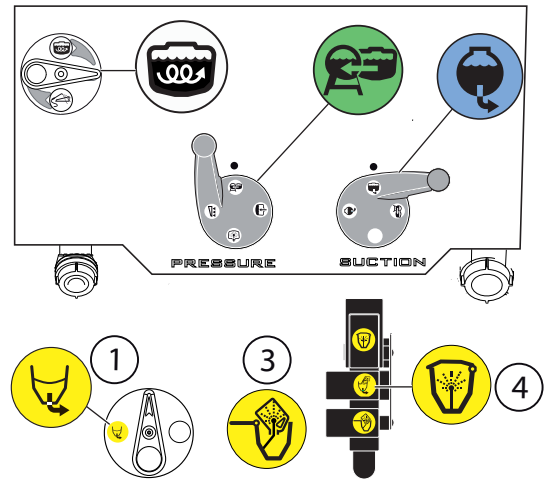
- Open the TurboFiller lid, measure the required amount of chemical and pour it into the TurboFiller.
- Open the TurboFiller suction valve fig.1 and press the lever fig.2 to transfer the contents from the TurboFiller to the main tank.



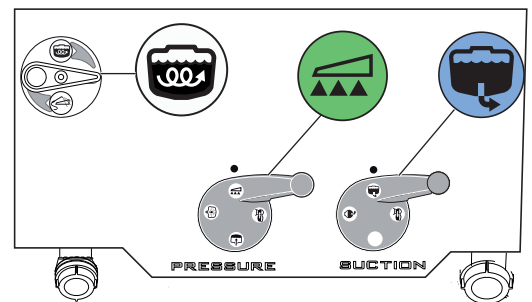
5- Operation

Rinsing

- Turn the Smartvalve suction valve to the position shown in the picture.
- Hold the container upside down over the multi-hole nozzle and press the control lever fig.3.
- Close the TurboFiller lid again and press the TurboFiller rinse control lever fig.4.
- Close the TurboFiller suction valve fig.1 after rinsing the TurboFiller.



- 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.



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.



For the TurboFiller gauge reading to be reliable, the sprayer must be on flat ground. For more precision, use a calibration jug.



Before using the container rinsing lever, hold the container or flask over the multi-hole nozzle to avoid any risk of the liquid splashing.



The container rinsing device uses the liquid. Use clean water to rinse containers several times before disposing of them.

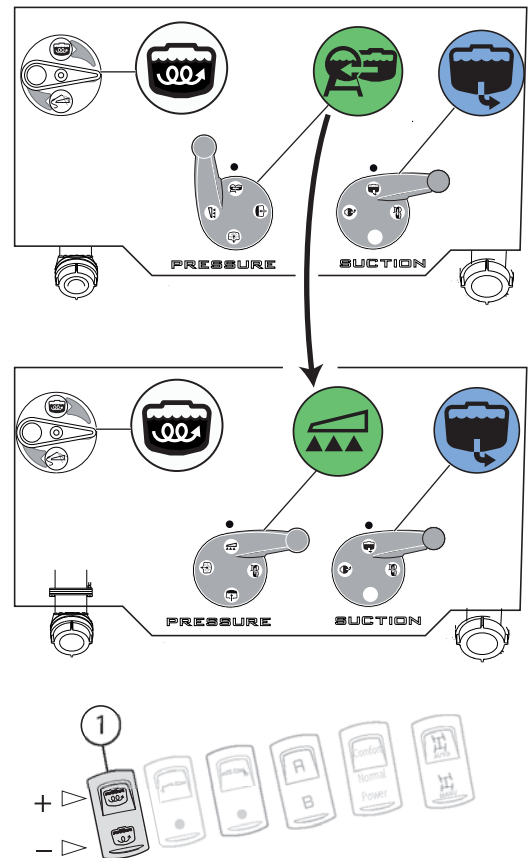


Carefully clean the inside of the TurboFiller with clean water at the end of the spraying job.

Agitation before re-starting 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 valves 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 fig.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.

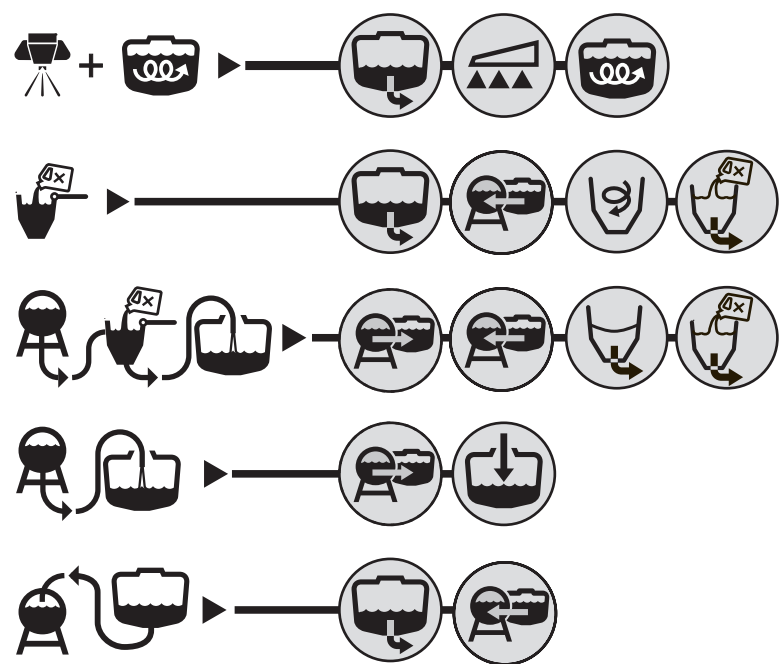


Before positioning the SmartValve pressure pump in the [TRANSFER] position, it is important to check that the transfer connector plug has been screwed in correctly and is completely closed. If this is not the case, there is a risk of contamination and injury from the effect of the pressure if the plug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

5- Operation

Quick reference - Operation

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



Cleaning

General information

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



ATTENTION! Read the different chapters carefully. Before carrying out an inspection or a repair, first read the relevant chapters. If any part remains unclear or requires facilities which are not available, then for safety reasons please contact your HARDI dealer's workshop.



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



ATTENTION! Before cleaning, read the chapter on the filling/cleaning area

Guidelines

- Read the instructions carefully for the products that you use. Take note of any particular instructions regarding your protection, deactivating agents etc. Read the detergent and deactivating agent instruction labels. If cleaning procedures are given, follow them closely.
- Be familiar with local legislation regarding the storage of pesticides, washing them, mandatory decontamination methods etc. If in doubt, contact the appropriate local department, e.g. department of agriculture.
- Rinsing of pesticides usually takes place in a cleaning field. This is a field that is not used for crops. No liquid flow or leak should reach streams, ditches, wells, springs etc. Use an appropriate cleaning area with a hard, impenetrable surface (concrete), with drainage to a tank to avoid unexpected contamination of the groundwater. The rinsing water should be diluted and spread over a larger surface to ensure biodegradation. Always respect the applicable local legislation.
- Cleaning starts with the calibration, as a well calibrated sprayer will ensure the minimal amount of remaining spray liquid.
- Get into the good practice of cleaning the sprayer immediately after use. It will be safe and ready for the next spraying job. This also prolongs the life of its components.
- It is sometimes necessary to leave spray liquid in the tank for short periods, e.g. overnight, or until the weather becomes suitable for spraying again. Unauthorised persons and animals must not have access to the sprayer under these circumstances. See also Parking the sprayer on page 50.
- If the product applied is corrosive (e.g. liquid fertilisers), it is recommended to coat all metal parts of the sprayer before and after use with a suitable rust inhibitor.

5- Operation

Cleaning the tank and liquid system

- Dilute remaining spray liquid in the tank with at least 10 parts of water and spray the liquid out in the field you have just sprayed.
- Select and use the appropriate protective clothing. Select detergent suitable for cleaning and suitable deactivating agents if necessary.
- Rinse and clean the sprayer and tractor externally. Use detergent if necessary.
- Remove the tank and suction filters and clean. Be careful not to damage the mesh. Replace suction filter. Replace the filters after complete cleaning of the sprayer.
- Start the pump and rinse the inside of the main tank. Remember to clean the top of the tank. Rinse and operate all components and any equipment that has been in contact with the liquid. Before opening the distribution valves and spraying the liquid out, decide whether this should be done in the field again or on the soakaway.
- After spraying the liquid out, stop the pump and fill at least 1/5 of the tank with clean water. Note that some chemicals require the tank to be completely filled. Add appropriate detergent and/or deactivating agent, e.g. washing soda or triple ammonia. Specific detergents for sprayers are recommended because some are also involved in lubricating built-in valves etc.
- Start the pump and operate all controls enabling the liquid to come in contact with all the components. Save the sections for the end. Some detergents and deactivating agents work best if left in the tank for a short period. Check the instruction label.
- Drain the tank and let the pump run. Rinse inside of the tank, again letting the pump run.
- Stop the pump. If the pesticides used have a tendency to block nozzles and filters, remove and clean them immediately.
- Replace all the filters and nozzles and store the sprayer. If, from previous experiences, it is noted that the solvents in the pesticide are particularly aggressive, store the sprayer with the tank lid open.



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



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



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

Cleaning and maintenance of filters

Clean filters ensure the good functionality of:

- regulation, valves and diaphragms
- nozzles
- the pump

which could be irreversibly damaged if the filters are not clean.

The most important filter is the suction filter. It protects all sprayer components. Check it regularly.

Use of rinse tank and rinsing nozzles

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

A. For diluting of remaining spray liquid residue and spraying the liquid in the field, before cleaning the sprayer. This cleaning procedure is divided in three main steps:

Rinsing the liquid system:

1. Empty the sprayer as much as possible. Close the agitation valve and spray until air comes out of all nozzles.
2. Turn the SmartValve suction valve to "Rinse tank" and the pressure valve to "Filling".
3. Engage and run the pump at approx. 300 rpm
4. When another 1/3 of the content in the rinse tank has been used, turn the SmartValve suction valve to "Main tank". Next activate all valves on the pressure side to rinse the hose and components, in the following order:
Open the suction valve of the TurboFiller, open the Vortex jets then close them when clean water appears. Close TurboFiller lid and squeeze the chemical container cleaning grip. Open the TurboFiller lid again and check that the funnel is empty. When empty, close the TurboFiller suction valve again.
5. Turn the SmartValve suction valve to "Main tank" and the SmartValve pressure valve to "Spraying" and spray the tank content in the field you have just sprayed.

Rinsing the main tank:

6. Turn the SmartValve suction valve towards "Rinse tank" and the SmartValve pressure valve to "Tank cleaning".
7. When approx. 1/6 of the content in the rinse tank has been used (75 l), turn the SmartValve suction valve to "Main tank".
8. Turn the SmartValve pressure valve to "Spraying" and spray the content of the tank in the field you have just sprayed.
9. Repeat points 6 - 8 one more time.

External rinsing:

10. Turn the SmartValve suction valve towards "Rinse tank" and the SmartValve pressure valve to "Tank cleaning".
11. When approx. 1/3 of the content in the rinse tank has been used (150 l), turn the SmartValve suction valve to "Main tank".
12. Turn the SmartValve pressure valve to "External Cleaning Device" and wash the device using the spray gun located on the sprayer's right side (optional).
13. Stop the pump.

B. For rinsing the pump, operating unit, spray lines etc. in case of unexpected shutdown of spraying before the main tank is empty.

Rinsing the liquid system:

1. Turn the SmartValve suction valve to "Rinse tank" and the pressure valve to "Spraying".
2. Close the agitation valve.
3. Engage the pump and spray the content of the rinse tank into the field until the nozzles give out clean water.
4. Stop the pump.



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



ATTENTION! It is advisable to increase the forward speed (drive twice as fast if possible) and reduce the pressure to 1.5 bar (20 psi). The diagrams below describe the valve positions according to different operations.



ATTENTION! If a cleaning procedure is recommended by the manufacturer of the used product, follow it closely.

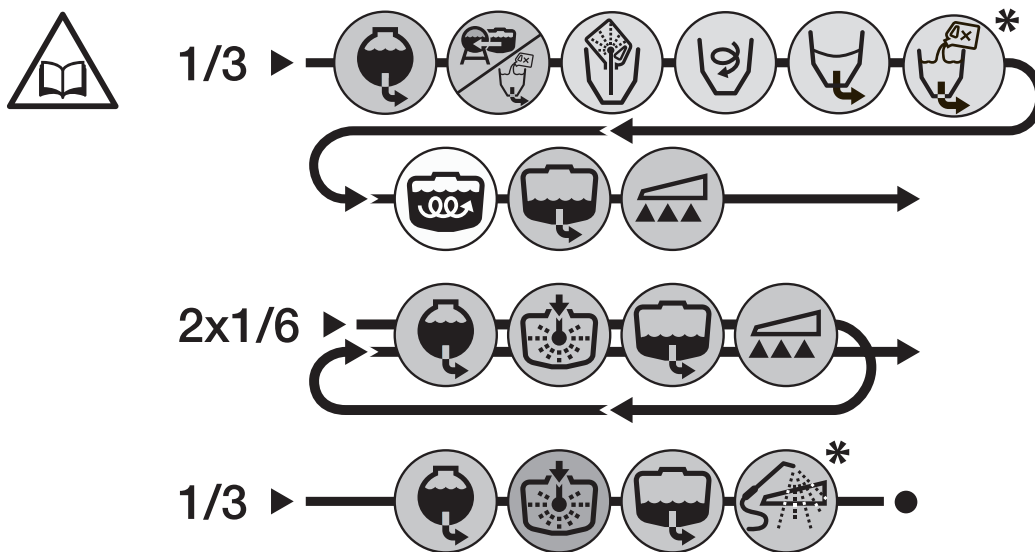


ATTENTION! If the sprayer is cleaned with a high pressure cleaner, lubrication of the entire machine is recommended.

5- Operation

Quick reference - Cleaning

The diagrams below describe the valve positions according to different operations.



Technical residue

Inevitably a quantity of spray liquid will remain in the system as the pump takes in air when the tank is about to become empty.

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

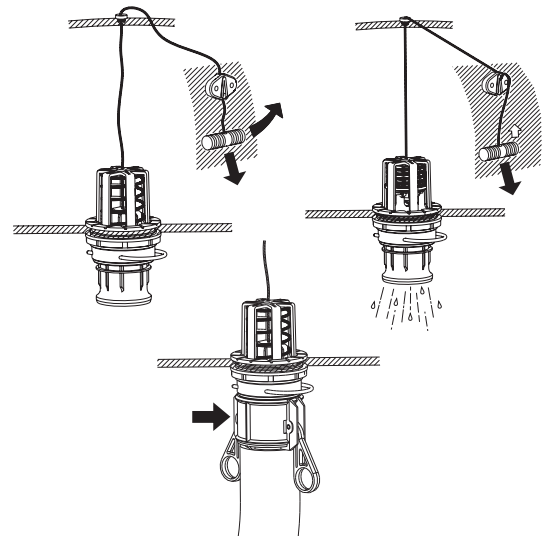
The technical residue varies between 55 and 60 litres, depending on the boom length and tank capacity. These values are measured with the sprayer on level ground. The residues in the tank should be diluted immediately in a ratio of 1:10 with clean water and should then be sprayed on the crop just sprayed at double the driving speed.

For more information about waste management, see the SPRAY TECHNIQUES book.

Using the drain valve

The drain valve is located and operated from the platform just beside the main spraying tank lid. Pull the string to open the drain valve. The valve is spring-loaded, but can be kept open by pulling the string upwards in the V-shaped slit. To release, pull the string downward and the valve will close automatically.

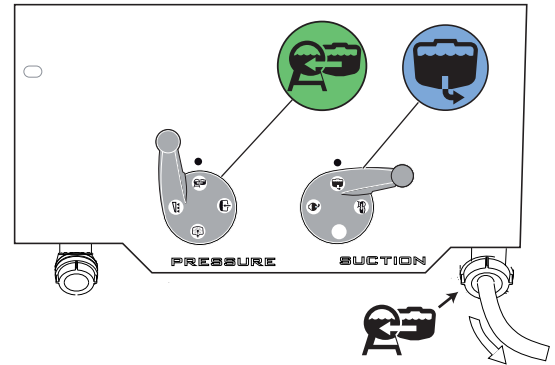
If draining the content of the tank into a reservoir, a snap-connector with hose can be connected to the drain valve.



Transfer to external tank

This is done the following way:

- Connect a hose from an external tank to the snap-connector on the sprayer (pressure).
- Turn the SmartValve pressure valve to "Transfer".
- Turn the SmartValve suction valve to "Main tank".
- Start the pump.



External cleaning - Use of External Cleaning Device (optional equipment)

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

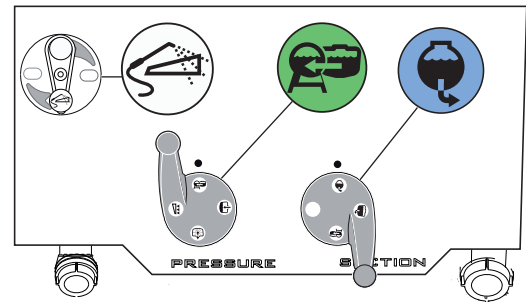
This prevents contamination of storage places, etc. and gives the sprayer a longer life.



Cleaning of the sprayer should always be carried out according to the regulations in force. For further information, see the SPRAY TECHNIQUE book.

The external cleaning equipment is located on the left side of the sprayer. To use the equipment:

- Start the sprayer pump and adjust the speed to around 300 rpm.
- Turn the SmartValve suction valve to "Rinse tank" and the pressure valve to "Transfer".
- Check that the pressure snap-connector is fully plugged.
- Turn the agitation valve to "External Cleaning Device" and then clean sprayer.
- After cleaning, close the agitation valve again.
- Roll the hose up onto its hose reel.



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.

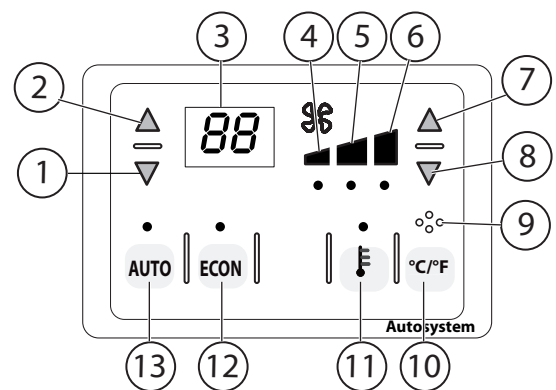
The temperature regulation system is automatic (microprocessor technology), which makes it possible to offer maximum comfort without modification of the manual temperature control.



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

1. Reduction in interior temperature.
2. Increase in interior temperature.
3. Programmed temperature display.
4. 1st ventilation speed indicator light.
5. 2nd ventilation speed indicator light.
6. 3rd ventilation speed indicator light.
7. Increase in ventilation speed.
8. Reduction in ventilation speed.
9. Interior temperature sensor.
10. Celsius/Fahrenheit temperature selection.
11. Outdoor temperature reading.
12. Shutdown of air conditioning compressor.
13. Automatic function activation.



Operation of air conditioning control unit

The temperature is obtained by pressing the adjustment keys fig.7 or fig.8 and the AUTO key fig.13. The following functions are activated:

- Automatic regulation of interior temperature
- Automatic adjustment of ventilation speed

AUTO control

- Press the AUTO key to activate automatic mode; the corresponding LED lights up.

ECON control

This control is generally used when the outdoor and interior temperatures are similar.

