EVRARD GROUPE HARDI

ALPHA 3400-4100

HARDI NOVA

OPERATING and MAINTENANCE Manual

Référence : 677828
Edition : 11/02

SUMMARY

1- DECLARATION OF CONFORMITY FOR EEC

CE

THE MAKER

HARDI-EVRARD
301, Rue du 21 Mai 1940
F -62990 BEAURAINVILLE

Declares that the product

Type ALPHA 3400 and ALPHA 4100 SPRAYER

Which is the subject of the declaration conforms to the basic of health and safety requirements stipulated in EEC Directive 89/392/CE, 91/368/CE et 93/368/CE.

The following standards have been taken into account in order to implement, according to normal practice, the health and safety regulation laid down in EEC Directives :

EN 292-1
EN 292-2

In addition, the owner of the machinery is obliged to keep this manual throughout the life of the machine and, in the event of resale, to pass it on the purchaser.

Beaurainville, 1 December 1999

The Manager
HARDI-EVRARD

1-1 USING THE SELF-PROPELLED ALPHA

The agricultural sprayer is designed for applying plant protection products and liquid fertilizers to crops. It must be used only for this purpose, to the exclusion of all others.

Please follow the Highway Code and any regulations in force with regard to road driving.

We strongly recommend that you obtain training in crop protection and handling plant protection products to ensure crop treatment with total safety for those accompanying you and for the environment.

1-2 DELIVERY REPORT

The delivery report, given when the mobile unit is delivered, must be returned to :

HARDI EVRARD
BP 59
77542 SAVIGNY LE TEMPLE CEDEX
FRANCE

duly completed, dated and signed by the concessionaire and the user, the return of this document causing the guarantee to start running. We would ask you to read carefully the guarantee clauses stipulated in the delivery report.

All the following specifications and characteristics are subject to improvements without notice and immediate revision of this manual.

1-3 SAFETY PRECAUTIONS

Watch for this symbol, it means WARNING, CAUTION, PAY ATTENTION. Your safety is involved, so be alert !

This symbol indicate the possibilty of frost damage.

Read and pay attention to the instruction book before starting and operating the sprayer.
It is equally important that other operators of this equipment read and understand this book.

Do not permit passengers to ride on the machine. There are no safe places for others than the driver.

Pressure test with clean water prior to filling with chemicals.Wear personal protection, always (gloves, overalls, rubber boots, and face protection shield).

Wash the entire machine inside and outside, as far as possible, to remove all chemicals.

Depressurize equipment after use and before servicing.

Do not service and repair the machine when the machine is running.

Disconnect electrical power before servicing (arc welding, etc.).

Before starting the engine, make sure that nobody is carrying out service or maintenance jobs on the sprayer. Wash and change cloths after spraying jobs.

Remove all inflammable or explosive material from the area.

Do not eat, drink or smoke whilst spraying or working with contaminated equipment.

Immediately, after spraying job, wash and change the clothes.

In case of poisoning, seek medical advice or call an ambulance. Retain chemical label or container for identification of chemical.

Keep childrens away from the sprayer.

Do not enter the sprayer tank.

If any portion of this instruction book remains unclear after reading, contact your HARDI-EVRARD dealer for futher explanation before using the equipment.

1-4 ROAD DRIVING

On the road, it is essential to follow the directions of the Highway Code or any other regulation with regard to compulsory equipment on agricultural machinery (lighting, warning beacon, etc.) The sprayer and tractor must conform to local rules.

It is essential to take note of the overall dimensions of the sprayer prior to any road travel. These dimensions are the subject of chapter 10.

1-5 PLANT PROTECTION PRODUCTS

Safe use of sprayers is dependent on the user, who must take the usual precautions when he is handling plant protection products and working with machine. It is, for example, essential to be aware of the non-compatibility of various different products used and be careful to read the product maker's instructions. The sprayer must be carefully cleaned after each use as chemical residues can damage the spray circuit.
Decree n° 92-1261 of 03 Décembre 1992.

1-5-1 CONTAINERS

Observe local legislation regarding chemical residues and mandatory decontamination methods. If in doubt contact the authorities e.g. Department of Agriculture.

1-5-2 STORAGE OF THE PRODUCTS

Do not store chemicals near the water. Store chemicals behind locked doors do not allow unauthorized persons and children to access the chemicals.

1-5-3 PERSONNAL PROTECTION

Chemicals will penetrate gloves, rubber boots etc. after a certain period of contact. This period will vary from a few hours to several days depending on rubber materials and chemical used. Be familiarised with the quality of your protection equipment, and renew them according to the instructions.
Wash your gloves before taking them off. Do not touch the contaminated outer side of the gloves with bare hands when taking them off.
If chemicals are splashed over you, remove soaked clothing at once and wash with soap and water instantly. Plant protection chemicals will penetrate the skin, and affect your health. Consult chemical label regarding precautions to be taken against poisoning.

1-5-4 PLANT PROTECTION CHEMICAL

Please obtain current information for decontamination methods (e.g. leaching of pesticides).
If you do not know this legislation, refer to the agricultural authorithies (Department Agriculture)

1-6 CLEANING THE SPRAYER

The sprayer must be cleaned on an uncultivated piece of land. There must be no seepage or running to watercourses, gutters, wells or springs. The rinsing water must not no discharged into drains.

1-7 NITROGEN ACCUMULATOR

OLAER OPERATING INSTRUCTIONS CE 109294-1

NI 06- ENGLISH

1 GENERAL

This equipment is designed, manufactured and tested in compliance with European Directive 97/23 EC.
Strict compliance with the instructions given in this document and all relevant documents is essential.
The supplier disclaims all liability for any direct or indirect damage to property or personal injury and all responsibility for consequential damage such as, for example, operating losses arising from the failure to follow the instructions given below.
Before commissioning and during operation, it is important to refer to the regulations for the use of hydraulic accumulators in force on the installation site.
Compliance with current regulations is the responsibility of the operator who must ensure that the documents supplied with the equipment are kept in a safe place. They may be required for inspection purposes.

2 SAFETY DEVICES

Current site regulations require the use of all or some of the following safety devices:

- Overpressure protection device
- Decompression device
- Pressure gage
- Pressure gage connector
- Isolator
- And so on

The operator is required to comply with these regulations.

3 HANDLING - STORAGE

The original packing is suitable for handling and storing the equipment, unless otherwise specified.

3.1 Handling

Handle with care.

The inflation valve must not be subjected to any impact, however slight.

3.2 Storage

Store in a cool, dry place. Do not expose to flames or heat.
Storing an accumulator inflated to its inflation pressure Po for a long period of time is not recommended (see Section *5.1.1*).

4. ACCUMULATOR MARKING

It is strictly forbidden to change any information and markings without the prior written agreement of Olaer.

The following information is indicated on the accumulator:

- Olaer logo
- Accumulator reference
- Nominal volume V of the tank in liters
- Basic allowable limits:
  - temperature range TS in °C
  - maximum pressure PS in bar
- Fluid used
- Test pressure PT in bar
- Test & manufacture date: MM/YYYY

And, for volumes of more than 1 liter:

- EC logo
- Accreditation number of the certifying body

Note : For volumes up to and including 1,0 liter, marking can be slightly different

5. COMMISSIONING

The equipment must only be commissioned by qualified technicians (contact Olaer or an approved Olaer agent).
Before installation, visually check that the accumulator is not damaged.
Before carrying out any work on the hydraulic system, ensure that it is depressurized.
Incorrect installation may result in serious accidents.
It is strictly forbidden to:

- **weld, solder, drill, or perform any other operation that may change any mechanical properties!**
- **modify the accumulator or its components without the prior written agreement of Olaer.**

Explosion hazard and/or danger of bursting!
For further information about the commissioning or use of the accumulator, contact Olaer or an approved Olaer agent.

5.1. Commissioning recommandations

5.1.1 Inflation pressure Po

The inflation pressure (Po) is calculated according to the operating conditions indicated by the customer.
The accumulators are supplied as follows:

- Ready for use, inflated to Po,
- Inflated to approximately 5 bar (storage pressure).
  In this case, the accumulator must be inflated to Po before it is put into service (see Section 5.2).

5.1.2 Inflation gas

Use only nitrogen that is at least 99.8 % pure.

It is strictly forbidden to use oxygen or air to inflate the accumulator!

Explosion hazard!

5.1.3 Maximum allowable pressure
The maximum pressure (PS) is indicated on the accumulator.
Check that the maximum allowable pressure is greater than that of the hydraulic circuit.
For any other pressure, you will have to contact Olaer.
5.1.4 Allowable pressure ratio
The maximum allowable pressure ratio (Pmax / Po) between maximum hydraulic pressure (Pmax) and inflation pressure (Po) is indicated on the table at the end of this document (see Section 8).
Check that the actual pressure ratio is inferior than the allowable ratio.
5.1.5 Allowable pressure range
The maximum allowable pressure range (Pmax - Pmin) between maximum and minimum hydraulic pressure indicated on the table at the end of this document (see Section 8).
Check that the pressure range of the hydraulic circuit is inferior than the allowable pressure range
5.1.6 Allowable temperature range TS
The temperature range (TS) is -10°C to +80°C.
Check that the allowable temperature range covers the operating temperatures (environment and hydraulic fluid temperatures).
For any other temperature, you will have to contact Olaer.
5.1.7 Hydraulic fluid used
Use only mineral oil (group 2 fluid).
To ensure compatibility with any other fluid, you will have to contact Olaer.
It is strictly forbidden to use an accumulator with a fluid for which it is not designed.
A group 1 fluid, in particular, must not be used in an accumulator designed to use a group 2 fluid.
Group 1 (dangerous fluids) includes explosive, highly flammable, easily flammable, flammable, highly toxic, toxic, combustive fluids (as defined in Article 2 Section 2 of European Directive 67/548/EEC of 27 June 1967). Group 2 (non-dangerous fluids) contains all the other fluids.
5.1.8 Installation site
Ensure that the labels and markings are clearly visible.
Leave at least 200 mm above the inflation valve for the checking and inflation instruments.
Take the environmental conditions into account and, if necessary, protect heat sources, electric and magnetic fields against lightning, moisture, bad weather and so on.
For optimum performance, place the accumulator as close as possible to the unit being used. It can be installed vertically with the inflation valve upwards, or it can be mounted horizontally.
5.1.9 Mounting
Mount the accumulator as follows:
- Ensure that the pipes connected directly or indirectly to the accumulator are not subjected to any anormal force.
- Ensure that the accumulator cannot move, or minimize any movement that may occur as a result of broken connections.
The accumulator must not subjected to any stress or load, in particular from the structure with which it is associated.
5.1.10 Final check before startup
The pre-startup check must be carried out in accordance with current site regulations.

5.2 Inflation (refillable accumulators)

Secure the accumulator.
Determine a safety area not in line with the openings (hydraulic and nitrogen side). Caution: parts may be ejected in the event of component breakage.
Use a checking and inflation instrument (refer to the instructions on how to use the latter) to inflate, deflate and check the inflation pressure Po.
Olaer checking-inflation tools (supplied as optional extras) are used to inflate, deflate and check the pressure of the accumulators.

Note: The nitrogen pressure varies according to the temperature of the gas. Whenever nitrogen is used to inflate or deflate the accumulator, allow the temperature to stabilize before checking the pressure.
Never exceed the maximum allowable pressure PS indicated on the accumulator.
Check the inflation valve for leaks (for example using soapy water).
Use the safety cap to protect the inflation valve.

5.3. Hydraulic Pressurization

First check the inflation pressure Po (see Section 5.2).
Check the hydraulic circuit for leaks.
Check that the hydraulic pressure never exceeds the maximum allowable pressure PS indicated on the accumulator.

6. MAINTENANCE

Before removing the accumulator from the hydraulic circuit, you must ensure that there is no residual hydraulic pressure in the accumulator.
Before dismantling the accumulator, ensure that no inflation pressure remains *(see Section 5.2)*!

Once they have been commissioned, Olaer accumulators require practically no maintenance.
To keep the equipment in good working order and ensure a long service life, the following maintenance work is recommended:

6.1 Inflation Pressure Po Checks (refillable accumulators)

When the accumulator has been commissioned, check the inflation pressure Po once a week for the first month. After that, adjust the frequency of such checks (weekly, monthly, six-monthly, annually) depending on the pressure drop.
See Section 5.2.

6.2 Other Operations

You are advised to carry out the following checks (at the intervals recommended by Olaer and d pending on the operating conditions):

- Check the safety devices and connections.
- Check the accumulator mountings.
- Visually inspect the accumulator for any sign of wear and tear such as corrosion or deformation.

To maintain an accumulator when it is in service (regular requalification operations, etc.), refer to the current site regulations.
For disassembly, cleaning and reassembly operations, contact Olaer or an approved Olaer agent.
Use only original spare parts.

7 ACCUMULATOR DISPOSAL – RECYCLING

Before recycling or disposing of an accumulator, depressurize it and remove the inflation valve. Decontaminate, if necessary.

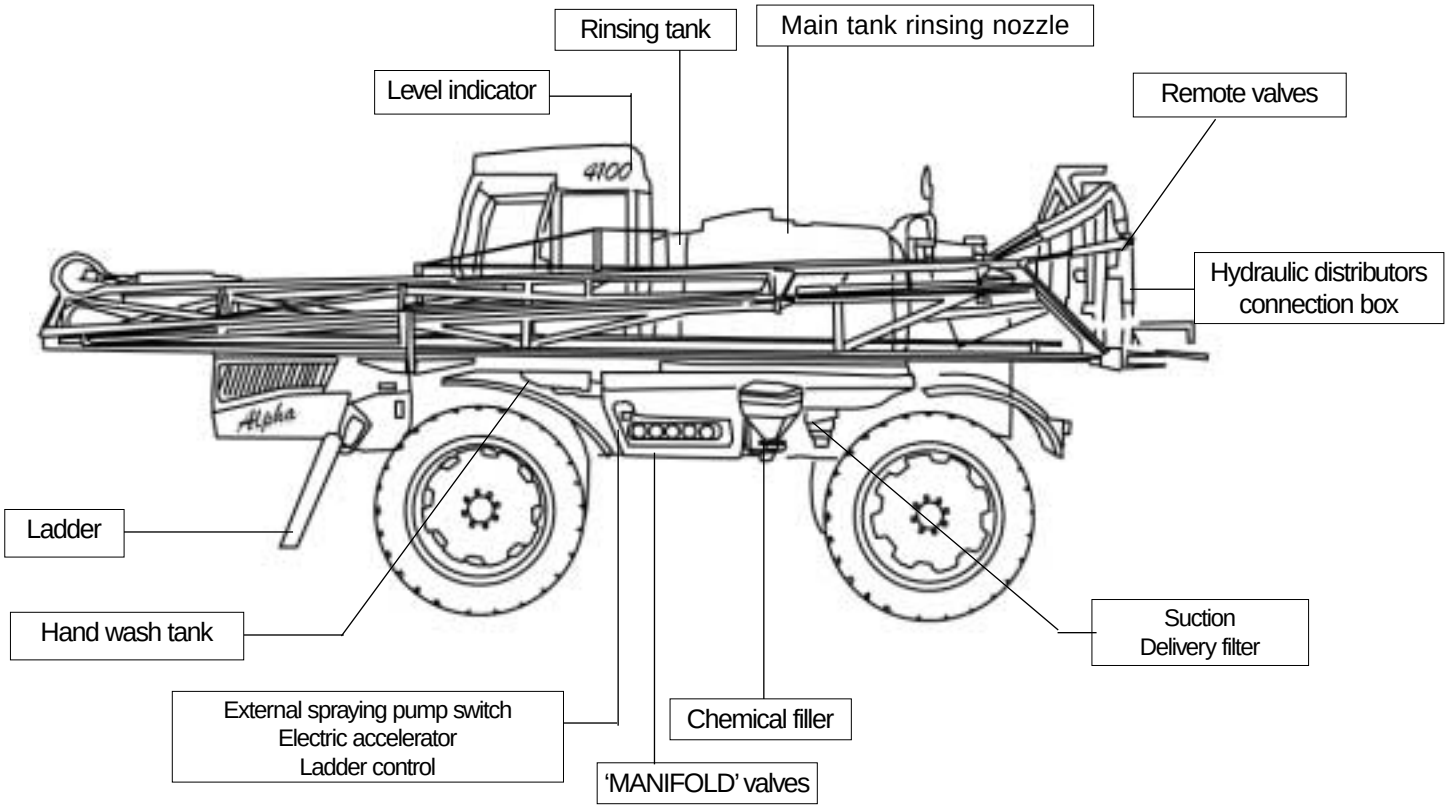
8 TECHNICAL DATA

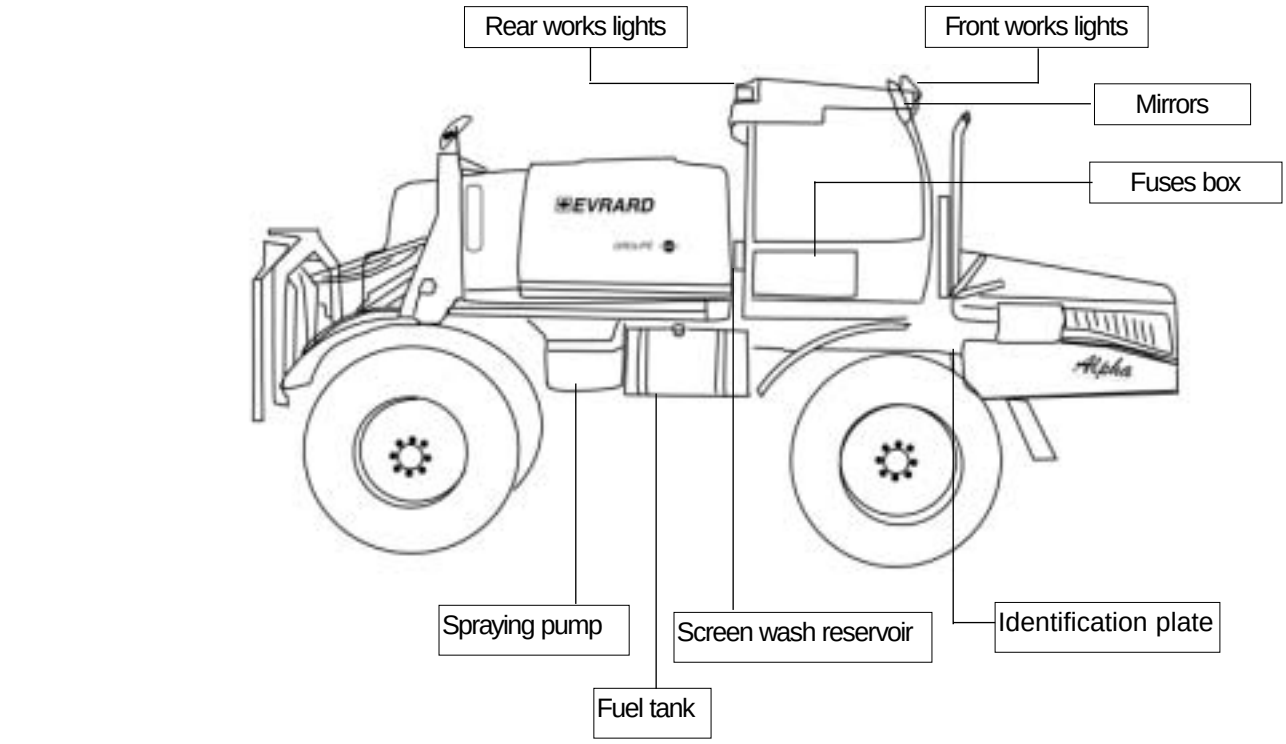
Designation	Volume V (L)	Max allowable pressure PS (bar)	Allowable temperature range TS (°C)	Allowable pressure ratio Pmax / Po	Allowable pressure range Pmax - Pmin (bar)	Proof pressure PT (bar)	Work Fluid
0.075.250	0.075	250	-10°C / +80°C	4	210	375	—
0.16.250	0.16	250	-10°C / +80°C	4	210	375	
0.32.210	0.32	210	-10°C / +80°C	4	175	315	
0.50.210	0.50	210	-10°C / +80°C	4	175	315	
0.75.160	0.75	160	-10°C / +80°C	4	135	240	
0.75.210	0.75	210	-10°C / +80°C	4	175	315	
0.75.330	0.75	330	-10°C / +80°C	4	150	495	
1.0.330	1	330	-10°C / +80°C	4	275	495	
1.4.140	1.4	140	-10°C / +80°C	4	120	210	Mineral oil (Fluid Group2)
1.4.210	1.4	210	-10°C / +80°C	4	180	315	
2.100	2	100	-10°C / +80°C	4	80	150	
2.250	2	250	-10°C / +80°C	4	180	375	
2.4.250	2.4	250	-10°C / +80°C	4	180	375	
4.5.250	4.5	250	-10°C / +80°C	4	180	375	

*For any other pressure or temperature, you will have to contact Olaer.
**For water compatibility with any other fluid, you will have to contact Olaer.

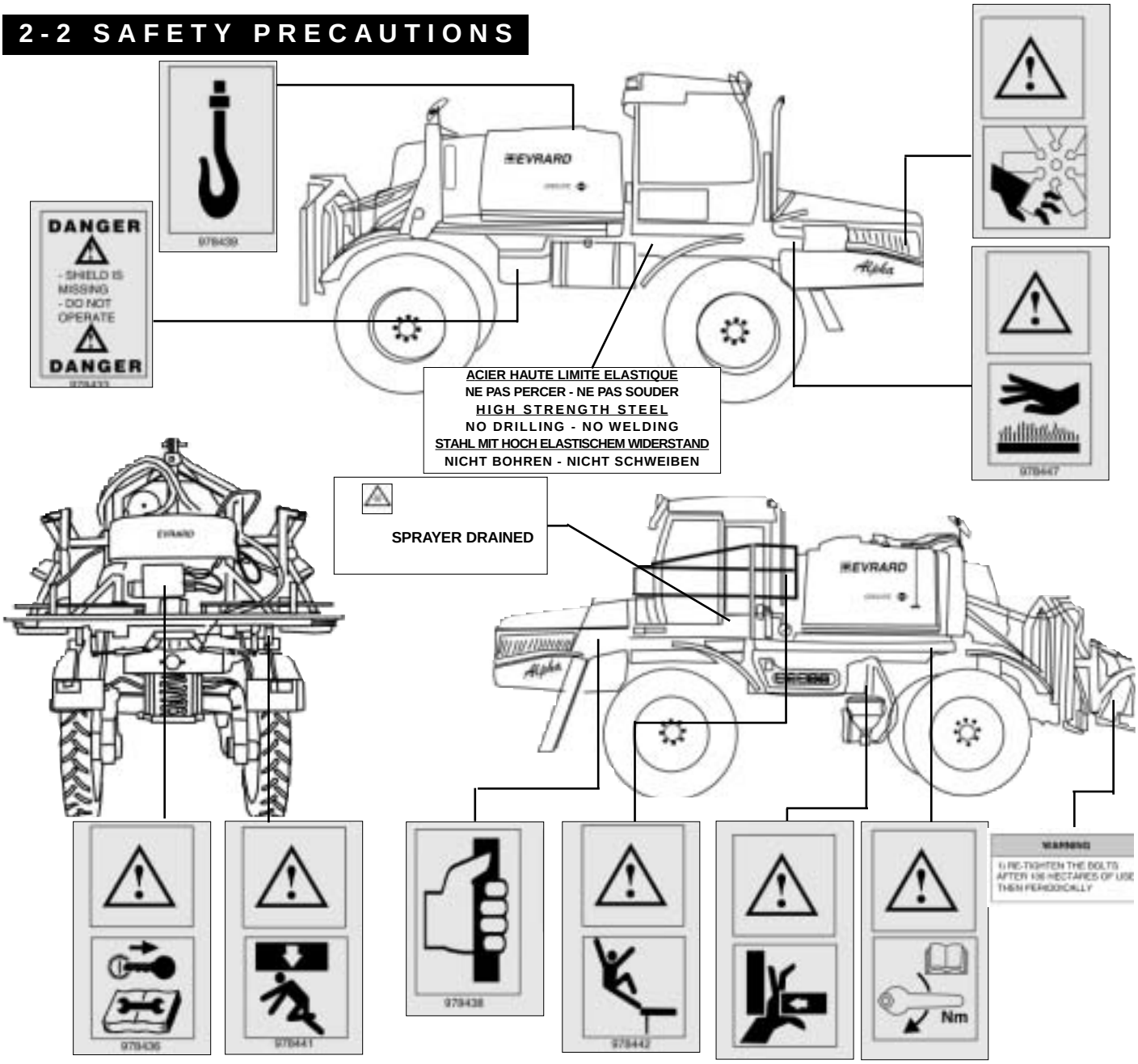
2- DESCRIPTION OF ALPHA SPRAYER

2-1 MAIN EQUIPMENT IDENTIFICATION





2-2 SAFETY PRECAUTIONS



Danger of falling part

use ladder

Danger of user error

Hot parts, danger of burning

Check periodically the aluminium boom

Do not use if all protection guards are missing

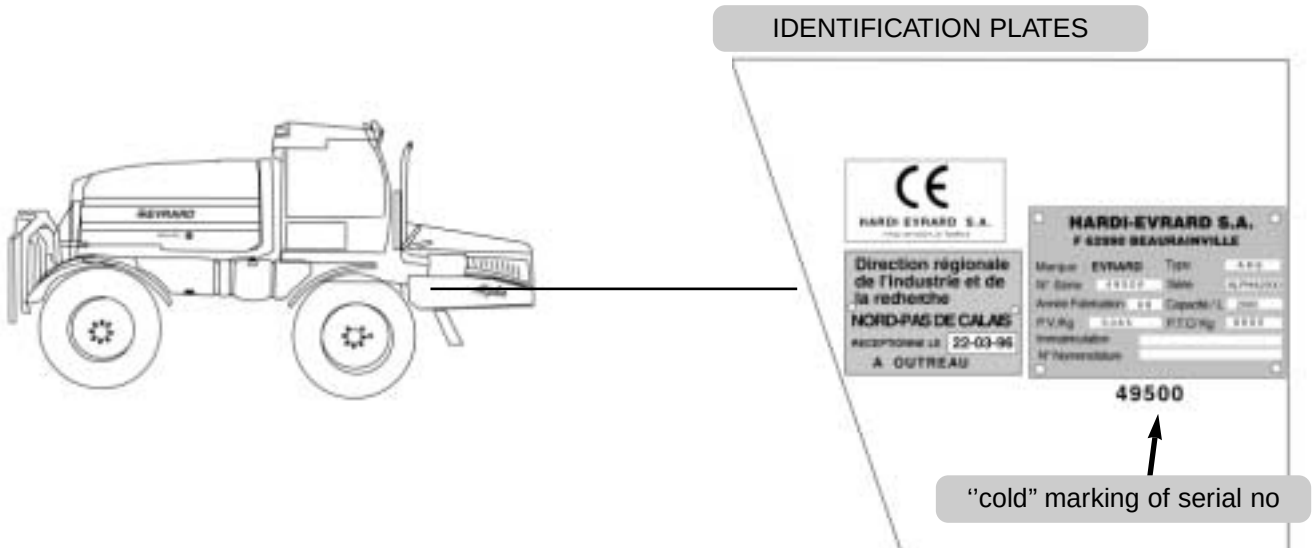
see operating and maintenance book

SPRAYER DRAINED

Spraying circuit drained with compressed air (winter period)

2-3 IDENTIFICATION

The information relating to the identification of the self-propelled ALPHA appears on a plate placed on the right-hand side of the machine. (serial number, type of model, manufacturing date, capacity of main tank, empty and full weights).

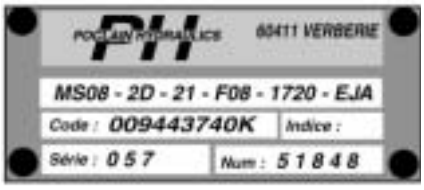


Maker :	**EVRARD**
Serial number :	**(*5 numbers*)**
Please use the serial number for information and to order parts for your sprayer	
Type : general type of the self-propelled.	**AH11**
Serial : model	***ALP4100***
Capacity / L : tank nominal capacity	***4100***
''P.V./ Kg'' : empty weight (*****)	***8780*** *(1)*
''P.T.C./ Kg'' : full weight (*****)	**13660** *(1)*

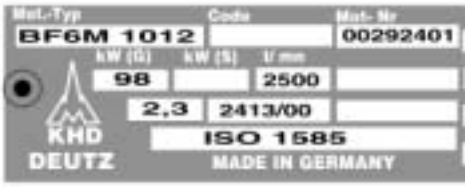
(*) 28m HAZ sxS11 2xS18 580/70R38

HYDROSTATIC PUMP PLATE

CAB PLATE



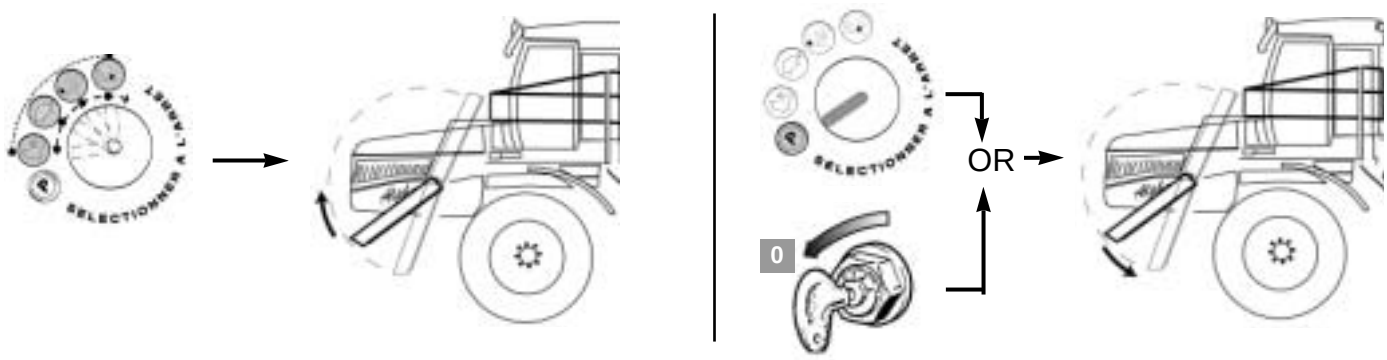
HYDRAULIC WHEEL PLATE



ENGINE PLATE

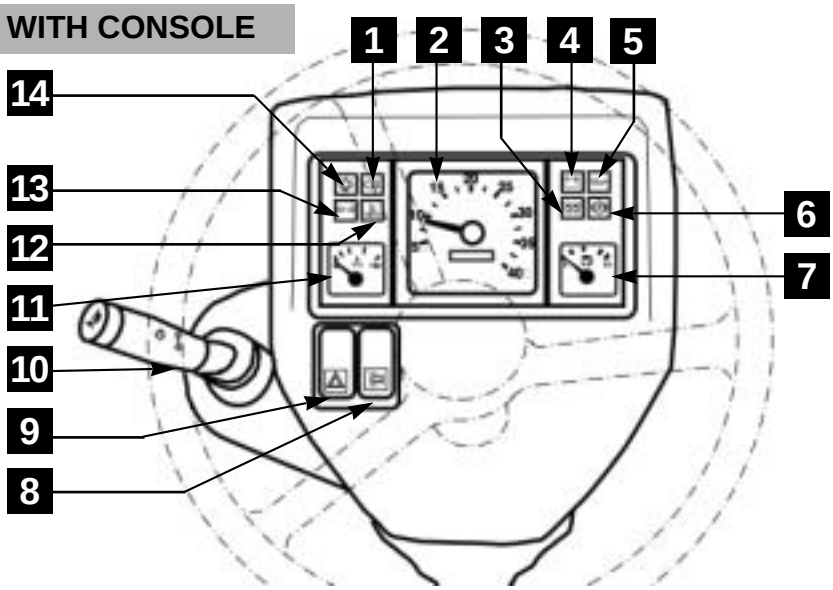
2-4 CAB ACCESS

When the machine is stopped, the ladder is at low position.
- To raise automatically the ladder, start the engine **AND** release the parking brake .
- To come down the ladder, stop the engine **OR** operate the parking brake.