- Press the ECON key to deactivate the air conditioning compressor; the corresponding indicator lights up. If the required temperature is not reached, the AUTO LED automatically switches off

Temperature increase or decrease

- Press the keys fig.1 or fig.2 to select the required temperature, between 16°C and 32°C. If you select a value lower than 16°C, the display will indicate [LO] (low). Conversely, if the value is higher than 32°C, the display will indicate [HI] (high).

If you select [LO], you will obtain maximum cooling. In this case:

- Ventilation is at its maximum.
- The air conditioning compressor is engaged.

If you select [HI], you will obtain the following operation:

- Ventilation is at its maximum.

- The air conditioning compressor is disengaged.



NOTE! When [LO] or [HI] is activated, the automatic temperature regulation is deactivated and the AUTO indicator is switched off.

Increase or decrease in ventilation speed

- Press the key fig.7 or fig.8 to adapt the ventilation speed. The speed indicators fig.4, fig.5 and fig.6 light up according to the ventilation speed.



NOTE! By pressing on the [AUTO] key, the ventilation speed returns to the initial speed



NOTE! If the ventilation is completely shut down, the air conditioning control unit is deactivated. It can be restarted by pressing the [AUTO] key.

Outdoor temperature display

- Press the key fig.11, to display the outdoor temperature. When it is close to 0°C the corresponding indicator lights up to show a risk of black ice.

Temperature unit selection °C/°F

Press the key [°C/°F] to select the required display mode. The indicator shows that the temperature is displayed in Fahrenheit.



NOTE! When the temperature rises above 37°C (99 °F), the display indicates [HI].

Air conditioning error codes

In the event of operating anomalies in the air conditioning, the control unit will display the code [E] followed by the error code.

E1	outdoor air temperature sensor cut off
E2	outdoor air temperature sensor short circuited
E3	interior air temperature sensor cut off
E4	interior air temperature sensor short circuited
E5	mixed air temperature sensor cut off
E6	mixed air temperature sensor short circuited

When temperature regulation in automatic mode is no longer possible, the temperature inside the cabin is no longer regulated and the ventilation is locked at medium speed.

As soon as the fault disappears, the control unit starts to function again after it is reset to zero with the contact key.

5- Operation

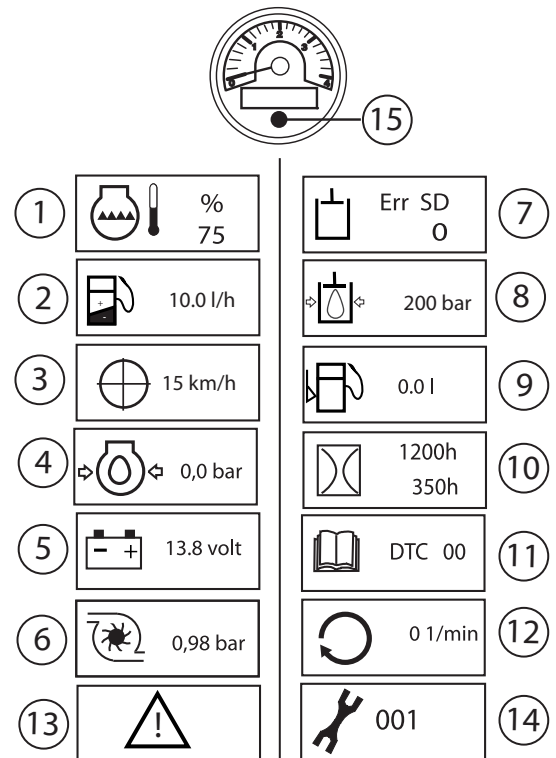
CANcockpit - rev counter

General information

The multi-function rev counter is dedicated to engine management. It is made up of an electronic rev counter and a display that shows the main engine data, the frequency of maintenance operations and any errors in the engine and the hydraulic transmission.

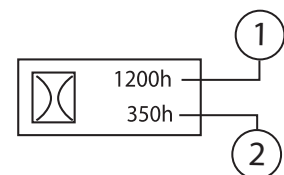
Description of messages

1. Engine water temperature
2. Volume of fuel in the tank
3. Theoretical forward speed
4. Engine oil pressure
5. Battery charge voltage
6. Turbocharger pressure
7. Faults in hydraulic transmission
8. Hydraulic pressure of the transmission
9. Immediate fuel consumption
10. Partial and total hour meter
11. Engine faults
12. Engine rev counter
13. Priority faults in hydraulic transmission (SD error)
14. Maintenance intervals (001-002-003)
15. Pushbutton information display



Partial and total hour meter

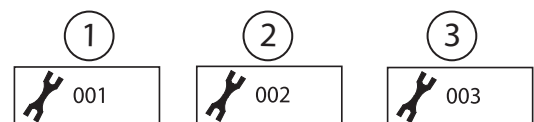
1. Total number of hours
 2. Partial number of hours
- Press the pushbutton fig.4 for 5 seconds to reset the partial hour counter to zero.



Maintenance

The maintenance frequency is defined as follows:

1. First servicing after 150 hours
2. Servicing every 500 hours
3. Servicing every 1000 hours



After maintenance operations, the period displayed should be reset.

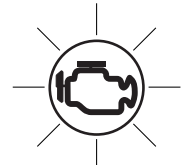
- Turn the battery switch to disconnect it.
- Hold the pushbutton down fig.11, then turn the starter key (without starting up), the display shows a dark area.
- Release the pushbutton; the display indicates the maintenance code to be reset
- Press the pushbutton again until this screen switches off completely, then release the pushbutton. The CANcockpit goes into auto test mode (the rev counter needle moves, the display is backlit), and the software version is displayed, then the CANcockpit returns to normal user mode.

Engine faults

Engine faults are displayed in the format DTC xx.

The number [xx] indicates the number of ongoing faults. An indicator lights up on the control panel to indicate the presence of an engine fault.

If xx = 0 is displayed, this means that there are no engine faults.



NOTE! If the engine fault indicator lights up on the control panel, stop the engine immediately.

- Press the pushbutton fig.11 several times until the symbol [DTC] and the fault number appear.

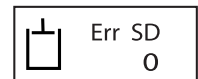


NOTE! If the fault found corresponds to one of the following codes: SPN100-SPN102 - SPN110, the engine will operate in downgraded mode, i.e. its power will be automatically reduced

Faults in transmission

Faults in transmission are identified in the format Err SD x. The figure [x] denotes the number of ongoing faults. If x = 0 is displayed, this means that there are no transmission faults.

The symbol fig.1 and an acoustic alarm indicate the presence of one or more faults in the transmission.



- Press the pushbutton as many times as necessary to cancel the acoustic alarm.
- Press the pushbutton again to display the message [Err SD x].

5- Operation

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.

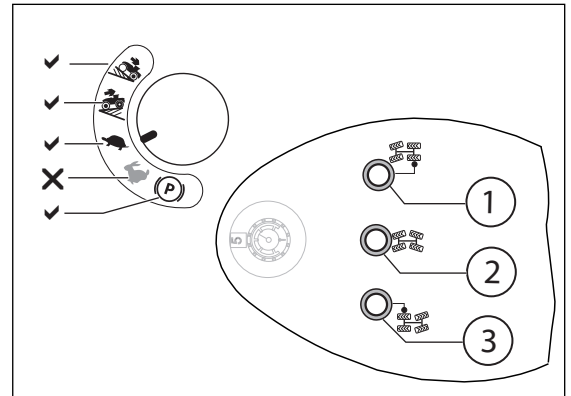
The automatic 4-wheel steering is made up of two position sensors fitted on the front and rear rods, a 4-wheel steering activation pedal, a switch and indicators on the control panel.

DESCRIPTION

1. Green indicator: rear wheels aligned.
2. Orange indicator: 4-WHEEL STEERING in operation.
3. Green indicator: front wheels aligned.

i NOTE! 4-WHEEL STEERING mode is automatically deactivated in ROAD mode.

i NOTE! As a safety measure, before travelling on the road, ensure that the rear wheels are aligned. The indicator fig.1 lights up indicating that the rear wheels are aligned.



Travelling in 2-wheel steering

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

- Press the switch to activate [AUTO] mode.

If the rear wheels are not in a straight line, the indicator fig.2 remains lit up and the indicator fig.1 is switched off:

- Turn the steering wheel until the rear wheels are aligned, the indicator fig.1 lights up continuously and the indicator fig.2 is switched off.



Travelling in 4-wheel steering

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

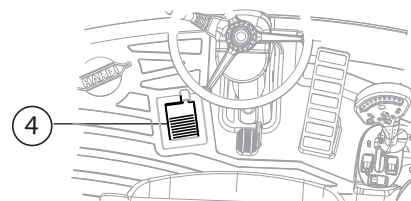
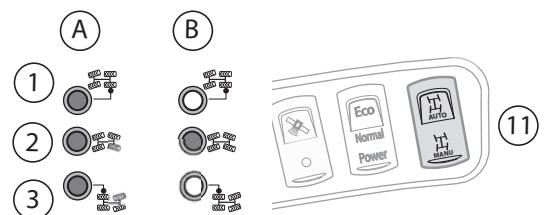
- Press the pedal fig.4 and turn the steering wheel until the front wheels are in a straight line.

The indicators fig.1 - 2 - 3 light up to indicate that the operating conditions for 4-WHEEL STEERING have been met (figure A).

- Keep the pedal pressed down and turn the steering wheel to use 4-WHEEL STEERING mode (figure B).

To leave 4-WHEEL STEERING mode:

- Release the pedal and turn the steering wheel to put the rear wheels back in a straight line. The indicator fig.2 lights up.



Travelling 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 fig.1 and fig.3 light up to indicate that the operating conditions in offset rear wheel steering have been met.
- 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 fig.1 lights up, 2-WHEEL STEERING mode is automatically activated.

5- Operation

Steering - 4-wheel steering version with crab steering (optional)

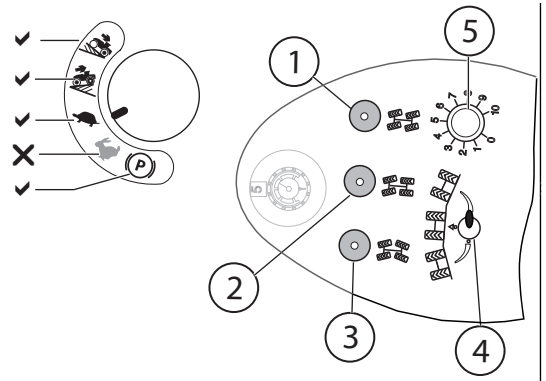
General information

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 self-propelled vehicle can be equipped with an electronic 4-wheel steering mechanism with automatic alignment and "CRAB" steering.

DESCRIPTION

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.



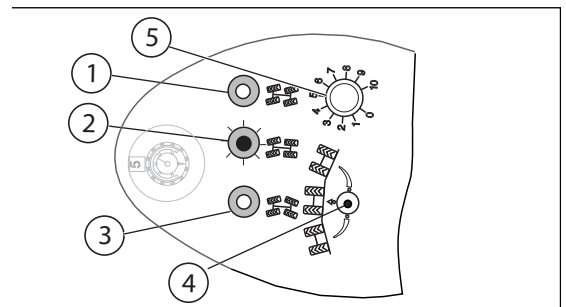
NOTE! As a safety measure, when ROAD mode is selected, the rear wheels are automatically aligned in a straight line and the system is deactivated after a few seconds.

On start-up, 2-WHEEL STEERING is selected by default. However, make sure that the switch fig.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:

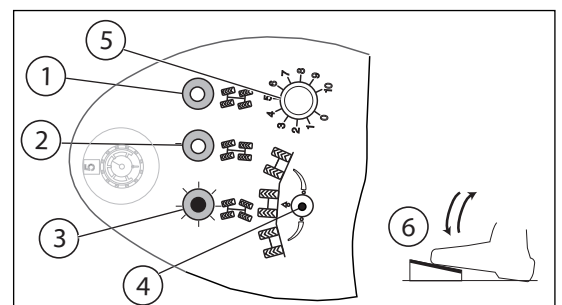
- Ensure that the switch fig.4 is in the central position.
- Press the pushbutton fig.2; the corresponding indicator lights up.



4-wheel steering mode

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

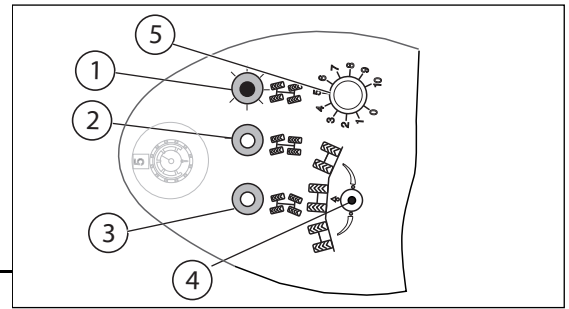
- Ensure that the switch fig.4 is in the central position.
- Press the pushbutton fig.3.
- Briefly press the pedal fig.6 to activate 4-wheel steering mode; the corresponding indicator fig.3 lights up.



"CRAB" mode

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

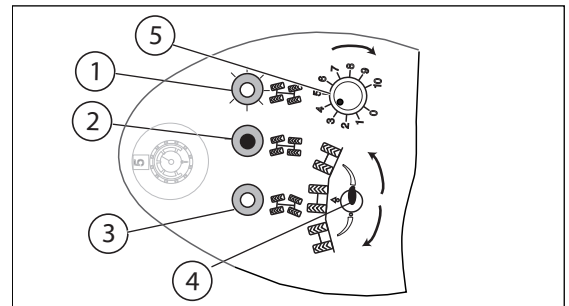
- Ensure that the switch fig.4 is in the central position.
- Press the pushbutton fig.1; the corresponding indicator lights up.
- To leave this mode, press one of the pushbuttons fig.2 for 2-wheel steering mode or fig.3 for 4-wheel steering mode.



Travelling 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 fig.5 right or left. To use this mode:

- Ensure that the machine is in 2-wheel steering mode.
- Turn the switch fig.4 to select the wheel inclination direction
- Turn the rotating button index fig.5 slightly to obtain the required wheel inclination. Position 10 corresponds to the maximum wheel turning angle.



To deactivate slanting mode:

- Position the switch fig.4 in the central position; this will cancel SLANTING mode and activate 2-WHEEL STEERING mode.

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.

1. Lubricant to be used (see table below).
2. Lubrication intervals.

Table of recommended lubricants

Parts	Capacity (litres)		Recommended lubricants - TOTAL
	crankcase (1)	with filter (1)	
DEUTZ TCD2012 L06 engine	15.0 l - 15.5 l	16.5 l	RUBIA TIR 8600 API ACEA E4 10W40
Hydrostatic transmission			EQUIVIS ZS46
Hydraulic system	60		AFNOR NF E 48-603HV ISO 6743/4HV
General lubrication			Multi EP2 ISO-L-XBCFB 2
Coolant	20		COOLELF AUTO SUPRA -37°C COOLELF AUTO SUPRA -37°C AFNOR NFR 15-601 - BS 6580
Pneumatic lubricator (pneumatic system option)			Reference: 6HU8000
Pneumatic nozzles			Lubricant for synthetics (plastic/plastic)



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

6 - Maintenance

Maintenance after using for the first time

After 10 hours

- Visual checks of rubber pipes and hoses and hydraulic oil level in tank.
- Inspection and tightening of wheel nuts - See page 74 .
- Inspection and tightening of bolts on HAZ - See page 76, and aluminium boom See page 77

After 150 hours

- Change of engine oil and replacement of oil filter cartridge (*).
- Replacement of fuel filter (*). See chapter "Every 500 hours - drainage and replacement of the oil filter".
- .Inspection of tightness and tension of engine belts (*).
- Change of hydraulic oil. See chapter "Every 1000 hours - drainage and cleaning of the hydraulic tank".
- Replacement of hydraulic system filters. See chapter "Every 500 hours - brake system hydraulic filter".
- Inspection and tightening of bolts on aluminium boom. See page 85.



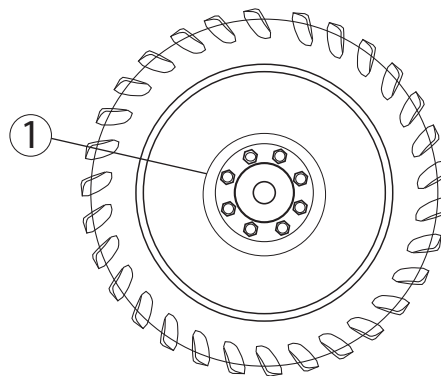
(*) see instructions in DEUTZ user and maintenance manual.

Wheel nuts

Check wheel nuts fig.1 and tighten if necessary applying a tightening torque of 60 daN.m (442.4 lbf.ft).

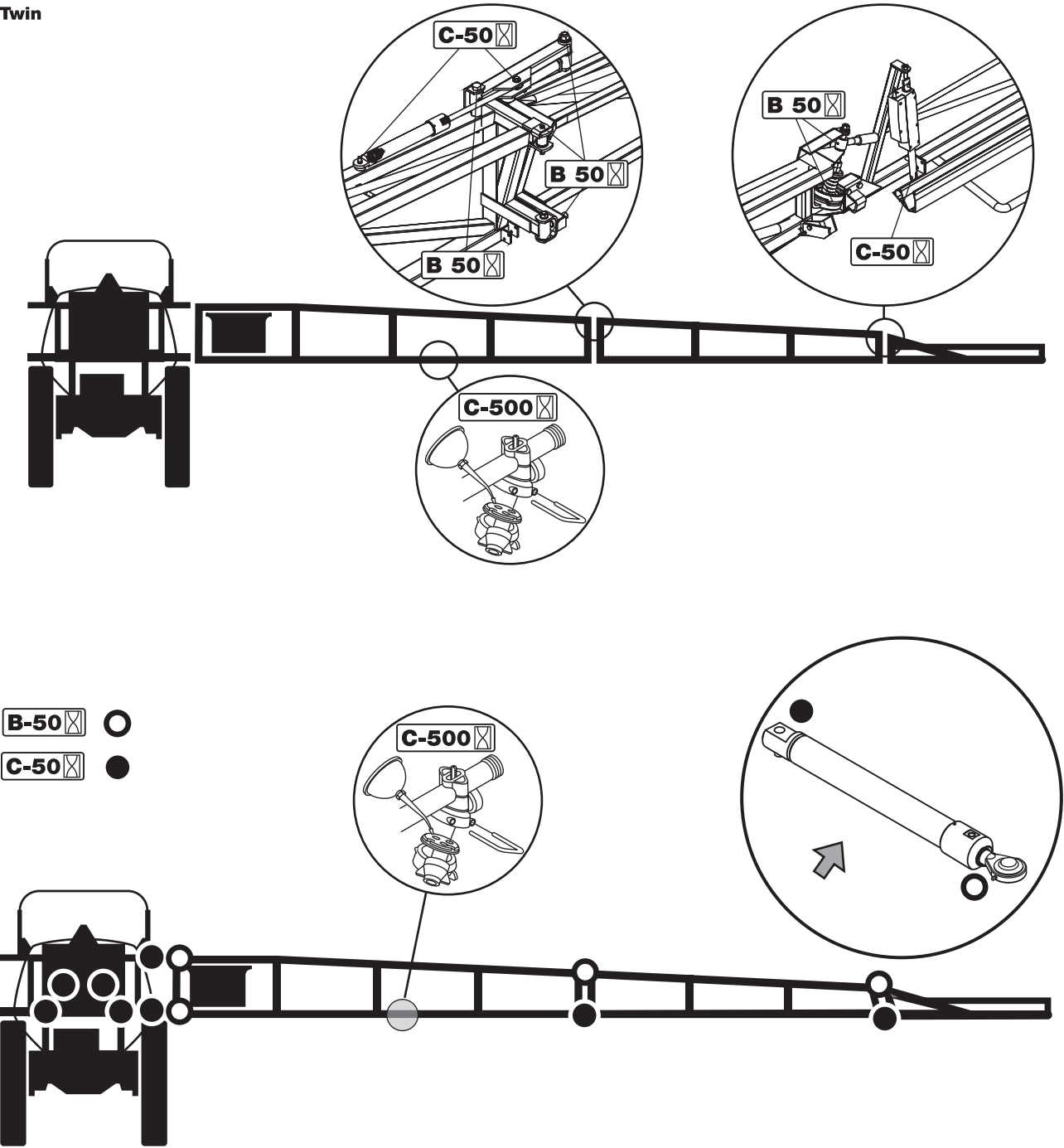


WARNING! Never oil or grease the wheel nut threads. Observe the tightening torque.



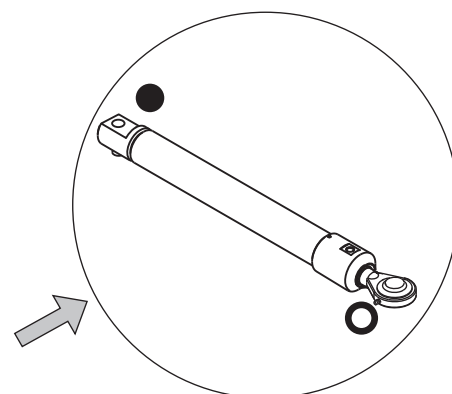
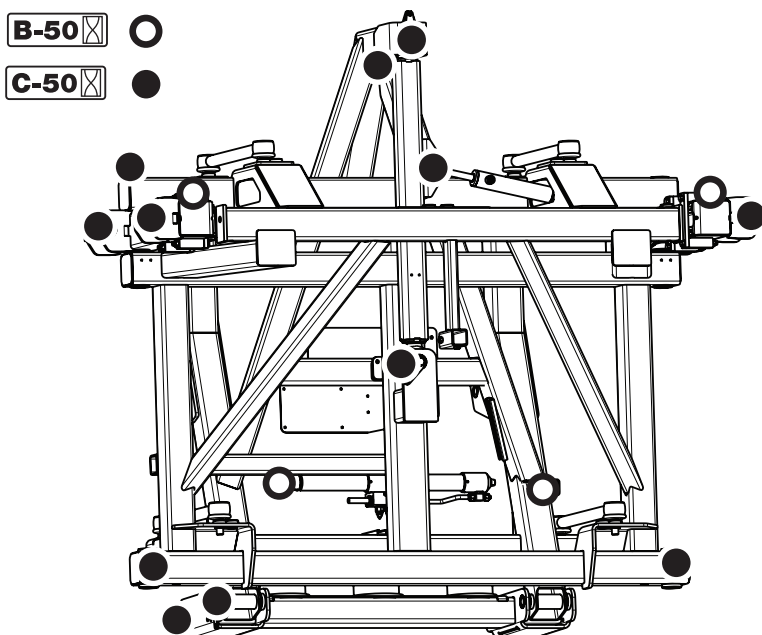
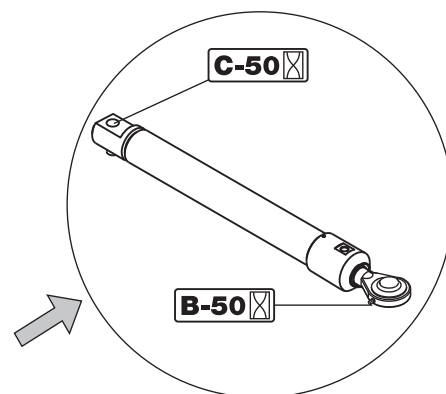
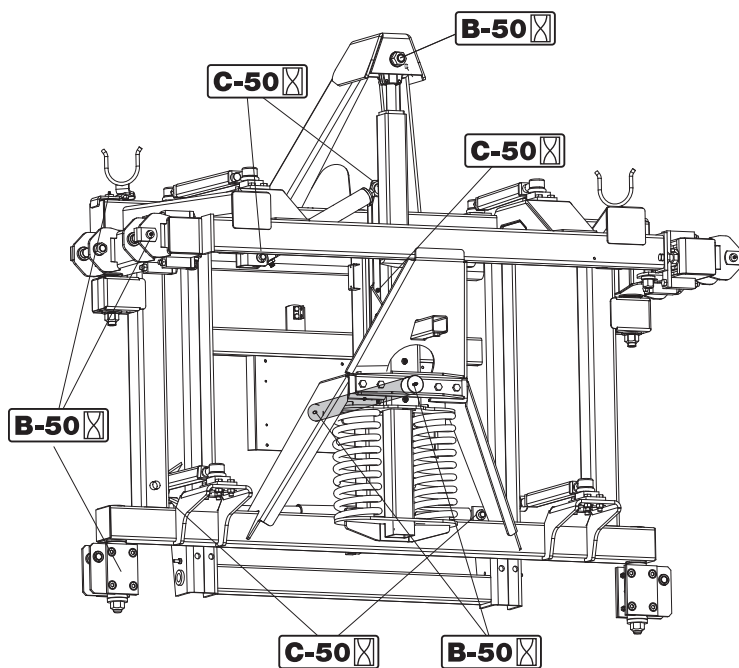
HAZ boom lubrication & oiling plan

Twin

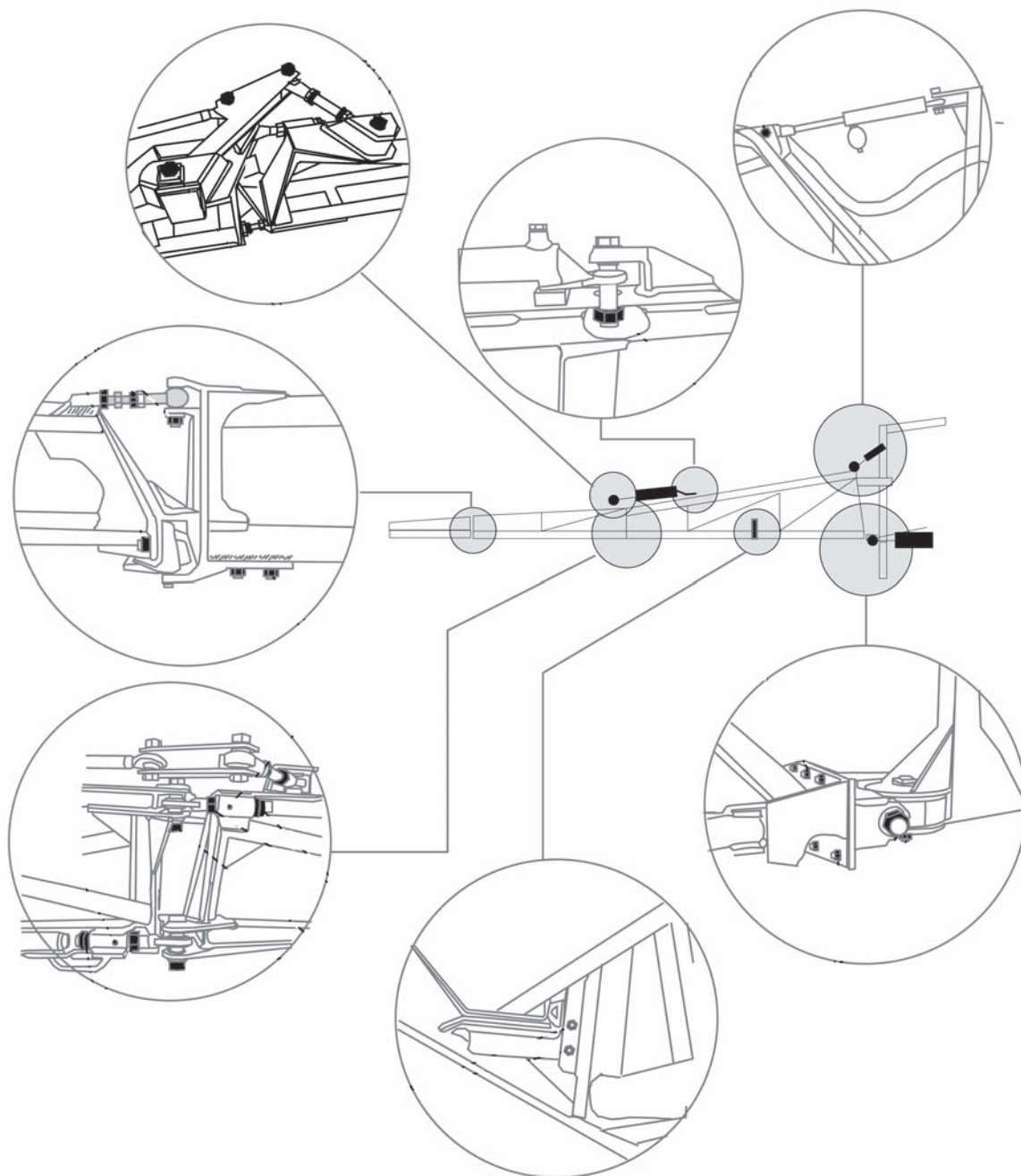


6 - Maintenance

HAZ boom lubrication & oiling plan (32-36 m)



Aluminium boom checks



- Check and tighten the bolts on the boom after 500 hectares, then at regular intervals.

ATTENTION

- 1) VERIFIER IMPERATIVEMENT LE SERRAGE DES BOULONS APRES 500 HECTARES DE FONCTIONNEMENT
- 2) RENOUVELER CE CONTROLE PERIODIQUEMENT

6 - Maintenance

Regular maintenance

Frequency

Daily	<ul style="list-style-type: none">Check sprayer filters.Check engine oil level (*).Check hydraulic oil level.Clean engine radiators (*).Check air filters are not clogged (*).Bleed compressed air tank.
Every 50 hours	<ul style="list-style-type: none">Lubricate chassis and boom.Lubricate 463 pump (diaphragm pump).Check tightening of bolts on aluminium boom.Check pneumatic lubricator filter level.Check hydraulic filter clogging.
Every 500 hours or at the start of each season	<ul style="list-style-type: none">Drain and replace the hydraulic system filters.Change engine oil and replace the engine oil filter (*).Bleed the fuel pre-filter.Replace the cabin active carbon filter.Check the liquid system and the accuracy of the settings.Check the nozzles.Adjust the boom if necessary.
Before storage	<ul style="list-style-type: none">Grease the DG control valve.
Every 1000 hours	<ul style="list-style-type: none">Check the engine belts (*).Replace the fuel filter and pre-filter.Replace the coolant (*).Check the engine air filter (*).Replace the engine air safety filter.Check the air conditioning coolant level (R134a).Clean the air conditioning condenser.Clean the hydraulic tank.Check the steering (wheel alignment).
Every 5 years	<ul style="list-style-type: none">Completely drain and refill the engine cooling circuit.



Resetting the CANcockpit

The CANcockpit displays the different frequencies of maintenance operations. After each maintenance operation, you can reset the CANcockpit.

001 = Maintenance to be carried out once at 150 hours.



002 = Maintenance to be carried out every 500 hours.

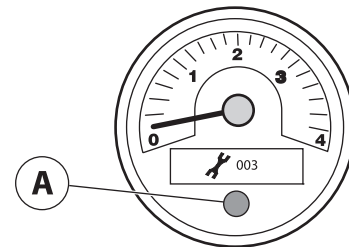


003 = Maintenance to be carried out every 1000 hours.



To reset one of the 3 periods of the CANcockpit displayed:

- Turn the battery switch to disconnect it.
- Hold down the button fig. A and turn the contact key (without starting the engine), the display shows a dark area.



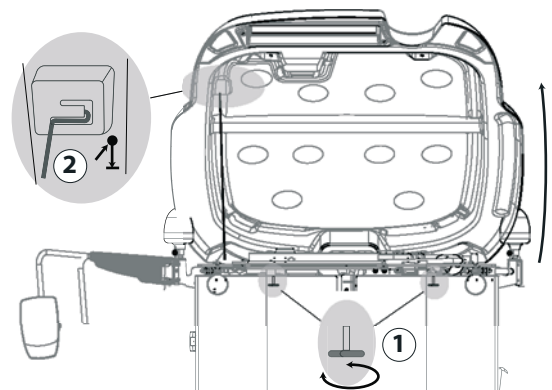
- Release the pushbutton, the display indicates the maintenance code.
- Press the pushbutton again until this screen switches off completely then release the pushbutton.

The CANcockpit then goes into auto test mode, the rev counter needle moves and the display is backlit, and the software version is displayed. The counter is then reset and returns to normal user mode.

Access to cabin roof

To work on certain cabin components (air conditioning, fuses, electrical circuits etc.), you have to raise the cabin roof.

- Unscrew the 2 screws fig.1 located inside the cabin.
- Raise the roof and position the holding bar fig.2 in the notch provided for this purpose.



WARNING! To avoid the roof falling, ensure that the holding bar fig.2 is correctly in place as shown in the picture.

6 - Maintenance

Every 10 hours - CycloneFilter



DANGER! To avoid chemicals coming into contact with the skin, wear protective clothing and gloves.



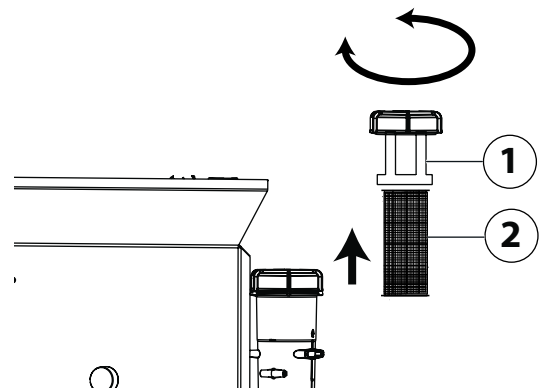
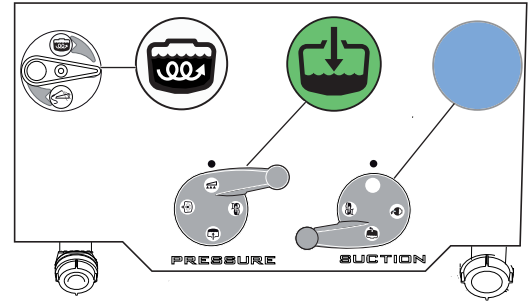
Before opening the CycloneFilter and to avoid any risk of splashing or accidental drainage of the tank, turn the valves as in the picture.

Dismantling

- Unscrew the lid fig.1.
- Lift the lid and the filter element fig.2 from the filter housing.
- Separate the filter element from the lid and clean it.

Reassembly

- If necessary, lubricate the 2 seals located on the lid and filter housing.
- Mount the filter onto the housing (which may not be greased).
- Place the assembly into the filter housing and screw the lid until it hits the stop.



Every 10 hours - EasyClean filter



DANGER! To avoid chemicals coming into contact with the skin, wear protective clothing and gloves.

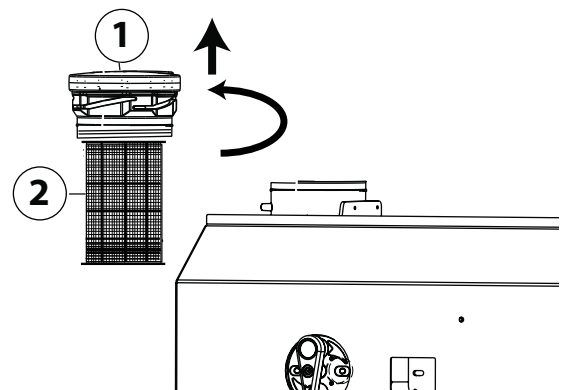
The filter comprises a clogging indicator as stated in the section "Description". However, the filter should be cleaned regularly.

Opening

- Turn the lid fig.1 anticlockwise.
- Remove the lid and the filter element.
- Clean the filter element.

Reassembly

- Grease the seal on the filter lid if necessary.
- Insert the filter element into the recess on the lid.
- Replace the assembly in the filter housing.
- Turn filter lid clockwise to close the lid.



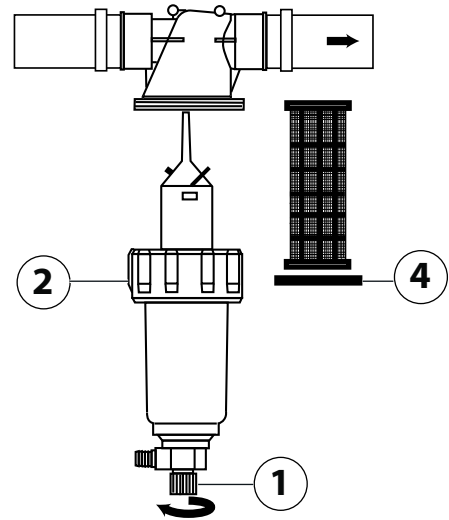
Every 10 hours - pressure filter



DANGER! To avoid chemicals coming into contact with the skin, wear protective clothing and gloves.

Pressure filters are only available on certain equipment. They are placed on the central frame near the spray nozzles. To clean:

- Unscrew the bleed screw fig. 1 to drain the filter
- Unscrew the filter housing fig. 2
- Clean the filter element fig.3 if necessary.
- Check the fitting of seal fig.4 before reassembly.



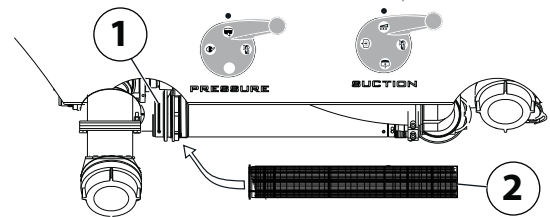
Every 50 hours - in-line filter for external suction



DANGER! To avoid chemicals coming into contact with the skin, wear protective clothing and gloves.

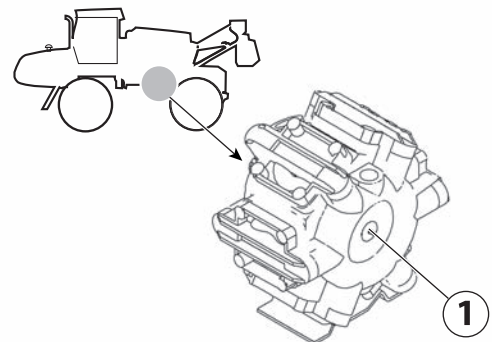
The filter should be cleaned when external suction performance is reduced.

- Remove the pin fig.1 and remove the connector.
- Remove the filter element and clean it.



Every 50 hours - lubrication of diaphragm pump 463

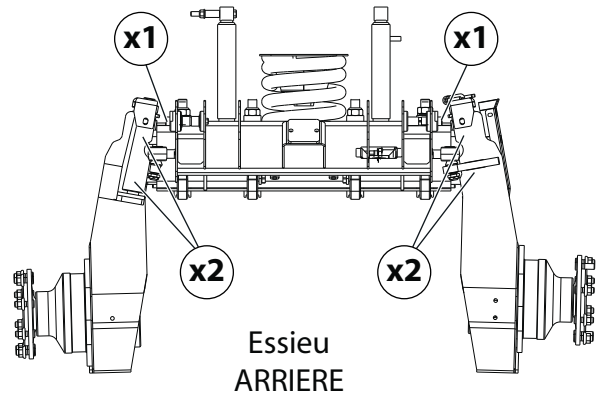
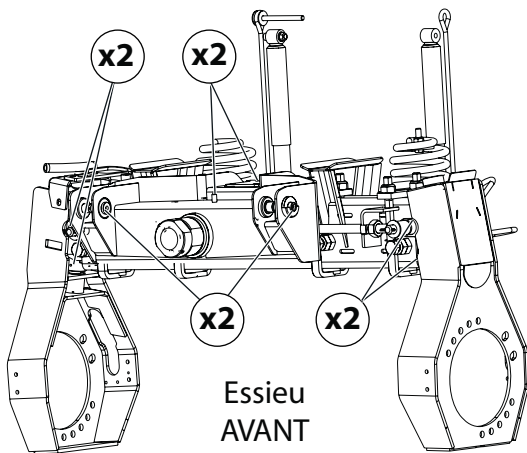
- Lightly grease the lubrication point located at the end of the pump.