2-5 CONSOLE DESCRIPTION

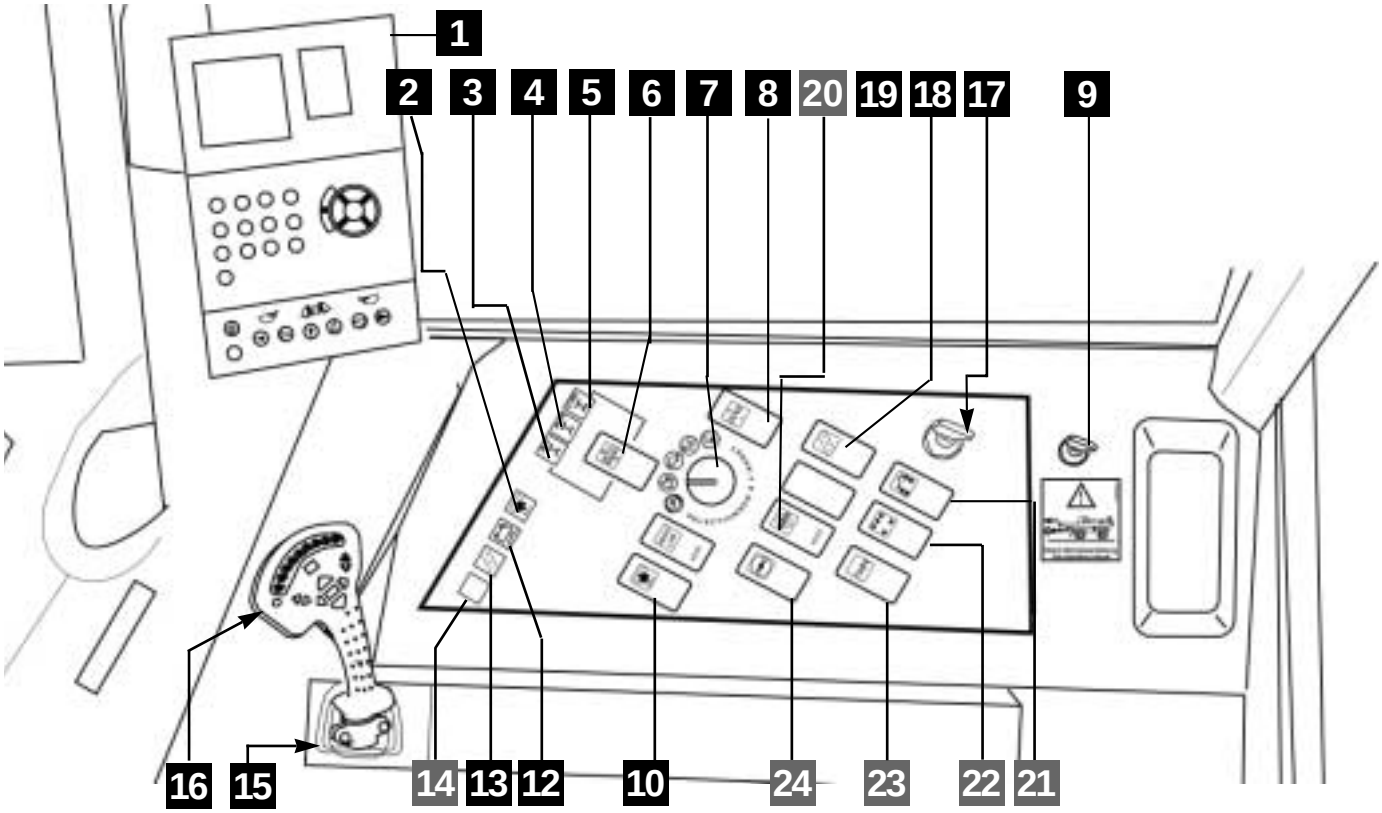
2-5-1 STEERING COLUMN WITH CONSOLE



1. Head lamp, main beam
2. Rev. counter and hour meter
3. Pre Heating light
4. Battery charge warning lamp
5. Engine oil pressure warning lamp
6. Parking Brake Light
7. Fuel gauge
8. Rotating amber warning beacon switch
9. Hazard warning light switch
10. Multi-function control switch
11. Engine temperature gauge
12. Engine temperature and coolant gauge light
13. Direction indicator warning lamp
14. Position lamp and dipped beam control lamp

Horn

2-5-2 CONSOLE



1 Hardi NOVA

2 Pump engagement light

3 Steering alignment light front

4 Steering alignment light rear

5 4 Wheel steering mode light

6 4 Wheel steering mode switch

7 Speed selector switch(rotating)

8 Throttle switch

9 Emergency unbrake switch (towing) 'Dyna+' version

10 Liquid pump engagement switch

12 Isolator warning lamp

13 Road security lamp

14 Oil pressure control control lamp (combined brake)

15 Joystick forward/reverse

16 Hydraulic and spraying control

17 Ignition switch

18 Road security switch

OPTIONS

19 Not used

20 Anti-skid switch (optional)

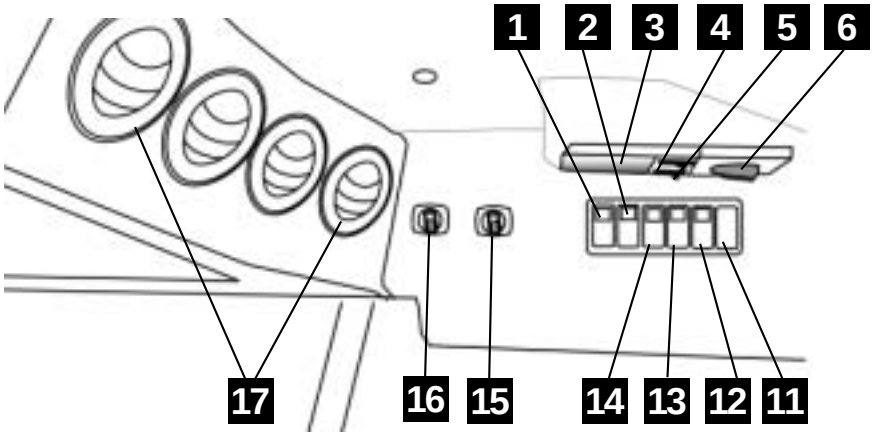
21 Not used

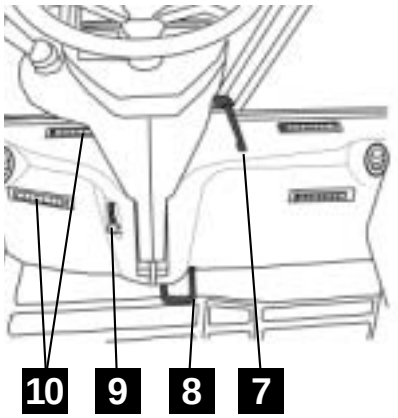
22 Not used

23 Not used

24 Not used

2-5-3 CAB ACCESSORIES



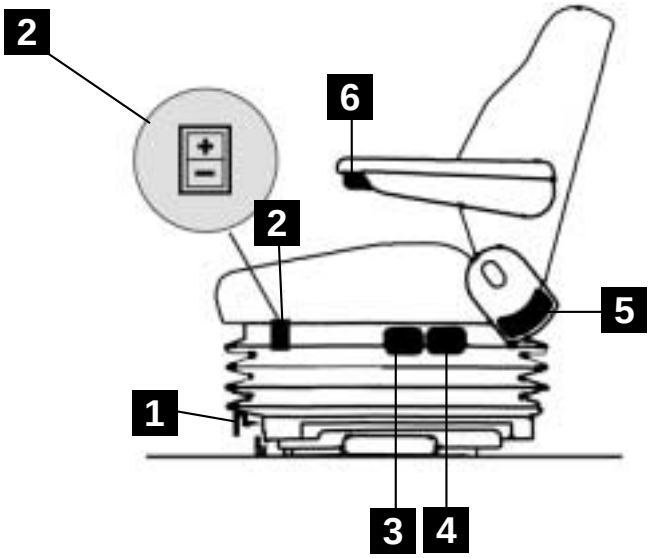


1. Windscreen wiper switch
2. Windscreen washer switch
3. Interior light
4. Map light switch
5. Map reading light switch
6. Map reading light
7. Steering column height adjustment
8. Steering column angle adjustment
9. Heater temperature control
10. Adjustable air vents
11. work lights switch (optional)
12. Rear work lights switch
13. Front work lights switch
14. 2 Speed fan switch
15. Air conditioning fan control 3-speed switch
16. 3 Speed fan switch, air conditioning
17. Air conditioning air vents

2-6 DRIVER'S COMFORT

2-6-1 SEAT

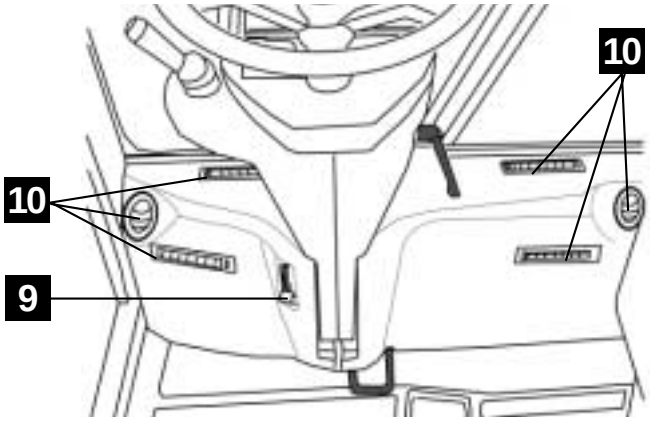
As this is mounted on hydraulic shock absorbers and integrated longituginal suspension, it protects the driver from shaking which inevitably occurs during driving. The various position adjustments, made by means of identifiable levers, improve comfort. The body-contoured seat and back cushions are fitted with aerated fabric which is pleasant to the touch and very strong.

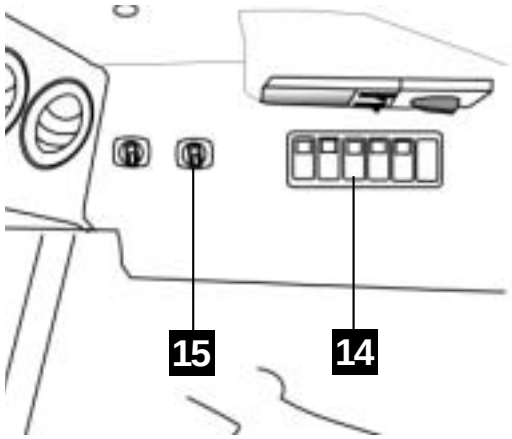


1. Longitudinal adjustment.
2. Adjustment according to weight
3. Front seat cushion angle adjustment
4. Back seat cushion angle adjustment
5. back angle adjustment
6. Arm rest adjustments.

2-6-2 HEATING

The cab heating is provided by the DEUTZ engine. A ventilation unit with adjustable air vents located on both sides of the cab provides heating and window de-misting





1- Adjust the temperature by means of the thermostat **(9)**

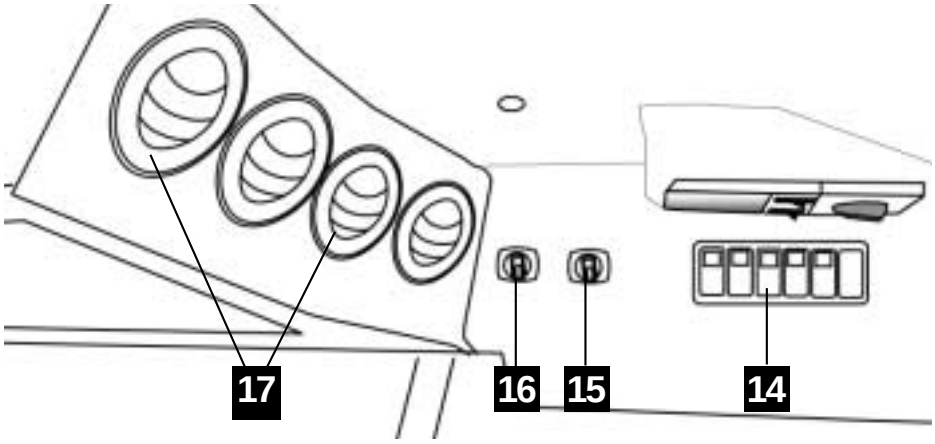
2- Set the flow of warm air by turning the 2-speed fan switch **(14)**

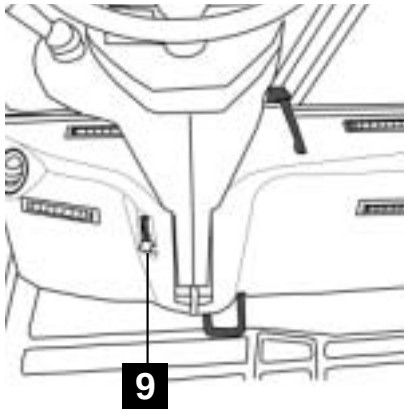
3- Stop the air conditioning by turning the switch **(15)**

4- Open and position the air diffusers **(10)**

2-6-3 AIR CONDITIONING

This includes a unit fitted high up in the cab and a compressor driven by the DEUTZ engine..





1- Adjust the temperature by means of the thermostat **(16)**

2- Set the flow of cold air by turning the 3-position switch **(15)**

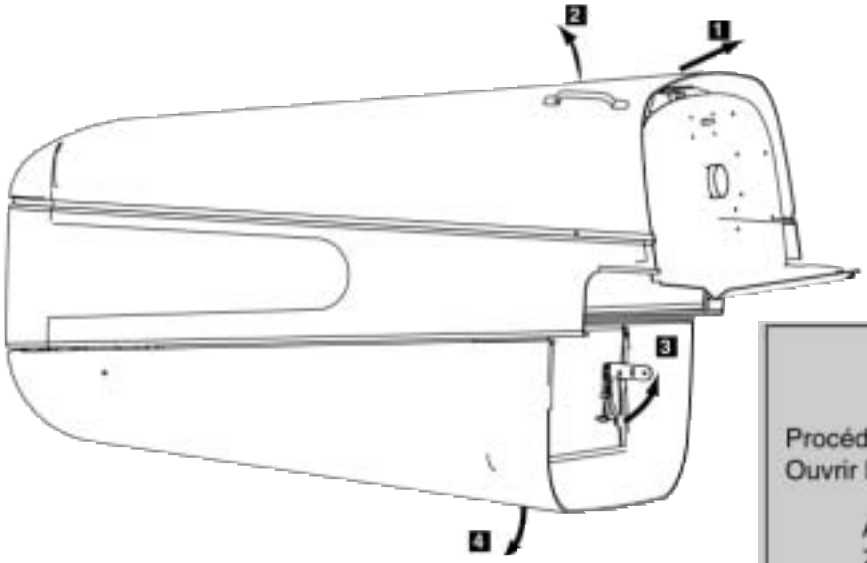
3- Switch off the warm air **(14)** and set the heater temperature control **(9)** and set the heater temperature control to minimum.

Open and position the air diffusers **(17)**

ALWAYS KEEP THE CAB DOOR CLOSED WHEN AIR CONDITIONING IS FUNCTIONING

2-7 ENGINE

2-7-1 ENGINE ACCES

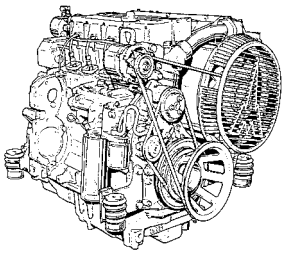


Engine bonnet opening procedure :
Open upper part before lower part

Procédure d'ouverture du compartiment moteur :
Ouvrir le capot supérieur avant la partie inférieur

Achtung bei öffnen der motorhaube :
Zuerst obere, dann untere Haube öffnen

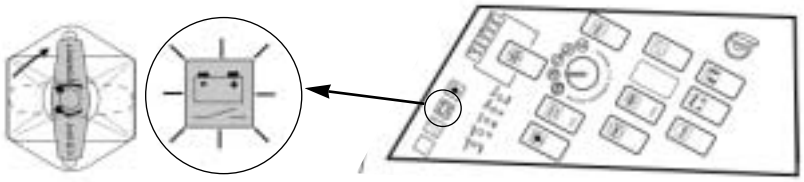
2-7-2 STARTING THE ENGINE

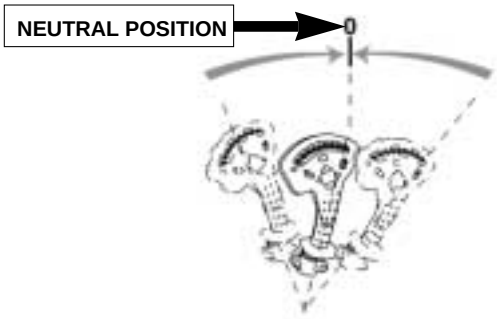


Before starting, the following points must be checked :
- Engine oil level
- Coolant level
- Fuel gauge
- Hydraulic reservoir oil level

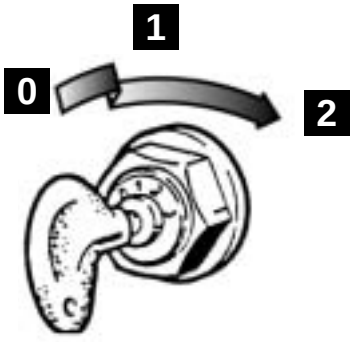
For futher details, see the MAINTENANCE section of this manual and the engine instruction book

- Turn the battery cut-out vertically; the cut-off battery warning lamp lights up.





- Place the joystick control lever in the neutral position
A position detector ensures safety when starting



- Turn the ignition key to pos. **1**, the three warning lamps light up and the Cut-off battery goes off

Battery charge →

← Engine oil pressure

Pre-heating →

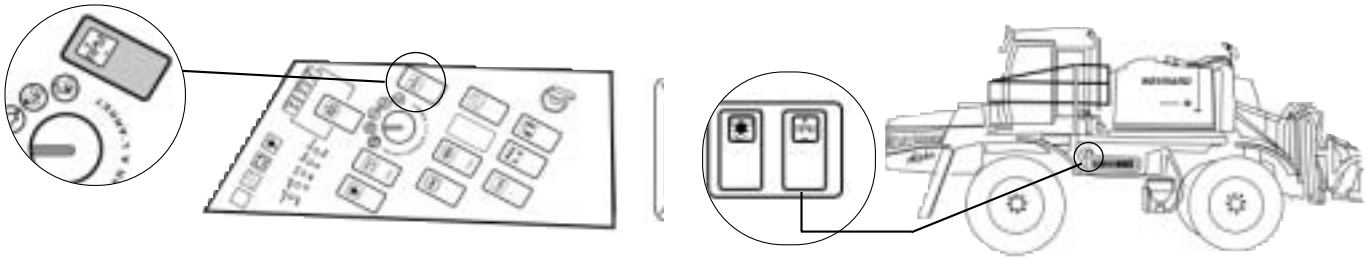
- Turn the ignition key to pos **2** to start the engine, then the pre-heating lamp goes off.
- Release the ignition key as soon as the engine is running, then the engine oil pressure warning lamp and the battery charge warning lamp go off.

WARNING

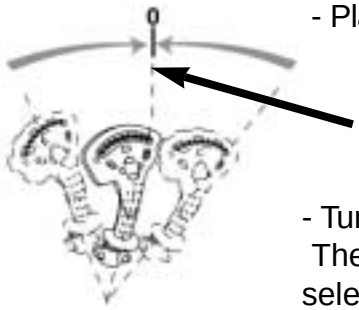
IF THE ENGINE OIL PRESSURE WARNING LAMP STAYS, STOP THE ENGINE IMMEDIATLY

2-7-3 ENGINE ACCELERATOR

The engine accelerator is provided with two electric control switches **(**on cab panel and outer).



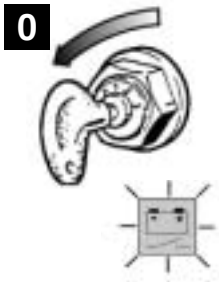
2-7-4 STOPPING THE ENGINE



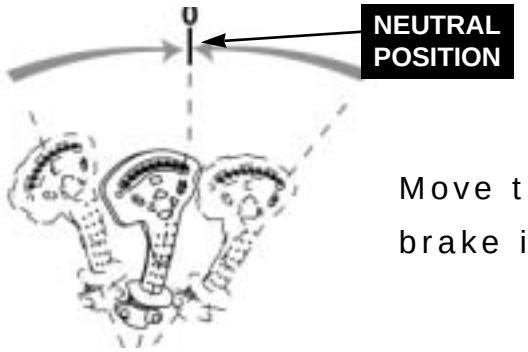
- Place the joystick lever to the ‘’neutral” position

- Turn the selector to position parking brake ***‘’P ‘’***
  The two parking brake warning lamps light up simultaneous (placed on the selector and the instrument column panel)

- Réduce engine speed before stopping, in order to stabilize the engine temperature



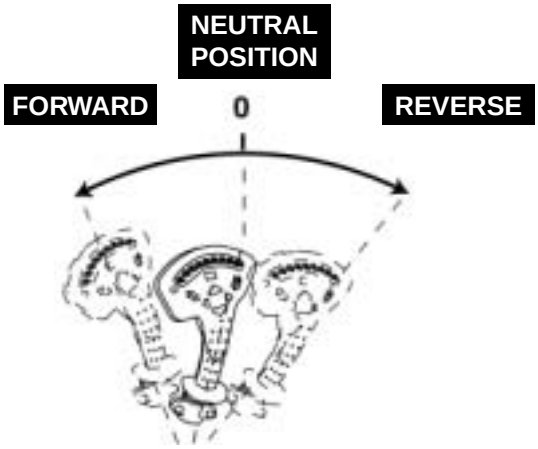
- Turn the switch key to the left ; The two-warning lamps light up. The isolator warning lamp light up, as soon as the switch key is on the position **0**

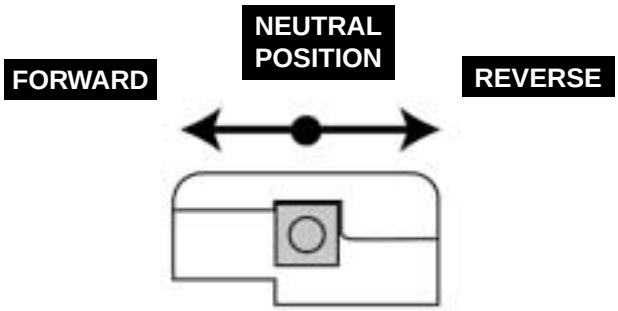


Move the advance lever gently as the hydraulic brake is very effective.

2-8 ADVANCE CONTROL

2-8-1 DRIVER'S CONTROL LEVER





- **Moving** the self-propelled forward by tilting the control lever forward
- **Moving** the self-propelled reverse by tilting the control lever back

- **Braking** and **stopping** the self-proppeled in the ''neutral position" is carried out by indexing the lever half-away along its travel.

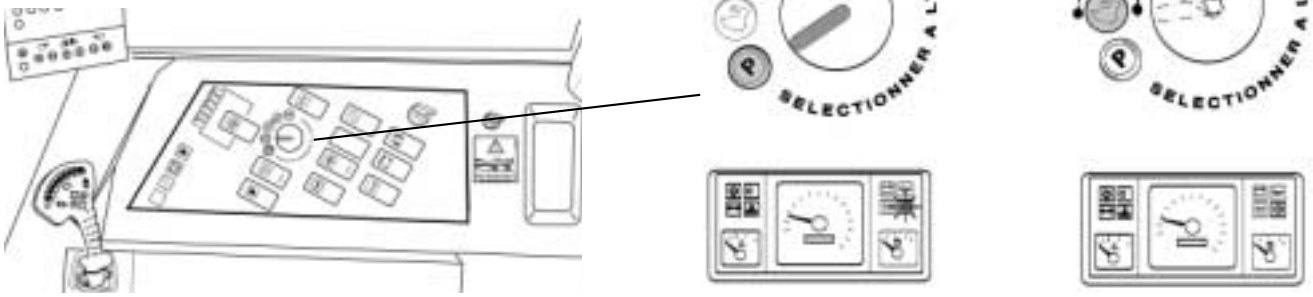
2-8-2 BRAKE ENGINE

WARNING

The hydrostatic transmission calls for high engine speed, giving the main hydraulic pump its maximum **drive** and **braking** performance. For this purpose :

adjust the accelerator lever progressively to an engine speed of a **minimum of 1800 to 2000 r.p.m.** before moving off.

2-8-3 PARKING BRAKE

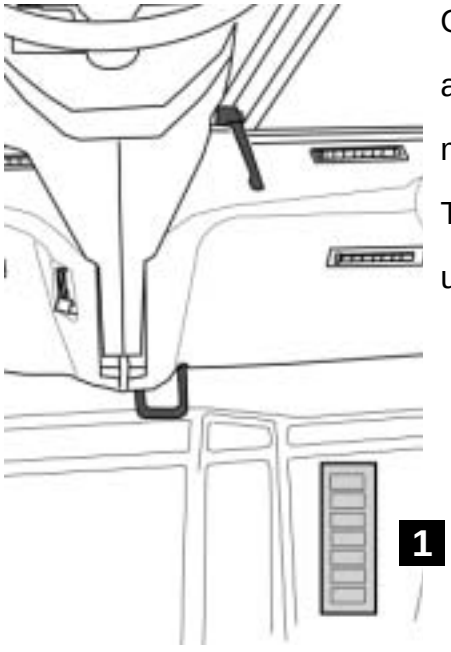


In case of loss of hydraulic pressure the parking brake will engage automatically

WARNING

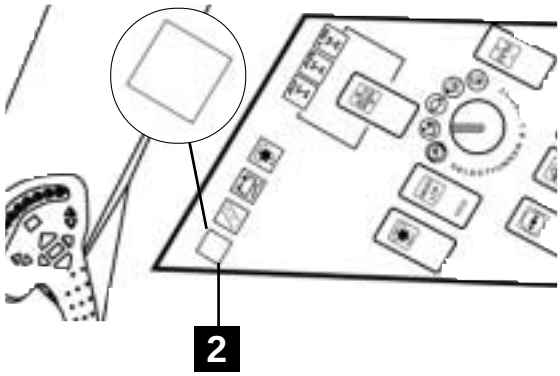
FOR YOUR SAFETY, NEVER ACTIVATE THE PARKING BRAKE WHEN THE SELF-PROPELLED IS MOVING !

2-8-4 COMBINED EMERGENCY / PARKING BRAKE



On some models, the sprayer is fitted with a combined emergency and parking brake, which can be variable proportioned. On this model, the operating pedal **(1)** is placed on the floor.

This manoeuvre can also be proportioned in order to apportion the use of brake power in emergency situation.



If the oil pressure control lamp **(2)** lights upn, the oil pressure is too low for the brakes to be activated.

Stand by and keep the engine on till sufficient oil pressure has been generated. The control lamp will then turn off and the Alpha Twin Force can be operated again.

2-8-5 SPEED SELECTOR

FAST Speed

Used for road transport where high speeds are necessary.
Speed range : **0** .. **25** km/h

Slow SPEED

Used for field where full traction are necessary.
Speed range : **0** .. **12.5** km/h..

" INTERMEDIATE" Speed

Used generally for spray in the field when driving uphill in slippery condition where change in weight distribution will cause spinning front wheels
Speed range : **0** .. **18** km/h

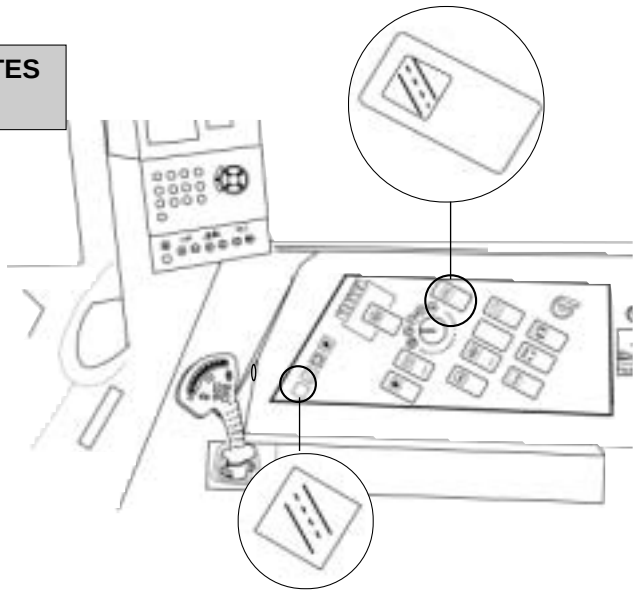
Used generally for spray in the field when driving downhill in slippery condition where change in weight distribution will cause spinning rear wheels.
Speed range : **0** .. **18** km/h.

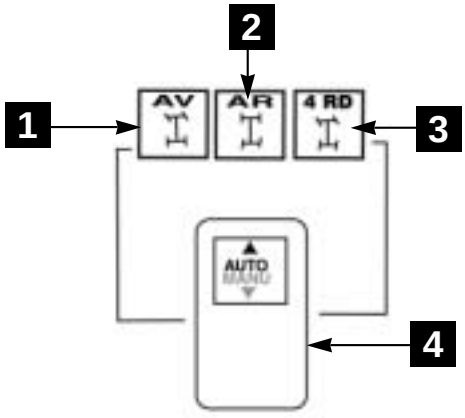
2-9 WHEEL STEERING

2-9-1 DESCRIPTION

The steering is of the hydrostatic type. If the pump fails to work, the steering can be operated in a closed circuit by means of the ‘’ORBITROL” distributor. The pump also operates the hydraulic circuit by means a priority valve.
With a distributor, 2 position pick-ups, a switch and a pedal, the 2-wheel steering functions can be used.

1- SET THE SWITCH TO ‘’*ROAD SECURITY*” TO OPERATES THE 4-WHEEL STEERING FUNCTIONS





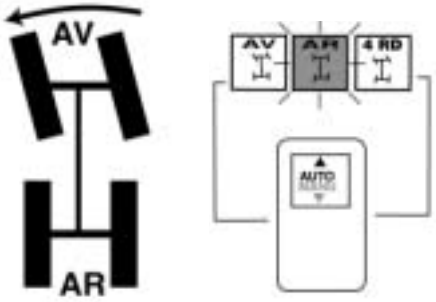
1 **FRONT** wheel warning lamp

2 **REAR** wheel warning lamp

3 **4 -WHEEL** steering warning lamp

4 **AUTO / MANUAL** switch

2-8-2 TWO WHEEL STEERING

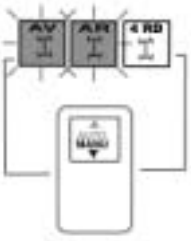


- Set the switch to ***‘AUTO’.***
- Turn the steering control so as to place the rear wheels in straight position; the‘REAR’ warning lamp goes on.

In this operating mode, only the front wheels can steer and the rear wheels remain straight

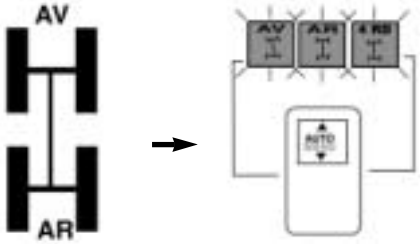
2- wheel steering is operating

2-9-3 FOUR WHEEL STEERING



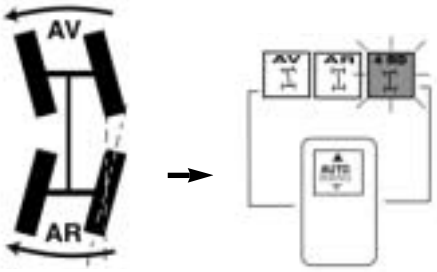
In this operating mode, the front and rear wheels steer at the same time and opposite direction.
For this purpose :
- Set the switch to *'AUTO'.*
- Press the 4-wheel pedal.
- Turn the steering control so as to place the front and rear wheels in straight position

- Keep the pedal depressed as long as 4-wheel-steering is required.



-The green warning lamp is activated (front and rear wheels are in straight position)
- Front and rear wheels steer in opposite direction.

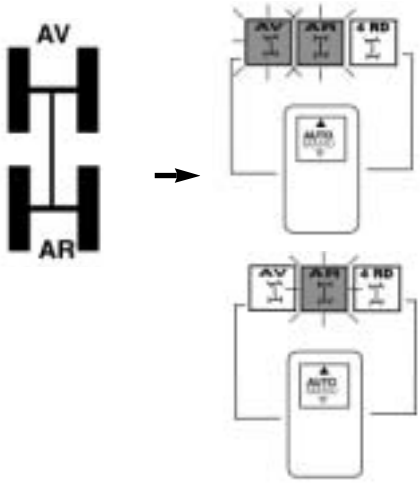
4- wheel steering is operating



When the wheels are turned,the red warning lamp goes out but green warning lamp is still activated..

To return to 2-wheel-steering :

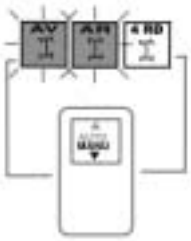
- Release the pedal



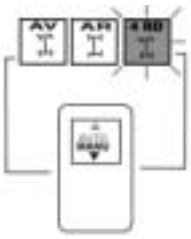
- Turn the steering control so as to return the rear wheels to the straight position, *'REAR' and 'FRONT'* warning lamp light up. Green warning lamp goes out.

2- wheel steering is operating

2-9-4 TWO WHEELS IN ‘’CRAB” FORMATION



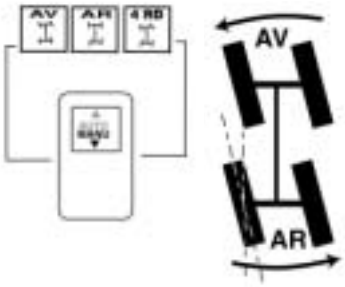
In this operating mode an adapted crab steer can be done by using the steering wheel and pedal.
For this purpose :
- Set the switch to ***‘MANU’***.
- Turn the steering control so as to place the front and rear wheels in straight position; the **‘*FRONT”*** and ‘***REAR*’** warning lamp goes on.



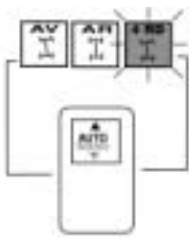
- Press the 4-wheel pedal.
-Turn the steering control so as to put the rear wheels position is required. The warning lamp ***‘REAR’*** goes out.

- Release the pedal

In this operting mode, only the front wheels can steer and the rear wheels remain in the same position

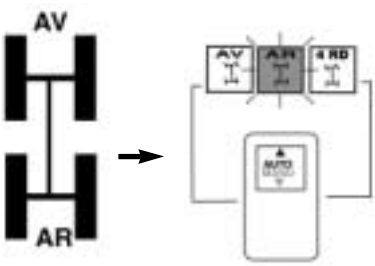


2- wheel steering in ‘’CRAB” is operating



For returning to 4-wheel steering :

- Set the switch to *‘AUTO*’ . The warning lamp *‘4 wheel steering*’ goes out

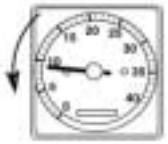


- Turn the steering control so as to the rear wheels in straight position. The warning lamp *‘REAR*’ goes on

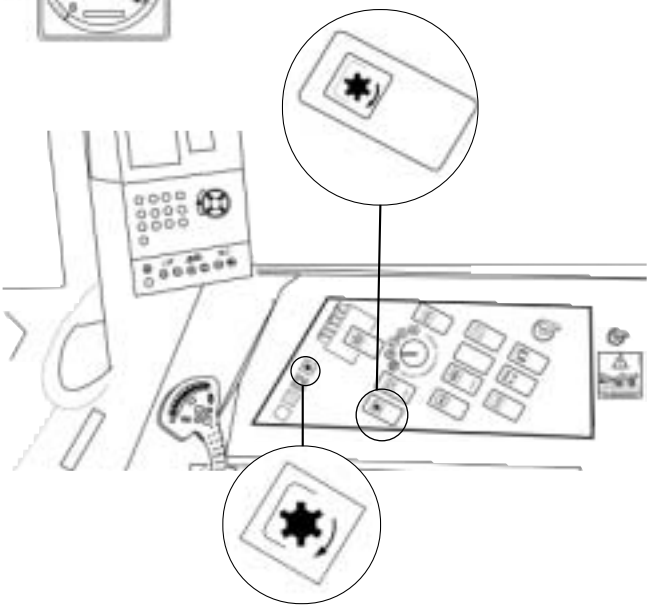
2- wheel steering is operating

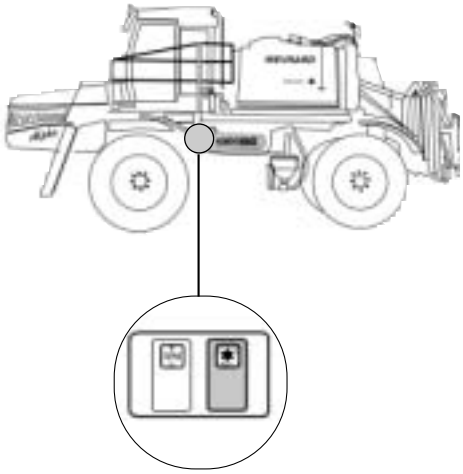
2-10 SPRAY PUMP

WARNING
IF SPRAY PUMP IS EMPTY IT IS ESSENTIAL TO PRIME IT



- Operate the switch ‘’***RPM*** ” ref **1** to reduce speed to minimum before engaging



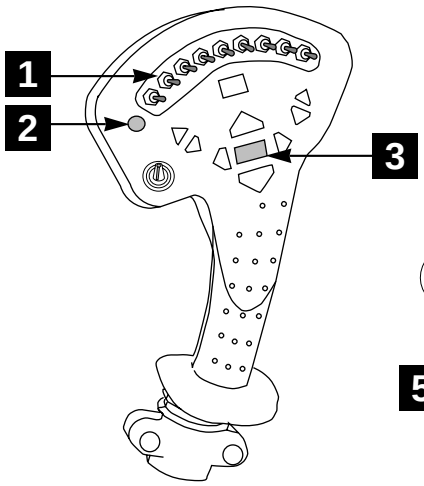


- Switch on the switch.

A lamp indicates that the spray pump is engaged.

2-11 BOOM FUNCTIONS

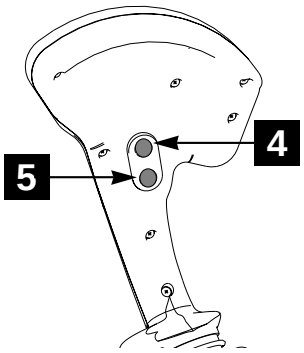
2-12-1 SPRAY AND AIR ANGLING CONTROL



1 Individual spray section switches

2 Spray control lamp

3 Spray on/off

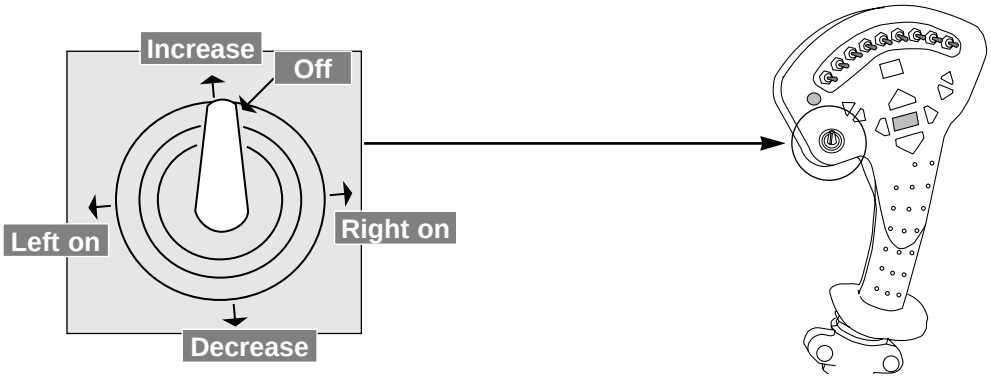


4 Recall TWIN preset 1 **(forward)**

5 Recall TWIN preset 2 **(back)**

2-11-2 FOAM MARKER CONTROL

- Press the switch to the left or right-hand side ,to select the hand side foam deposit
- Press the switch to up or down-hand side to adjust distance between blob interval
- Press the switch to stop the foam marker



For further information, Please refer to the Hardi NOVA manual

2-12 BOOM FUNCTIONS

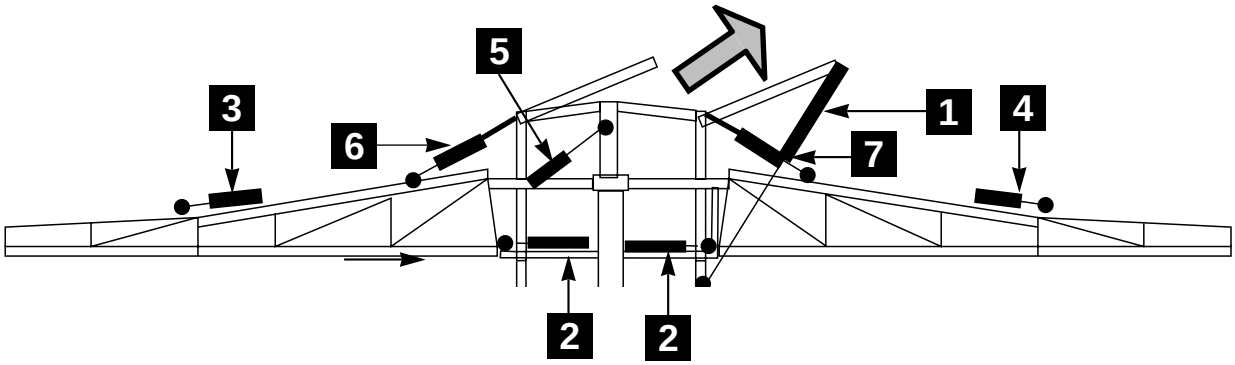
2-12-1 SAFETY

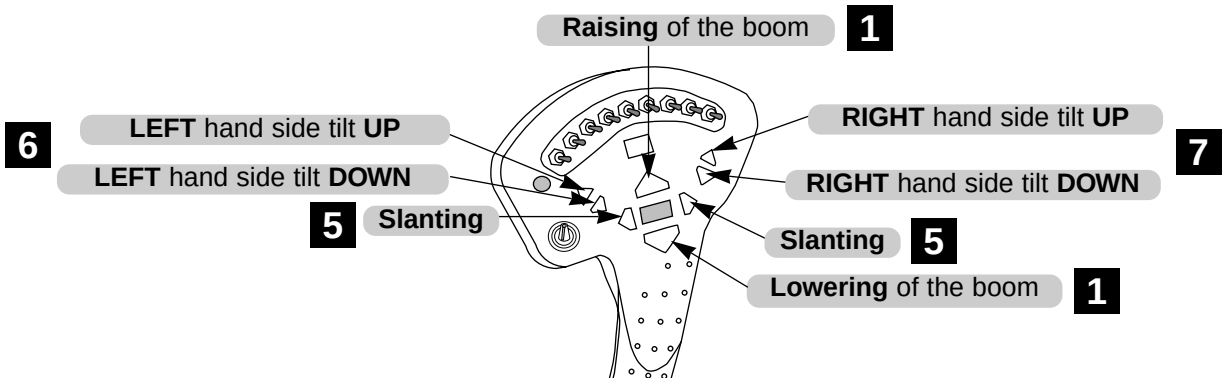
- The folding functions must only be operated when sprayer is stationary on a flat area.

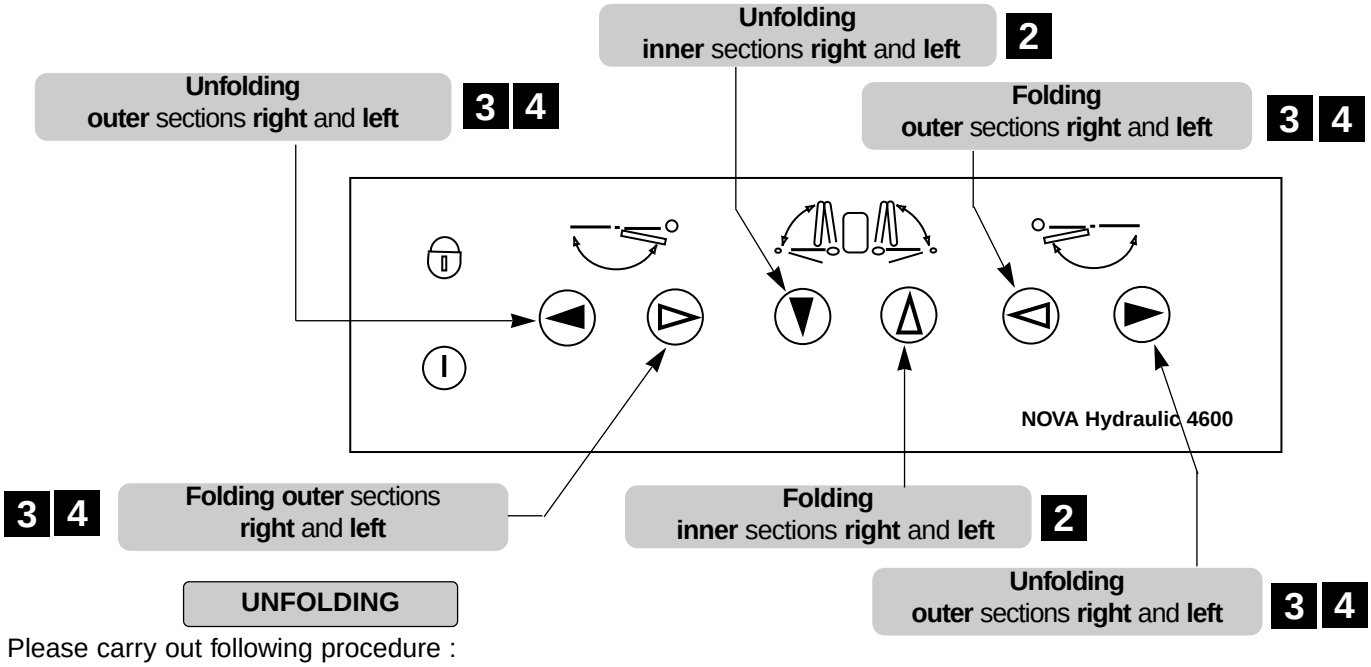
Before any movement of the boom, make sure that no ostacle is close to sprayer (post, an individual, road, etc...).

- Reduce engine speed before using the boom hydraulic function.

2-12-2 ''HAZ'' BOOM







UNFOLDING

Please carry out following procedure :

- Operate the switch **(1)** to lift the boom clear of the rear transport brackets. Ensure that the booms are clear from the transport brackets before unfolding is commenced
- Operate the switches ***(2) (3)*** to open inner sections
- Operate the switches ***(3) (4)*** to open outer sections

Operate switch **(1)** to lower the boom and adjust above the crop or ground level

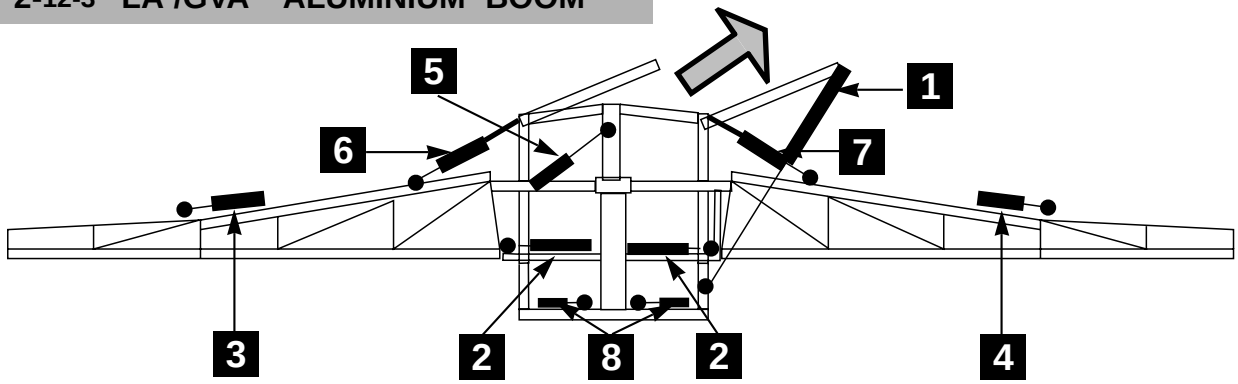
- Operate the switch ***(5)*** to slope the boom.
- Operate the switch **(7)** to raise RIGHT tilt
- Operate the switch **(6)** to raise LEFT tilt

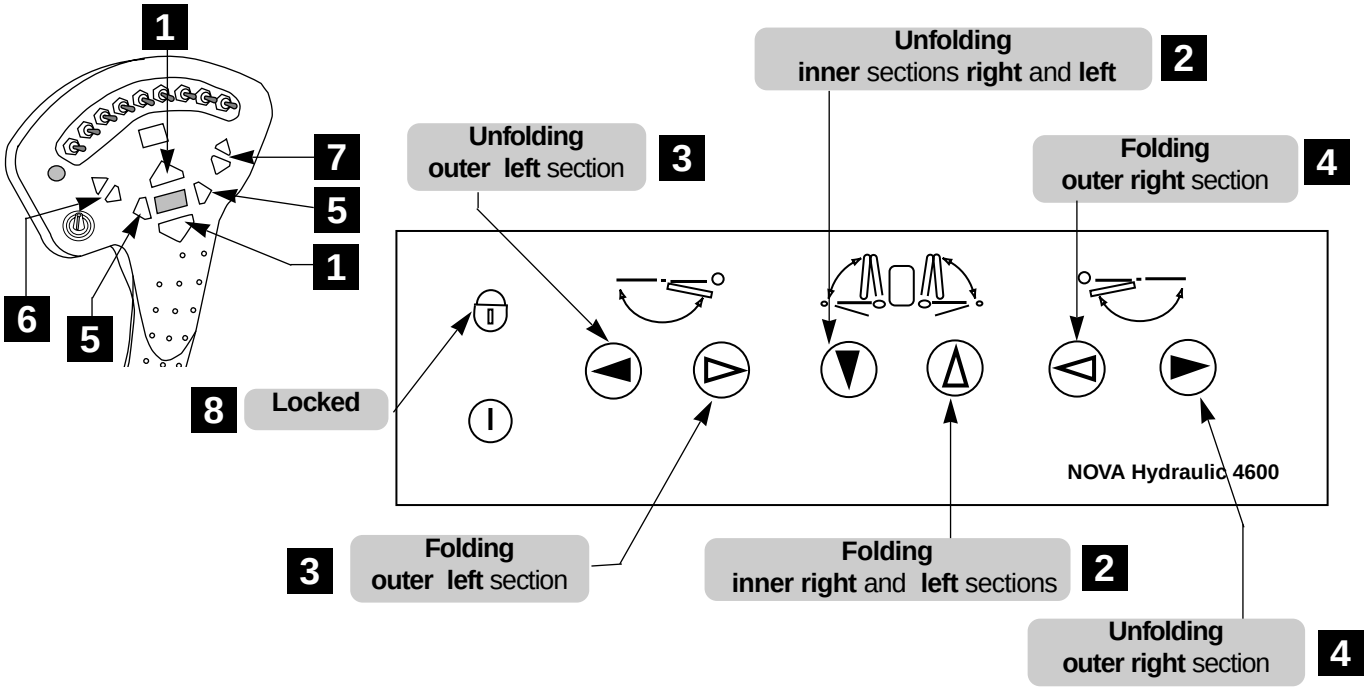
FOLDING

Please carry out following procedure :

- Operate the switch ***(5)*** to control the boom horizontally
- Operate the switch ***(1)*** to lift the boom to upper position
- Operate the switch **(3) (4)** to close the outer sections
- Operate the switch ***(2) (3)*** to close the inner sections
- Operate the switch ***(1)*** to lower the boom until boom rests on rear transports brackets.

2-12-3 ''LA /GVA'' ALUMINIUM BOOM





UNFOLDING

Please carry out following procedure :
- Operate the switch **(1)** to lift the boom clear of the rear transport brackets. Ensure that the booms are clear from the transport brackets before unfolding is commenced
- Operate the switches **(2)**
- Operate the switches ***(3) (4)*** to open outer sections

Operate switch **(1)** to lower the boom and adjust above the crop or ground level
- Unlocked the boom ***(8)***
- Operate the switch ***(5)*** to slope the boom.
- Operate the switch **(7)** to raise RIGHT tilt or operate the switch **(6)** to raise LEFT tilt

FOLDING

The folding movement shoul be carried out on level ground

Please carry out following procedure :
- Operate the switch ***(5)*** to control the boom horizontally
- Operate the switch ***(1)*** to lift the boom to upper position
- Operate the switch ***(8)*** to lock the boom
- Operate the switch ***(3) (4)*** the outer sections
- Operate the switch **(2)** to close inner sections
- Operate the switch ***(1)*** to lower the boom until boom rests on rear transports brackets.

The locking of the boom is used to unfold one outer section at a time, for this purpose :
- Operate the switch ***(8)*** to lock the boom
- Operate the switch to close the LEFT outer section **(13)** or to close the RIGHT outer section ***(4)***

The locking must be only used when a obstacle is close to the boom (post, road, etc. ...).

2-13 AIR ASSISTANCE

With TWIN air assistance, energy is added to the spray droplets to improve control with the spray liquid. Using TWIN it is possible :

- Carry the spray droplets safety to the target and increase plant deposit
- Minimize 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

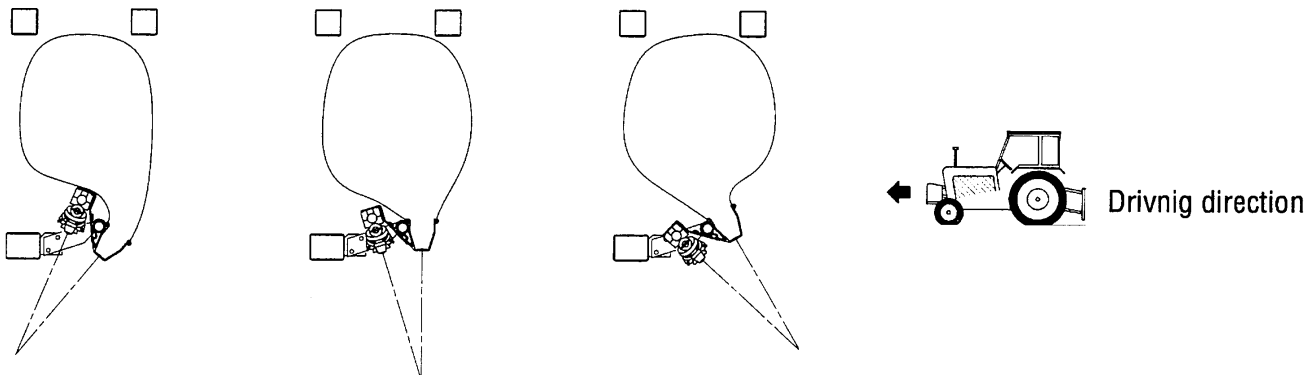
2-13-1 AIR SPEED / AIR VOLUME

The fan speed is infinitely variable and can produce from 0 to 35 m/s (78mph) air speed at the air outlet. This equals from 0 to 2000 m^3 air/m boom/hour (3,872 CFM/A boom/hour).
The air speed must be adjusted to the spray job. The tables below give a guide line.

Air asssistance				
	Low	Medium	High(H)	Very high (VH)
Air speed (m/s)	5-10	10-20	20-30	30-35
Fan r.p.m.	400-1000	1000-1900	1900-2700	2700-3100
	Oil pressure (bar)			
Boom 18 m	20-40	40-75	75-125	125-180
Boom 20-21 m	25-50	50-90	90-150	150-200
Boom 24-28 m	30-70	70-140	140-190	190-240

2-13-2 ANGLING OF AIR AND LIQUID

The main purpose of the TWIN angling system is to counteract for the negative influence which wind direction and driving speed have on the quality of the spray job. Further the ‘’co-angling” at air and liquid can help ‘’opening” dense crops for better penetration.
The TWIN FORCE air system can be set at any angle from 40° forward to 30° back (defined by air stream)



Spray job	Air assistance
Bare ground / low vegetation Early stage row crop	Low / Medium
Spraying only the top of a crop i.e. Ear spraying in wheat *	Low
Penetration in open crop *	Medium / High
Penetration in dense crop *	High / Very high

* Can be checked with water sensitive paper

The air speed and angling must always be adjusted individually for each spray job and the given weather conditions.
It is always a good idea to get used to a new sprayer out in a field using only water in the tank.
On this occasion the following routine for air adjustment should be practised :

- Start with air vertical
- Set the air speed ..... A
- Find the best angling ..... B
- Readjust the air ..... A

IMPORTANT ! Fine turning of air speed and angling will often be necessary all through the spraying job.
It is easiest to find the best air setting to reduce drift when the sun is low and behind the bom (backlight)
These conditions make the drift more visible

A A Setting of 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 minimum setting.
2- Then increase the air speed until you see drift again - note maximum setting.
3- Now you know the range of air speeds that can be used with minimum drift.

Bare ground / low

The range of air speeds is usually very small.

Taller crop

The taller the crop the wider the range of air speeds that can reduce drift.

At higher wind speeds

More air is needed on the sprayer and it is advisable to drive more slowly and use minimum boom height (40 cm)/(16 in).

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

Step 2 : Set the optimal air speed within possible the range mentions above.

Conditions	Air speed recommendations
Bare ground/ low crop :	Use maximum air within the possible range
Taller crop :	Deeper crop penetration requires more air on the sprayer (if you are in doubt check with water sensitive paper)
Forward speed :	Higher forward speeds require more air on the sprayer
Volume rate :	Lower volume rates require more air assistance to avoid drift

B Angling of air and liquid, 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.

NOTE ! Often it will be necessary to drive with two different anglings, so the angling is changed when changing driving direction after turning at the headland.

Wind direction	Angle / air speed
Head wind :	Angle forward
Down 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.

Crop condition	Angle / air speed
Bare ground : low vegetation	Low air speed and angling back will often be the best setting to avoid
Dense crop:	The angling feature is ideal to help opening the canopy and improve penetration. If you follow the crop movement as you are varying the angling you will find at certain settings the crop will open more for penetration

If wind speed, wind direction or for some reason forward speed changes during spraying the optimum angling is likely to change too. Be aware that with certain combinations of air speed and angling you can ‘’close” or flatten the crop and make penetration impossible - follow the crop movement intensively especially when setting the air assistance and keep an eye on the crop all through the application. NOTE !

- It is most important that the sprayer operator is familiar with the above rules of thumb before using the TWIN sprayer.

- All volume rates, pressures and air adjustments stated in the following tables are, of course, guidance. Special conditions regardings climate, crop quality, spraying time and applied chemical can change the procedure. The tables are show practice in northern Europ, and conditions may be very different in the other countries. If you want some local advice you are very welcome to contact the TWIN application expert at the HARDI importer or daughter company in your country.

- The volume rate can generally be reduced to half of what is applied with a conventional sprayer, but with a minimum of 50-60 l/ha at 7-8 km/h. Exceptions are of course liquid fertiliser and herbicides whose selectivity is based large droplets that will only stick to the weeds

- Low drift nozzles can also be fitted on a TWIN sprayer and help reduce drift even further.

- If there is a detailed spraying instruction on the chemical label regarding drop size, spray pressure, spray volume rate etc. this should be followed. Enclose this one bag of water sensitive paper and instruction of how to use with all TWIN sprayers.

2-13-3 WATER SENSITIVE PAPER

USE WATER SENSITIVE PAPER TO HELP FIND THE BEST AIR SETTING. Some time spent in different types of crops with clean water in the tank and some water sensitive paper will be valuable experience for the future work with your TWIN sprayer. The paper can be cut into smaller pieces (to simulate the target) and fixed with double sided tape at relevant places in the crop. Then spray with pure water and check the blue spots (droplets) on the paper. This way you can test different spraying techniques. Water sensitive paper is available at your local HARDI dealer, part No.893211

Rye - Tractor speed 8 km/h

Spray task	Growth Stage Feekes scale	Volume rate l/ha	Nozzle ISO	Pressure bar	Air setting
Herb. spraying, residual type	0	75	F-015-110	2.1	L
Herb. spraying, post-emergence	1-2	100	F-015-110	3.6	L/M*
Autumn fungicide	2-3	75	F-015-110	2.1	M
Herb. spraying, spring	4	75	F-015-110	2.1	M
Growth regulation	5-6	100	F-015-110	3.6	M
Fungicide, Eyespot	5-6	100	F-015-110	3.6	M/H
Fungicide, leaf disease	7-8	100	F-015-110	3.6	M/H
Growth regulation	8-9	75	F-015-110	2.1	M
Insecticide spraying	10-10.5	75	F-015-110	2.1	M
Herb. spraying,	At the latest				
Couch grass	10 days before harvest	75	F-015-110	2.1	M/H

Spring Rape - Tractor speed 8 km/h

Spray task	Growth Stage Feekes scale	Volume rate l/ha	Nozzle ISO	Pressure bar	Air setting
Herb. spraying	Pre-drilling	75	F-015-110	2.1	L
Herb. spraying	Post-drilling	75	F-015-110	2.1	L
Pests	At emergence	75	F-015-110	2.1	L*
Herb. spraying broad-leaf-species	3-4 true leaves	100♦	F-02-110	2.1	L/M
Herb. spraying monocotyledonous species	4 true leaves	100	F-015-110	3.6	M
Pests; blossom beetle	1 beetle/plant when in bud	75	F-015-110	2.1	M
Pests; brassica pod midge and cabbage seed weevil	Beginning flowering	75	F-015-110	2.1	M/H
Pests; brassica pod midge and cabbage seed weevil	At full flowering	75	F-015-110	3.6	H
Fungicide	At end of flowering	100	F-015-110	3.6	H/VH
Herb. spraying, Couch grass + desiccation	2 weeks before harvest	100	F-015-110	3.6	H/VH

♦ If applying full dose rate Benasalox (Benazolin - ethyl + Clopyralid) and Bladex (Cyanazin) in a tank mix, use water rate 150 l/ha.

Winter Rape - Tractor speed 8 km/h

Spray task	Growth Stage Feekes scale	Volume rate l/ha	Nozzle ISO	Pressure bar	Air setting
Herb. spraying	Pre-drilling	75	F-015-110	2.1	L
Herb. spraying	Post-drilling	100	F-015-110	3.6	L*
Volunteer cereal	Pre-emergence	100	F-015-110	3.6	L
Pests	At emergence	75	F-015-110	2.1	L/M*
Volunteer cereal	4 leaf stage	100	F-015-110	3.6	M
Pests	2-3 beetles/ plant when in bud	75	F-015-110	2.1	M
Pests; brassica pod midge and cabbage seed weevil	Beginning of flowering	100	F-015-110	3.6	M/H
Pests	Full flowering	100	F-015-110	3.6	H
Fungicide	Full flowering and until ceasing	100	F-015-110	3.6	H/VH
Herb. spraying, Couch grass + desiccation	2 weeks before harvest	100	F-02-110	2.1	H/VH

Peas (yellow) - Tractor speed 8 km/h

Spray task	Growth Stage Feekes scale	Volume rate l/ha	Nozzle ISO	Pressure bar	Air setting
Herb. spraying	Pre-emergence	75	F-015-110	2.1	L
Pests (pea and bean weevil + thrips)	Post-emergence	100	F-02-110	2.1	L
Herb. spraying	2-5 cm high	100	F-02-110	2.1	M
Fungicide spraying (grey mould + leaf and stem pod spot and pea weevil	Prior to flowering	100	F-02-110	2.1	M/H
Fungicide spraying (grey mould + pea weevil)	14 days later	100	F-02-110	2.1	H
Aphids spraying	At flowering until ceasing	100	F-02-110	2.1	M
Herb. spraying, Couch grass + desiccation by systemic herbicide	2-4 weeks before harvest	100	F-015-110	3.6	H
Withering by contact herbicide	2-4 weeks before harvest	150	F-02-110	4.6	H

NOTE! All volume rates, pressures and air suggestions indicated in these tables are only guiding. Special conditions regarding climate, quality of the crop, spraying time and chemicals applied (burning) may partially change the procedure.

* NOTE! If dust is deposited on leaves the air speed must be reduced.