6 - Maintenance

Every 50 hours - lubrication of front and rear axle

Grease the front and rear axles according to the picture.



Every 50 hours - engine cooling

Radiator

- Lift the engine cover to access the radiators.
- Clean the radiators preferably with compressed air starting from the inside and working outwards.



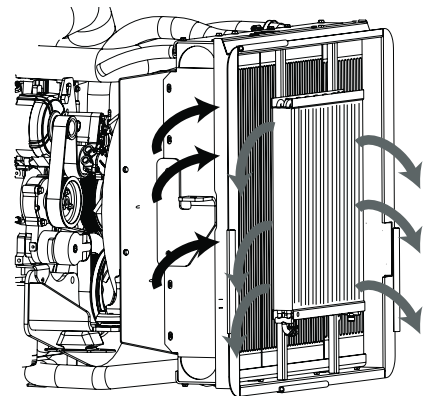
NOTE! Take care not to damage the radiator slots during cleaning operations



ATTENTION! When the machine is operating in areas with a lot of dust or pollen, 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.



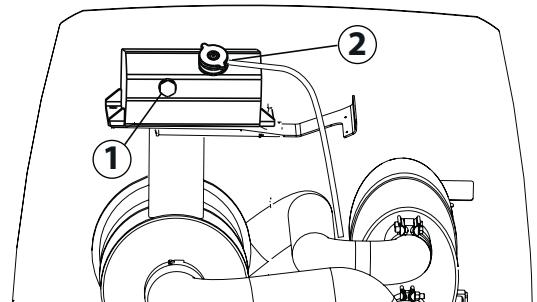
Level

- It is best to check the coolant level when the engine is cold.
- Remove the plug fig.2 to add coolant.



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

If the engine overheats, the CANcockpit displays the temperature and an error message [DTC 110]. In this case the engine will operate in downgraded mode. You should shut it down as soon as possible and check the cooling circuit.



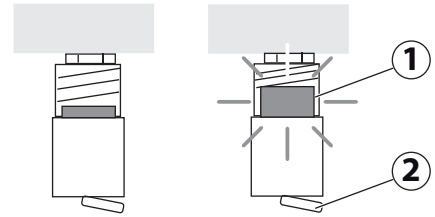
Every 50 hours - checking and cleaning the engine air filter

Air filter check

An air filter clogging indicator is placed on the engine suction hose near the air filter.

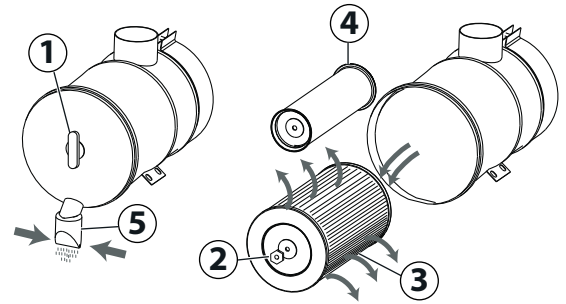
When the indicator fig.1 appears, you should clean the air filter. After cleaning.

- Reset the indicator by pressing the lever fig.2.



Dismantling the filter:

- Loosen the screw fig.1 and remove the air filter lid.
- Loosen the screw fig.2 and take out the air filter.
- Remove the dust from the filter fig.3 with compressed air from the inside to the outside.
- Replace the filter assembly.
- Press the flap fig.5, as shown in the picture to remove the dust.

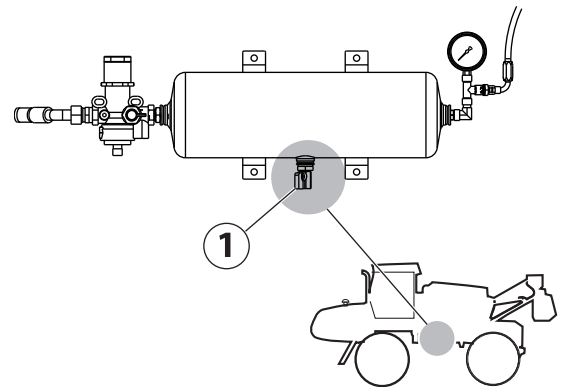


Every 50 hours - compressed air tank

- Turn the bleed valve fig. 1 to drain the condensation water contained in the tank.



WARNING! The compressed air tank is pressurised!



Every 50 hours - tyre pressures

- Check the tyre pressures according to the table.



DANGER! Never inflate tyres above the recommended pressure. This could present a risk of explosion and cause serious injury.



WARNING! If the tyres have to be replaced, check that they are within the load capacity rate.

6 - Maintenance

Every 250 hours - hydraulic filter

The hydraulic suction filters are fitted with clogging indicators.

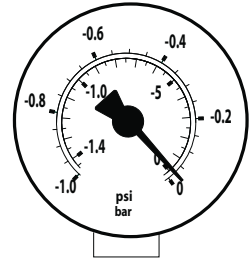
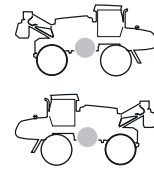


NOTE! The clogging indicator is read when the hydraulic oil is at the normal temperature for use.

- Regularly check the clogging level.

Less than 0.7 = filters in good condition.

More than 0.7 = filters to be replaced.



Every 250 hours - filter and lubricator (optional)

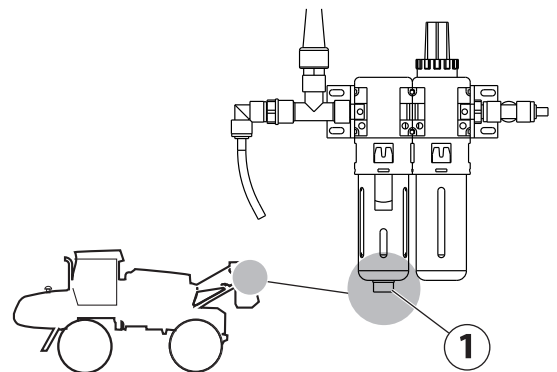
Self-propelled vehicles fitted with a compressed air system have a filter and lubricator mechanisms for the compressed air which is necessary for correct operation of the pneumatic components.

Bleed

- Press the pushbutton fig.1 under the filter to bleed the filter tank.



NOTE! The filter can be bled when the system is pressurised.



Dismantling and filling the lubricator

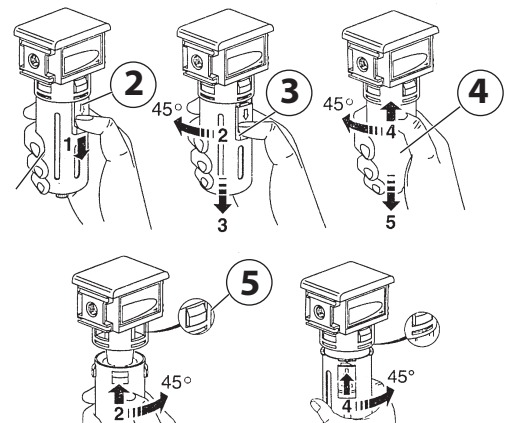


WARNING! To avoid splatter, depressurise the compressed air system before dismantling the tank.

- Press the clip fig.2 to unlock the protective bowl.
- Rotate by 1/8 turn to remove the protective bowl.
- Rotate by 1/8 turn to dismantle the tank.
- Rotate the oil tank (4) by 1/4 turn and pull down (5) to dismantle it.



WARNING! The lubricator is designed to operate only with a special lubricant for pneumatic systems. (recommended lubricant - reference: 6HU8000).



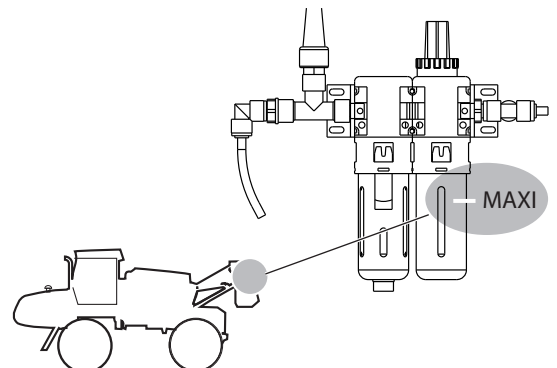
- Fill the tank without exceeding the maximum limit.
- Fit the tank centring clamps before rotating by 1/8 turn.

Cleaning the tank

- Clean the tank with a soapy solution.



ATTENTION! The tank is made from polycarbonate, never use a solvent-based solution.



Every 250 hours - sprayer pressure gauge

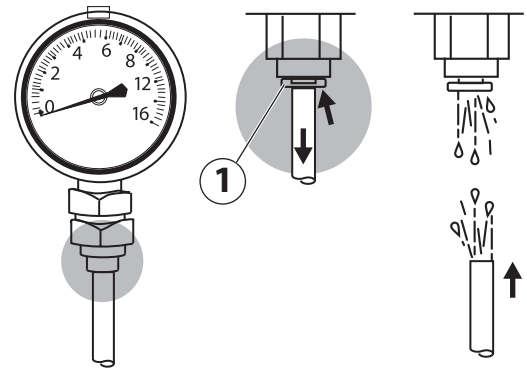


WARNING! The hose may be subject to residual pressure and cause liquid splatter. To avoid all risk of accidental splashing, wear protective goggles and gloves.

The pressure gauge may no longer display the pressure with sufficient accuracy. This may be due to clogging of the hose connecting it to the liquid system.

In this case, you can dismantle the pressure gauge to rinse the hose.

1. Push the ring fig.1 and remove the hose.
2. Spray clean water to rinse the pressure gauge hose.
3. Reconnect the pressure gauge by simply pushing the hose into the connector.



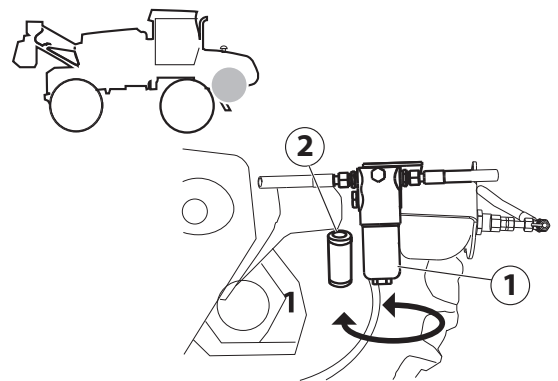
Every 500 hours - brake system hydraulic filter

To replace the filter cartridge:

- Unscrew the filter housing fig.1.
- Remove the filter cartridge fig.2 and replace it with a new one.



WARNING! It is essential to use an original filter.



Every 500 hours - hydraulic filters in the tank



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



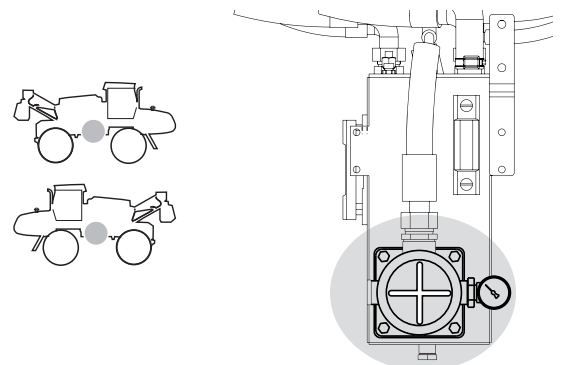
DANGER! Hot oil can cause serious burns.



WARNING! It is essential to use an original filter.

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

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



6 - Maintenance

- Completely unscrew the lid and remove the filter assembly.

A small quantity of oil will escape from the filter housing; it must be collected in a container provided for this purpose. A one-way valve at the end of the filter housing retains the oil from the tank.

- Unscrew the knob fig. 1 to remove the filter. To facilitate this operation, gently press the spring fig.2.
- Remove the cups from the filter element fig.3.
- Carefully clean the magnetic core fig.4 with a cloth.



WARNING! It is essential to use original filter elements.



WARNING! Before replacing the parts, note the oil level in the tank fig.1.

1. initial level before refitting filters
 2. level after refitting the filters
- Refit the new filter. The oil level will drop by around 10 mm, which means that the filters have been fitted correctly.
 - Top up with oil to the maximum level fig.2.
 - Start the engine on idle then stop it after a few seconds. This evacuates the air contained in the hydraulic system.
 - Start the engine again on idle and then gradually increase the engine speed.



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

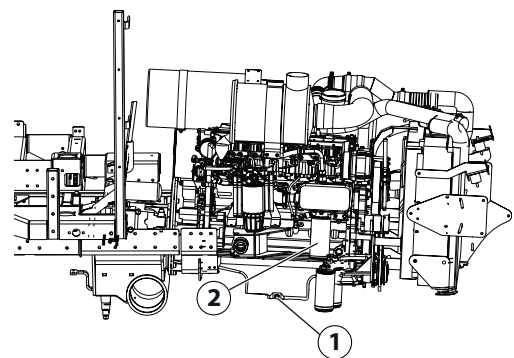
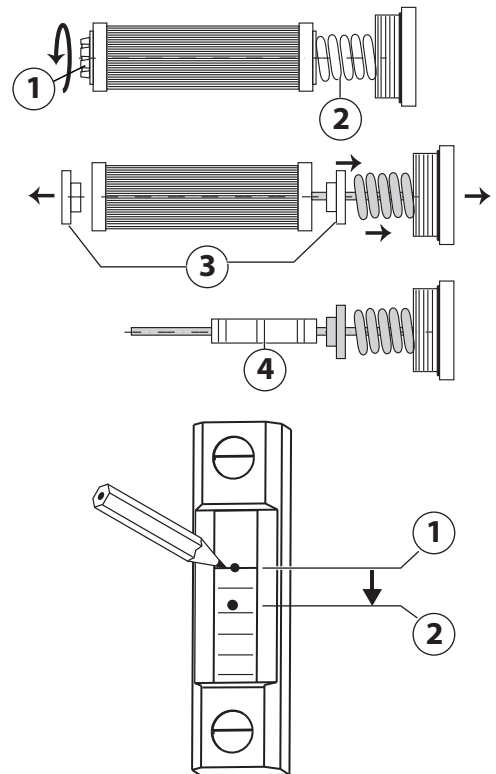
Every 500 hours - drainage and replacement of the oil filter

Drainage of the engine takes place while the engine oil is hot.

1. Loosen the drainage screw.
2. Loosen the oil filter and replace it with a new one.
3. Fill the engine via the hole fig.
4. Check the level fig.x.
5. Check the level after a few minutes' operation.



NOTE! It is essential to use original filter elements.



Every 500 hours - bleeding water separator fuel prefilter

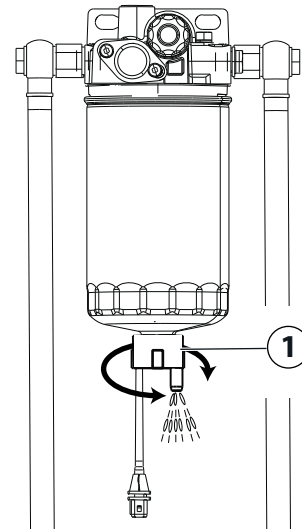
Traces of humidity may be contained in the fuel. This may be due to condensation and this is why the prefilter is equipped with a water separator device.

1. Loosen the sensor fig.1 by approx. 2 turns to allow the water contained in the filter to escape.
2. Tighten again after complete bleed.



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

If too much water is detected in the prefilter, the following error message [DTC97] will be displayed on the CANcockpit.



Every 500 hours - replacement of fuel filters

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

Replacing the filters

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



NOTE! It is essential to use original filter cartridges.

Bleed

After reassembling the fuel filters, you should bleed the supply circuit.

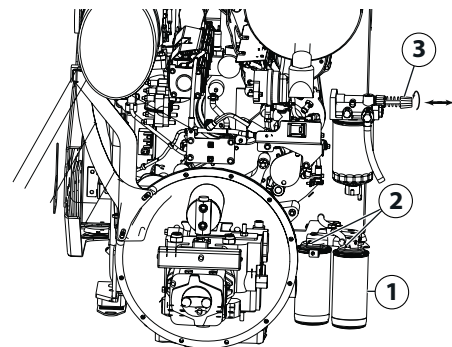
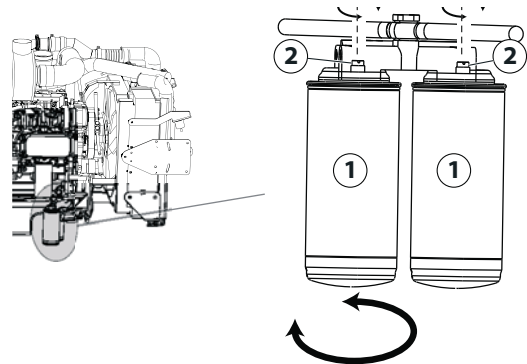
- Loosen the 2 bleed screws fig.2.
- Unlock the hand pump by pushing and turning the pushbutton fig.3, as shown in the picture.
- Pump until the fuel runs over the bleed screws fig.2.
- Tighten the bleed screws.
- Start the engine while continuing to operate the pump.



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



NOTE! Never loosen the injection connectors as this could lead to a fuel leak.



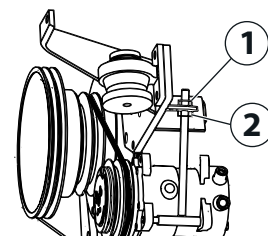
Every 500 hours - air conditioning compressor belt

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

- Loosen the counter-nut fig.1.
- Tighten the nut fig.2 to retain the belt, then tighten the counter-nut.



NOTE! Check the belt tension again after 8 hours of use.



6 - Maintenance

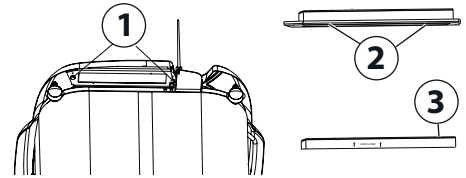
Every 500 hours - active carbon filter

The cabin is fitted with an active carbon filter that purifies the air entering the cab interior. It is fitted outside the cabin 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 cabin and completely loosen the screw on the left side fig.1.
- Remove the housing and active carbon filter assembly.
- Remove the filter from its housing by removing the 2 screws fig.2 using a Philips screwdriver.
- Fit the new active carbon filter respecting the direction of assembly. (The foam fig.3 is visible).
- Refit the assembly to the cabin.



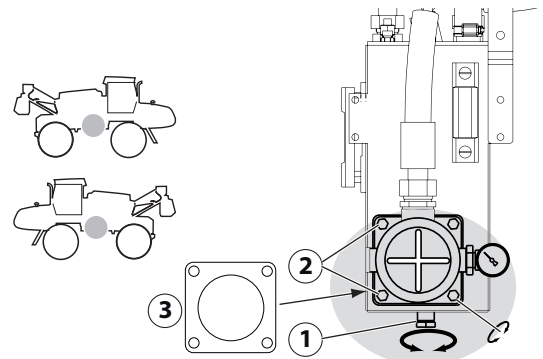
WARNING! The frequency of replacement is given for information purposes. However, if odours appear in the interior of the cab, this means that it is no longer completely effective, and it must be replaced as soon as possible.