Potatoes - Tractor Speed 6 Km/h

Spray task	Growth stage	Volume rate l/ha	Nozzle ISO	Pressure bar	Air setting
Herb.spraying	Pre-emergence	75	F-01-110	2.7	L
Herb.spraying	Post-emergence	75	F-01-110	2.7	L/M*
Herb.spraying	Haulm 15 cm high	75	F-01-110	2.7	M
Diseases (potato blight)	1. spraying latest July 1	150	F-02-110	2.6	H/(VH)
Same treatment to be repeated with 10 days' interval until 2 weeks before harvest.					
Desiccation	When the tubers have the size required	200	F-03-110	2.1	H/(VH)

Spring Barley - Tractor speed 8 Km/h

Spray task	Growth stage Feekes scale	Volume rate l/ha	Nozzle ISO	Pressure bar	Air setting
Herb.spraying	2-4	75	F-015-110	2.1	L/M
Wild oat sprayng	3-5	100	F-015-110	3.6	M
1. Fungicide spraying	5-7	50	F-01-110	2.1	M
Aphids spraying	7-10.1	100	F-015-110	3.6	H
Growth regulation	8-10.1	50	F-01-110	2.1	H
2. Fungicide spraying	9-10.1	100	F-015-110	3.6	H
Herb.spraying Couch grass	Latest 10 days before harvest	50	F-01-110	2.1	M/H

Winter Wheat - Tractor Speed 8 Km/h

Spray task	Growth Feekes scale	Volume rate l/ha	Nozzle ISO	Pressure bar	Air setting
Herb. spraying pre-emergence	0	75	F-015-110	2.1	L
Herb. spraying post-emergence	1-2	100	F-015-110	3.6	L/M*
Fungicide autumn	2-3	75	F-015-110	2.1	M
Herb. spraying spring	4	75	F-015-110	2.1	M
Growth regulation	4	75	F-015-110	2.1	M
Eyespot	5-6	75	F-015-110	2.1	M
1.Fungicide, leaf disease	7	75	F-015-110	2.1	M
Growth regulation	8-9	75	F-015-110	2.1	M/H
1. Aphids spraying	8-9	75	F-015-110	2.1	M/H
2.Fungicide, leaf disease	9-10	75	F-015-110	2.1	M/H
2. Aphids sprayng	10-10.5	50	F-01-110	2.1	L
Fungicide, Ear diseases	10-11	50	F-01-110	2.1	L
Herb.spraying Couch grass	Latest 10 days before harvest	50	F-01-110	2.1	M/H

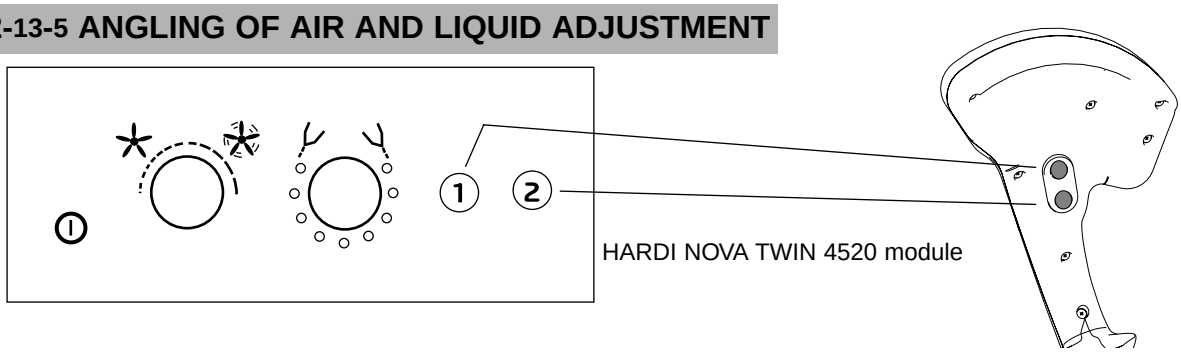
Sugar Beets - Tractor Speed 6 Km/h

Spray task	Growth stage	Volume rate l/ha	Nozzle ISO	Pressure bar	Air setting
Herb.spraying residual type	Pre-drilling	75	F-01-110	2.7	L
Pests	Seed-leaf stage	100	F-015-110	2.1	L/M*
1. Herb.spraying	Cotyledon + 2 true leaves of same size	100	F-015-110	2.1	L/M
Pests	Between 1. and	100	F-015-110	2.1	L/M
2. Herb.spraying	7-10 days later than 1. herb. spraying	100	F-015-110	2.1	L/M
1. Herb.spraying Couch grass	Couch grass has 3-4 leaves	75	F-01-110	2.7	M/H
2. Herb.spraying Couch grass	3-4 weeks later than 1. couch grass spraying	75	F-01-110	2.7	M/H
Pests (aphids)	Months of June	150	F-02-110	2.6	H
Fungicide (mildew)	Beginning of August	100	F-015-110	2.1	H

NOTE! All volume rates, pressures and air suggestions indicated in these tables are only guiding. Special conditions regarding climate, quality of the crop, spraying time and chemicals applied (burning) may partially change the procedure.

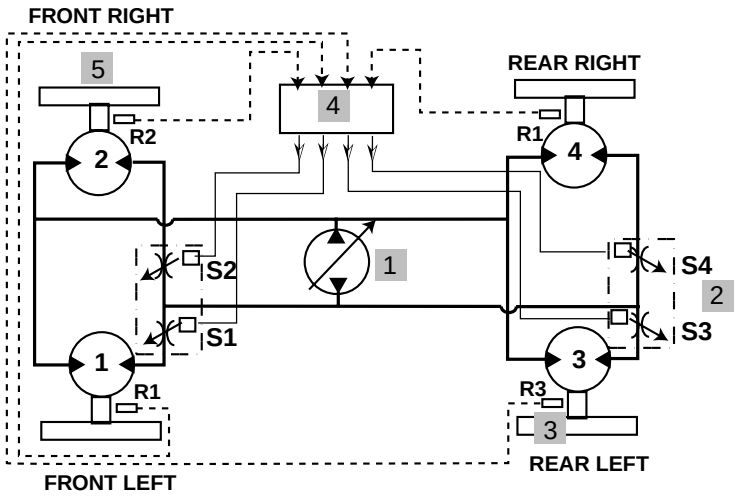
* NOTE! If dust is deposited on leaves the air speed must be reduced.

2-13-5 ANGLING OF AIR AND LIQUID ADJUSTMENT



By pressing the TWIN module pre-set or switches on the joystiick for more than 3 seconds , the current settings of the fan speed and the air slot angle is memorized.
By pushing one of the pre-set keys, the Twin module activates the appropriate stored parameters for speed and air air angle (HARDI NOVA see Nova manual)

2-14 ELECTRONIC ANTI-SKID UNIT (OPTION)



1 Hydraulic pump
2 Hydraulic valve S1 to S4
3 Speed sensor R1 to R4
4 Electronic unit
5 Hydraulic motor 1 to 4

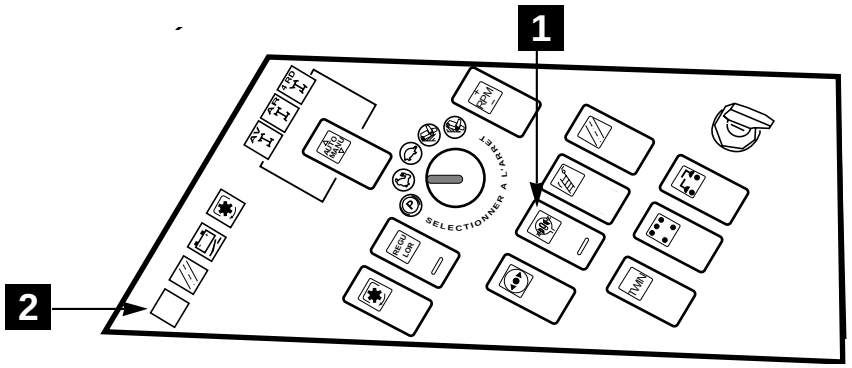
Speed sensor (Input)
Hydraulic valve control (Output)
Hydraulic circuit

The speed sensors ***R1*** to ***R4*** incorporated the hydraulic motors ***(5)*** continuously measure the rotation speed of each drive wheel. The regulating computer ***(4)*** compares those speeds and if necessary reduces hydraulic flow to the wheel which has a tendency to spin.

The anti-skid system has to be operated when the machine works in hard and hilly conditions

CAUTION : Switch on the anti-skid system before starts slipping of the machine

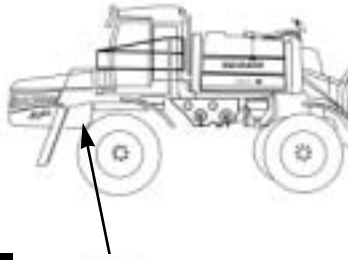
Push on the switch ***(1)***, control light ***(2)*** lights up to indicate anti-skit is operating



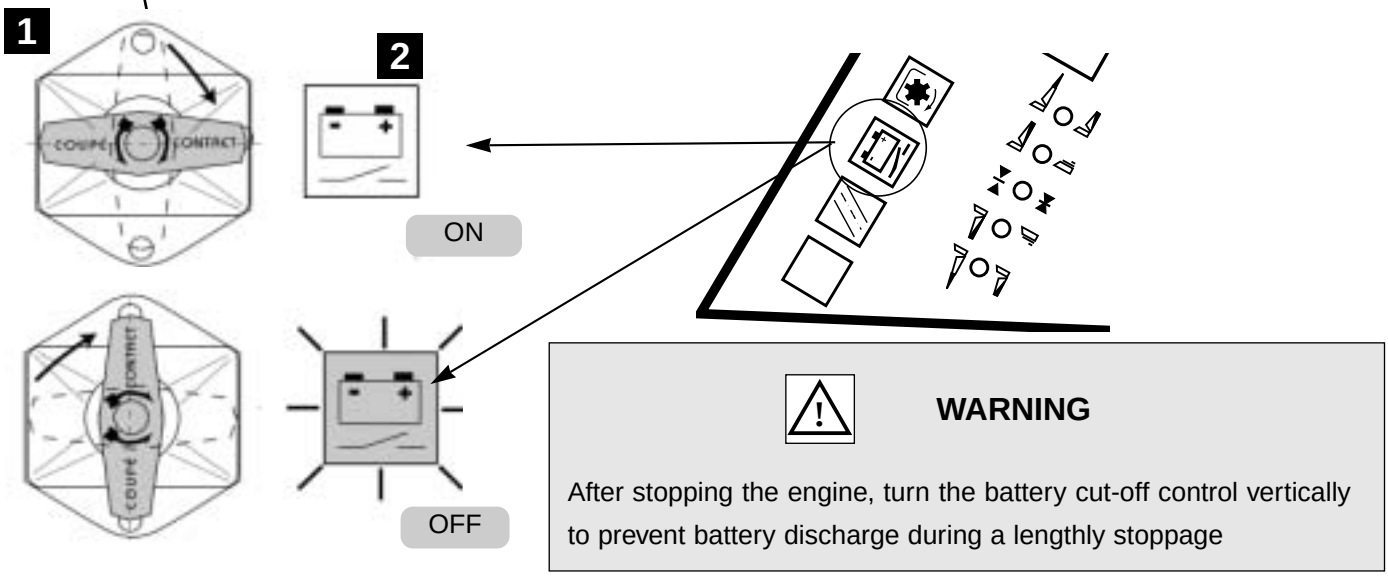
3- PREPARATION

As your equipment has been assembled for being transported, it is important to prepare the sprayer before it is used for the first time.

3-1 ELECTRIC CIRCUIT



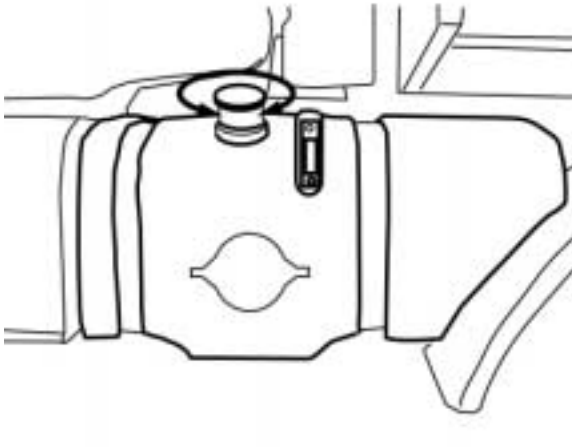
- Check the tighness of the battery terminals
- Turn the driver's control lever horizontally to put the electrical system in use. A voltage present warning lights up on the instrument panel.
- Check the lighting and signals.



WARNING

After stopping the engine, turn the battery cut-off control vertically to prevent battery discharge during a lengthly stoppage

3-2 DIESEL TANK

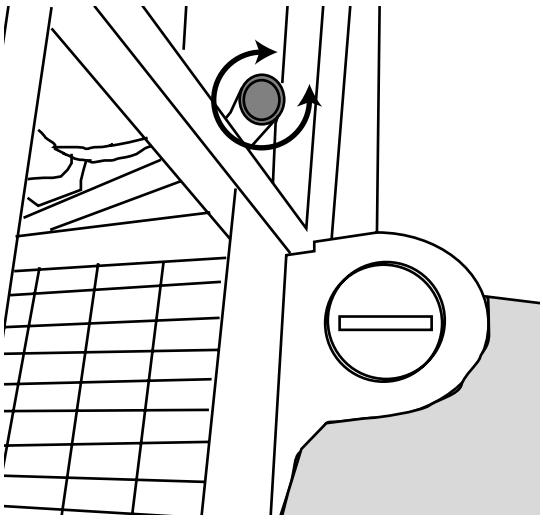


The **320** litre diesel oil tank is located on the right-hand side. Before filling the tank, you must :

- Stop the engine
- Do not smoke.
- Carefully clean the tank cap **(1).**
- Do not let any impurities in; use a funnel if necessary.
- Be careful about the quality of fuel used, particularly in winter.
- Take care that the tank is not emptied completetly so as to avoid the entry of impurities or air into the system.

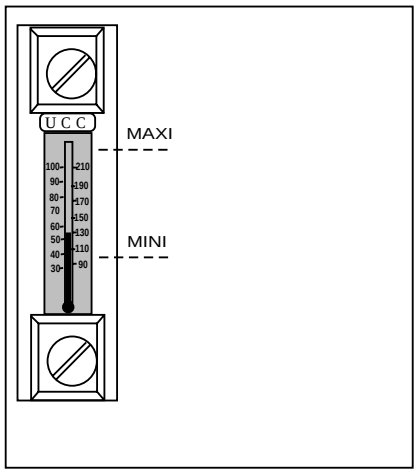
Fuel tank sight glass **(2)** indicates the maximum fuel level in the tank.

3-3 HYDRAULIC OIL RESERVOIR



This **60** litre reservoir is located under the cab. The filler cap is situated on the reservoir on the left-hand side of the machine **(1)**

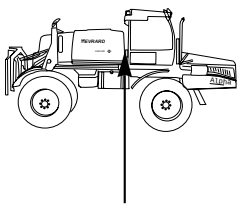
- Carefully clean the tank cap.
- Do not let any impurities in; use a funnel if necessary.
- Take care do not let any water in the oil tank
- Always fill the reservoir with hydraulic oil of the same characteristic as those of previous oil. (***TOTAL EQUIVIS ZS46***).

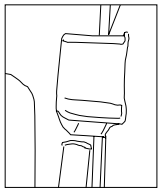


- Check the hydraulic oil level through a sight glass situated on the left-hand side of the oil reservoir. A thermometer indicates the oil temperature.

Sight-glass and température

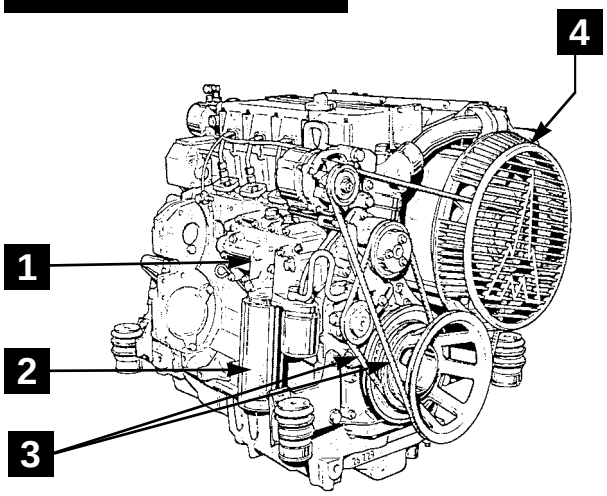
3-4 SCREEN WASH RESERVOIR





- Fill the screen wash reservoir with liquid for screen wash

3-5 ENGINE



As the engine is a major element in itself, a specific manual has been provided. Please study it carefully before continuing. The main points, however, must be checked before the **first starting**, particulary

- Oil level ref.**1**.
- Correct tightening of the oil filter cartridge ref.**2**.
- Tension of the engine belts ref.**3**.
- Coolant level ref. **4**.

3-6 TYRES

3-6-1 PRESSURE

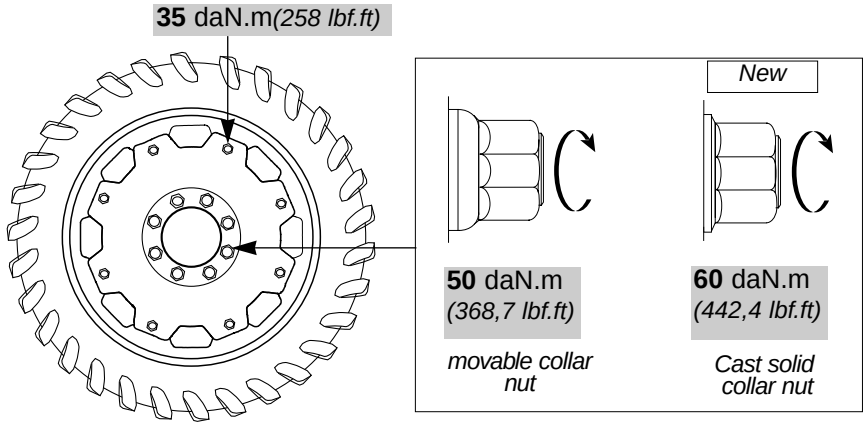
- Check the tyre pressure which should be in accordance with the following table :

ALPHA **3400** et **4100**	bar
300/95R46	3,6
460/85R34	1,6
480/70R38	1,6
600/70R30	1,6
520/70R38	1,6

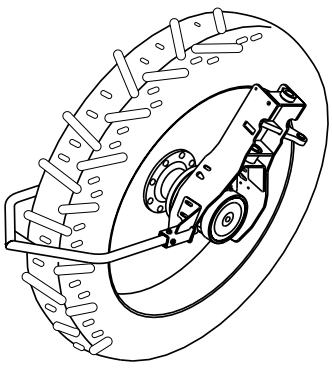
3-6-2 BOLTS TIGHTING

- Check wheels and bolts using a torque wrench after **1** hrs, **2** hrs and **8** hrs of operation and then periodically.

- Never lubricate wheels bolts or threads
- It is essential to follow recommendation wheels bolts torques.



3-6-3 STRAW-DIVIDERS



The straw divider equipment is used to reduce the crops damage.

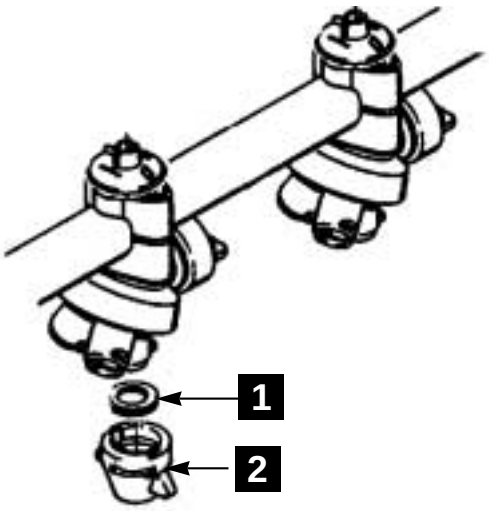
3 - 7 SPRAY

3-7-1 FITTING THE NOZZLES

Choosing the **type of nozzle**,***volume/ha***, ***speed*** and ***pressure***, refer to the*'Technical Application"*.

- Fit the nozzles to the Four-way nozzles, ensuring that the nozzles seals are in place.

Triplet



1 Seals
2 ISO ''Color Tips" with integrated nuts

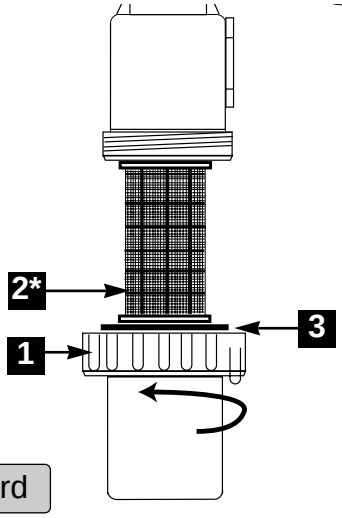
3-7-2 FILTERS

Check the assembly of the filtration elements :
- A inlet filler is present.
- A suction filter.
- A delivery filter.
- In-line filter.

Sprayers components such as valves, diaphragms and operating unit may be blocked or damaged during operation
Nozzles blockages do not occur whilst spraying
Long life of the pump. A blocked suction filter will result in pump cavitation.

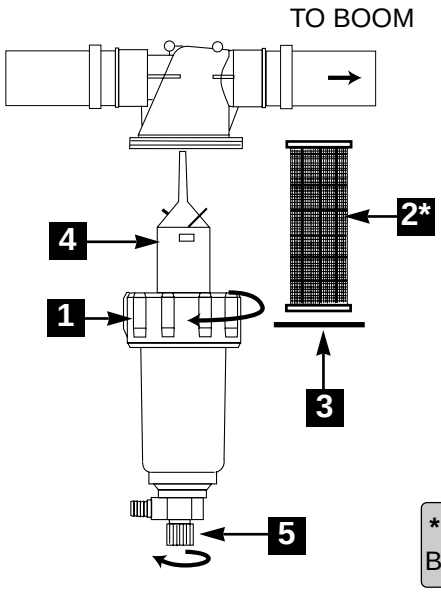
Suction filter

- Undo the nut ***(1)*** and remove the bowl
`- Clean element ***(2)*** in clean water
- Check the presence of the seal ***(3)***
- Reassemble the filter unit.



***** White color element filter (**32** mesh) delivered as standard

Delivery filter



The delivery filter is located at the left-hand side of the machine.
Prior to any spraying, it is essential to put filter element into the filter.

- Undo the nut ***(1)*** to remove the bowl
- Check the filter element ***(2)*** , seal ***(3)*** and the tube ***(4)***

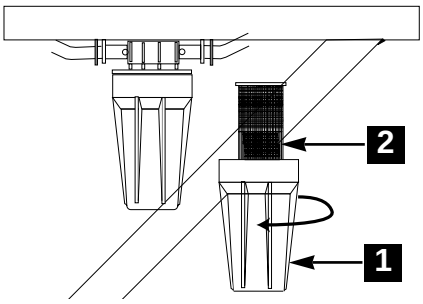
The cleaning filter is automatic, for this purpose :

- Undo gently the draining valve ***(5)*** , the impurities are emptied out

*** White** filter element **600 microns (32mesh),**delivered as standard
Blue filter element **300 microns (50mesh)**

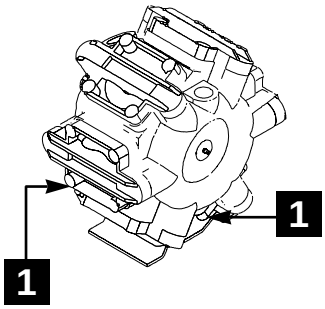
In-line filters

The in-line filters are mounted directly to the boom
- Close the boom supply by means of the Regulor.
- Remove the bowl of the filter **(1)**
- Clean the filter element **(2)**
- Choose appropriate element filter and the density of chemical products to prevent the blockage of the nozzles.



*** blue filter 300 microns (50 mesh), delivery as standard**
Red filter element 175 microns (80 mesh)
Yellow filter element 140 microns (100 mesh)

3-7-3 PUMP



- Check the drain plug located on the diaphragm HARDI pump **(3)**

- Check that the red handle of the drain valve located on the left side of the mobile unit is released
- Check that the cord of floating gauge is free.

3-7-4 ADJUSTMENT OF PRESSURE EQUALISATION

Choose the correct nozzle for the spray job by turning the TRILET nozzle bodies. Make sure that all nozzles are the same type and capacity. See the ‘’Spray Technique” book.

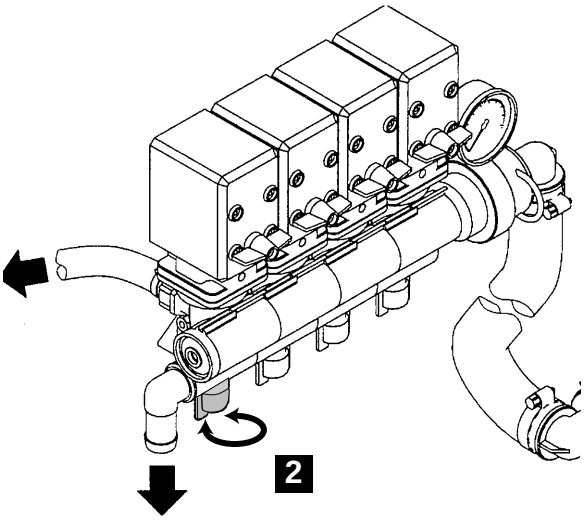
- Close the first distribution valve switch **(1)**
- Turn the adjusting screw(s) **(2)** until the pressure gauge again shows the same pressure
- Adjust the other sections of the distribution valve in the same way.

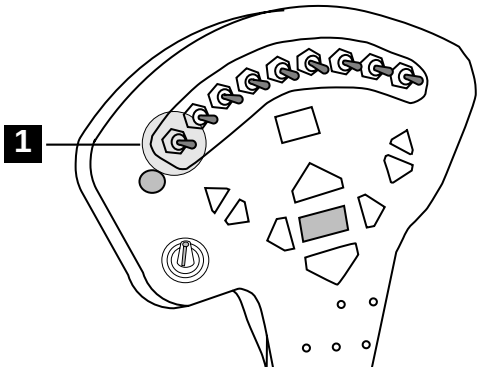
NOTE !

Herealter ajustment of pressure equalisation will only be needed when :

- you change to nozzles with other capacities

- the nozzle output increases as the nozzles wear





4- SPRAYING

This chapter sets out the principle of normal circulation, semi-continuous and continuous spray.

Choosing the type of nozzle and working pressure, refer to the ‘’Spray Technique” manual.

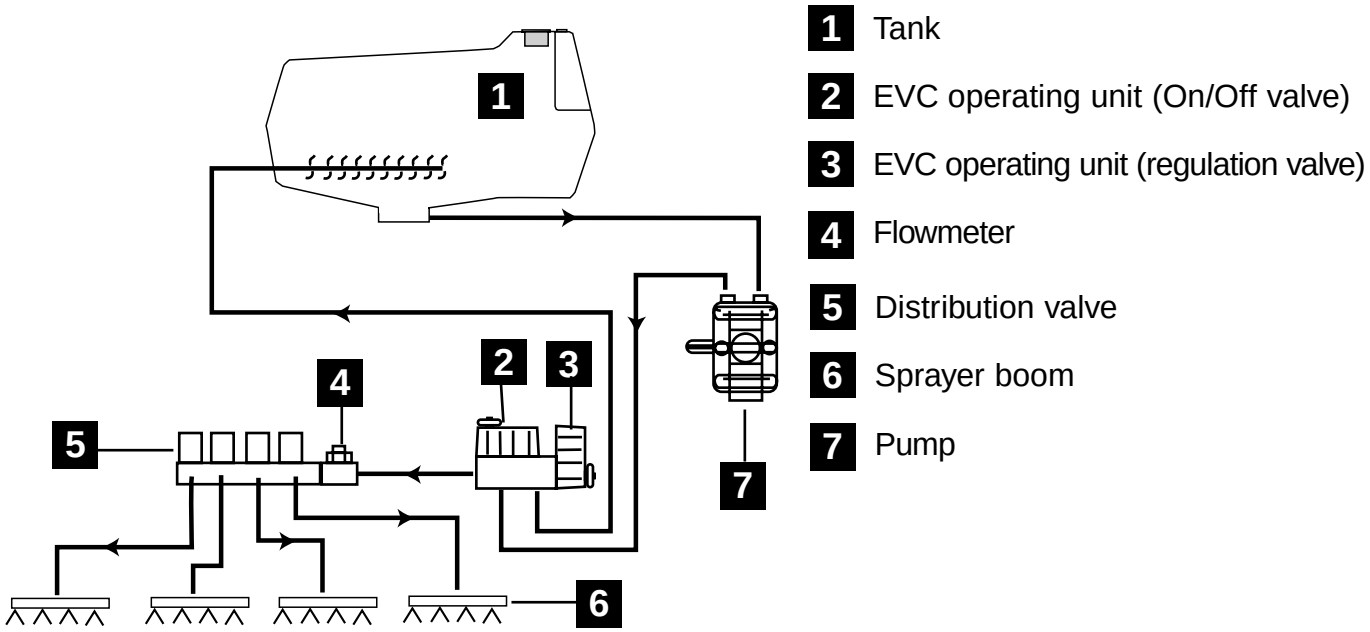
4- 1 PRINCIPLE OF CIRCUIT

The Alpha sprayer is equipped, as standard, with Hardi Nova regulation

During spray, the pump delivery is distributed between :
- The spray boom **(6)** equipped with nozzles.
- The return to the tank via the EVC operating unit (regulating valve) **(3)** for agitation

Regulation is achieved by the regulating valve ***(3)*** operated by the Hardi Nova in accordance with the programming carried out by the user.

When spray stops :
- The remote valves are in the closed position.
- All the delivery from the pump returns to the tank via the On/Off valve.



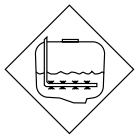
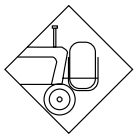
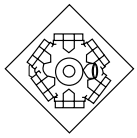
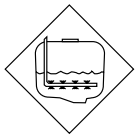
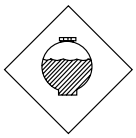
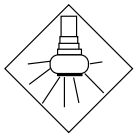
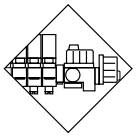
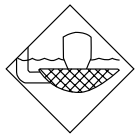
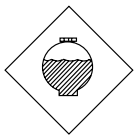
1 Tank
2 EVC operating unit (On/Off valve)
3 EVC operating unit (regulation valve)
4 Flowmeter
5 Distribution valve
6 Sprayer boom
7 Pump

4- 2 DETAILS FOR SPRAYING STAGES

4-2-1 PICTOGRAMS

On the sprayer, each valves is indicated by :
- A number (1, 2, 3, 4,5,8 andt 9
- A pictograms
- A coloured disc (green : pressure, black : suction, blue : return)

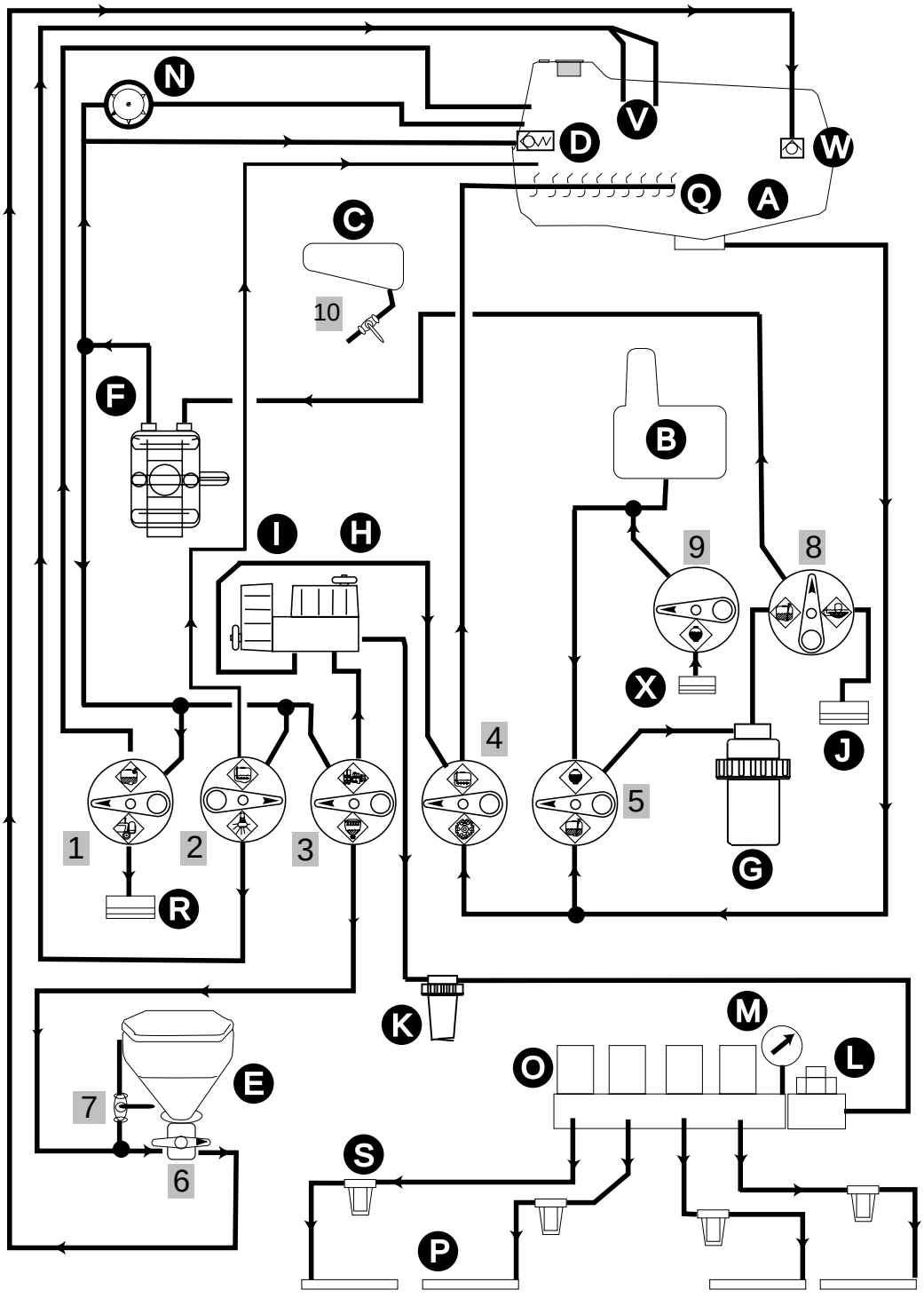
The figure below gives details of these pictogram.