Every 1000 hours - drainage and cleaning of the hydraulic tank

The hydraulic tank should be drained and cleaned to remove the residue that accumulates in the bottom of the tank. This operation significantly reduces the risk of pollution from the machine's hydraulic system.

To drain and clean the tank:

- Loosen the drainage screw fig.1 to completely drain the tank.
- Loosen the 4 screws fig.2 to dismantle the filters.
- Carefully clean the inside of the tank.
- Refit the assembly using new seals fig.3.
- Check the tightness after filling.



NOTE! There is no need to drain the pipes.



ATTENTION! Use the recommended hydraulic oil, see section "Table of recommended lubricants" on page 73.

Every 1000 hours - 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.

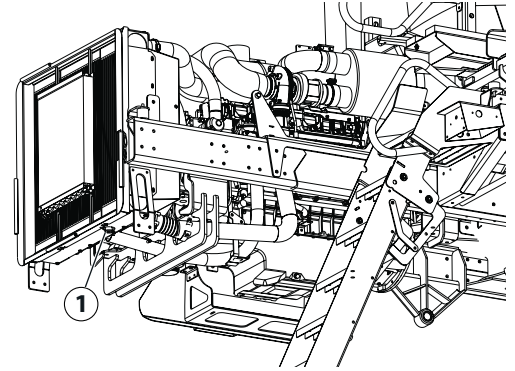


WARNING! Never reverse the polarity.

Every 5 years - engine coolant replacement

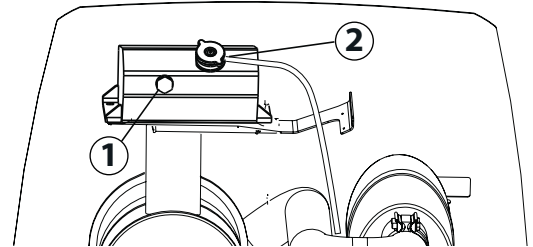
The cooling system should be drained every 5 years.

- Loosen the drainage screw fig.1 to completely drain the cooling system.
- Fill the system with coolant. Only use the recommended coolant. See "Table of recommended lubricants" on page 73.



Level

- Start the engine and wait until the engine operating temperature is reached, then check the coolant level fig.1. Top up, if necessary, through the filler plug fig.2.
- Check the coolant level again when the engine is cold and top up if necessary.



DANGER! The coolant should be collected in a suitable airtight container. Never decant it into food containers or drinks bottles.



ATTENTION! Only use the recommended coolant. It should never be mixed with other coolants even if they are equivalent. See "Table of recommended lubricants" on page 73. For further information, see the DEUTZ engine user and maintenance manual.

Every 1000 hours - air conditioning

Checking of the R134a gas charge should be carried out by a specialist. The dryer filter should be replaced every 2 years. The air conditioning system contains a fluorescent tracer to detect gas leaks. It remains effective for approx. 2 years. A label indicates the fluorescent tracer filling date.

6 - Maintenance

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.

463 pump valve and diaphragm replacement

A sets of parts comprised of valves fig.2 and fig. 2A, diaphragms fig.5 and screws fig.4 can be used to repair the 463 pump.

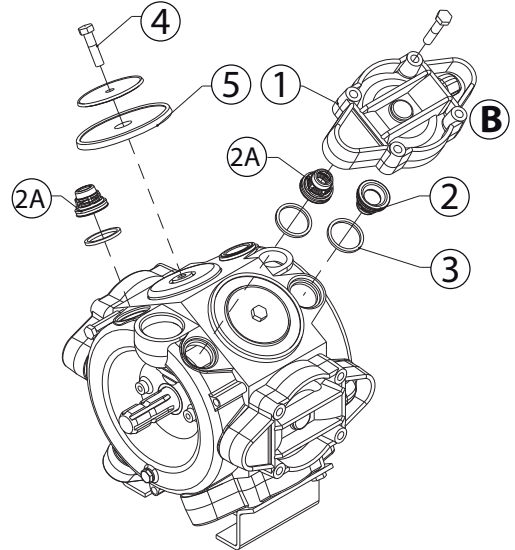
Valves:

- Remove the lid fig.1 to replace the valves fig.2 - note the direction of the parts for correct reassembly.



WARNING! A special white valve fig.2A should be fitted at the top of the pump as shown in the illustration. The other valves are black.

New seals are recommended on reassembly fig.3.



Diaphragms:

- Remove the cup fig.6 to lift the diaphragm fig.5.

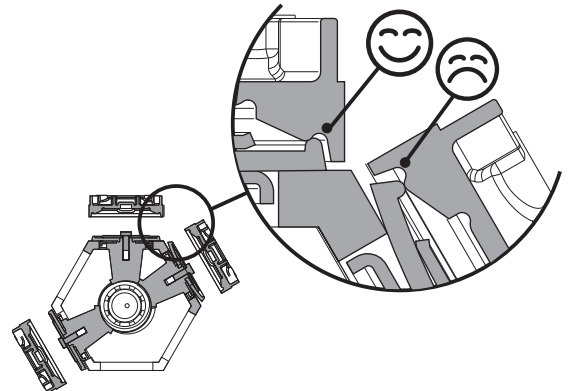


NOTE! If you find traces of damp on the crankshaft, dry it and apply a new layer of grease.

- Check that the water drainage hole is not blocked.
- Reassemble the diaphragms and cups using the original screws.

Cup tightening torque: 90 N.m.

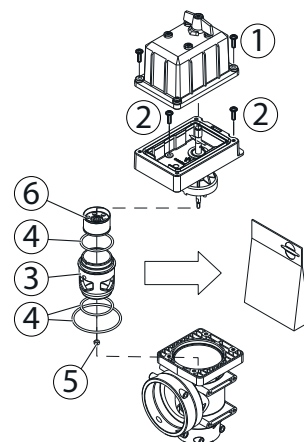
Cover screw tightening torque fig.B: 90 N.m.



NOTE! Before tightening the cover bolts fig. B, the diaphragms should be positioned between the centre and the top to allow correct sealing between the pump body and the lid fig.B. Turn the pump shaft if necessary.

Control valve cylinder check/replacement

- The pressure may no longer be sufficient or it may become unstable. In this case, replace the cone and the cylinder of the control valve (EFC valve).
- Loosen the 4 retaining screws fig.1 and remove the lid.
 - Loosen the 4 screws fig.2.
 - Replace the cylinder fig.3 and the seals fig.4.
 - Loosen the nut fig.5, and remove and replace the cone rep.6.
 - Reassemble in reverse order.



Distribution valve seal check/replacement

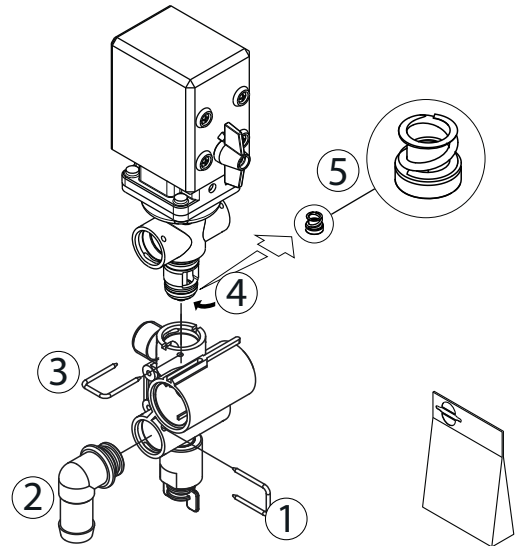
Regularly check the tightness of distribution valves with clean water.

Check

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

Replacement

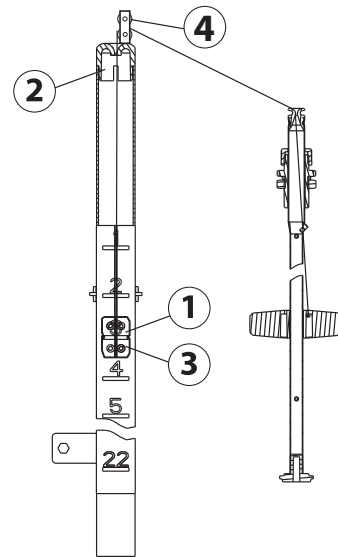
- Gently lift the pin fig.3 and remove the motorised valve from its housing.
- Loosen the screw fig.4 and replace the seal fig.5.
- Reassemble in reverse order.



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 fig.3 and adjust the position of the indicator with respect to the indications on the pole.
- Check that the wheels fig.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 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.

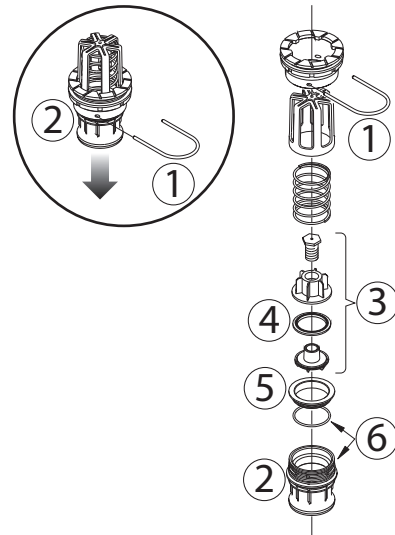


DANGER! Do not enter the tank - the parts can be changed from the outside.



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

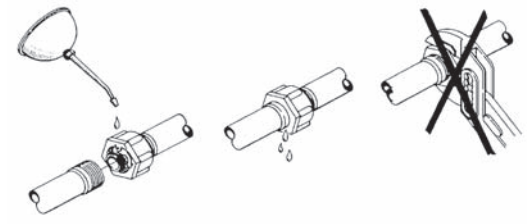
- Ensure that the tank is completely empty.
- Close the drain valve and release the control cord.
- Remove the pin fig.1 and pull on the part fig.2 The drain valve assembly can be removed downwards.
- Check the wear on the cord and the valve assembly fig.3, replace the seal fig. 4, then reassemble.
-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



Boom connectors and pipes

Incorrect sealing of the pipes is often due to:

- Missing seals or bushings
- Damaged or incorrectly seated seals
- Dry or deformed seals or bushings
- Foreign bodies

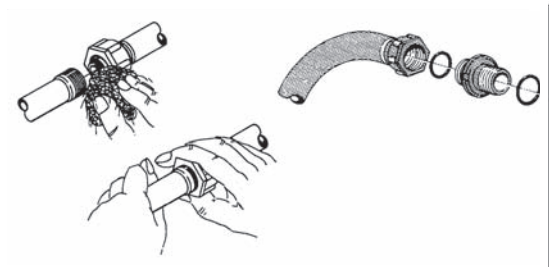


In case of leaks:

DO NOT OVERTIGHTEN. Disassemble, check condition and position of seals and bushings. Clean, lubricate and reassemble. The seals must be lubricated ALL THE WAY ROUND before refitting. Use non-mineral lubricant.

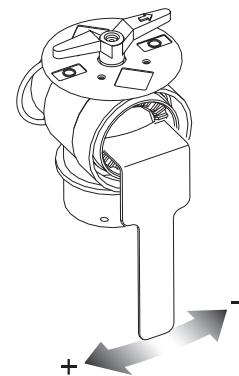
The straight connectors should only be tightened by hand.

The elbow connectors can be tightened with a clamp.



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.

HAZ boom

Boom adjustment - general information

Before commencing adjustment jobs, please check the following points:

1. The sprayer must be well lubricated (see "Lubrication").
2. Place sprayer on level ground (horizontal).
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.

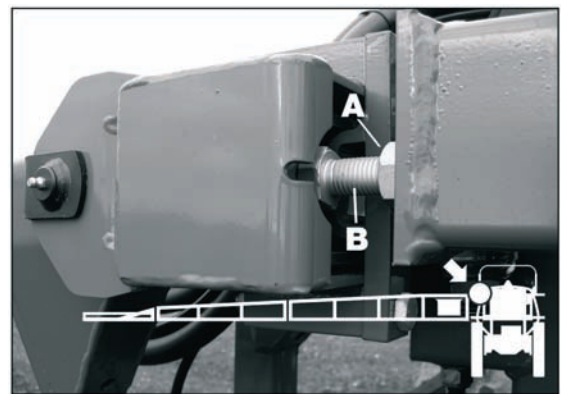


WARNING! Nobody is allowed to be under the boom whilst adjustment is being carried out.

Alignment of central and inner boom sections

The boom tip must point slightly forward. If necessary adjust the inner section folding as follows: Depressurise the folding rams.

1. Loosen the counter-nut fig.A.
2. Adjust stop screw fig.B until the correct setting is reached.
3. Tighten counter-nuts again.



6 - Maintenance

TR4 - TR4R aluminium boom

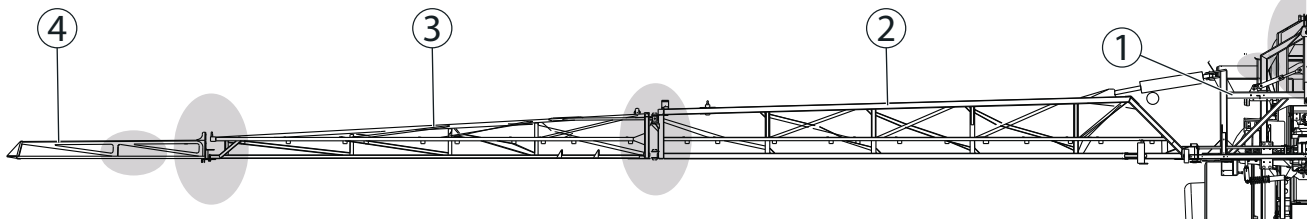
General information

Before adjusting the boom settings, check the following points:

1. The boom must be well lubricated (see "Lubrication").
2. The machine should be parked on flat horizontal ground.
3. The boom must be unfolded and horizontal.



WARNING! As a safety measure, there should be no one near the boom during adjustment operations.

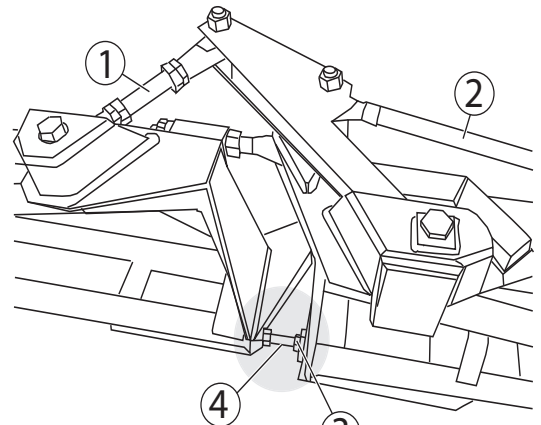


1. Central frame
2. Inner section
3. Outer section
4. Break-away section

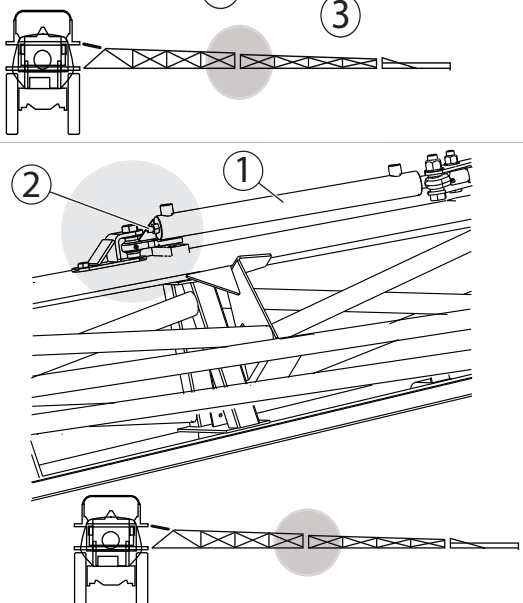
Horizontal alignment of outer sections (TR4 - TR4R)

This adjustment is for changing the alignment of the outer section with respect to the inner section.

- Unfold the boom completely.
- Loosen the counter-nut fig.3 and turn the screw fig.4 to change the alignment of the outer section
- Ensure that the ram rod fig.2 is fully out.
- Adjust the length of the rod fig.1 until the screw fig.4 is supported.
- Rotate the rod for 2 more turns to fix the outer section in place.

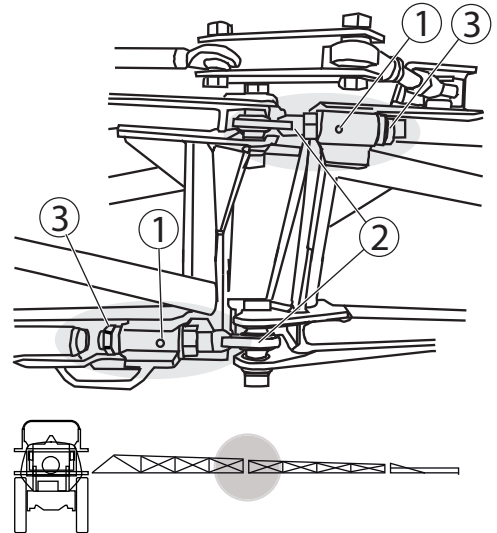


- Fold the outer section completely.
- Loosen the nut fig.2 to increase the holding of the outer section in transport.



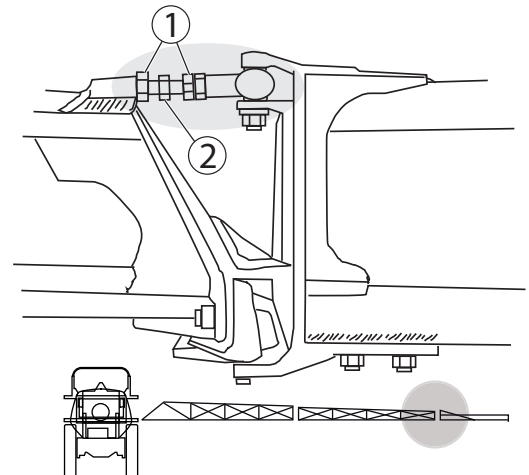
Vertical alignment of outer sections and end sections (TR4 - TR4R)

- Loosen the locking screws fig.1
- Adjust the ball joints fig.2 by working on the nuts fig.3
- After adjustment, tighten the screws and counter-nuts.



Vertical alignment of outer sections with break-away sections (TR4 - TR4R)

- Tighten the counter-nuts fig.1.
- Turn the rod fig.2 for vertical adjustment of the outer section.
- Tighten the counter-nuts fig.1 again.



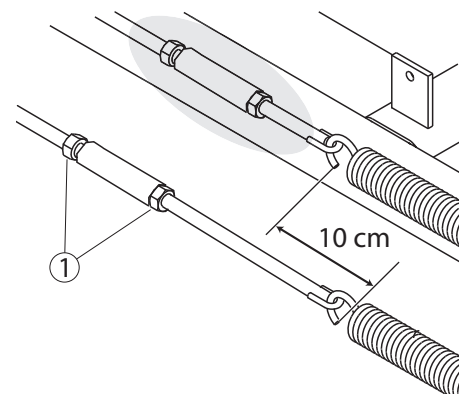
Adjustment of break-away sections - (TR4 - TR4R)

The end sections of the boom can be break away. The spring tension determines activation of break-away when the section encounters an obstacle.

- Change the spring tension by working on the nuts fig.1.

The 10 cm distance corresponds to the spring tension.

The tension corresponds to the distance of the spring when idle, to which 10 cm should be added.



NOTE! A tension value that is too low can cause untimely activation of the safety system.



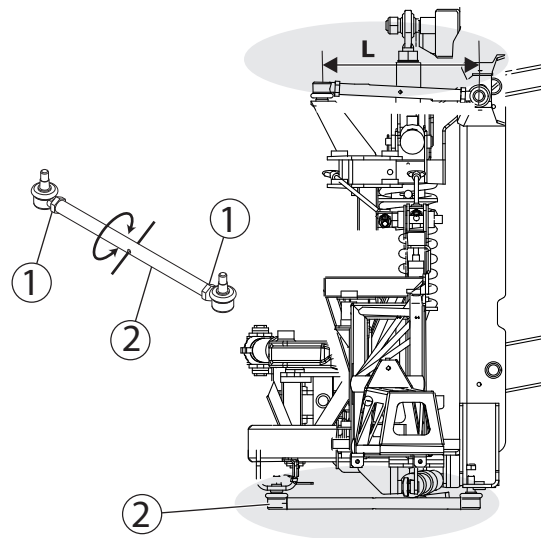
TRES IMPORTANT
TENSION DU RESSORT MINIMUM : 10 CM

6 - Maintenance

Adjustment of parallel setting of the central frame (LPA2 frame)

The central frame should be parallel to the frame of the lift frame, particularly if you change the position of the lower connecting rods. Only the lower connecting rods can be adjusted. To make the adjustment:

- Loosen the counter-nuts fig.1.
- Using an appropriate rod, turn the connecting rod fig.2 clockwise to shorten it, which will bring the fixed rack frame closer. Conversely, if you turn the rod anticlockwise, the central frame will move away from the fixed lift frame.



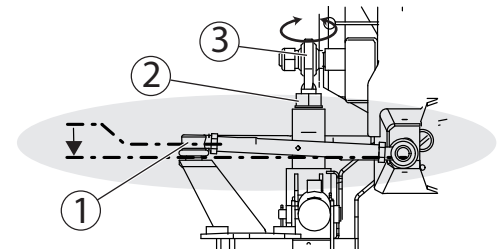
Lift frame	Centre distance (mm)
LPA2	515
LPA5	500

Suspension adjustment

For optimum use of the suspension, the upper connecting rods fig.1 should be slightly inclined, as shown in the picture.

Inclination adjustment:

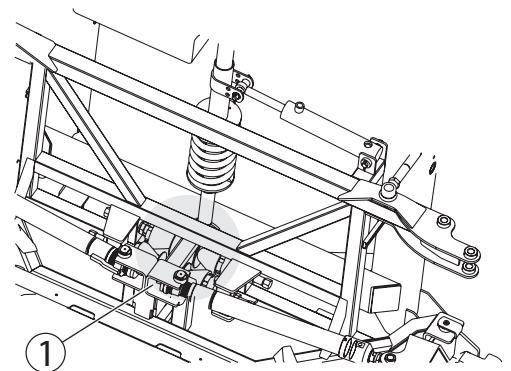
1. Unfold the boom completely on flat ground.
2. Maintain the suspended central frame before carrying out the adjustment.
3. Loosen the counter-nut fig.2 and remove the ball joint fig.3.
4. Adjust the ball joint fig.3 at the top to obtain the correct position for the connecting rods.



Replacement and adjustment of anti-yaw device (LPA2 frame)

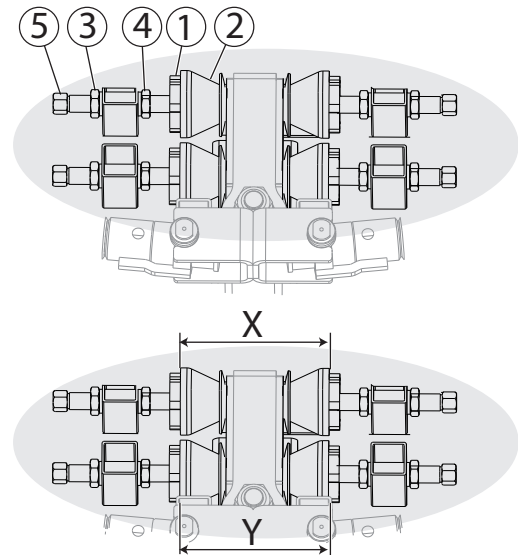
Checking dampers

- To ensure good stability and damping of the boom, it is essential to check the anti-yaw device regularly.
- Perform a visual check of the status of the damper blocks fig.1. Otherwise they should be replaced.



Damper replacement

- Unlock and loosen the clamp nut by one turn fig.1.
- Unlock the damper block fig.2.
- Unlock the counter-nut fig.3.
- Loosen the counter-nut fig.4 until it hits the stop on the clamp nut fig.1.
- Dismantle the damper block fig.2 while pulling on the axle fig.5.
- Grease the axle on refitting and reassemble in reverse order.
- Repeat the same operations for the damper blocks.



Damper adjustment

- Loosen counter nuts fig.3 and fig.4.
- Hold the axle fig 5. and turn the nut fig.4, until the damper block is in position according to the adjustment table below.

Boom	Damper blocks	X (front)	Y (rear)
TR4R 24 m	2	203 mm	--
TR4R more than 24 m	4	203 mm	198 mm



ATTENTION! Both dampers should have identical settings. To do this, the length of the axles should be equal with respect to the brackets.

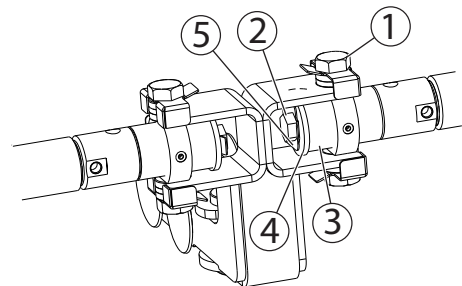


NOTE! All damper blocks should be replaced at the same time.

Replacement and adjustment of dampers (LPA2 frame)

Damper replacement:

- Unfold the boom completely on flat ground.
- Loosen the 2 screws fig.1 to dismantle the dampers.
- Remove the screw fig.2 and the washer fig.4 and the damper fig.3.
- On reassembly, apply glue to the screws fig.2, then tighten them until they make contact with the washer fig.4, and tighten to the value shown in the table below.
- Fold the stop tab fig.5 over the head of the screw.



Boom	Number of turns
TR4 24 m	3
TR4R more than 24 m	1.5

6 - Maintenance

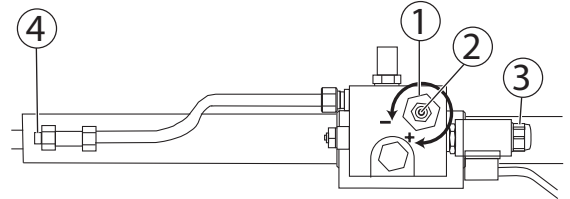
Boom hydraulic damper

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 fig.1.
- Turn the pressure limiter screw fig.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 increased oscillation of the boom.



NOTE! The basic setting is obtained by completely tightening the pressure limiter screw fig.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 fig.2 to cancel the damper function
- Press the manual control fig.3 and push back the damper rod completely.
- Remove the filler screw fig.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 (see above).

Compressed air pressure adjustment

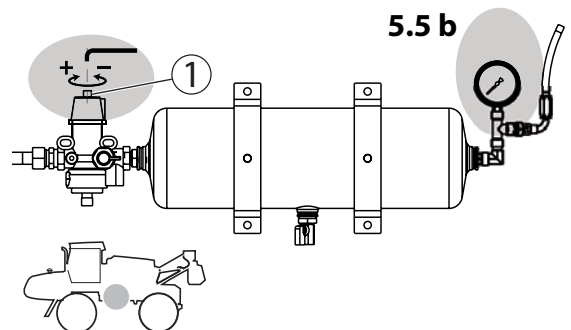
ALPHA evo self-propelled vehicles are fitted as standard with a mechanically controlled air compressor, which is used to operate the pneumatic nozzles.

Air pressure adjustment

- Turn the screw fig.1 clockwise to increase the pressure.

Activation pressure = 6.0 bar

Maximum admissible pressure = 6.0 bar

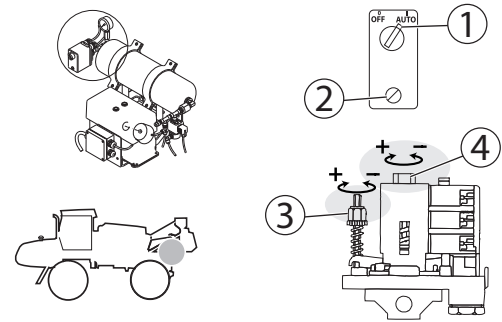


Some ALPHA evo self-propelled vehicles may be fitted with an electrical air compressor at the rear of the machine.

Air pressure adjustment

Air pressure adjustment is carried out by a pressure gauge located near the electrical air compressor.

- Turn the button fig.1 to the [AUTO] position.
- Remove the pressure gauge cover by loosening the screw fig.2.
- Adjust the activation threshold by working the screw fig.4.
- Adjust the activation threshold by working the screw fig.4.



Activation pressure = 5.0 bar

Activation pressure = 4.0 bar

Change of bulbs

1. Switch off the headlights by using the switch.
2. Loosen the holding screw to access the bulb.
3. 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.

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.

Troubleshooting

Control valve DG4

In cases where breakdowns have occurred, the same factors always seem to come into play:

- Minor leaks on the suction side of the pump will reduce the pump capacity or stop the suction completely.
- A clogged suction filter will hinder or prevent suction so that the pump does not operate satisfactorily.
- Clogged up pressure filters will result in increasing pressure at the pressure gauge but lower the flow at the boom.
- Foreign bodies stuck in the pump may prevent the valves from closing correctly and thereby reduce pump flow.
- Poorly reassembled pumps, especially diaphragm covers, will allow the pump to suck air resulting in reduced or no capacity.
- Hydraulic components that are contaminated with dirt lead to rapid wear to the hydraulic system.
- A poorly charged or faulty battery.

Therefore, always check:

- Suction, pressure and nozzle filters are clean.
- Hoses for leaks, creases and cracks, paying particular attention to suction hoses.
- Bushings and seals are present and in good condition.
- Pressure gauge is in good working order. Correct dosage depends on it.
- Operating unit functions properly. Use clean water to check distribution valves.
- Hydraulic components are maintained clean.
- The battery and its connections are in good working order.

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 Excessive agitation	Check connectors
		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.
		Brown - pos. (+). Blue - neg. (-).
	Polarity inversion	Check valve seals (obstruction)
	Valve does not close completely	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
		Check control (handle or REGULATOR6). Check multi-function handle Check REGULATOR6 configuration Check printed circuits and connections

Transmission

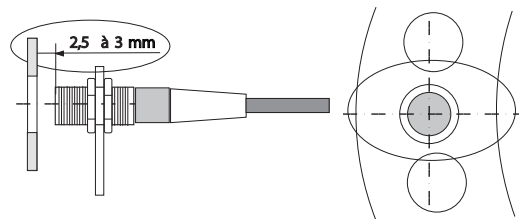
FAULT	POSSIBLE CAUSES	SOLUTION
Vehicle does move forward	Incorrect use	Check that the parking brake is disengaged. Lever in neutral.
	Electronic failure	Read the error code on the CANcockpit and contact technical support Check electrical circuits (connections, cables etc.)
	Hydraulic failure	Check feed pressure of transmission pump (28 bar) Check operating pressure (max 450 bar)
Forward 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) on the CANcockpit and contact technical support
	Electrical faults	Check retractable gangway is working correctly (position sensor)

7 - Troubleshooting

Mechanical incidents

Speed transducer

The speed sensor used by the flow regulation is fitted to the left rear wheel of the machine. Ensure that the detection distance is correct (2.5 mm to 3.0 mm) and that the disc is not fogged.



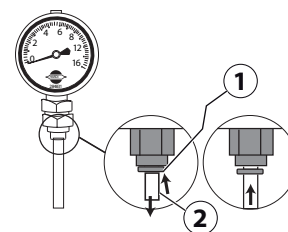
Spray pressure gauge

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 fig.1, then remove the hose fig.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 information

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.

i 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".

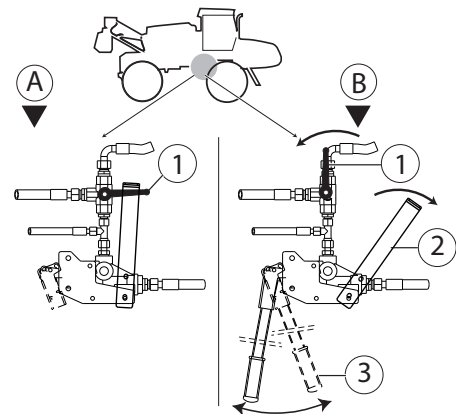
! To carry out all of these operations safely, it is essential to activate the parking brake.

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 fig. 2 and put the valve handles into a vertical position.
- Fit the handle fig.3 to the hand pump.
- Work the pump until the brakes on both motors are fully released.



i NOTE! The hand pump handle fig.3 is stored in the cabin.

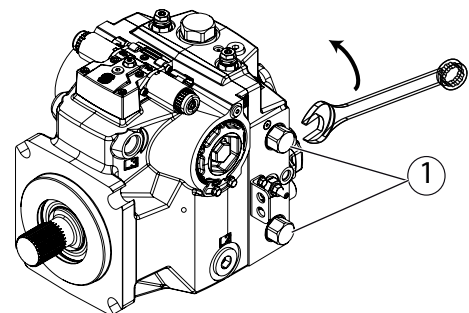
i NOTE! Do not continue to work the hand pump after the brakes have been fully released. Excessive pressure could damage the motor braking mechanism.

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

Transmission pump high pressure valves

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

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



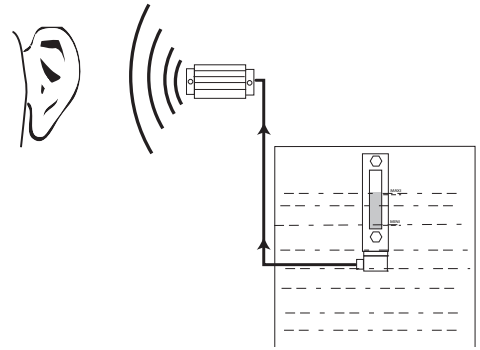
The high pressure valves should be tightened before the machine is started up again.

7 - Troubleshooting

Hydraulic tank level alarm

The hydraulic tank is fitted with a level detector fig.1, connected to an acoustic warning signal fig.2 located near the driver's seat. If this alarm sounds:

- Shut down the machine and stop the engine.
- Check the tightness of the hydraulic system and make any repairs.
- Add oil to the tank in line with the technical specification. See "Table of recommended lubricants" on page 73.



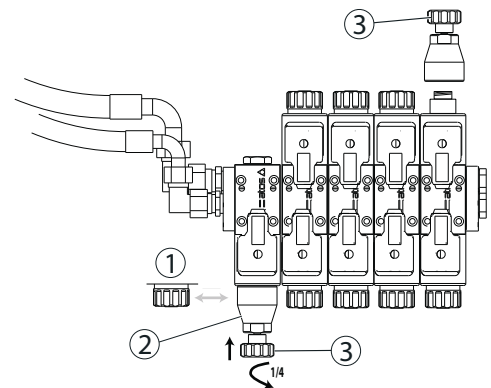
Hydraulic block - manual control and pressure adjustment

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 fig.1 and the screw on the faulty distribution valve.
- Screw the emergency pushbutton fig.2 in place and fit the previously removed nuts.



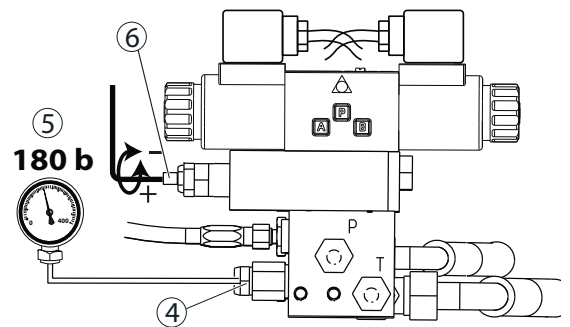
Using the emergency pushbutton

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

B. Spray pressure regulation.

- Connect a pressure gauge fig.4 to the pressure socket fig.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 fig.6 to obtain the operating pressure.

Maximum pressure = 180 bar.

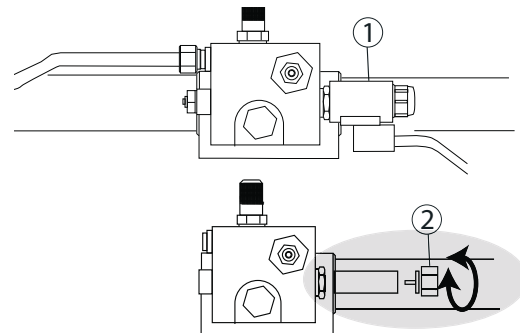


Boom damper control - manual unlocking

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 fig.2 to unlock it.



Error messages

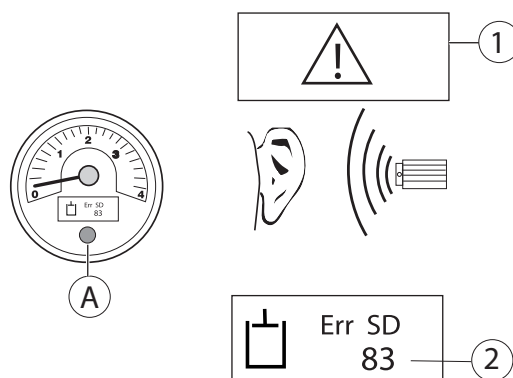
Transmission errors

When an operating anomaly appears in the hydraulic transmission the symbol on the right is displayed on the CANcockpit.

1. Alarm connected to the machine transmission (SD).
2. Error code of alarm in progress.

If an operating fault appears in the transmission, an acoustic alarm placed near the operator's seat sounds and the message fig.1 is displayed in the CANcockpit.

- Press the pushbutton fig. A to display the error code [SD] in progress fig.2.



Example

Err SD 83 CAN bus communication error



NOTE! The error code automatically disappears when the operating anomaly has been resolved.

Table of SD error codes

Error codes	DESCRIPTION	Error codes	DESCRIPTION
001	Low battery voltage	070	Loop error
002	Low battery voltage	071	PWM2 current loop error
003	12V sensor low supply voltage	074	Loop error pump 1
004	12V sensor high supply voltage	080	Brake pressure sensor signal out of range
005	5V sensor low supply voltage	083	CAN bus communication error: signal not received
006	5V sensor high supply voltage	084	High pressure sensor signal out of range
007	Stack overflow	092	Joystick sensor error
008	E2prom memory error	097	Analogue mode selector sensor error
009	FLASH memory error	100	Joystick limitation control error
010	RS232 memory error	102	Transmission temperature too high error
011	CAN bus connection error	200	Offroad SD: high battery voltage
012	Current return protection	201	Offroad SD: low battery voltage
020 to 045	Internal system error	202	Offroad SD: 12V supply voltage sensor out of range
051	MAF loading error		
052	Inconsistent key		
053	Inconsistent MAF		
054	Inconsistent input/output		
055	Error in sensitive parameter		
056	SDPHASE code error		
057	Checksum error		
058	Min/Max error in parameter		

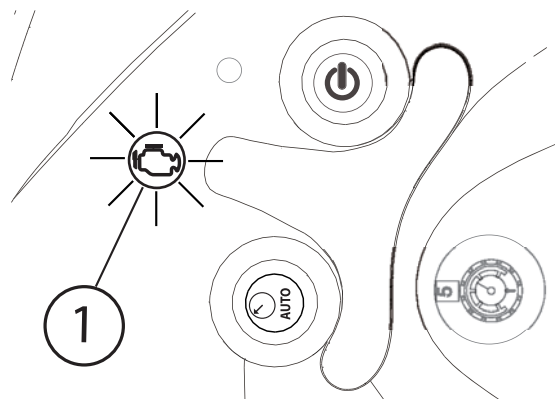
7 - Troubleshooting

Engine errors

When an operating anomaly in the engine appears, the engine changes to one of the following downgraded modes:

1. Limitation of engine speed to 1500 rpm.
2. Power limitation.

A fault indicator appears on the control panel to show that the engine is operating in downgraded mode. Shut down the engine immediately and carry out the checks.