N° and coulor	Pictogram	Operation	N° and coulor	Pictogram	Opreration
1 Green		Filling the main tank	**4** Blue		Spraying with agitation
		Transfer the main tank to the outside			Spraying without agitation
2 Green		Spraying with agitation	**5** Black		Suction from rinsing tank
		Rinsing the main tank			Suction from main tank
3 Green		Spraying	**8** Black		Suction from main tank
		Admixture of products mix/ admixture			External suction
			9 Green		Filling the rinsing tank

- Wear personal protection (gloves,overalls,rubber boots and face protection shields) before using chemicals.

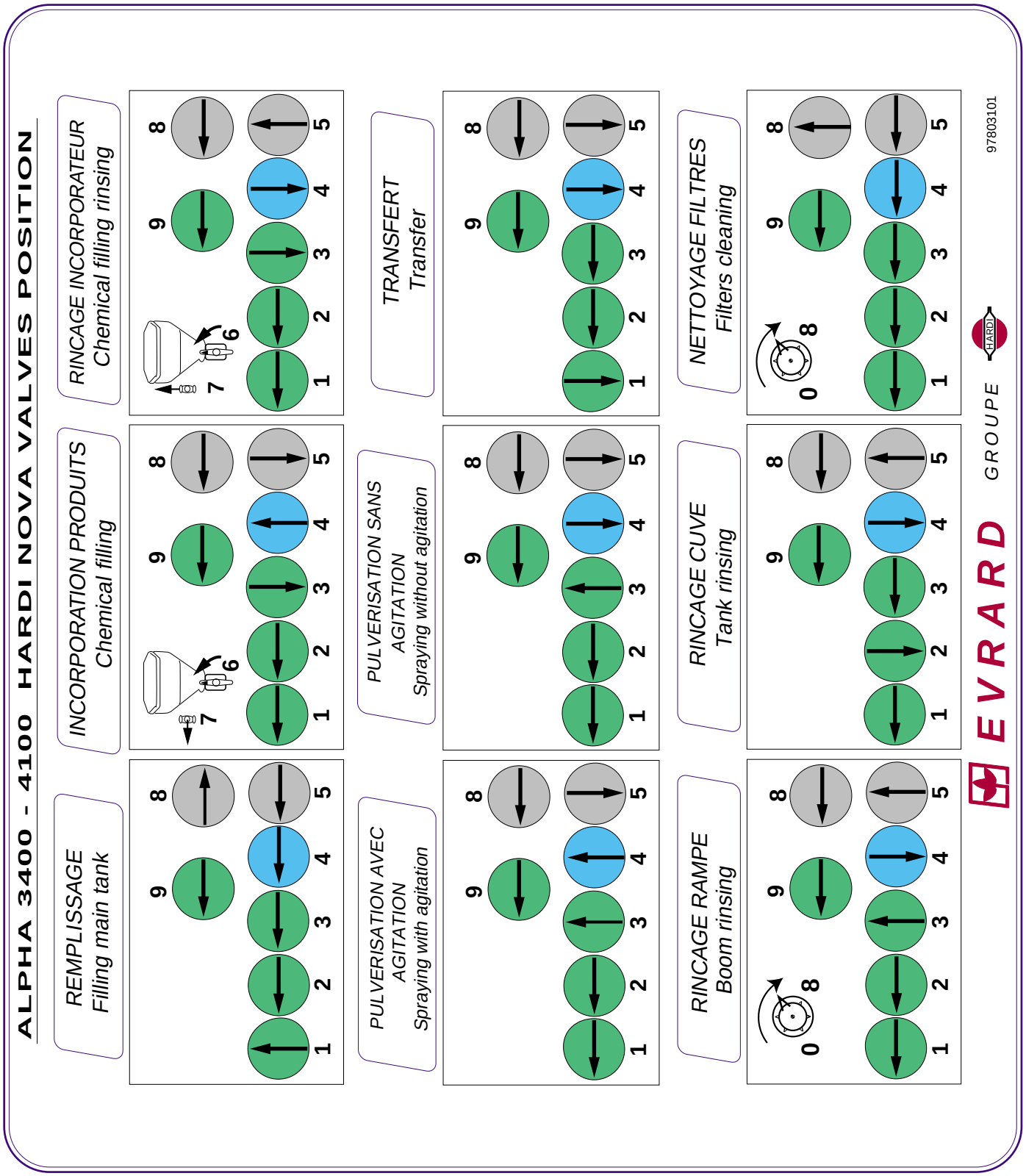
- Always read the chemical label prior to use and follow instructions given on the label.

4-2-3 FUNCTION DIAGRAM



- A Main tank
- B Rinsing tank
- C Clean water tank (Hand wash)
- D Safety valve
- E Mixing unit
- F Pump
- G Suction filter
- H Regulation valve
- I On /Off Spray valves
- J Self fill suction
- K Delivery filter
- L Flowmeter
- M Pressure gauge
- N Manual 'Volu-regulating' valve
- O Boom Manifold
- P Distribution valves
- Q Agitation pipe
- R Transfer connection
- S In-line filter
- W No-return valve
- X Direct filling of rinsing tank

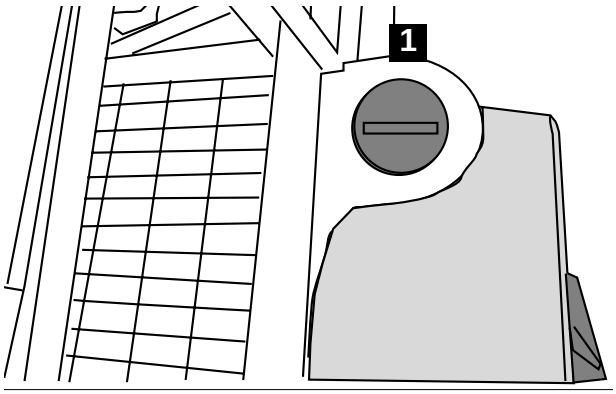
1. Direct filling main tank - transfer
2. Rinsing main tank
3. Spraying - Admixture
4. Spraying with agitation - No agitattion
5. Tank suction - Rinsing tank
6. Admixture
7. Rinsing the admixture unit
8. External suction / Tank suction
9. Direct filling rinsing tank
10. Hand washing valve


ALPHA 3400 - 4100 HARDI NOVA VALVES POSITION
REMPLISSAGE
Filling main tank
INCORPORATION PRODUITS
Chemical filling
RINCAGE INCORPORATEUR
Chemical filling rinsing
PULVERISATION AVEC AGITATION
Spraying with agitation
PULVERISATION SANS AGITATION
Spraying without agitation
TRANSFERT
Transfer
RINCAGE RAMPE
Boom rinsing
RINCAGE CUVE
Tank rinsing
NETTOYAGE FILTRES
Filters cleaning
EVRARD
GROUPE
HARDI
97803101

4- 3 SPRAYING CIRCUIT OPERATING

4-3-1 FILLING THE HAND WASHING TANK AND THE RINSING TANK

Hand washing



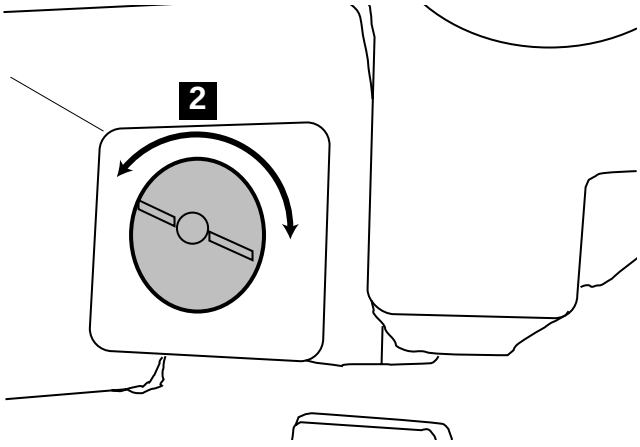
This **15** liter tank is incorporated in the main tank. It must be filled by gravity exclusively **with clean water ref.1**. It is solely for washing hands and rinsing when any toxic product is accidentally spashed.

Turn on valve n° ***10*** for opening.

For your safety, take care never to put chemical products in this tank and make sure it is always filled with clean water during work.

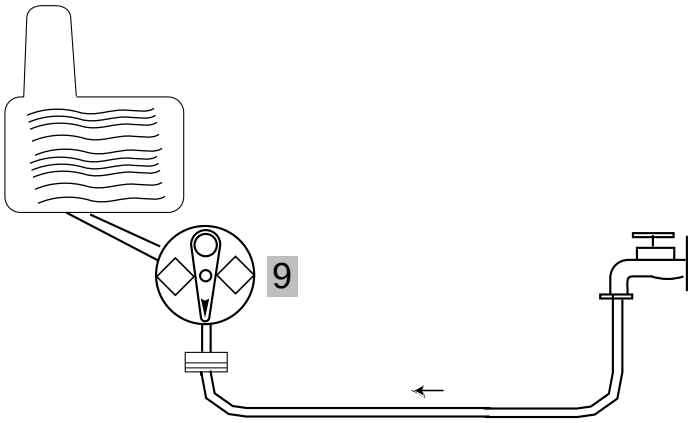
Rinsing tank

This **410** liter tank is located under the main tank. It must be **filled by gravity exclusively with clean water (1)**.
- It will be only used for rinsing the spray circuit



Rinsing tank filler cap **(2)**

Connect a pipe to connector and open valve **(9)** to filling the rinsing tank.



4-3-2 FILLING THE MAIN TANK

We recommend to fill up the main tank to half capacity before incorporating chemical product. When filling, continually check the level in the tank so as to prevent pollution by any overflowing. Plant protection products can be added by suction or gravity.

Filling by external suction

- Make sure that the boom sections are turned off
- Connect the suction pipe with the strainer to the symetrical connection of valve n° ***8.***
- Position the valves according to the above (fig 1- 1)
- Operate the switch to engage the pump at idle speed and progressively accelerate the engine approx. ***2000*** rpm.

When the tank is full (fig 1- 2)
Position the valve n° **8** for suction from the main tank.

Fig 1-1

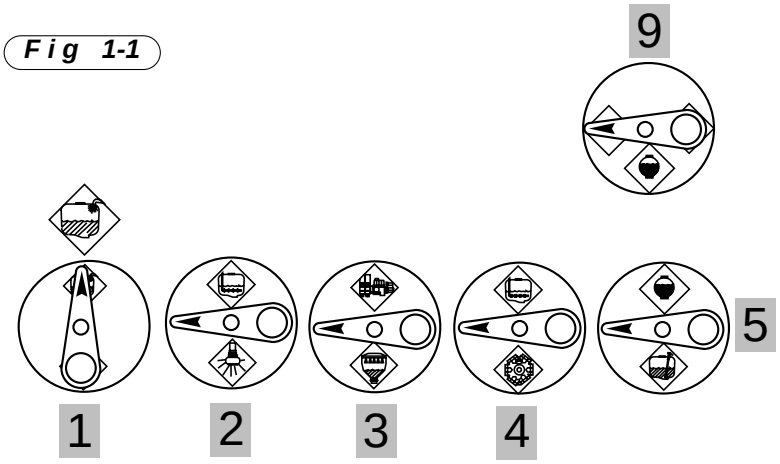
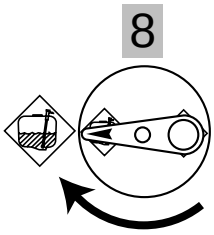


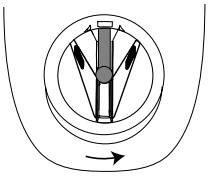
Fig 1-2



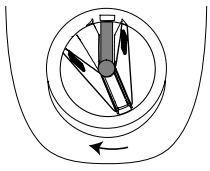
Filling by means of the main tank

- Make sure that the boom sections are turned off
- Close the Manifold valves ***(1)*** and valve ***(5)*** and release the draining valve of the main tank before filling the tank

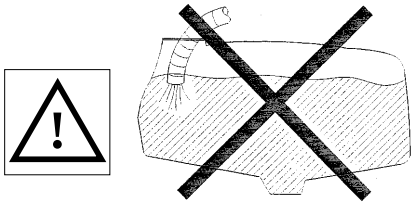
It is recommended to use as clean water as possible for spraying purposes

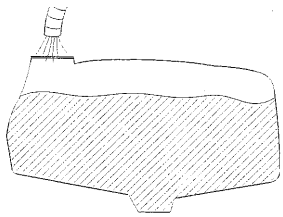


Opening



Closing





WARNING: Do not let filling hose etc. enter the tank. Keep it outside the tank, pointing towards the filling

If the hose is lead to the bottom of the tank, and the water pump at the water supply plant stops, chemicals can be siphoned back and contaminate the water supply lines.

4-3-3 ADDING THE PRODUCTS

WARNING: Wear gloves, glasses and face protection shield when operating. Fill up the main tank to half capacity before incorporating chemical product..Consult chemical label regarding precaution to be taken when filling.

Adding by gravity

The main tank is half-filled with water.
- Incorporate slowly chemical through the tank filter to prevent rust or other particles.

Adding by means of the mix/admixture unit

WARNING : Avoid contamination or personal injury. Do not open suction valve towards suction filling device unless pump is running and filling hose is connected. If this valve is opened without running, liquid will stream out of the valve.

- Switch off the spraying section
- Engage the pump at idle speed and progressively accelerate approx. ***2000*** rpm.

1- Close valve n° ***6*** (fig ***2-1***).
2- Position valve as above. (fig ***2-2***).

Fig 2-1

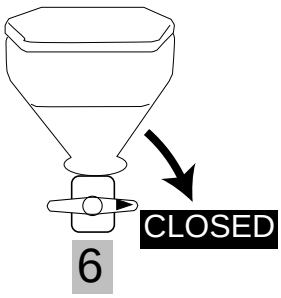
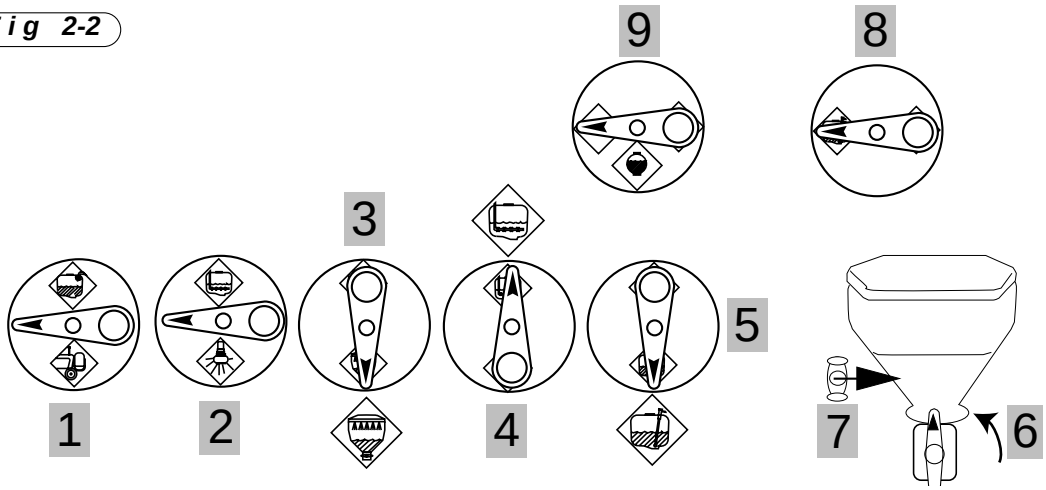


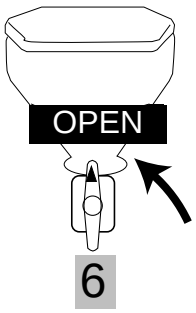
Fig 2-2



3- Pour the product into the mixer. Check the quantity with the graduated gauge in the mixer.

- Progressively open valve n° **6** . The product drawn up mixes with the contents of the tank (fig ***2-3***)

Fig 2-3



4- Use the handle to rinse the chemical containers. Water is dispersed from a large number of powerful jets for the purpose of rinsing out plant protection product container. (fig ***3-1***)

5- Position valves n° **5** for ‘Rinsing the tank” , (only to use new chemical product) (fig ***3-2***)

6- Open valves n° **6** and n°***7*** to clean the mixer. (fig ***3-3***)

7- Close valve n° **6** and position valve n° **8** for ‘’main tank suction” (fig **3-*4***)

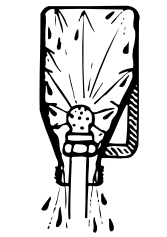


Fig 3-1

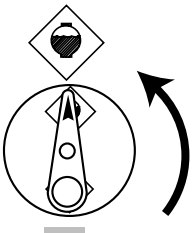


Fig 3-2

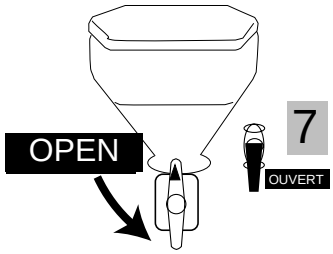
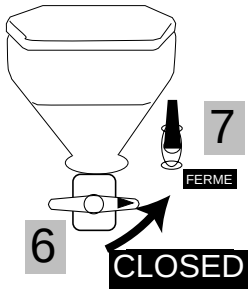


Fig 3-3



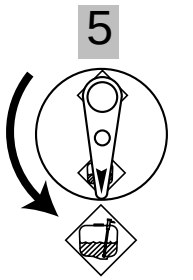


Fig 3-4

4-3-4 AGITATION OF MAIN TANK

Prior to any spraying, it is essential to put plant protection products back into suspension by agitation.

- Switch off the spraying section
- Position the valves as above (fig **3-5**)
- Engage the pump at idle speed and progressevely accelerate the engine in order to reach the nominal speed of the spray pump

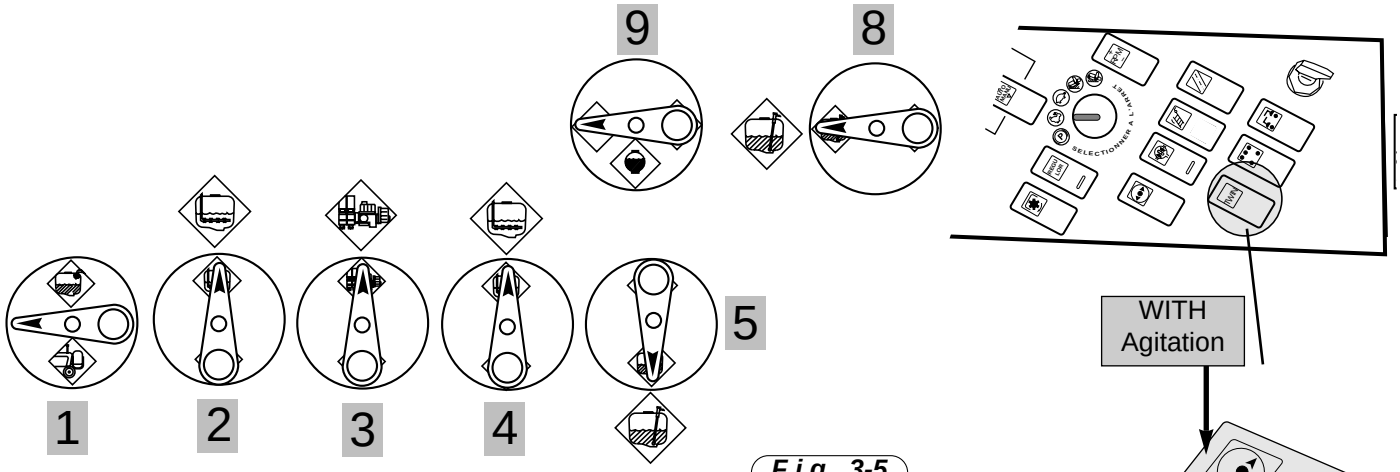
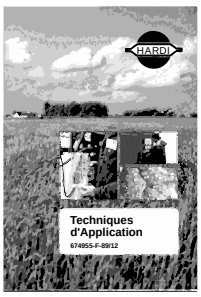
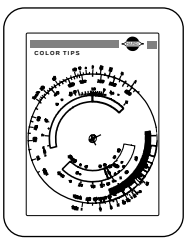


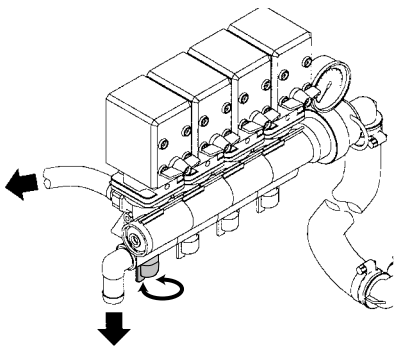
Fig 3-5

4-3-5 SPRAYING

Before proceeding, please refer to :







4-3-6 SPRAYING WITH AGITATION

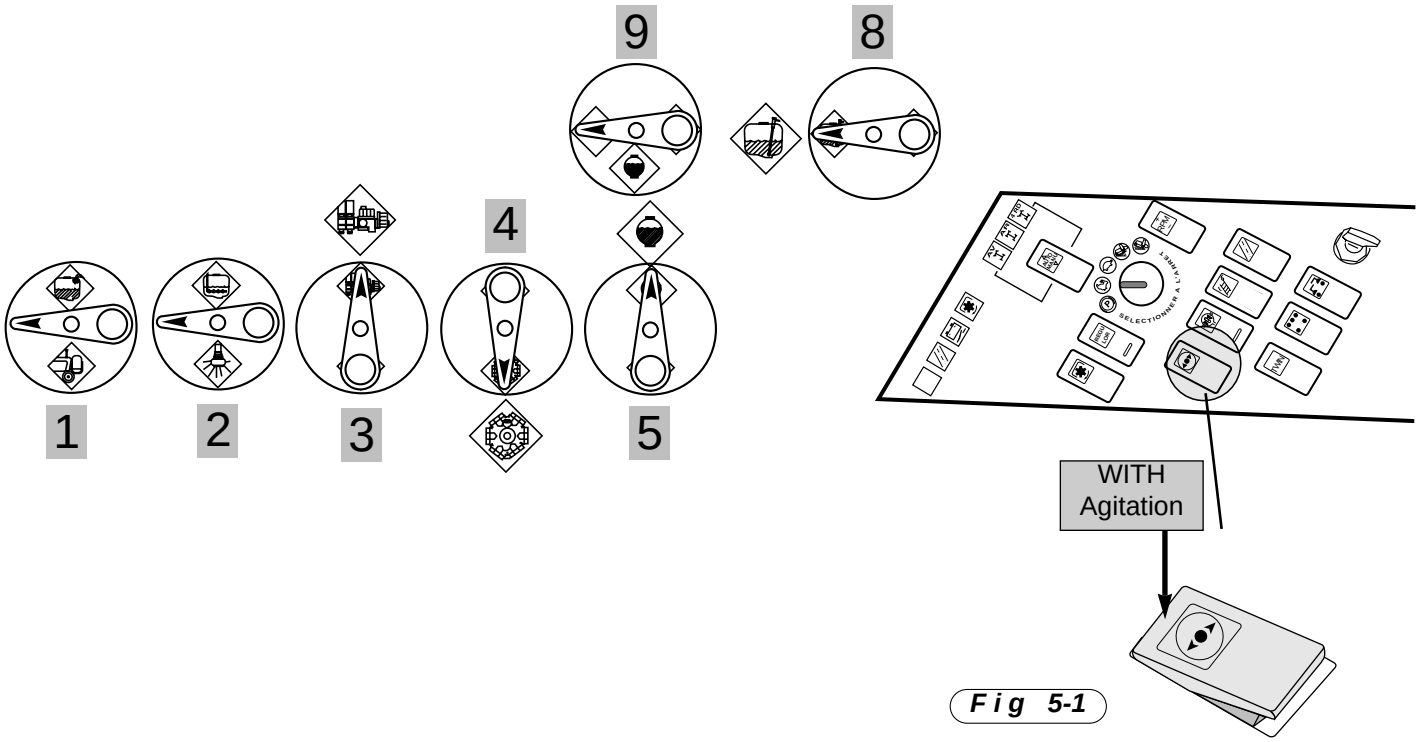


Fig 5-1

4-3-7 SPRAYING WITHOUT AGITATION

This mode of spraying must be only used with a practically empty tank so as to limit the agitation in the tank. Act as follows

- Switch off the spraying section
- Position the valves as above. (fig **5-2**) or position the switch (fig **5-3)** (électric valve as option)
- Appuyer sur l'interrupteur (fig **5-3** option vanne électrique) sur la position *''Sans Agitation"*
- Start the pump at the minimum engine speed and progressively accelerate to reach the max. speed to de 540 rev/mn, an engine speed of to **2000** rev/mn.
- Switch on the spraying sections.

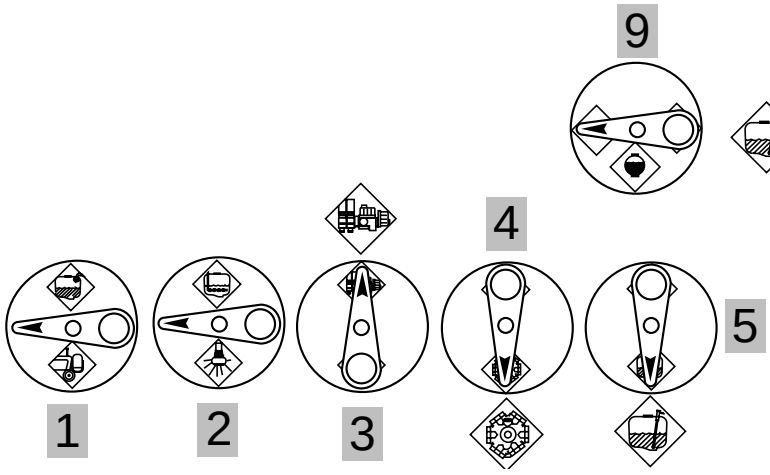


Fig 5-2

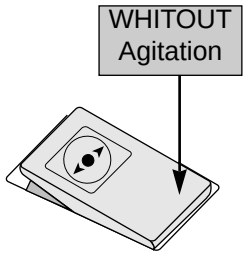


Fig 5-3

4-3-8 TRANSFER

The contents of the main tank are transferred to another external tank by means of the symetrical transfer connection.

- Switch off the spraying section
- Couple the transfer pipe to the connection valve at one end and the receiving tank.
- Position the valves as below (fig **7-1**)
- Engage the spray pump at idle and then progressively accelerate the engine.The main tank empties

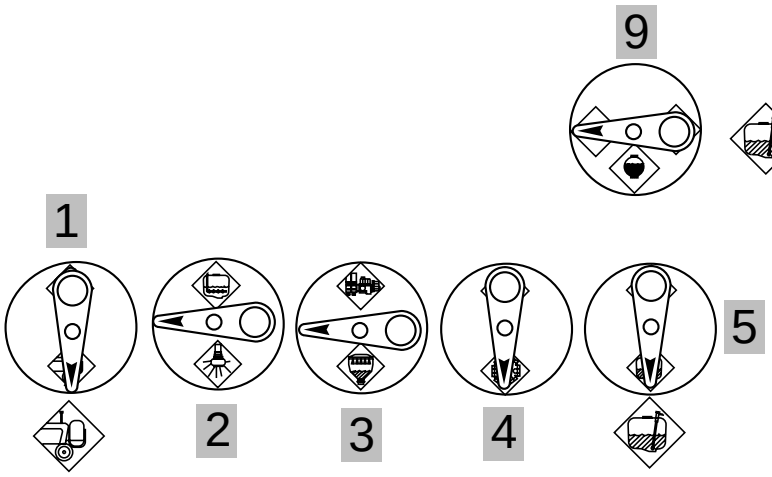
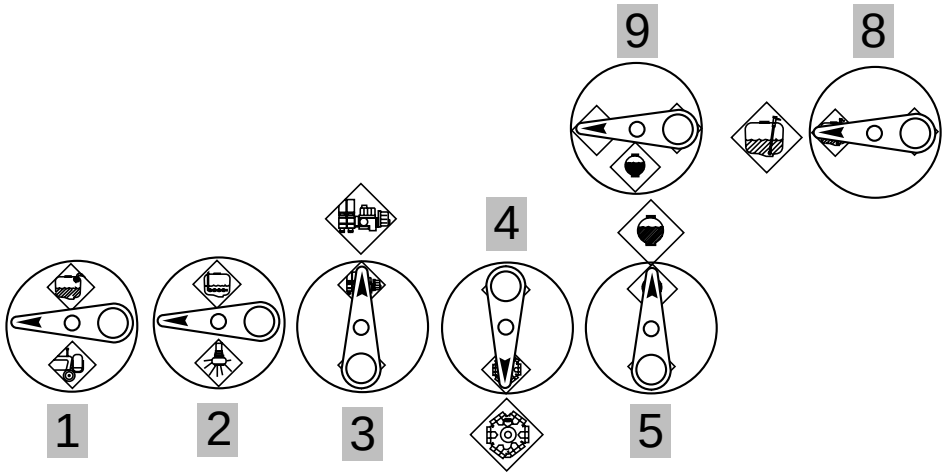


Fig 7-1

4-3-9 RINSING THE BOOM

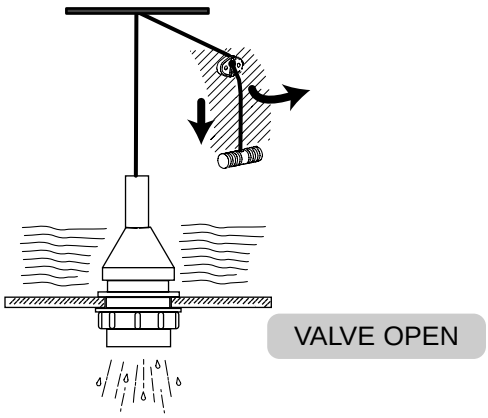
To prevent accumulation of chemical residue in the piping when the machine is stored or changing chemical product, we recommend to rinse the spraying circuit

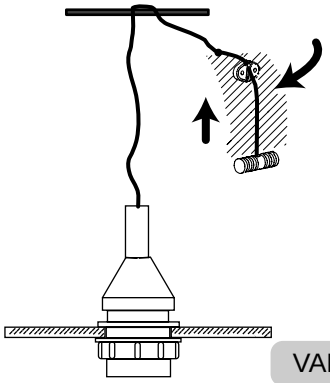


4-3-10 EMPTYING THE MAIN TANK

Empty the main tank completely after rinsing in compliance with local legislation.

For this purpose :
- Pull the red handle located on the left side of the sprayer in order to empty the main tank completely.
- When this is released, the valve closed again. To keep it open, secure the cord around the locating device.





4-3-11 MAIN TANK RINSING

The main tank is rinsing by clean water held in the rinsing tank. Note local legislation regarding dumping of residues and rinsing water.

Act as follows :
- Make sure that the main tank has been completely emptied and that the red handle of the drain valve has been released.
- Switch off the spraying sections
- Engage the spray pump at idle and then progressively accelerate the engine
- Empty the main tank.

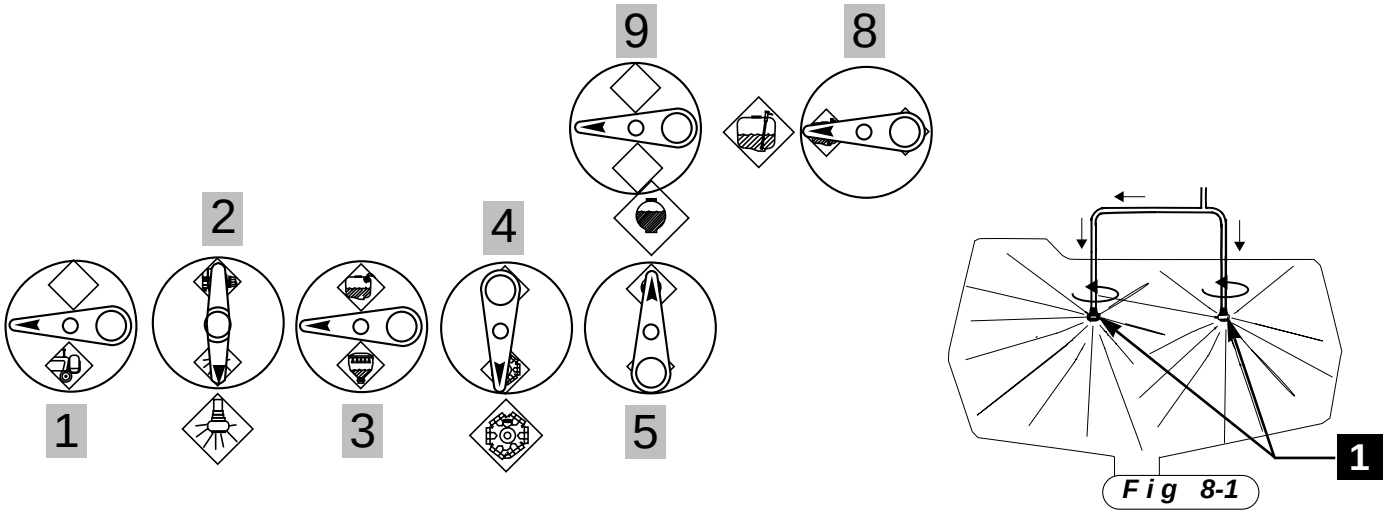
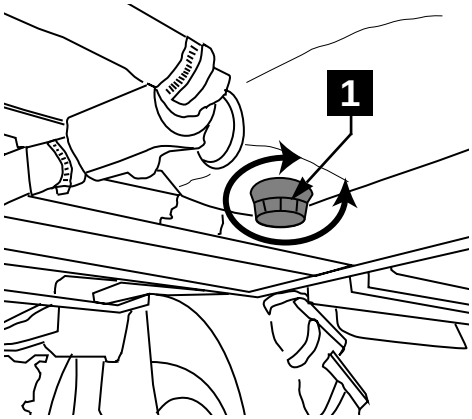


Fig 8-1

4-3-12 EMPTYING THE RINSING TANK



It is advisable to empty this tank from time to time so as to clean it

- Remove the underbelly cover
- Undo the draining screw **(1)** located at the left hand-side of machine
- Rinse the rinsing tank with clean water and refit the draining plug

5-CARE AND MAINTENANCE

This chapter describe the maintenance operations for the machine. To keep the machine in good, safe and reliable working order, as well as keeping the maintenance and repair costs to a minimum it is essential to follow the preventive maintenance programme given hereafter.

5- 1 TABLE OF LUBRICANTS

Element		Capacity		Lubrificant ***TOTAL***
		case	with oil filter	
DEUTZ Engine	**BF4M1013C** **BF6M1012C** **BF6M1013**	**11,0** l **14,0** l **17,0** l	**12,5** l **15,5** l **18,5** l	**Rubia 4400** **API CG-4 API SG ACEA E2/B2/A2-96**
Hydrostatic transmission Hydraulic system		**60** liters		**EQUIVIS ZS 46** **AFNOR NF E 48-603 HV ISO 6743/4 HV**
General lubrication				**Multis EP2** **ISO -L- XBCFB 2**
Coolant		**15** litrers approx.		**ORGANICOOL** **ASTM D 4985 - ASTM D 3306**

5- 2 MAINTENANCE

5-2-1 MAINTENANCE DURING THE RUNNING-IN-PERIOD

Interval	Equipments concerned
After **1** h After **2** h	Tighten wheel bolts
After **10** h	Check that hydraulic circuit is oil tight and oil hydraulic level Tighten wheel bolts. Check bolts of the aluminuim boom
After **50** h	Check engine for leaks. (*). Change engine oil and Change engine oil filter (*). Replace fuel filter (*) Check belts (*). Replace hydraulic circuit filters. Check bolts of the aluminuim boom
After **250** h	Change oil hydraulic filters and drain the hydraulic reservoir. Check air conditioning Drain water on fuel pre-filter

(*) follow instructions given in the DEUTZ manual without fail.

5-2-2 PERIODIC MAINTENANCE

Interval	Equipments
Every hour	Check spray filters..
Daily or Every **10** h	Check engine oil level (*) Check fuel level Check hydraulic oil level Clean air conditioning condenser
Every **50** h	Check boom / Grease nipples and chassis Grease HARDI spray pump Clean cooler (coolant, hydraulic) (*) Clean air-intake filter and engine cooler (*)
Every **250** h	Replace hydraulic filters Replace cab charcoal filters Change engine oil and replace engine oil filter (*) Drain water on fuel pre-filter
Every **500** h	Check v-belts of engine (*) Replace diesel oil filter and clean fuel pre-filter Check the refrigerant level (R134a) of air conditioning
Every **1000** h or **ANNUAL**	Drain diesel oil tank and diesel oil tank strainer Change oil in hydraulic reservoir Check the valves and diaphragms in diaphragm pumps Check the engine air intake, check for leakage (*) and pre-heating plugs (*) Change the safety air intake cartridge Check the electrolyte of the battery (*) Replace the engine coolant water (*) Check the steering

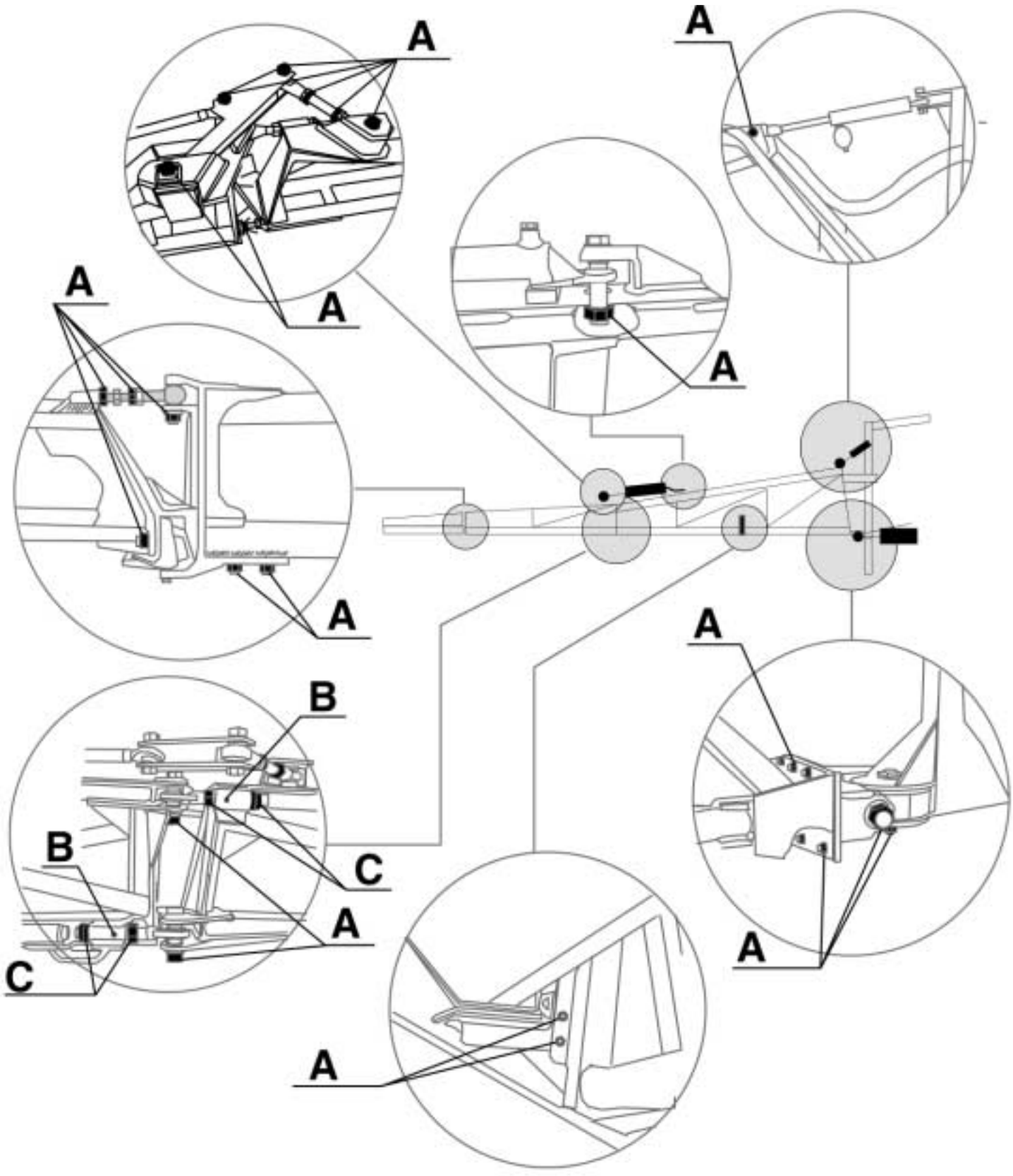
5-2-3 OCCASIONAL MAINTENANCE

Level indicator adjustment
Nozzles tubes and fittings
Cone check/renewal EVC operating unit
Cone check/renewal, EVC distribution valve
Adjustment of the 3-way Manifold valves
Seal renewal, drain valve.

5-2-5 ALUMINIUM BOOM MAINTENANCE

150

- Thigten the screws **(A)** after **10** and **50** hours of use, then periodically every **150** hours
- Loosen the lock-nuts **(B)** before tighten the nuts **(C)**

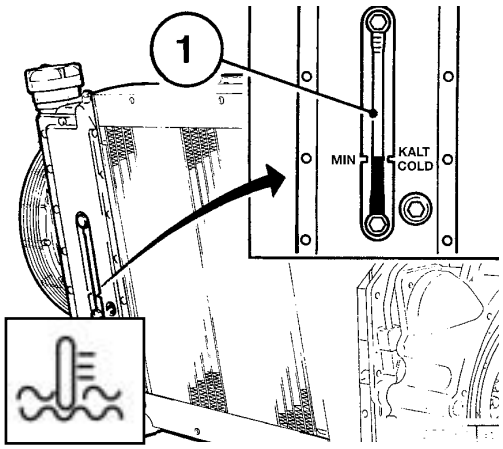


5-3-4 ENGINE MAINTENANCE

This chapter discribe operations maintenance on DEUTZ engine. Refer to the specific manual for the DEUTZ engine for all further information

10 - Engine oil level
- Fuel level

Coolant Level 10

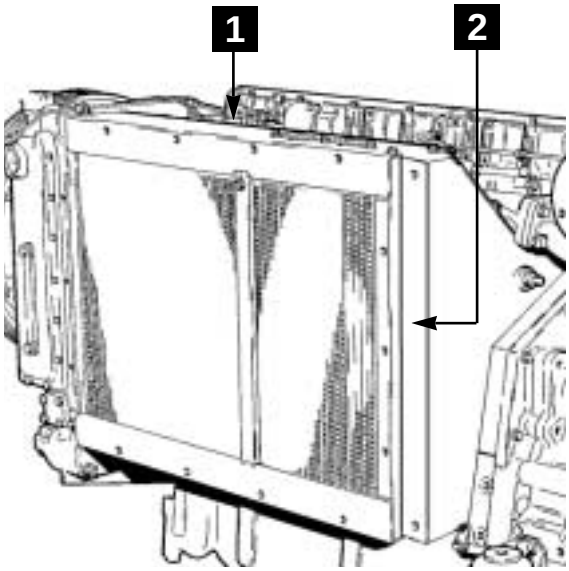


- When the engine is cold, coolant level shoud be above the ‘’MIN” mark. Top up with coolant if the level falls below the minimum mark on the sight glass, or if the coolant warning switch commes on.

- Start and run engine (1500 R.P.M approx).
- Turn on the heating valve on cab
- Unscrew the filler cap
- Fill up coolant up to upper edge of the filler neck
- Replace filler cap **(1)**

Use only cooling system protective liquid : reference TOTAL ORGANICOOL (See table of lubricants)
To prevent engine overheating (caused by sedimentation in the cooling system) do not mix with other coolants

Heat exchanger cleaning 50



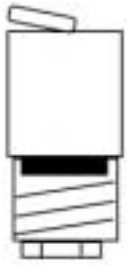
- Remove the service flap on the exchangert ref **1** and **2**
- Blow out heat exchanger with compressed air

Be careful not to damage the cooling fins

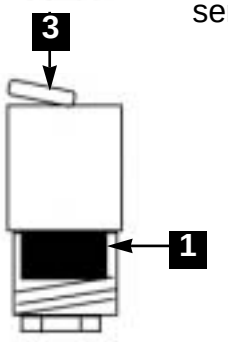
- Wash out loosened dirt with a hose.
- Re-fit device flap.
- Run the engine up to normal operating temperature to evaporate any remaining water.

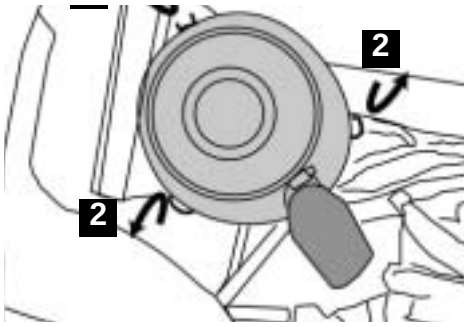
The amount of contamination in the cooling system depends on the spray application. Frequency of cleaning must be increase in the case of dusty environment

Air filter 50



A indicator is located on the engine air-intake.
If the red signal **(1)** is fully visible when the engine is off, you must clean the filter cartridge. Act as follow :
- Undo clip fasteners **(2)** and take off hood
- Blow out from inside out with dry compressed air (max. 5 bar). In difficult cases, tap out, taking care not to damage the cartridge.
- After carrying out service work, reset the signal by pressing the button **(3)** on the service indicator.



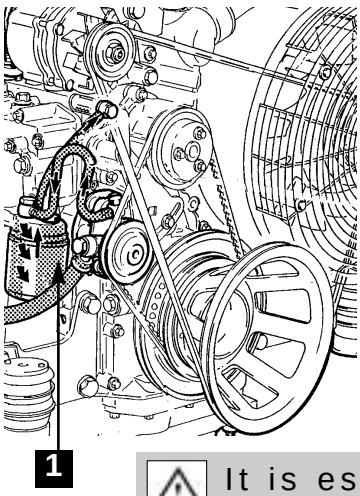


Changing Engine oil 250

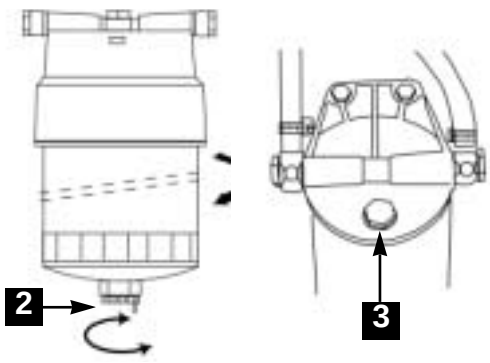
- Only use quality of lube oil (see table of lubricant).
- Ensure that the engine is on level surface
- Allow the engine to warm up (oil temperature approx. 80°c /146°F.)
- Place oil tray under the engine
- Drain oil and replace the oil filter
- Fit oil drain plug with a new gasket and tighten firmly
- Fill with lube oil (see table of lubricant) and check oil level, if necessary top up with oil as far as the upper bar

⚠ It is essential to use the maker's genuine oil filter

Changing Fuel Filter
Draining Fuel Préfilter 250

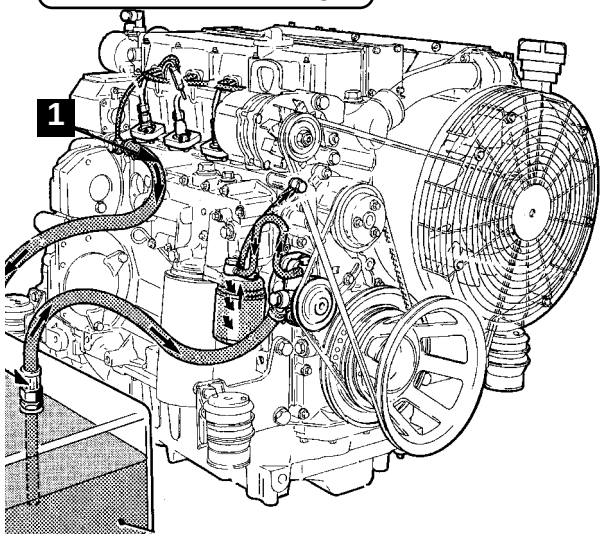


- Replace the fuel filter **(1)**
- Draining water from the prefilter, by loosing the drain screw **(2)**
- Fill up the bowl by the orifice **(3)**
- Vent the engine fuel circuit (see chapter below)



⚠ It is essential to use the maker's genuine fuel filter cartridge

Fuel circuit Venting

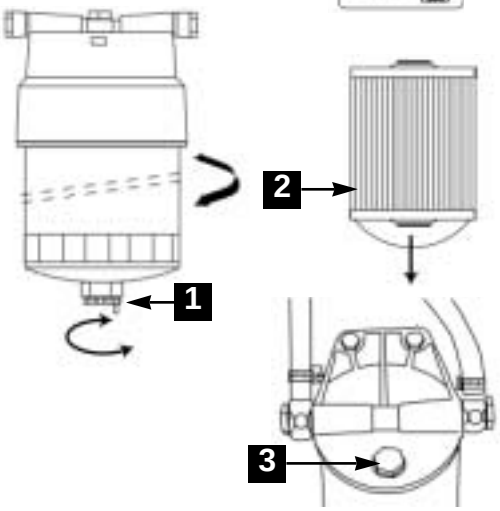


The fuel system must be vented when the engine is started after maintenance or if the tank has been run empty.
- Undo the banjo bolt with pressure-regulating valve ref **1**
- Start the engine and run it until the fuel runs out
- Tighten the banjo bolt.

⚠ Never undo the line to injector to vent the fuel circuit

Fuel Préfilter

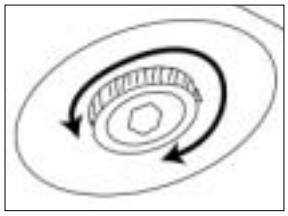
500



- Place a fuel collecting container below the prefilter
- Loosen the drain screw **(1)** and drain the fuel
- Unscrew the bowl **(2)** and remove the filter element
- Clean any dirt which might be present off the sealing surface of the filter carrier and the filter element housing
- Insert a new O-ring and replace the filter element (replace if necessary)
- Fill up the bowl by the orifice **(3)**.
- Vent the engine fuel circuit (see chapter Fuel Circuit venting)
- After the engine has been started, check for leaks

Fuel Tank

1000

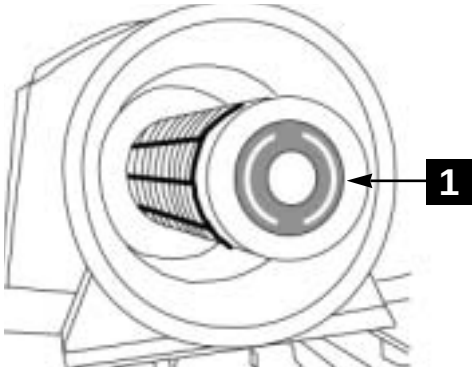


- Remove the drain plug when the fuel level is at the minimum.
- Clean the diesel oil tank to eliminate impurities and condense.

- When clean fuel is streaming out, fit the drain plug again.

Safety Cartridge 1000

This safety cartidge is located in the air filter After **five** air cleaner service or after **two** years at the latest, replace safety cartridge (never clean).

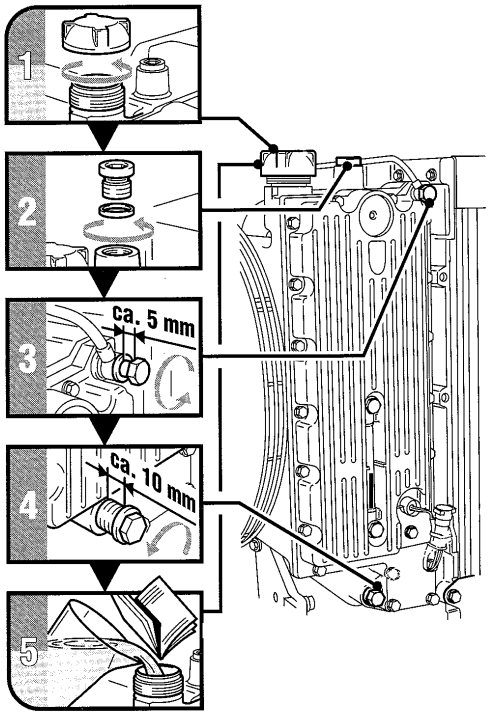


- Take off hood and extract the air filter
- Pull out the splint **(1)** to extract the safety cartridge
- Install new safety cartridge
- Replace air filter and hood, do up clip fasteners

Never clean safety cartridge. Always install a new cartridge

Draining Cooling System 1000

Use only cooling system protective liquid : reference TOTAL ORGANICOOL (See table of lubricants)
To prevent engine overheating (caused by sedimentation in the cooling system) do not mix with other coolants



DRAINING

- Open the heater valve in cab
- Unscrew drain plug (**4**), fully
- Rinse the cooling circuit with pure water

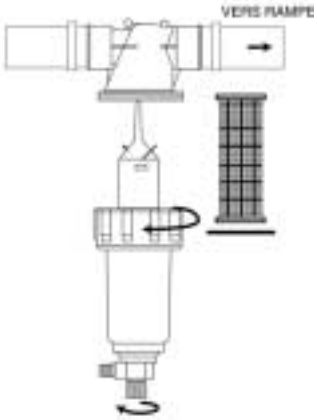
FILLING UP

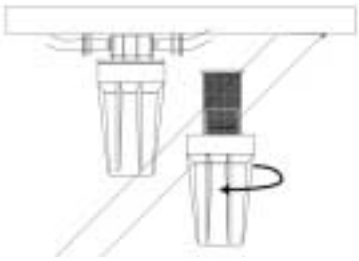
- Unscrew cap filler **(1)**
- Turn out bleed plug **(2)**
- Relax screw plug **(3)**
- Screw drain plug **(4)** in up to first groove
(Do not screw completly the drain plug)
- Top up coolant to filler neck up edge. The coolant runs out from bleed plug **(2)**.
After filling coolant, tighten **(2)**, **(3)** and **(4)**
- Start and run the engine up to normal operating temperature to open the thermostat housing. Check coolant level and add coolant if necessary
- Open the heater valve in cab to circulate coolant in the circuit
- Check coolant level and top up if necessary

Capacity : **15** l approx.

5-2-6 EVERY HOURS

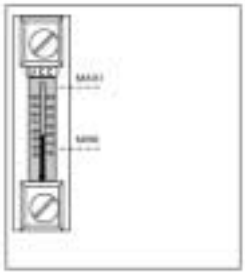
Spray filters 1





5-2-7 EVERY 10 HOURS OR DAILY

hydraulic oil level 10



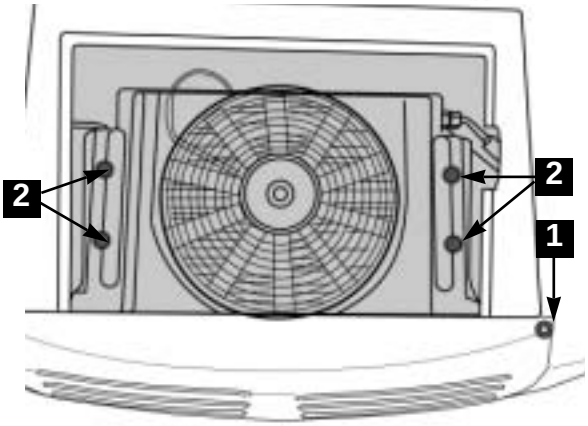
ALWAYS USE A SIMILAR HYDRAULIC OIL

- Check the hydraulic oil level through the sight glass situated on the reservoir An audible warning located on under the instrument panel indicates a lack of oil in the hydraulic system. Check the hydraulic circuit immediately for leaking and refill oil into the hydraulic tank.

- Clean the area around the filling cap.
- Fill hydraulic oil through a filter unit to guarantee the purity. Filter ratio : 10 micron absolute or better.

For a good draining of the oil, it is preferable for the machine to have been running prior to the hydraulic oil change

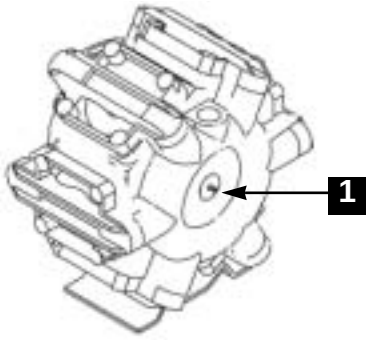
Air conditioning Condenser 10



- Remove the service flap on the condenser **(1)**
- Remove the fan support **(2)**.
- Blow out air conditioning the exchanger with compressed air
- Refit the assembly

5-2-8 EVERY 50 HOURS

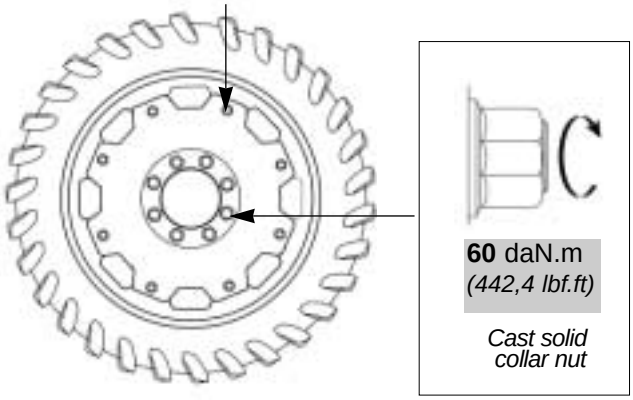
463 diaphragms pump 50



- Lightly grease the nipple **(1)** of the pump

Wheels 50

35 daN.m*(258 lbf.ft)*

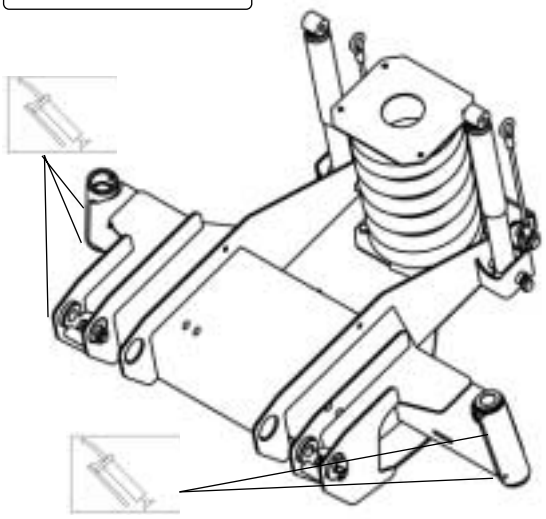


ALPHA **3400** and **4100**	bar
300/95R46	3,6
460/85R34	1,6
480/70R38	1,6
600/70R30	1,6
520/70R38	1,6

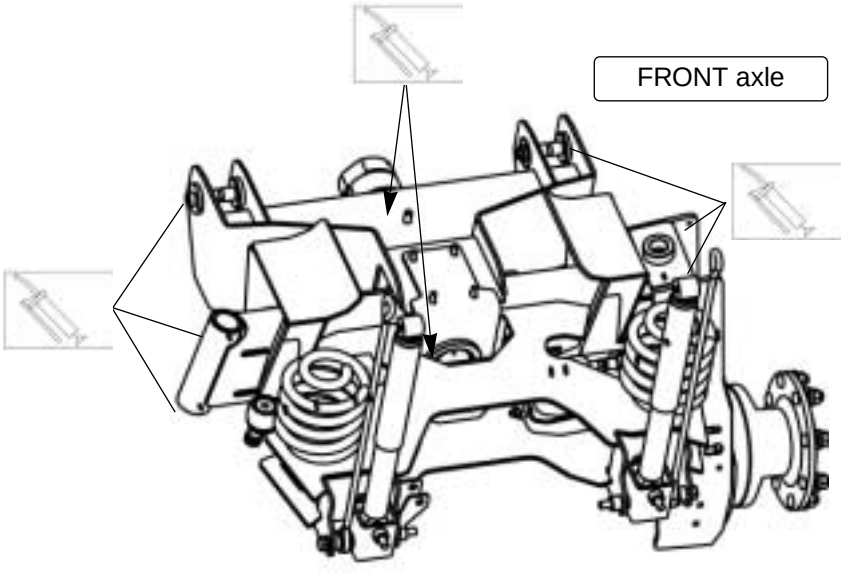
- Check the tyre pressure wich should be in accordance with the following table :