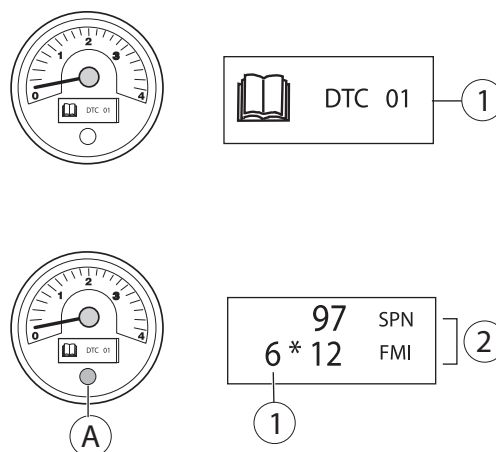
An error code is displayed in the CANcockpit.

1. Alarm connected to the machine transmission (SD).
2. Error code of alarm in progress.

If a priority fault appears in the engine, a message [DTC x] fig.1 is displayed automatically in the CANcockpit. Otherwise, press the pushbutton fig. A to display the message on the right. This message also indicates the number of errors in progress in the engine.

- Press the pushbutton fig. A to display details of the error in progress.

1. Number of cycles for this fault.
2. SPN and FMI code (see table).



Example

6 Error has appeared 6 times.
97 -12 Water present in fuel prefilter.



NOTE! Most of the messages are automatically cancelled when the fault disappears.

Engine errors

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

7 - Troubleshooting

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

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 "SwOut" = 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

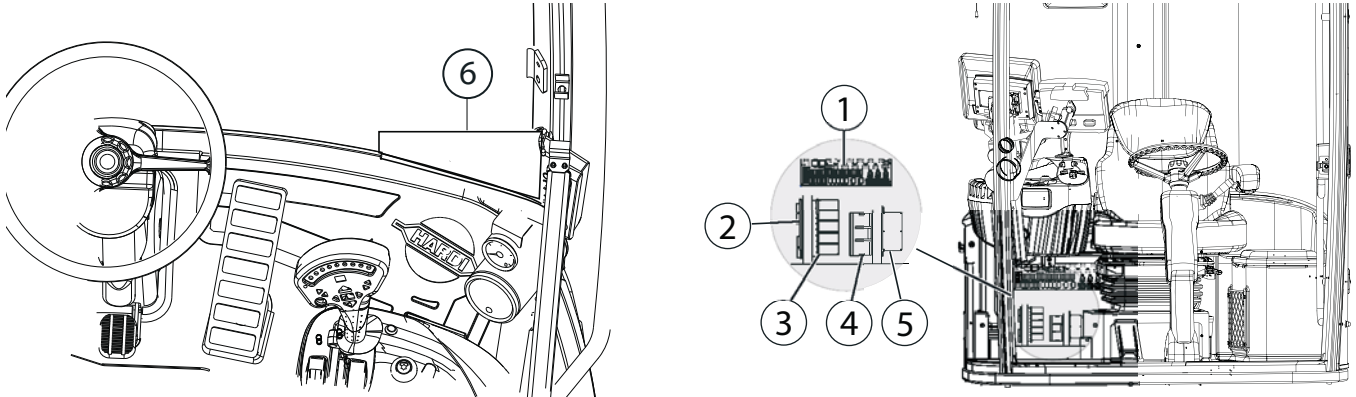
7 - Troubleshooting

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

Electrical incidents

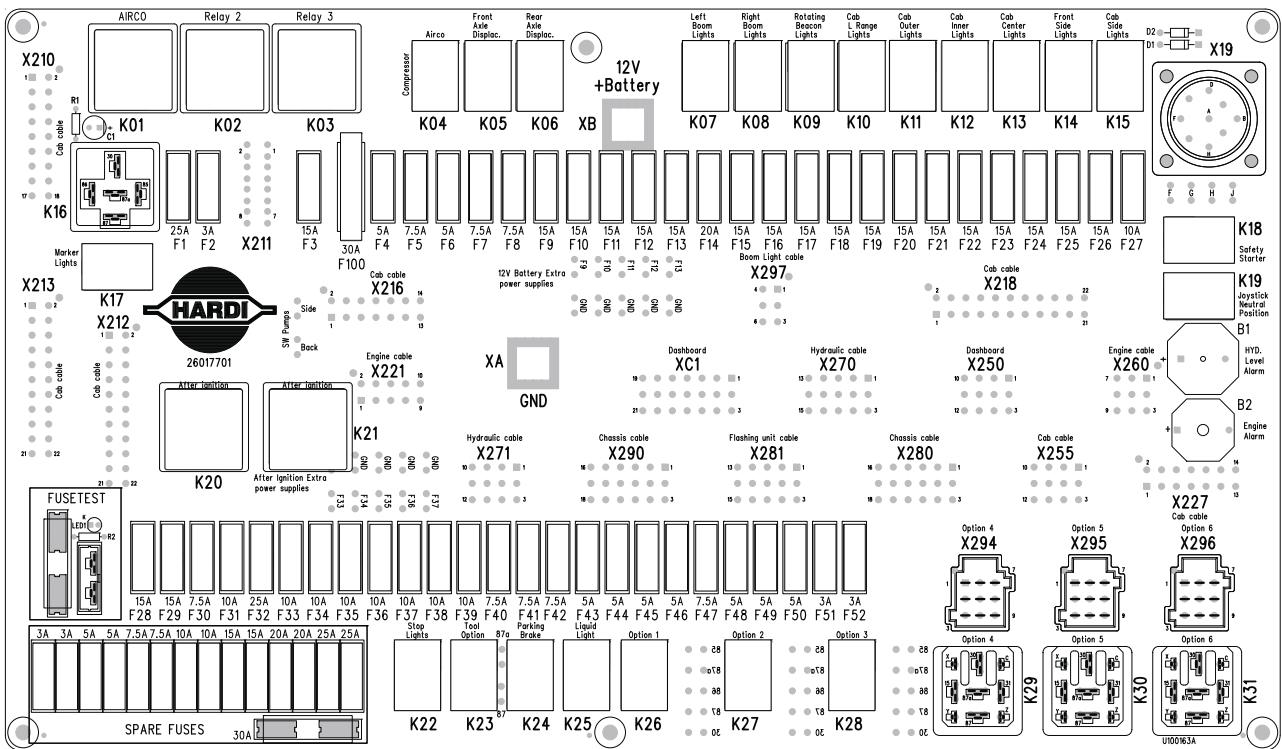
Location of main components

The main computers for the machines are fitted in the cabin and can be accessed after removal of the protective plate.



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 transmission computer (SD).
6. Engine computer (EMR).

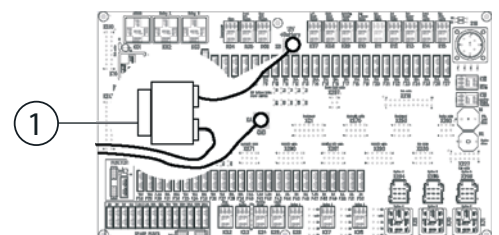
Main circuit fuses and relays.



HC 9500 computer fuse

The HC9500 computer fuse is located behind the main circuit.

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



7 - Troubleshooting

Code		Description	Code	Amp. (A)	Description
F1	25.0	side lights/cabin backlighting	F29	15.0 A	main beam headlights
F2	3.0 A	12 V BAT - ceiling	F30	7.5 A	acoustic alarm
F3	15.0 A	direction indicator	F31	10.0 A	work area lighting (optional)
F4	5.0 A	12V BAT radio	F32	25.0 A	windscreen washer pump - windscreen wipers
F5	7.5 A	rear view mirrors	F33	10.0 A	12 V after contact - optional
F6	5.0 A	air conditioning compressor	F34	10.0 A	12 V after contact - optional
F7	7.5 A	front hydraulic motor capacity	F35	10.0 A	12 V after contact - optional
F8	7.5 A	rear hydraulic motor capacity	F36	10.0 A	12 V after contact - optional
F9	15.0 A	12 V BATT - optional	F37	10.0 A	12 V after contact - optional
F10	15.0 A	12 V BATT - optional	F38	10.0 A	ROAD- parking - 4-wheel drive standard mode
F11	15.0 A	12 V BATT - optional	F39	10.0 A	BRAKE lights
F12	15.0 A	12 V BATT - optional	F40	7.5 A	12 V after contact with SD module- input 1
F13	15.0 A	12V BATT - optional	F41	7.5 A	12 V before contact console
F14	20.0 A	12V BATT - optional	F42	7.5 A	12 V after contact with SD module- input 2
F15	15.0 A	not used	F43	5.0 A	not used
F16	15.0 A	not used	F44	5.0 A	not used
F17	15.0 A	hazard lights	F45	5.0 A	brake pressure - hydraulic level - alarms
F18	15.0 A	cigarette lighter - 12V sockets	F46	5.0 A	not used
F19	15.0 A	seat compressor unit	F47	7.5 A	12 V after contact engine error
F20	15.0 A	not used	F48	5.0 A	12 V after-contact console
F21	15.0 A	right rear cabin lights	F49	5.0 A	12 V after contact right and left direction indicator
F22	15.0 A	left rear cabin lights	F50	5.0 A	12 V after contact cabin switches
F23	15.0 A	not used	F51	3.0 A	12 V after contact air conditioning and radio
F24	15.0 A	front cabin lights	F52	3.0 A	12 V after contact J1939 diagnostic socket
F25	15.0 A	front cabin side lights			
F26	15.0 A	starter contactor			
F27	10.0 A	starter solenoid			
F28	15.0 A	main beam headlights			

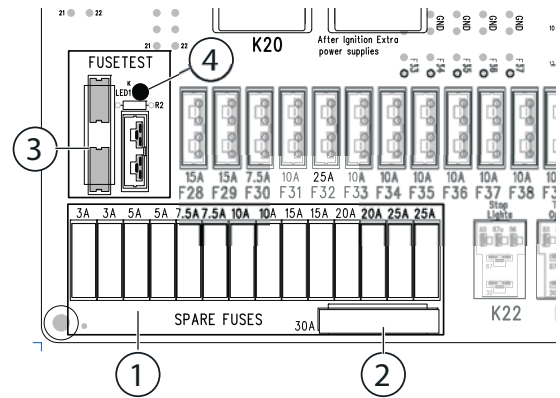
Relays	Description	Relays	Description
K01	not used	K16	not used
K02	not used	K17	backlighting - side lights
K03	air conditioning power	K18	engine starter control
K04	air conditioning compressor	K19	forward handle neutral position
K05	front hydraulic motor capacity	K20	circuit control after contact
K06	rear hydraulic motor capacity	K21	circuit control after contact
K07	not used	K22	BRAKE lights
K08	not used	K23	ROAD mode
K09	hazard lights	K24	parking brake
K10	not used	K25	work area lighting (optional)
K11	right rear cabin lights	K26	not used
K12	left rear cabin lights	K27	not used
K13	not used	K28	not used
K14	front cabin lights		
K15	front cabin side lights		

Fuse test

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

To test a fuse.

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



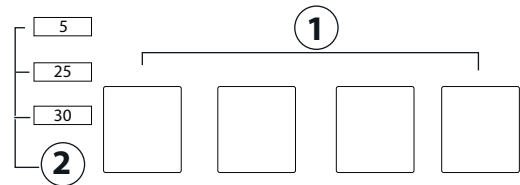
NOTE! Ensure that the replacement fuse has the same capacity as the original fuse.

Some circuits need to make contact to use the fuse test device.

Cabin fuses

These fuses are located in the cabin roof.

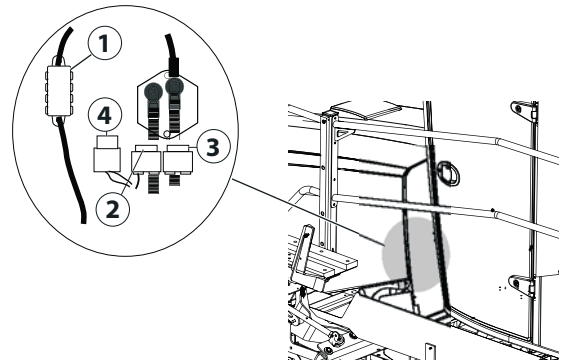
- air conditioning control relay (motor fan)
- air conditioning fuses



Engine - cabin - REGULOR 6 fuses

These fuses are fitted between the cabin and the engine as shown in the picture.

- main cabin fuse "MEGAFUSE" 100 A
- engine computer fuse -EMR: 30.0 A
- power fuse: 80.0 A (REGULOR 6 equipment only)
- engine computer relay- EMR



7 - Troubleshooting

Lighting

Main beam headlights

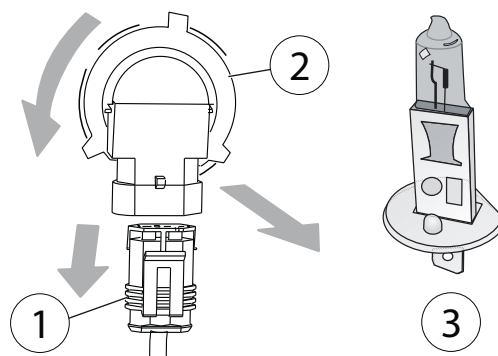
A. Replacing the halogen bulb:



ATTENTION! Before changing the bulb, ensure that the appliance is disconnected and wait for the bulb to cool down completely in order not to burn yourself.

- Disconnect the connector fig.1.
- Turn the base of the bulb fig.2 anticlockwise.
- Replace the halogen bulb.

Halogen bulb fig.3: H1 - 12 V - 55W.



NOTE! Never touch the halogen bulb directly with the fingers but hold it with a soft cloth.

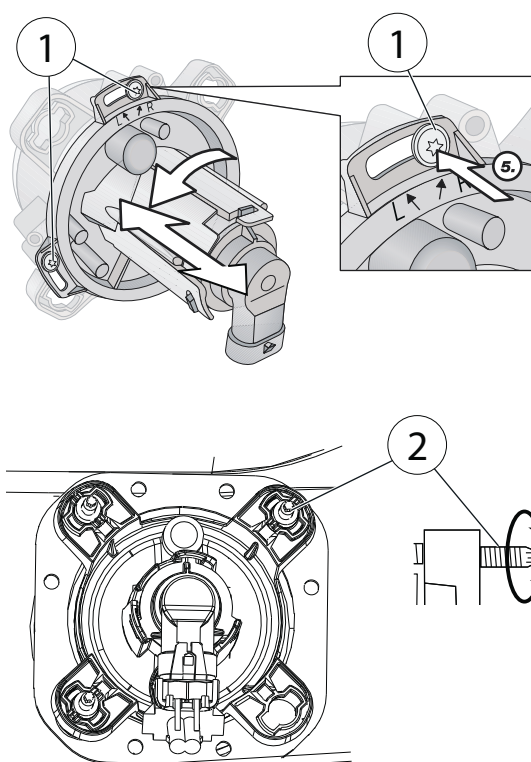
B. Headlamp settings

When you have to replace a headlamp, ensure that it is suitable for operation in the direction of the traffic; on the right for most countries or on the left for some other countries¹

L: driving on the LEFT.

R: driving on the RIGHT

1. Lamp bracket attachment screws.
2. Light beam adjustment screw.

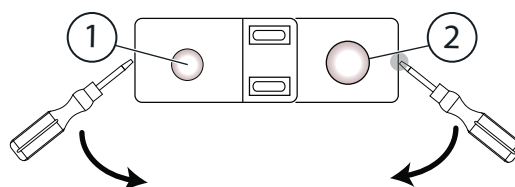


Cabin lighting

To replace the bulbs for lighting the cabin:

- Use a flat screwdriver and lift the cover gently.
- Replace the bulb.

1. 12 V - 10W bulb
2. 12 V - 21W bulb

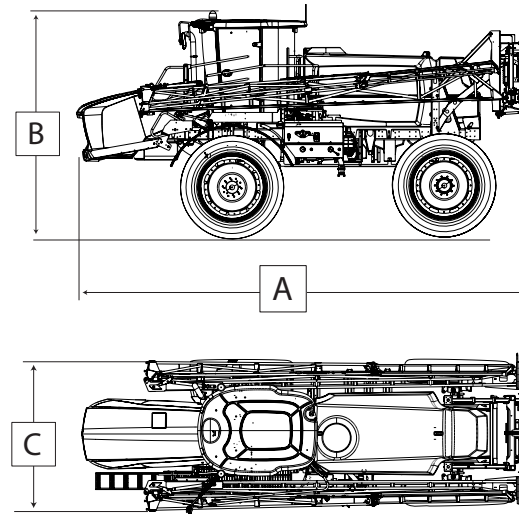


1. United Kingdom, South Africa, Australia etc.).

8 - Technical specifications

Features

Technical specifications



Tank l	3500	4100
Pumps, type l/min	463 - 276 /463H - 322 l/min	
Boom	FORCE, ALU, TWIN FORCE	
Regulation type	HC 9500	
Engine	Deutz 6cyl. 175 hp/210 hp optional (210hp standard in TWIN)	
Transmission	Hydrostatic in 4-wheel drive 25 or 40 km/hr	
Suspension	Mechanical with damper	
Steering	4-wheel drive- hydrostatic	
Track gauge adjustment	Mechanical with a range of 40 cm	
Turning radius (200 cm track gauge)	4.62 m	
Weight (empty) (with 38 m Alu boom)	8320 kg	8490 kg
Total length - (A)	8.71 m	
Total height (40 km/hr, 380/90R46) - (B)	3.91 m	
Boom width Alu 24 - 30 m - (C)	2.55 m	
Boom width Alu 32 - 40 m - (C)	2.73 m	
Boom width TWIN 18 - 30 m - (C)	3.01 m	
Boom width TWIN 32 - 36 m - (C)	3.45 m	
Track gauge (D)	182 - 354 cm	
Wheelbase	373 cm	
Ground clearance (380/90R46) (F)	120 - 165 cm	
Rinse tank	410 l	
Clean water tank	15 l	
Chemical storage locker	180 l	
Fill rate	800 l/min	
TurboFiller fill rate	125 l/min	
Fuel tank	320 l	

8 - Technical specifications

Tyre pressure

Tyre size	Dimensions (bar)	Load index
300/95R46****	3.8	TL156A2/145A8
600/65R28	1.6	TL147A8/144B
600/70R30	1.6	TL152A8/149B
460/85R34	1.6	TL147A8/144B
520/70R34	1.6	TL148A8/145B
18.4R34XM	3.2	TL157A8
620/75R34XM	3.2	TL170A8
460/85R38	1.6	TL149A8/146B
520/70R38	1.6	TL150A8/150B
520/85R38	1.6	155A8/152B
580/70R38	1.6	155A8/155B
600/65R38	3.8	TL156A2/145A8
340/85R46	2.4	TL148A8/148B
480/70R34	1.6	TL143A8/143B
420/85R38	1.6	TL144A8/141B



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



NOTE! The pressure indicated in the table must be set. In the event of doubt about the technical features of the tyres, consult a specialist.

Boom width

Frame	Boom	Width	Inner section width	Sections
LPA2	TR4	24	15	6
		28	15	7
		30	16	5
		30	16	6
LPA5	TR4R	32	17	8
		33	17	8
		36	18	6
		36	18	8
	TR5	38	18	8
		36	18	6
		36	18	8
		38	20	8
		40	20	8

Component identification plates



Cabin

An identification plate is fitted below the operator's seat on the left and shows the Serial No.