Chassis and Boom 50

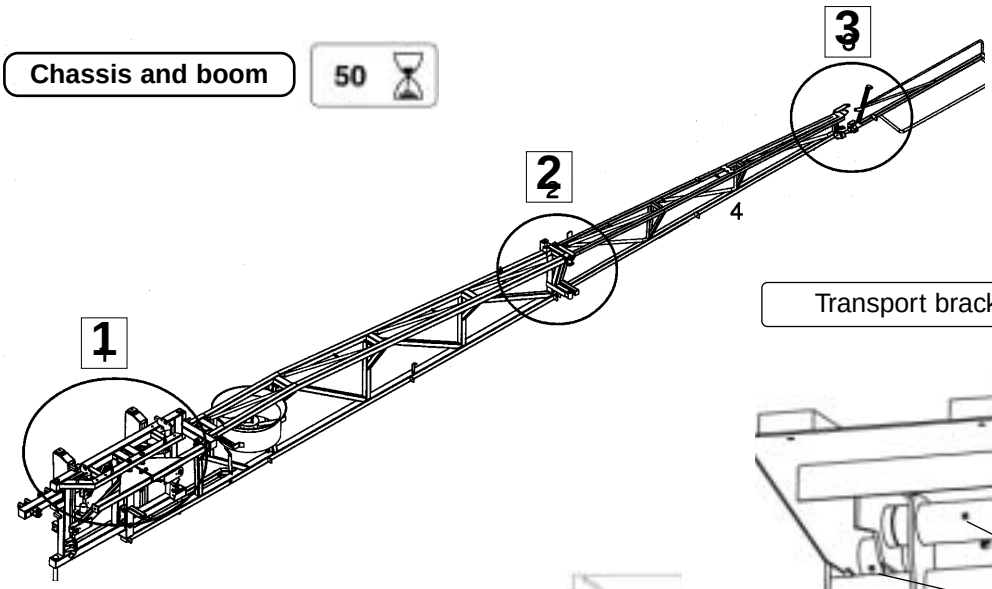
REAR axle



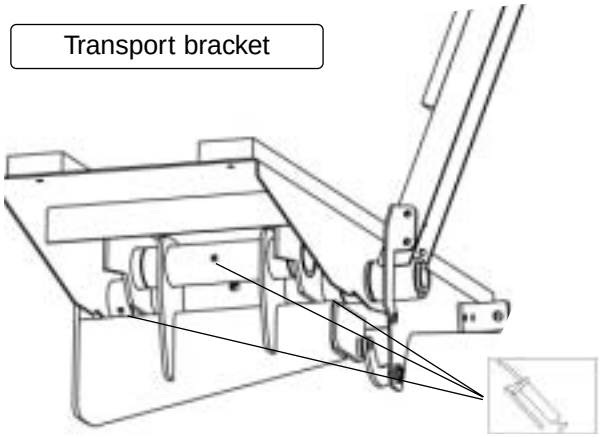
FRONT axle

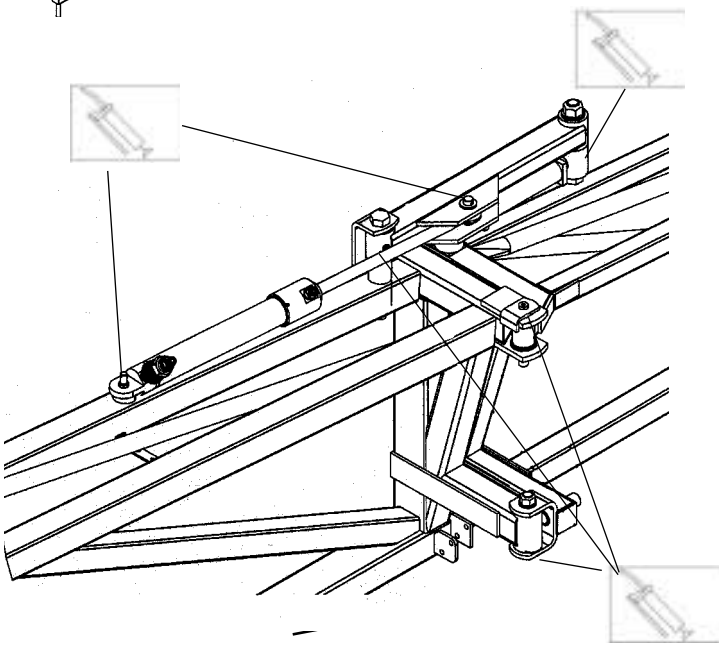


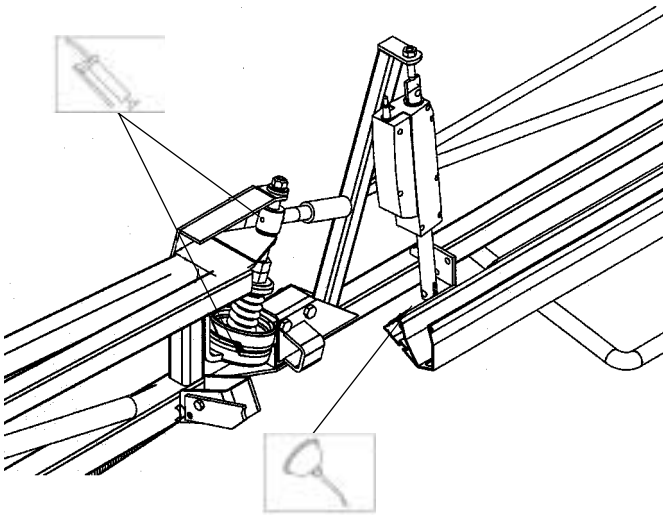
Chassis and boom 50



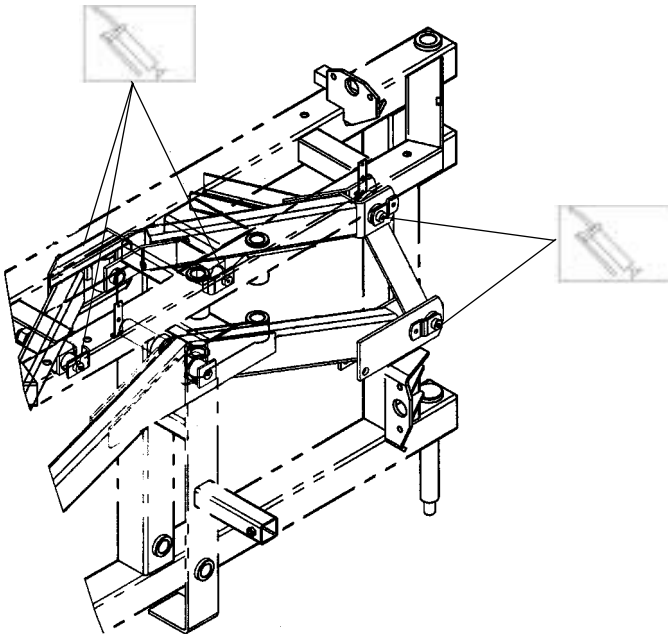
Transport bracket

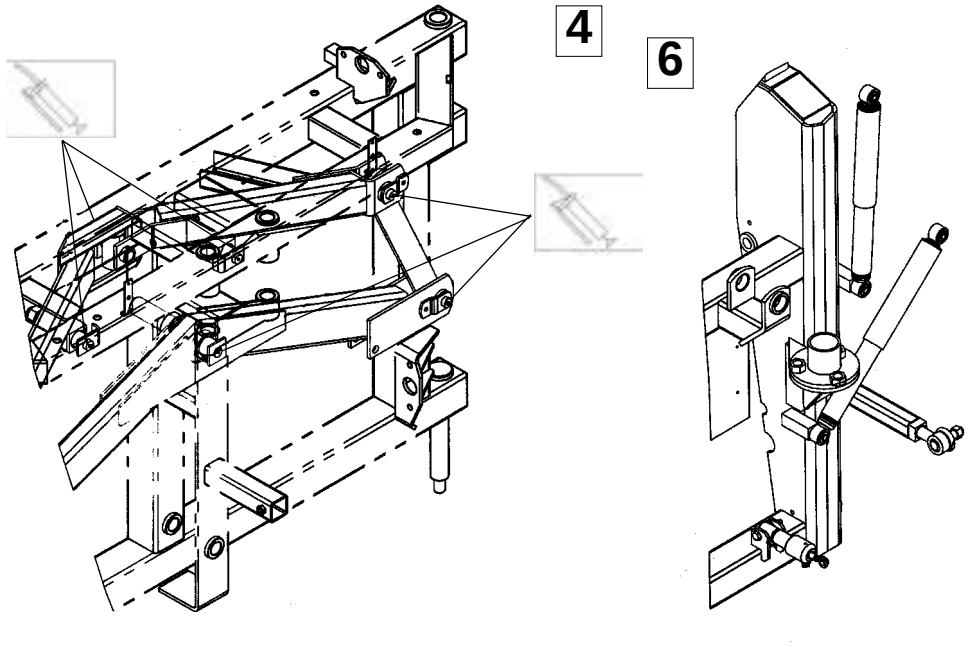






5

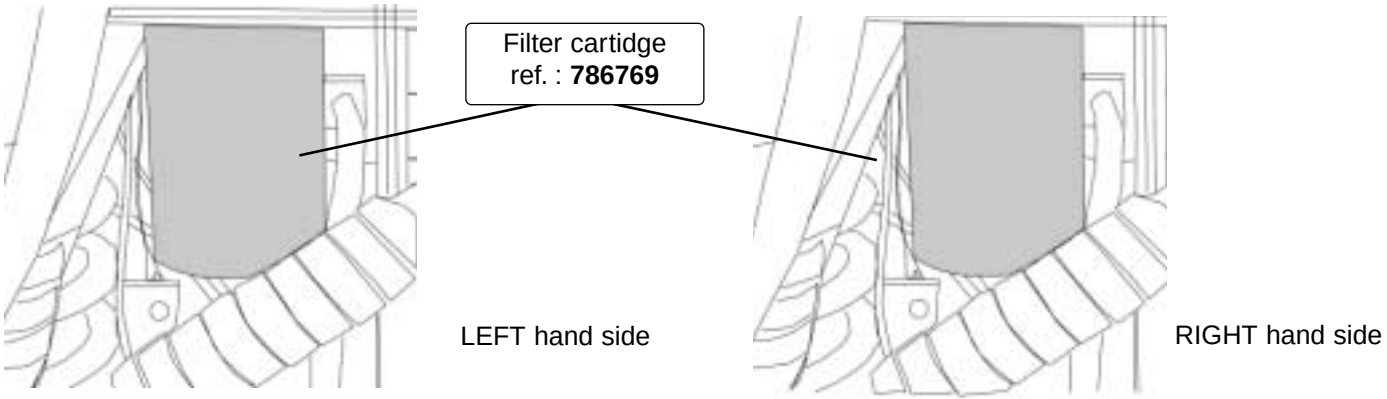




5-2-9 EVERY 250 HOURS

Hydraulic oil filters 250

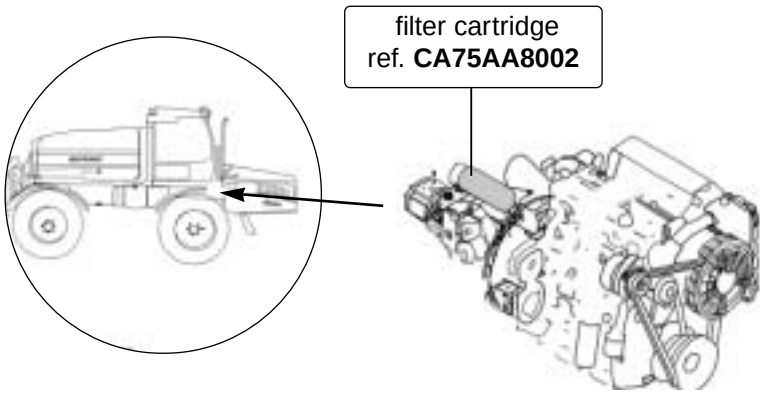
It is essential to use the maker's genuine hydraulic oil filters



The filter cartridges ***(1)*** are located on the each side of the machine.
- Unscrew the filter cartridges
- Lightly oil the joint.
- Screw on the new filter cartridge and turn 1/2 turn by hand

The filter cartridge is located on the hydrostatic pump

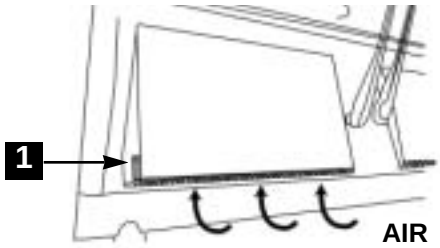
- Unscrew the filter cartridge located on the hydrostatic pump
- Lightly oil the joint
- Screw on the new filter cartridge and turn 1/2 turn by hand
- Check for leaks after re-assembly

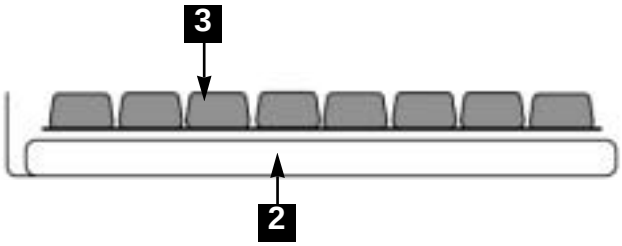


Carbon Cab Filters 250

This is located above the cab. Perfect operational condition of the filtration system is of primary importance for the user's health.

Frequency of replacement must be increased in the case of intensive and prolonged use



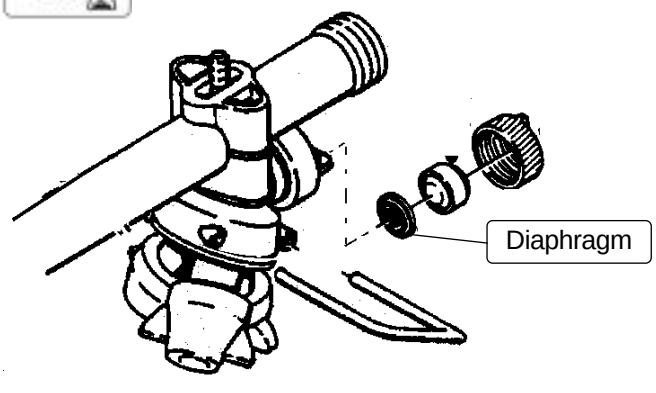


The carbon cab filters are located on either side of the cab close to the windscreen . Act as follows :
- Unscrew the fixing screw **(1)**
- Pull out the carbon filter cover **(2)** to extracting the carbon filter **(3)**
- Replace the new carbon cab filters (reference : **278238**) and refit the assembly

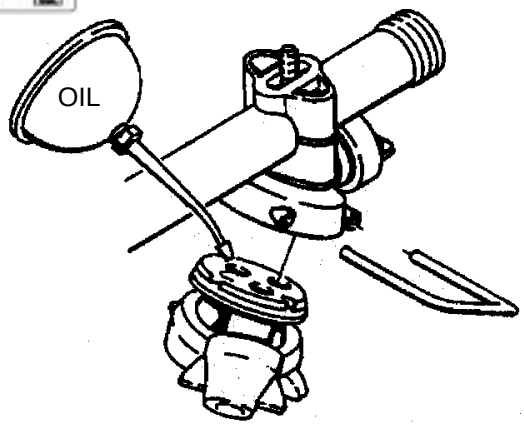
It is essential to replace the <u>two</u> carbon cab filters simultaneously

Trilets

250



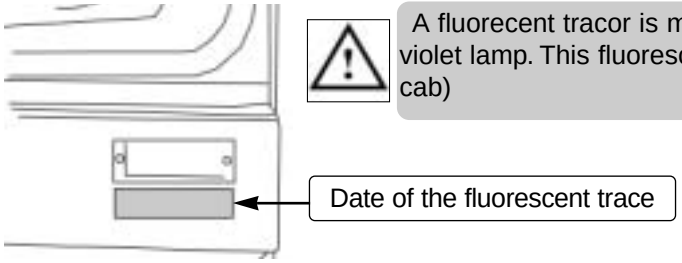
500



5-2-10 EVERY 500 HOURS

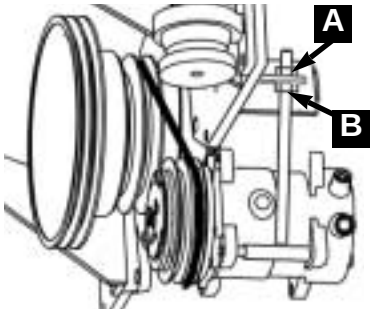
Air conditioning 500

If the air conditionning fails, it is preferable that the air conditioning unit be inspected for leaks and refilled by a specialist as soon as possible.



A fluorecent tracor is mixed with refrigerant. Leaks of gas is detected with a ultra-violet lamp. This fluorescent trace is active for 5 years (see the label stack in the cab)

- It is recommended to change the deshydrater filter every 2 years (ref. :278284)

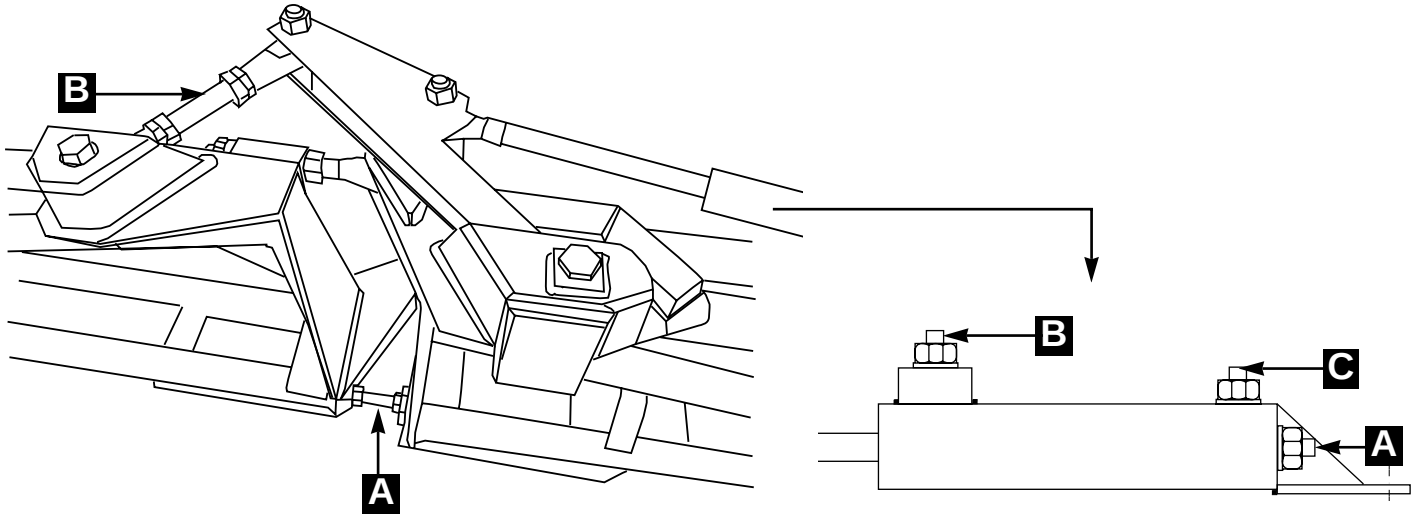


Check the tension of the air conditioning belt, for this purpose :

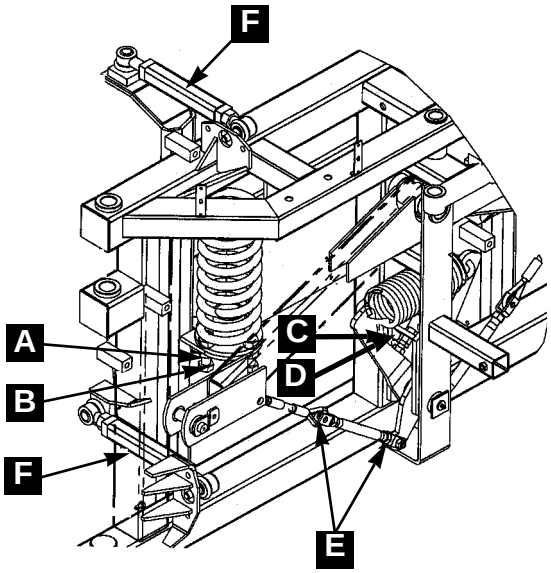
- Unscrew the locknut **(A)** of the belt tightener
- Screw the nut **(B)** to tension the belt and re-fit the locknut.
- Check the tension after **15** mn use.

32-36 GVA boom adjustment 500

- Adjust the screw **(A)** to align the outer boom section.
- Vent the ram
- Position the rod at the maximum position
- Adjust the hinge **(B)** to get the outer section in contact with the screw-stop **(A)**
-Screw on 2-turn the hinge **(B)** to lock the assembly**.**



HAZ Boom adjustment 500



1- Suspension spring tension

- Loosen the counter nuts **(A)** in either side and adjust the tension of the vertical springs on the bolts **(B)** to suit the boom weight. The adjustment is correct when the guide
- Tighten the counter nuts again **(A).**

2- Pendulum return spring and cables

- Ensure that the slanting ram is set midway
- Loosen the counter nuts **(C)** and adjust the stop screws **(D)** until the V-shaped mechanism is in symmetry
- Allowe max. ***1*** mm play between stop screw and arm
- Loosen the counter nuts **(E)** on the rigging screws, and adjust the length of the rigging screws until boom is level. The correct adjustment is reached when the spring opens ***1*** mm between the threads.
- Tighten the counter nuts again

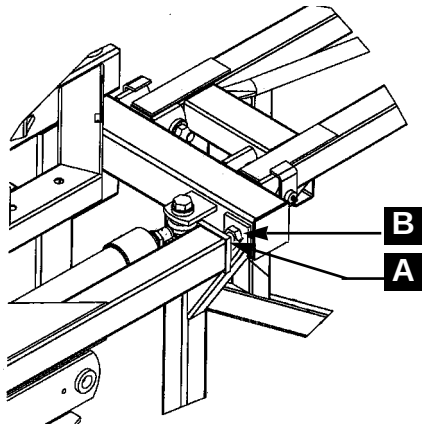
3- Guide rods length adjustment

The guide rods length should normally not need to be adjusted. If the suspension has been dismantled, the length must be checked or adjusted if necessary.
The trapeze and pendulum must hang freely. Adjust the length of the rod **(F)** accordingly.
- Loosen the counter nuts and adjust the rods.

4- Inner section folding adjustment

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

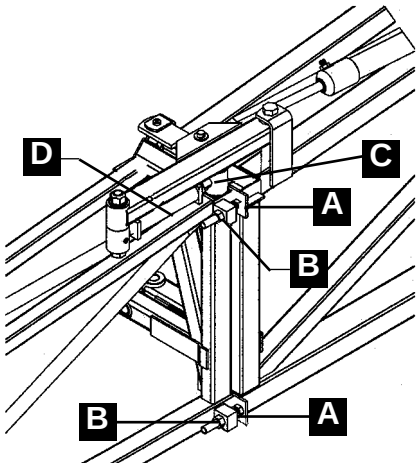
- Depressurize the folding rams
- Loosen counter nut **(A)**
- Adjust stop srew **(B)** until the correct setting is reached
- Tighten counter nuts again

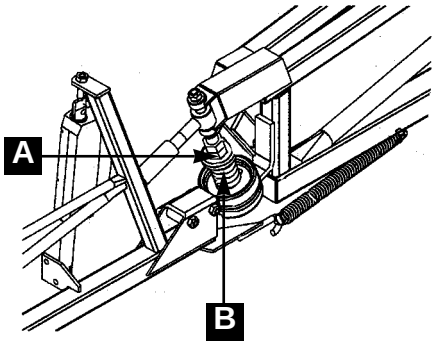


5- Outer section folding adjustment

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

- Depressurize the folding rams
- Loosen the counter nuts **(A)** and **(C)**
- Loosen the screws **(B)**
- Pressurize the folding ram until it is fully extended
- Adjust on the rigging screw (D) until the correct setting is reached
- Adjust the stop screws (B) up against the inner section
- Tighten counter nuts again





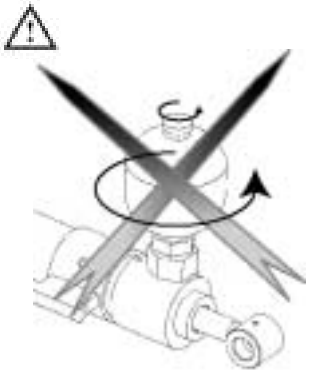
The breakaway section must be released when a force of approximately 150 N (34 lb) is applied to the extremity of the breakaway section. If necessary break-away section is adjusted as follows :

- Make sure the claw coupling is correctly lubricated.
- Loosen the counter nut **(A).**
- Adjust the nut **(B)** until the breakaway will release at a force of 150 N (34 lb) applied at the extremety of the section.
- Tighten the counter nut again

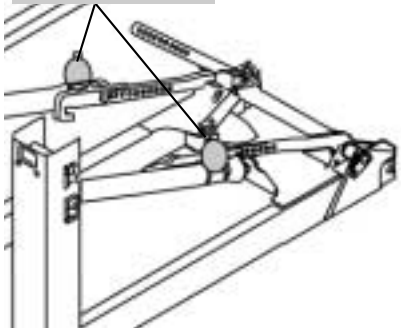
5-2-11 EVERY 1000 HEURES OR ANNUAL

Nitrogen accumulator 1000

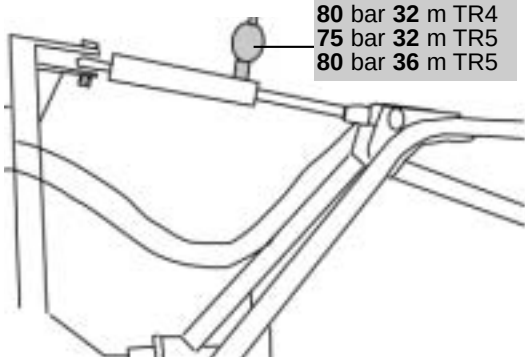
For your own safety as well as the others, the user must not remove the nitrogenPlease contact a HARDI-EVRARD concessionaire for maintenance.
qui s'assurera avant toute intervention sur les accumulateurs d'azote de :
Read carefully the 'OLAER' manual ref: 109294-1 (You can see the Olaer manual at chapter 1 of this manual)
Before maintenance lower completly the boom and Lock the boom. You must ensure that there is no residual hydraulic pressure in the accumulator and use the 'OLAER' checking-inflation tools.
Replace the safety cap to protect the inflation valve



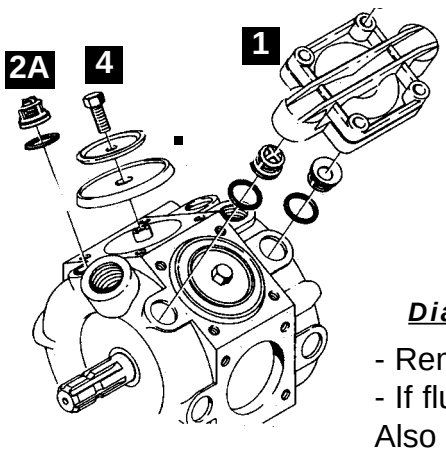
35 bar **24** m TR4
40 bar **28** m TR4
40 bar **30** m TR4
45 bar **32** m TR4
70 bar **32** m TR5
75 bar **36** m TR5



45 bar **24** m TR4
65 bar **28** m TR4
80 bar **30** m TR4
80 bar **32** m TR4
75 bar **32** m TR5
80 bar **36** m TR5



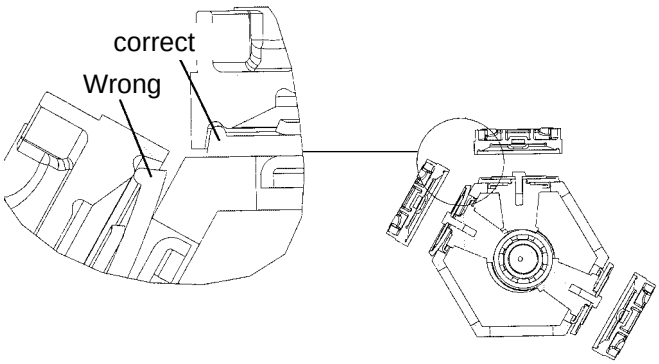
Valves and diaphragms 1000



- Remove valve cover **(1)** before changing the valves **(2)**
- Note their orientation so they are replaced correctly !
One special valve **(2A)** is used. It has to be placed in the valve opening shown
- It is recommended to use new gaskets **(3)** when changing or checking the valves.
- Tighten the bolts with the torque setting (**90** Nm)

Diaphrams

- Remove the diaphrams cover **(4)**.
- If fluids have reached the crankcase, re-grease the pump thoroughly. Also check that the drain hole at the bottom of the pump is not blocked.
- Reassemble with the torque setting (**90** Nm)



IMPORTANT !

Before tightening the 4 bolts for the diaphragm cover (B) the diaphragm must be positionned between centre and top to ensure correct sealing between diaphragm pump housing and diaphragm cover. Turn crank shaft if necessary

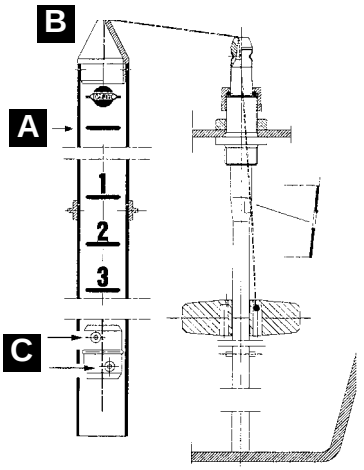
Battery 1000

To obtain a long life of the battery and ensure that the machine always is ready for use, the battery should be recharged regularly.
To prevent any risk of damage to electrical and electronic components or cause severe personal injury , take the following precautions:

WARNING

- Wear rubber gloves and goggles
- Never disconnect the battery terminals while the engine is running
- Never charge a frozen battery, it may be explode (minimum temperature : 16°).
- Check the density of electrolyte. (see DEUTZ notes).
- Check the polarities before reconnecting the terminals.
- Disconnect the terminals of the battery and place the latter in a well ventilated place, free from any source of sparks and flames (no smoking), before charging it.
- Disconnect the battery terminals and the alternator before to carry out electric welding on the machine
- A defective battery can damage electronic equipment
- Clean the battery terminals if necessary

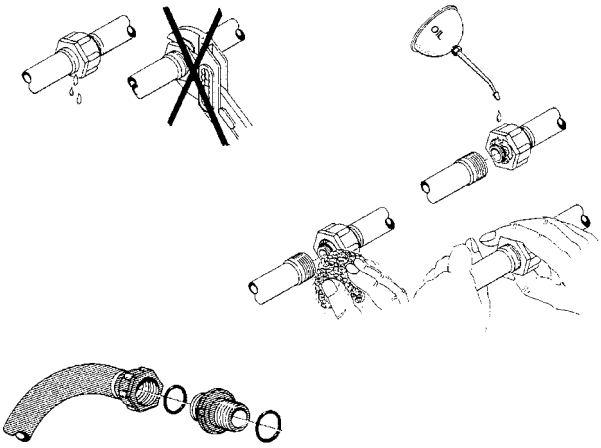
5-2-12 OCCASIONAL MAINTENANCE



Level indicator adjustment

The level indicator reading shoud be checked regulary
When the tank is empty, the float should lie on the stop pin, of the rod, and the O'ring on the indicator should be positionned at the top position line **(A)**
If any deviation is found, pull out the plug **(B)**, loosen screws **(C)**, and adjust the length of the cord

Nozzle tubes abd fittings



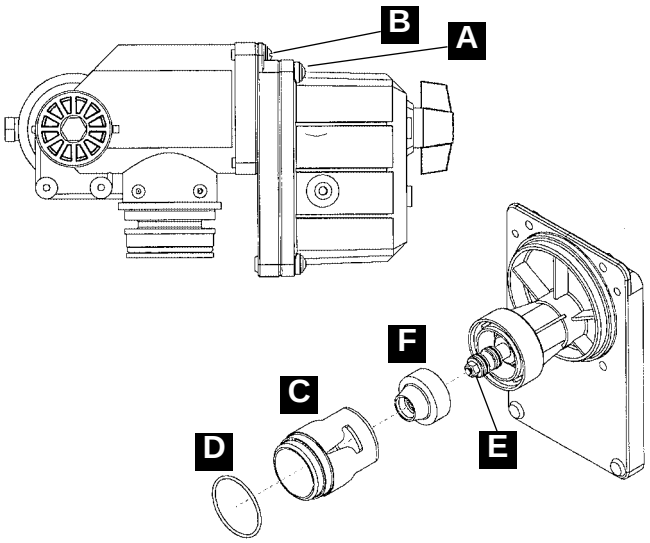
Poor seals are usually caused by :

- missing O-rings or gaskets
- damaged or incorrectly seated O-rings
- dry or deformed O-rings or gaskets
- foreign bodies

In case of leaks **DO NOT overtighten**.
- Disassemble, check condition and position of O-ring or gasket
- Clean, lubricate and reassemble
The O-ring must be lubricated **ALL THE WAY ROUND** before fitting on the nozzle tube. Use non-mineral lubricant.

For **RADIAL** connections only hand-tighten them.
For **AXIAL** connections, a liitle mechanical leverage may be used

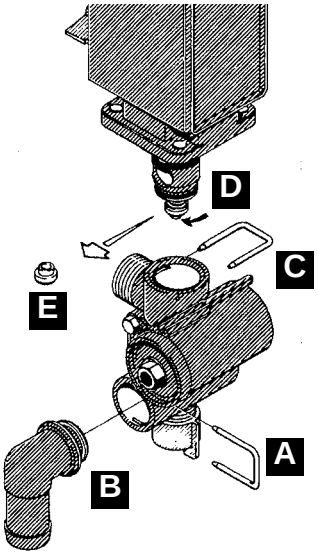
Cone check/ renewal EVC operating unit



If it becomes difficult to build up sufficient pressure or if pressure fluctuations occur, it may be necessary to renew cone and cylinder. A Hardi kit is available for this purpose n°. 741293

- Remove 4 x screws **(A)** and remove the housing
- Remove 4 x screws **(B)**
- Replace cylinder **(C)** and O-ring **(D)**
- Loosen the nut **(E)** remove and replace the cone **(F)**
- Reassemble in reverse order

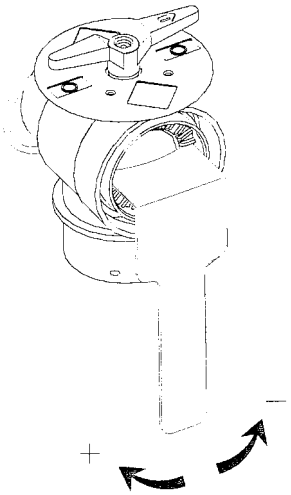
Cone check/ renewal, EVC distribution valve



Periodically check the distribution valves for proper sealing. Do this by running the sprayer with clean water and open all distribution valves.
- Cautiously remove the clip **(A)** and pull out the hose **(B)** for the preesure equalisation device

When the housing is drained, there should be no liquid flow through the pressure equalisation device. If there is any leakage, the valve cone **(E)** must be changed
- Remove the clip **(C)** and lift the motor housing of the valve housing.
- Then unscrew the screw **(D)** and replace the valve cone **(E)**
- Reassemble in reverse order.

Adjustment of 3-way-valve



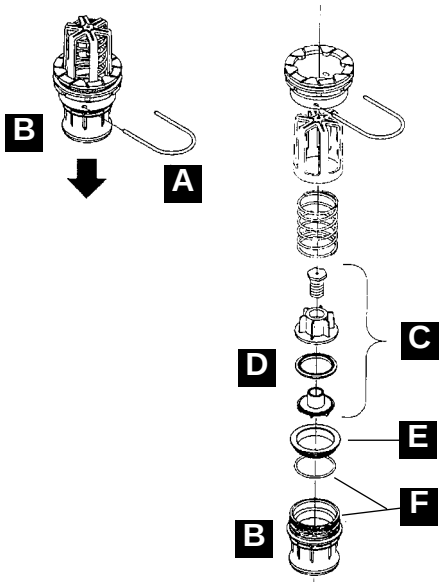
IThe Manifold valve can be adjusted if it is too tight to operate - or if it is too loose (=liquid leakage).

Use a suitable tool and adjust the toothed ring inside the valve as shown on the drawing.

Seal renewal, drain valve

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

Do not enter the inside of the tank - the parts can be changed from underneath the tank !

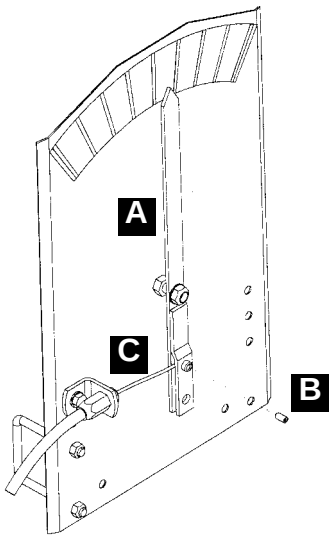


If the main tank drain valve leaks, the seal and seat can be changed the following way.