Manufactured for HARDI EVRARD		Unité de Production Rue du 21-MAI-1940 62990 BEAURAINVILLE France	
Manufactured By SIAC S.p.A.		Via Bergamo 10, 24040 Pontirolo Nuovo Bg (Italy)	
Code	166904050	Serial-No.	00023 09 11
Cabin	28019701	Model	ALPHA VTK/3500/4100


Transmission pump

An identification plate is fitted to the hydraulic transmission pump stating the Model No. and the Serial No.

		SAUER DANFOSS	
Model	11002495		
Model No	H1P 147R A A4CON E8GG2H3 L422L42 LL30 NN NNN G2S		
Serial No	N0663807770		
			

Hydraulic motors

An identification plate is fitted to each hydraulic motor, which shows the model (P/N) and the serial number of the hydraulic motor (S/N).

	
MS18- F -C21 - R18 - A520 - 58DM P/N	
Code :	A40402Q
Indice :	K
S/N	OF001722368004

Diaphragm pump

An identification plate is fitted to the diaphragm pump, which shows the Type and the Serial No.

Model: 463-10 and 463-12.

HARDI HARDI INTERNATIONAL A/S TAASTRUP DENMARK			
Type	463/10	r/min.max. 700	
No.	112	837	002
r/min.	l/min.	bar	kW
540	276	0	1.8
540	256	10	5.9
		max.15	

Centrifugal pump

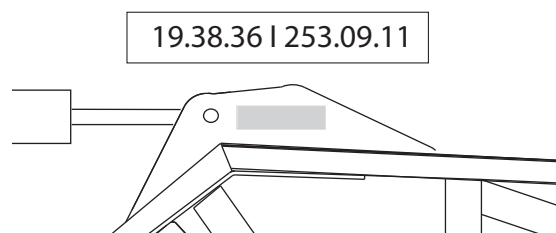
An identification plate is fitted to the HARDI EVRARD centrifugal pump which shows the type (item code) and serial number of the centrifugal pump.

EVRARD 62990 BEAURAINVILLE - FRANCE			
Type	73289501	N° série	19985A
Débit maxi	500 l/mn	Pression maxi	10 bar
Vitesse d'entrée		4500 r.p.m.	

8 - Technical specifications

Aluminium boom

The serial number of the aluminium boom is engraved on the inner section. This serial number is identical for both sides of the boom.



Nitrogen accumulators

Boom	Width (m)	Pressure (bar)
TR4	24	45
	28	65
	30	80
TR4R	32-33	80
	36-38	80
TR5	32	75
	36-38-40	80

Hydraulic pressure

Hydraulic systems	Pressure (bar)
Transmission	450
Auxiliary	180
Feed	28
Auxiliary	180
Dynamic braking	180

Air conditioning

Refrigerant gas = R134a

Charge = 1150 grammes

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

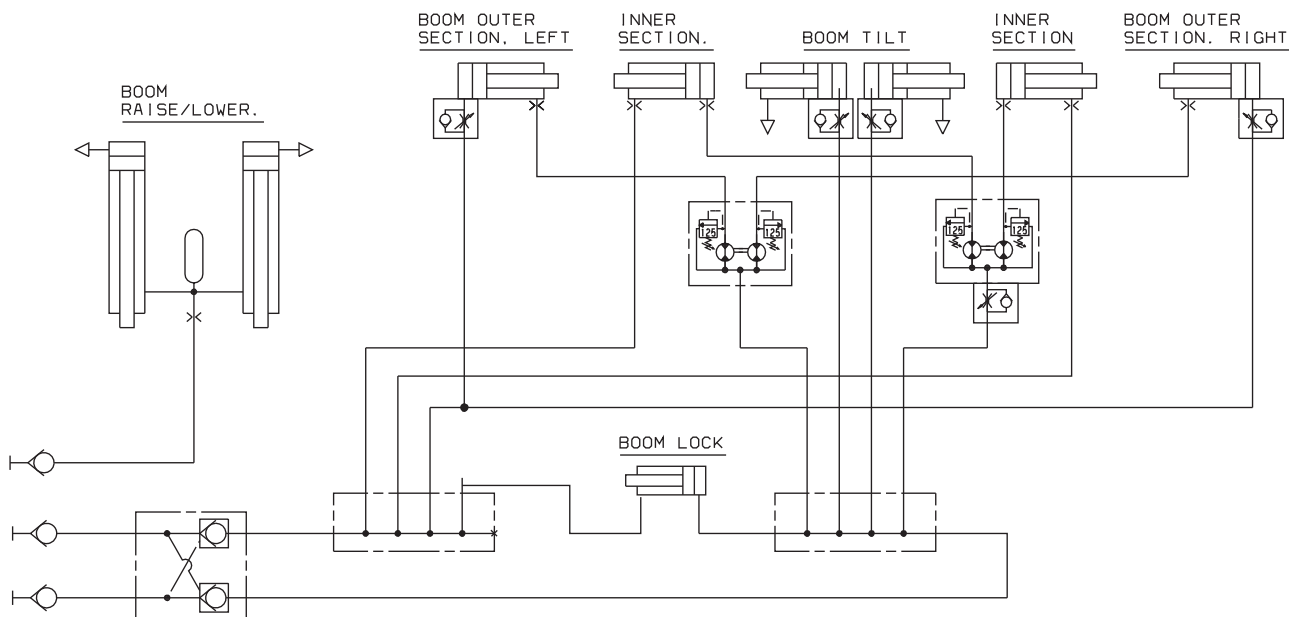
Filters: PP

Nozzles: Free POM

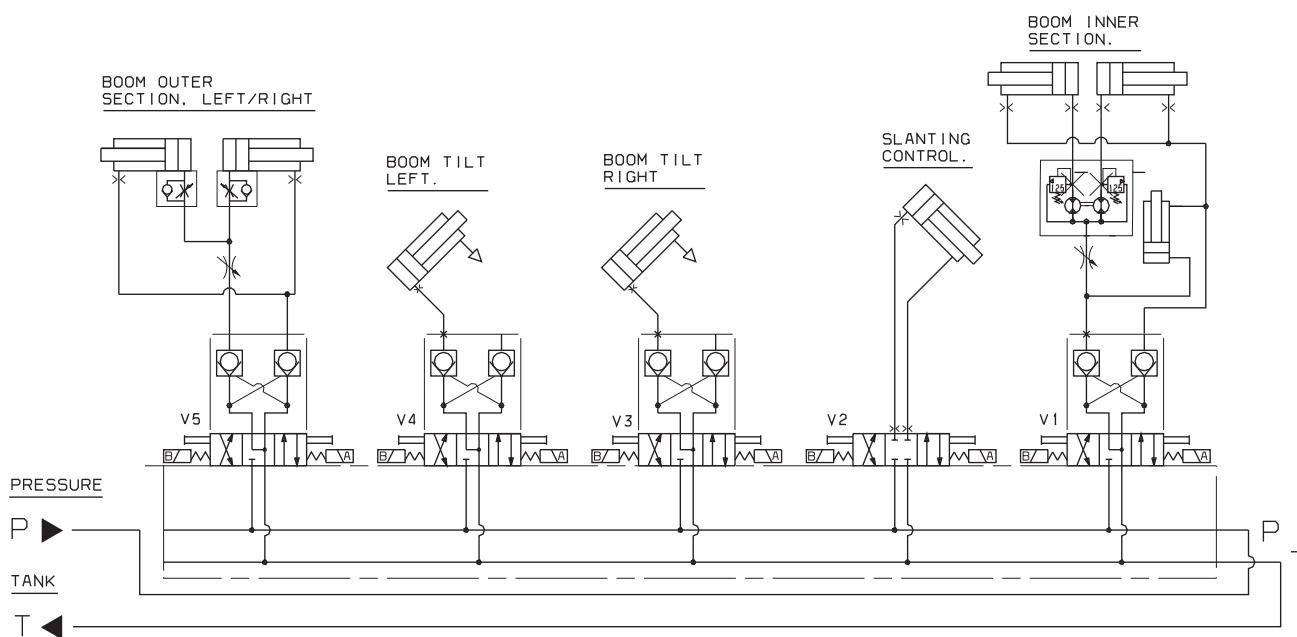
8 - Technical specifications

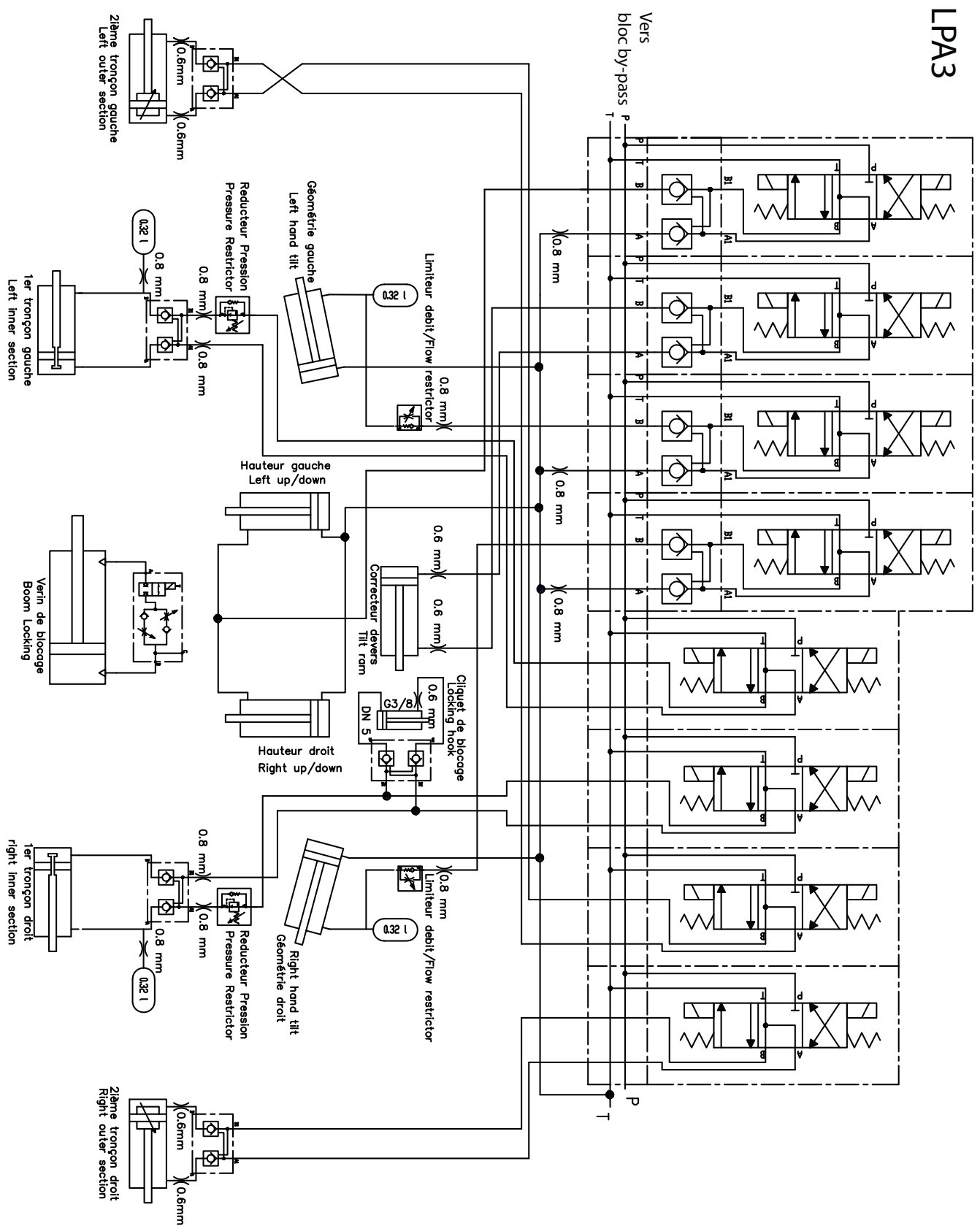
Boom hydraulic systems

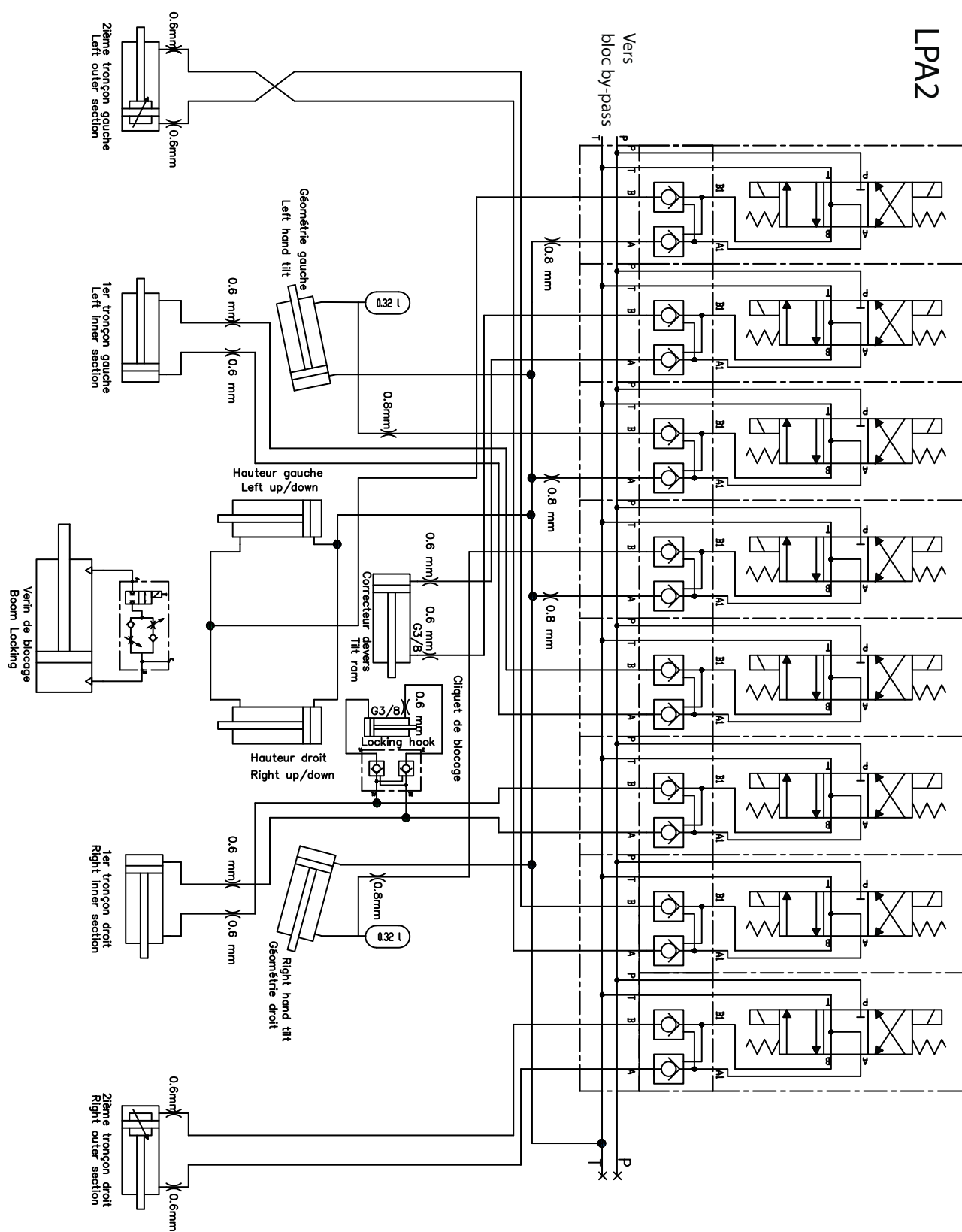
Boom hydraulic - Y

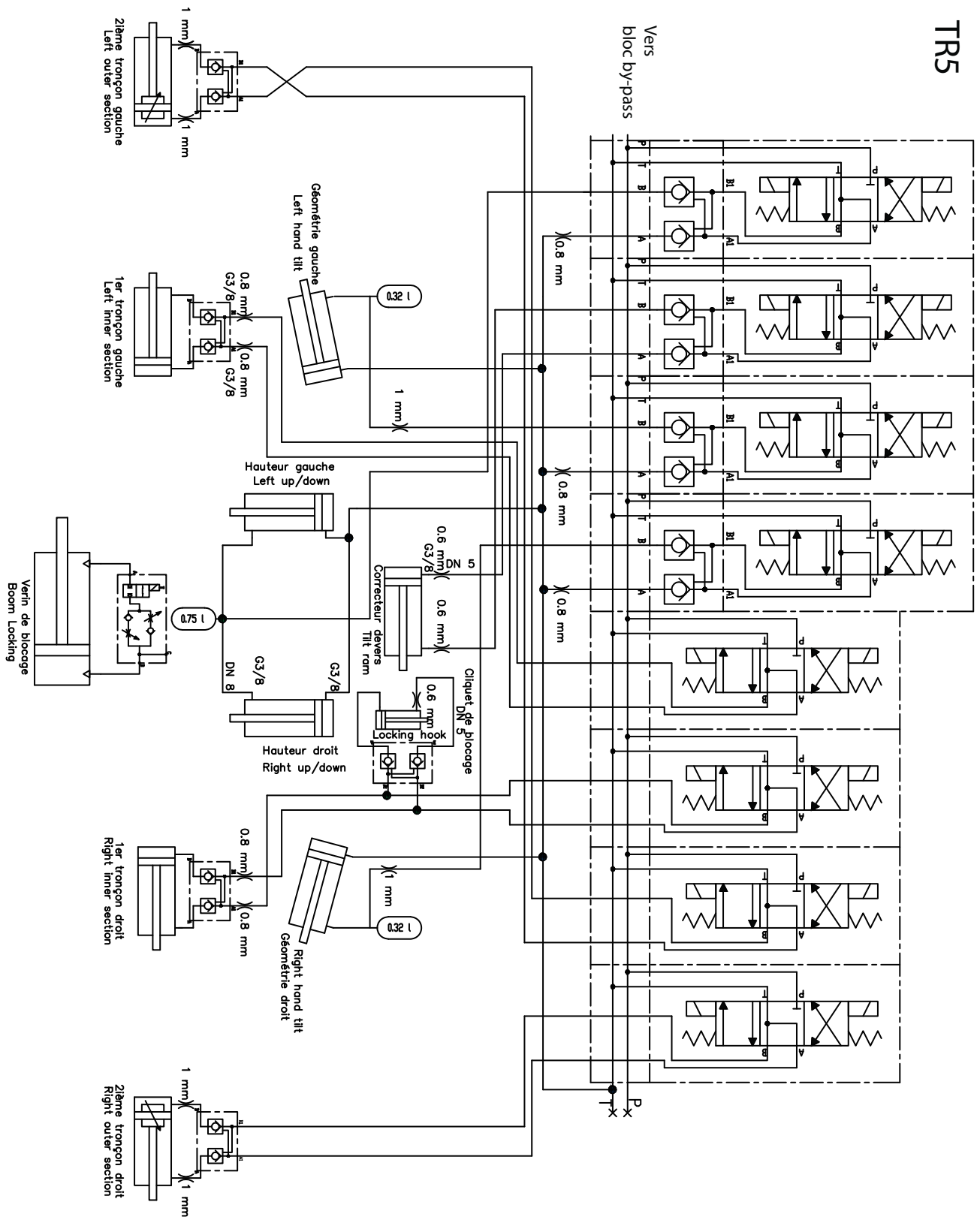


Boom hydraulic - Z









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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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