- Make sure the tank is empty and clean
- The valve must be closed and the string loose
- Pull out the clip **(A)** and pull down connectiong piece **(B)**

The entire valve assembly can now be pulled out.
- Check cord and valve flap assembly **(C)** for wear
- Replace seal **(D)** and assemble again
- Assemble the valve assembly again using a new valve seat **(E)**
- Lubricate O-rings **(F)** before assembly
- Fit clip **(A)** again

Adjustment of slanting indicator



If the position of the pointer on the indicator does not correspond to the actual boom position, the pointer **(A)** can be adjusted.

- Loosen the small bolt **(B)** sufficiently to allow the wire **(C)** to be adjusted.

- Place the pointer **(A)** in correct position and fasten bolt **(B)** against the wire **(C)** again.

Cab

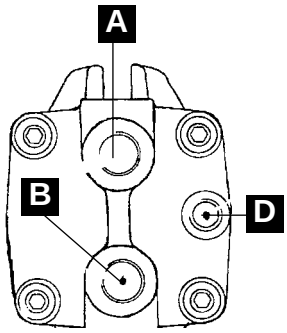
The roof of the cab must be cleaned carefully. You can use a sponge or a cloth, soak and rub very gently the fibre
Use carefully : Potasslum chloride, ammoniac.
Prohibited products : acétone, concentrated acid, trichloréthylene, white spirit, toluene

Spots	**Cleaning recommended**
Colour ink (Ball-pen ...)	Stain remover for Woven / Water solution+ use lightly Potasslum chloride
Blood	Hydrogen peroxide 10 vol.
Vegetal spot (coffee,wine, flowers...)	Hydrogen peroxide 10 vol. / Ammoniac diluted to 15%
Spot of oil, dirty oil,tar,,Fats	Use lightly Essence F Soapy water / Spray aerosol stain remover for carpet
Mud	Stain remover for carpet / soapy water
Stick / adhesive	Essence A
Rust	Hydrochloric acid dilued to 5% and rinsing with water

Theses recommendations are indicat and no exhaustive. Use others cleaning products after a test beforehand.

Fan transmission priming

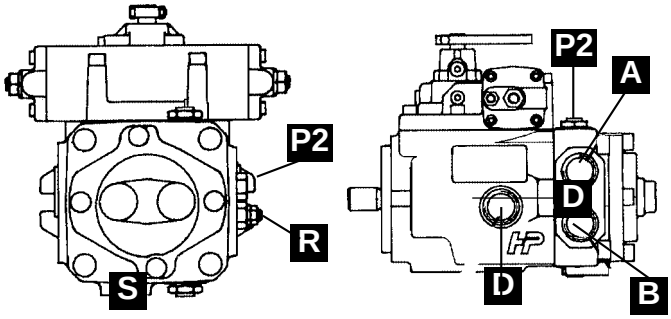
If the hydraulic pump fan has been dismantled, or pump or motor has been changed, the following priming procedure must be carried out before starting up the transmission.



- Fill the oil reservoir with fresh, clean oil to the top of sight glass.
- Fill the pump housing with oil through the drain pipe (D) which is dismantled at the tank connection. Reconnect and tighten.
- Check the oil level in the gear box
- Remove the drain hose (D) from the motor outside the blower housing.
- Set the fan r.p.m. at 0
- Engage the tractor P.T.O. with the engine running at idle
- Wait a few minutes
- Set the fan speed at 200 r.p.m.
- After a while the oil will start dripping constantly. Refit the drain hose and tighten.
- Set engine speed at 2000 r.p.m. , the fan should rotate at max. revolutions/mn.
- Recheck oil level at tank sight glass
- Retighten hose connections and check for leaks.
- Check fan speed pressure adjustments - see section on ‘’Fan speed adjustments” and ‘’Fan transmission pressure adjustment”

Fan transmission pressure adjustment

A	Pressure port
B	Return port
D	Drain port
P1	Connector for working pressure measurement
P2	Connector for feed pressure
R	Adjustment screw for feed pressure
S	Suction port



The transmission feed and working pressure are checked as follows :
- Connect a 40 bar (580 p.s.i.) pressure gauge to the feed pressure connector (P2), and a 400 bar (5800 p.s.i.) pressure gauge at the working pressure connector (P1).
- Set the engine at 2000 r.p.m. check with a tachometer
- Set the blower at max. speed
- Check the feed and working pressure :

Feed pressure,	***P2***	15-20 bar (218-290 p.s.i.)
Working pressure,	***P1***, approx.	
	18 m	180 bar (2610 p.s.i.)
	20 m	190 bar (2755 p.s.i.)
	21 m	200 bar (2900 p.s.i.)
	24 m	210 bar (2610 p.s.i.)
	27 m	240 bar (3721 p.s.i.)
	28 m	240 bar (3721 p.s.i.)

- Adjust feed pressure if necessary.

Failure to reach feed and working pressure indicates that the transmission needs overhauling.

6- GARAGING

This chapter deals with the actions to be taken for the purpose of garaging the sprayer in the winter period. They must be followed scrupulously as the guarantee does not cover damage caused by freezing

6- 1 OFF-SEASON STORAGE

- Protect the electrical components (alternator,branch box, connectors, regulating valve) from splashes of water.
- Clean the sprayer completely - inside and outside. Make sure that all valves, hoses and auxiliary equipment have been cleaned with detergent and flushed with clean water afterwards, so no chemical residue is left in the sprayer
- Renew possible damaged seals and repair possible leaks.
- Empty the sprayer completely and let the pump work for a few minutes. Operate all valvess and handles to drain as much water off the spraying circuit as possible. Let the pump run until air is coming out of all nozzles. Remember to drain the rinsing tank also.

- Pour ***80*** to***100*** litres of water with antifreeze into the main tank. See the antifreeze instructions to obtain sufficient protection from freezing.

- Spray for a few moments at the nozzles to protect the nozzles.

- Engage the pump and operate all valves and functions on the Manifold, operating , filler etc. allowing the anti-freeze mixture to be distribued around the entire circuit. Open the operating unit main on/off valve and distribution valves so the anti-freeze is sprayed through the nozzles as well. The anti-freeze will also prevent O-rings, seals, diaphragms etc. from drying out.

- Lubricate all lubricating points according to the lubricating scheme - regardless of intervals stated.

- When the sprayer is dry, remove rust from possible scratches or damages in the paint and touch up the paint.

- Remove the glycerine-filled pressure gauges and store them frost free in vertical position.

- Apply a thin layer of anti-corrosion oil on all metal parts. Avoid oil on rubber parts, hoses and tyres.

- All electric plugs and sockets are to be stored in a dry place. Remove the Hardi Nova control box and display from the cab and store them dry and clean (in-house).

- Apply grease on all hydraulic ram piston rods which are not fully retracted in the barrel to protect against corrosion.

- Chock up the wheels, to prevent moisture damage and deformation of the tyres.

- Fill up completely the fuel tank to prevent condensed water into the tank.

- Clean the engine air filter

- Cut the battery cut-off and disconnect the battery.

- Place the mobile unit under cover

6- 2 PREPARATION AFTER OFF-SEASON STORAGE

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

- Connect again the battery.
- Adjust the tyre pressure.
- Wipe off the grease from hydraulic ram piston rods.
- Fit the pressure gauges again.
- Connect the Hardi Nova control boxes.
- Drain oil and coolant of the engine, check V-belts tension, and check /replace engine air filter
- Replace carbon cab filters.
- Replace all hydraulic filters and drain the hydraulic oil tank.
- Check the air conditioning.
- Check all hydraulic and electric functions.
- Drain and rinse the spraying circuit with clean water.
- Check the spraying filters and nozzles.
- Check all Twin function.

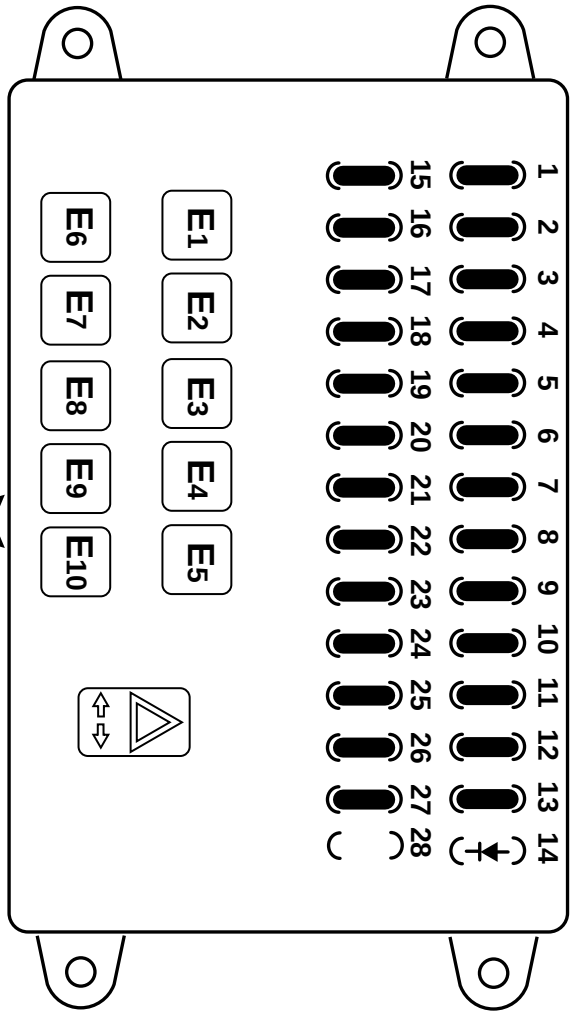
7- FAULTS IN OPERATION

This chapter lists the hazards which might arise in the course of using the sprayer. Some components can be repaired by the user. However, other elements can be repaired only by your concessionaire.

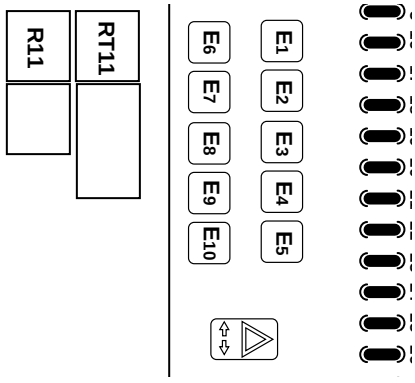
7-1 ELECTRIC CIRCUIT

7-1-1 FUSES AND RELAY

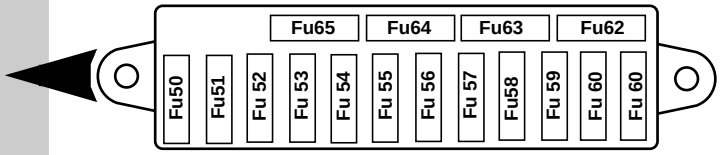
1	10A	Clutch air conditioning compressor
2	20A	Air conditioning condensor motor
3	25A	Air conditioning evaporator
4	15A	Rear working lights
5	7,5A	Windscreen washer motor
6	7,5A	Front Windscreen wiper motor
7	2,0A	Cab light (overheat)
8	15A	Fan control (heater)
9	15A	Front working lights
10	10A	Car radio
11	20A	Boom working lights (optional)
12	7,5A	Front hydr. motor displacement control
13	7,5A	Rear hydr. motor displacement control
14	(1,0A)	Diode for directional indicators
15	10,0A	Preheating engine control
16	7,5A	Advance unit
17	10A	hydr. motor displacement control & parking
18	7,5A	Pneumatic seat
19	7,5A	Oil hydraulic alarm- pressure switch for stop lights engine accelerator control- Engine temperature
20	7,5A	4-wheels steering unit
21	10A	Not used
22	7,5A	Spray pump control
23	2,0A	Road safety (hydraulic boom & 4-wheels drive)
24	10A	Option-after ignition supply
25	7,5A	Engine accelerator
26	5,0A	Agitation - no agitation valve
27	20A	Working lights (optional)
28	10A	Ladder control



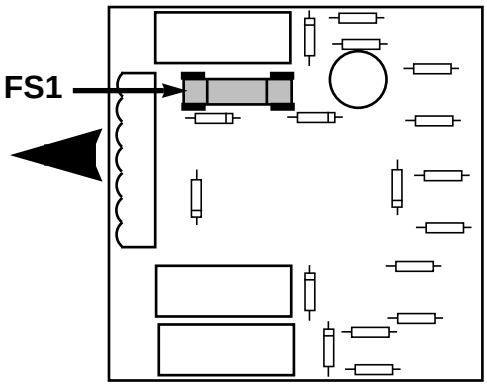
E1	Clutch air conditioning compressor relay
E2	Air conditioning condenser relay
E3	Accelerator relay
E4	Accelerator relay
E5	Battery cut-off relay
E6	Micro electro pump relay (Dyna+ version)
E7	
E8	Working lights relay
E9	Safety start relay
E10	Hydraulic oil level alarm relay
g c	Flasher unit
RT11	Intermitant windscreen wiper relay
R11	Windscreen wiper relay



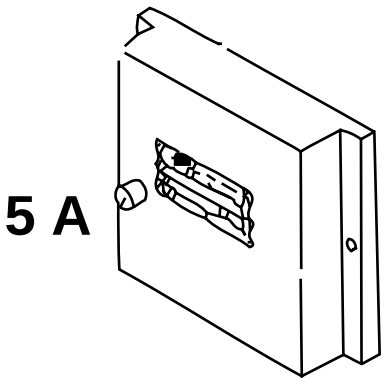
Fu50	7,5A	Electrical stoppage of engine
Fu51	7,5A	Warning lamp and back lights switches
Fu52	15A	Warning beacon
Fu53	7,5A	Right direction indicator lights
Fu54	7,5A	Horn
Fu55	7,5A	Flaher unit control
Fu56	7,5A	Right position lamps
Fu57	7,5A	Left position lamps
Fu58	7,5A	Right head lights Dipped beam
Fu59	7,5A	Left head lights- Dipped beam
Fu60	10A	Head lights- Main beam
Fu61	7,5A	Left direction indicator
Fu62	20A	Multi-function switch and warning lights
Fu63	15A	Hardi Nova +12 V electronic
Fu64	30A	Hardi Nova +12 V power Micro electro pump
Fu65		Not used



FS1 (slow blow fuse)	1,0A	Parking brake and displacement control

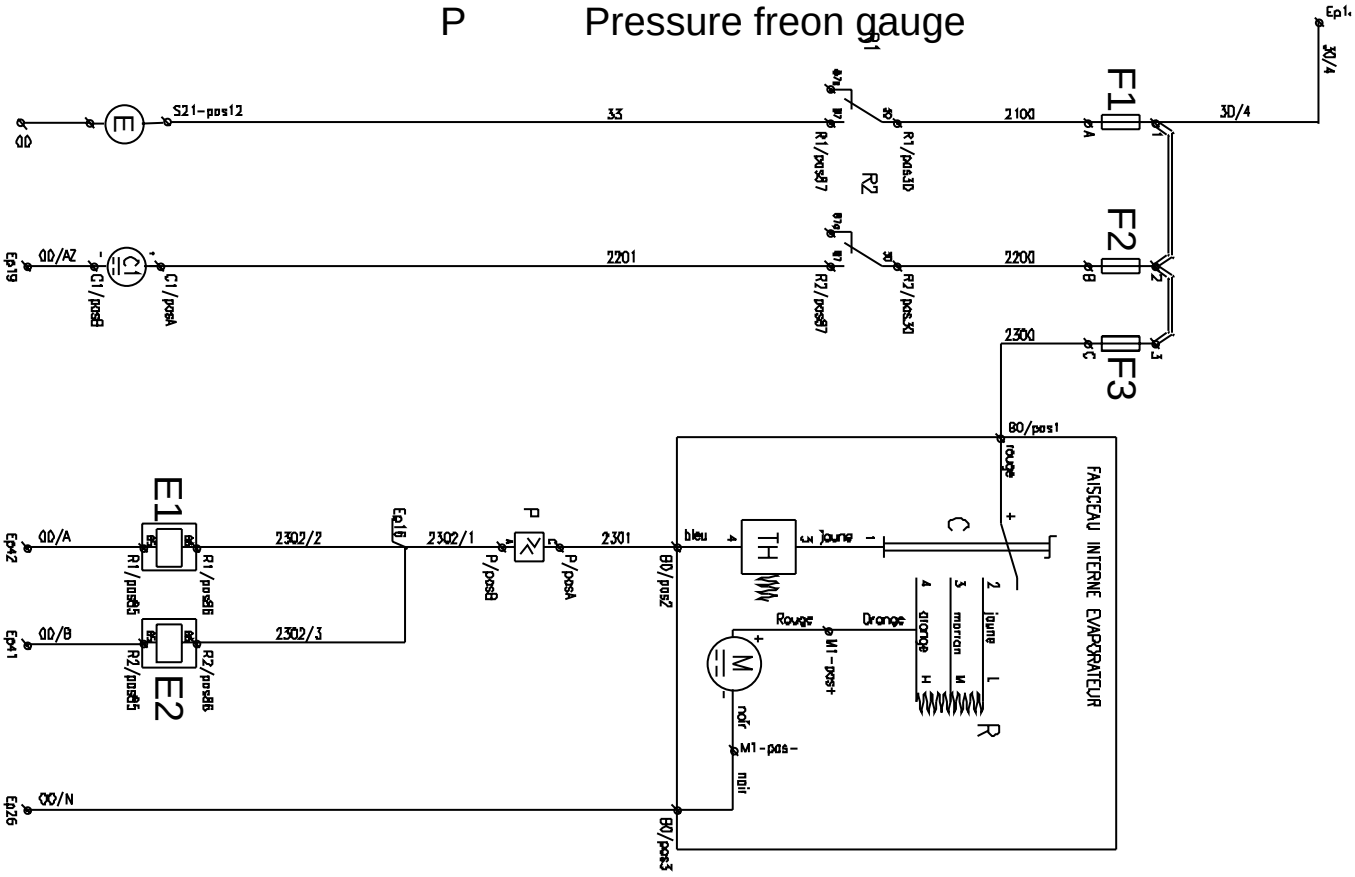


F1	Anti-skid (option)



7-1-2 AIR CONDITIONING WIRING DIAGRAM

F1	Compressor fuse
F2	Condenser fuse
F3	Evaporator fuse
E1	Clutch air conditioning relay
E2	Condenser relay
C1	Condenser motor
C	Air conditioning speed control switch
TH	Thermostat
M	Evaporator motor
R	Resistor
P	Pressure freon gauge



PROBLEMS	SOLUTIONS
The compressor does not work The condenser do not work	- Check that the thermostat works correctly - Check the relay *(E1)* and fuse *(F1)* of the compressor clutch - Check the relay *(E2)* and fuse *(F2)* of the condenser controller - Check that the ''binary" pressure works correctly. - Check the gas pressure and that the refrigeration circuit is air tight - Clean the condenser.
The evaporator do not work	- Check fuse *(n°3)* - The cabin fan does not work

7-1-3 ENGINE

PROBLEMS	SOLUTIONS
Engine is too warm	- Check engine coolant - Clean the engine cooler
il pressure warning lamp goes on **STOP IMMEDIATELY THE ENGINE**	- Checl the engine oil level - Check the electrical circuit
Battery charge warning lamp goes on	- Check the terminals of the battery - Check the alternator
No electric current	- Check battery charge and connections - Check the battery cut-off
Engine does not start	- Place driver's control lever in neutral position - Check the neutral position switch - Check the starter motor
The engine is turns over but does not start	- Check level of fuel in tank an diesel oil filters - Check pre-heating fuse *(n°15).* - Check pre-heating plug - Check the stopping unit
The engine runs but does not accelerate	- Check fuse *(n°25)* and accelerator unit

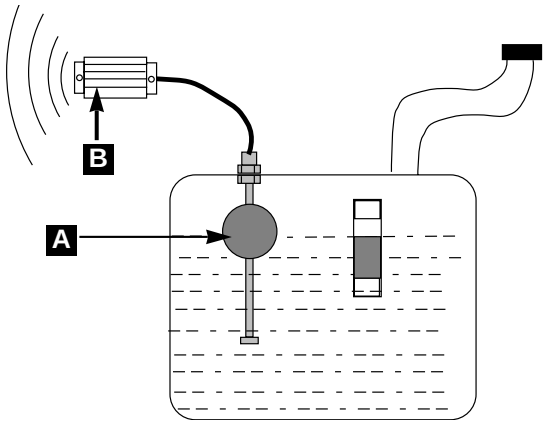
7-1-4 FOUR-WHEELS STEERING

PROBLEMS	SOLUTIONS
No signal from inductive sensor	- Check the fuse *(n°20)*. - Check electrical circuit and control unit
Faulty front or rear inductive sensor	- Check distance between disc and sensor - Check the inductive sensor - Check electrical circuit and control unit
Faulty of hydraulic distributor control (the LED on the coil goes out)	- Check the 2 red warning lamp are lights up - Check the pedal - Check the hydraulic distributor - Check electric circuit and control unit
Faulty of hydraulic distributor (the LED on the coil goes on)	- Check the hydraulic pressure *(130 bars)*. - Replace the hydraulic distributor.

7-2 HYDRAULIC CIRCUITS

7-2-1 OIL RESERVOIR ALARM

An oil level indicator **(A)** is situated at the top of the hydraulic reservoir. If audible alarm buzzer a located under the instrument panel indicates a leak of oil in the hydraulic system



- Stop immediatly the engine.
- Check the leak of the hydraulic circuit.
- Fill the reservoir with the same characteristic hydraulic oil.

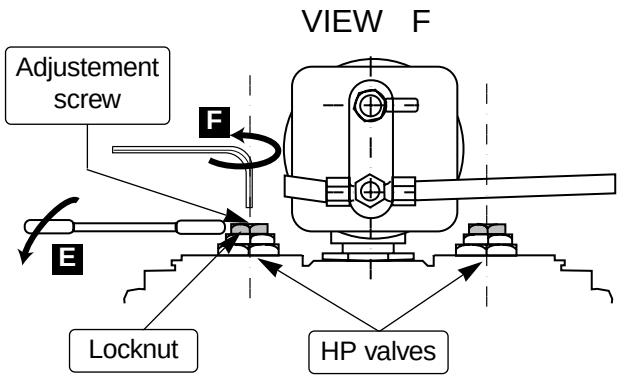
7-2-2 TOWING

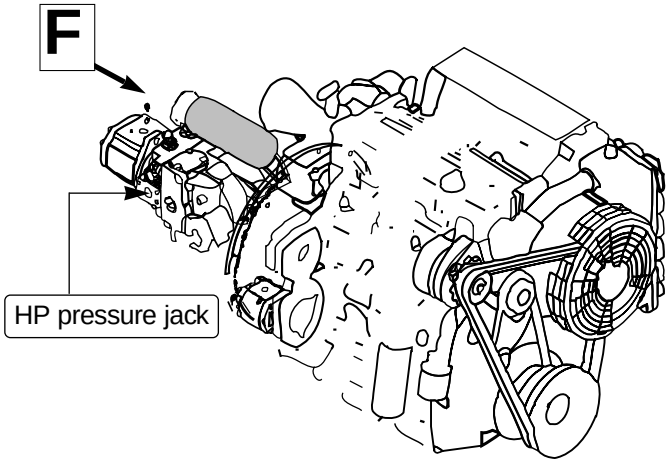
IN THE EVENT OF FAILURE OF HYDROSTATIC CIRCUIT, ACTIVATE THE PARKING BRAKE

Prior to any towing of the mobile unit as aresult as a result of failure of the engine or hydraulic circuit, it is essential to :

1- CANCEL THE SETTING OF THE HIGH PRESSURE VALVE OF HYDROSTATIC PUMP
2- RELEASE THE FOUR BRAKES OF THE HYDRAULIC MOTOR

1- Action on the advancing hydrostatic pump





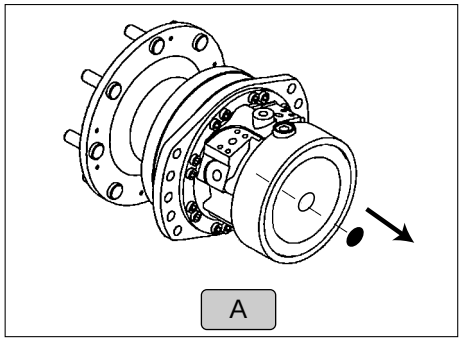
D: Slacken locknuts ref.**E.**

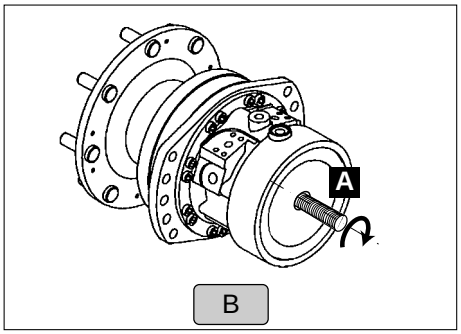
E : Completely unscrew the 2 Hc bolts situated in the safety nuts to cancel the setting of the valves (size 5 spanner 90R100 / size 8 spanner 90R130).

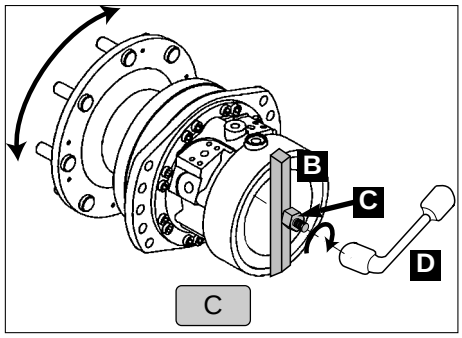
2- Action on wheel motors (Standard brake version)

In order for the mobile unit to be towed in case of problems, use the on-board kit placed in the cab, i.e. :
4 M16 threaded rods ref. **A.**
4 release bars ref. **B.**
4 M16 nuts ref. **C.**
1 box spanner, size 24 mm ref **D.**
1 open-ended spanner, size 19 mm ref. **E.**
1 hexagonal spanner ref. **F.**
(size 5 mm for 90R100 / size 8 mmfor 90R130).

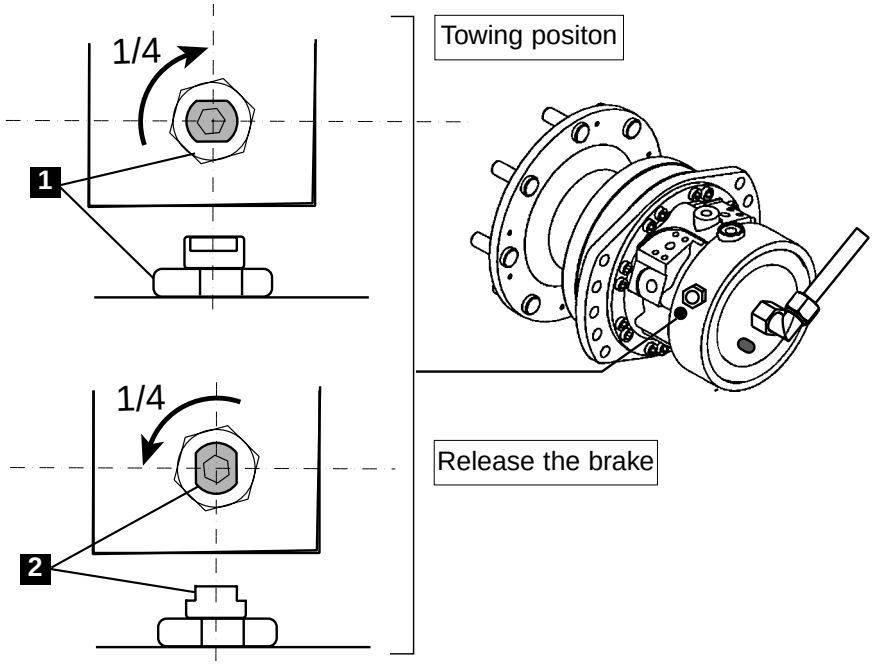
A - On each wheel motor, remove the centre rubber plug and fit parts refs. 1,2 and 3
B - Position the M16 threaded rods on the hydraulic motor
C - With release bar, ref.3, coming up against the wheel motor, turn nut, ref.2, to free the wheel.







2- Action on wheel motors (With Combined brake version)



1 Nm = 0.74 lbft

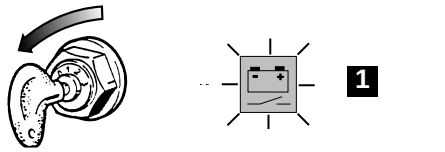
Towing positon

- Loosen the 2 counter nuts **(1)** situated on the brake housing
- To free the wheel, turn the screw **(2)**,(1/4 turn clockwise) until the flat side of the screw reach the wheel axis alignment.

Release the brake

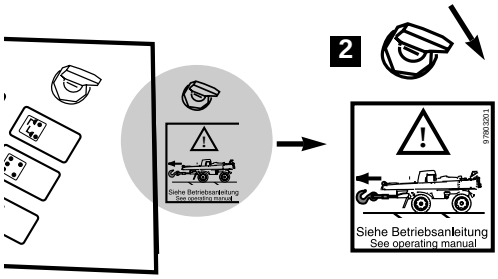
- Turn the screw **(2)** and place the flat side of the screw perpendicular with the axis of wheel motor.
- Tighten the 2 counter nuts (Torque setting **60** Nm)

3- Action on wheel motors (With DYNA+ version)



Towing

- Stop the engine, the isolator warning lamp **(1)** turns on.



- Before towing the machine turn the switch **(2)** to right side to release the parking brake

WARNING : Parking brake release when the micro electric pump is on

Parking brake

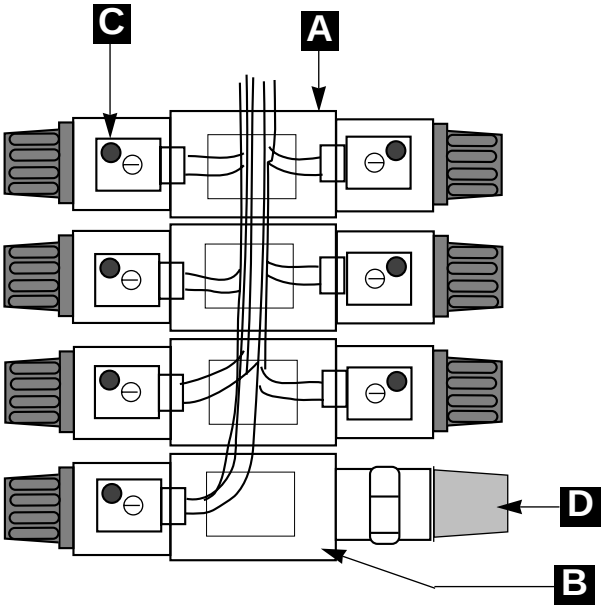
Turn the key **(2)** to left side to re-activate the parking brake

After this 2 operations, the mobile unit can be towed a distance of ***25 to 50 metres maximum*** and for a speed of ***5 km/h maximum)***.
After this, the valves must be set at 420 bars, to do this :

- Position a hydraulic pressure gauge to HP jack ***(600 bars)*** .
- Release the parking brake.
- Activate the parking brake on the cab.
- Start the engine and move the advance lever gently towards.
- Adjust the high pressure valve to obtain ***420 bars*** maximum.
- move the advance lever to neutral position.
- screw the locknut.
- Set the advance lever to reverse.
- Adjust the second high pressure valve to obtain ***420 bars*** maximum.

PROBLEMS	SOLUTIONS
The mobile unit is moving when the advance lever is on neutral position	- Adjust the neutral position switch (do not adjust the connecting rod between the joystick lever and the controller). - Check the mechanical neutral position of the hydrostatic pump.
The machine does not moving	- Check fuse *(n°16)*. - Check the parking brake is deactivate - Check by means the manual servo - Check the feeder pressure *(about 30 bar)*. - Check the high pressure circuit
The speed of mobile unit is unstable The speed of mobile unit is too slow	- Check the battery - Check the voltage control unit - Check hydraulic filters - Check the H.P. valves - Check the feeder pressure - Check leak of internal componants (hydrostatic pump, motors, etc...).
Hydraulic circuit too warm	- Check the oil level in the reservoir - Clean the oil radiator (see engine manual). - Check H.P. valves and leak of internal componants
No control of the hydraulic boom functions	- Check if the safety road switch is deactived - Check manually distributor, by pressing the manual control of the distributor and by-pass.
1- Faulty hydraulic system	In this case the LED of distributor and by-pass are lights up : - Check the pressure, the restrictor of the ram, the coil of the distributor.
2- Faulty of electrical system	In this case the LED of distributor and by-pass are lights off : - check battery, fuse, the control switch - Check the electrical circuit.

7-2-3 BOOM CONTROL DISTRIBUTOR



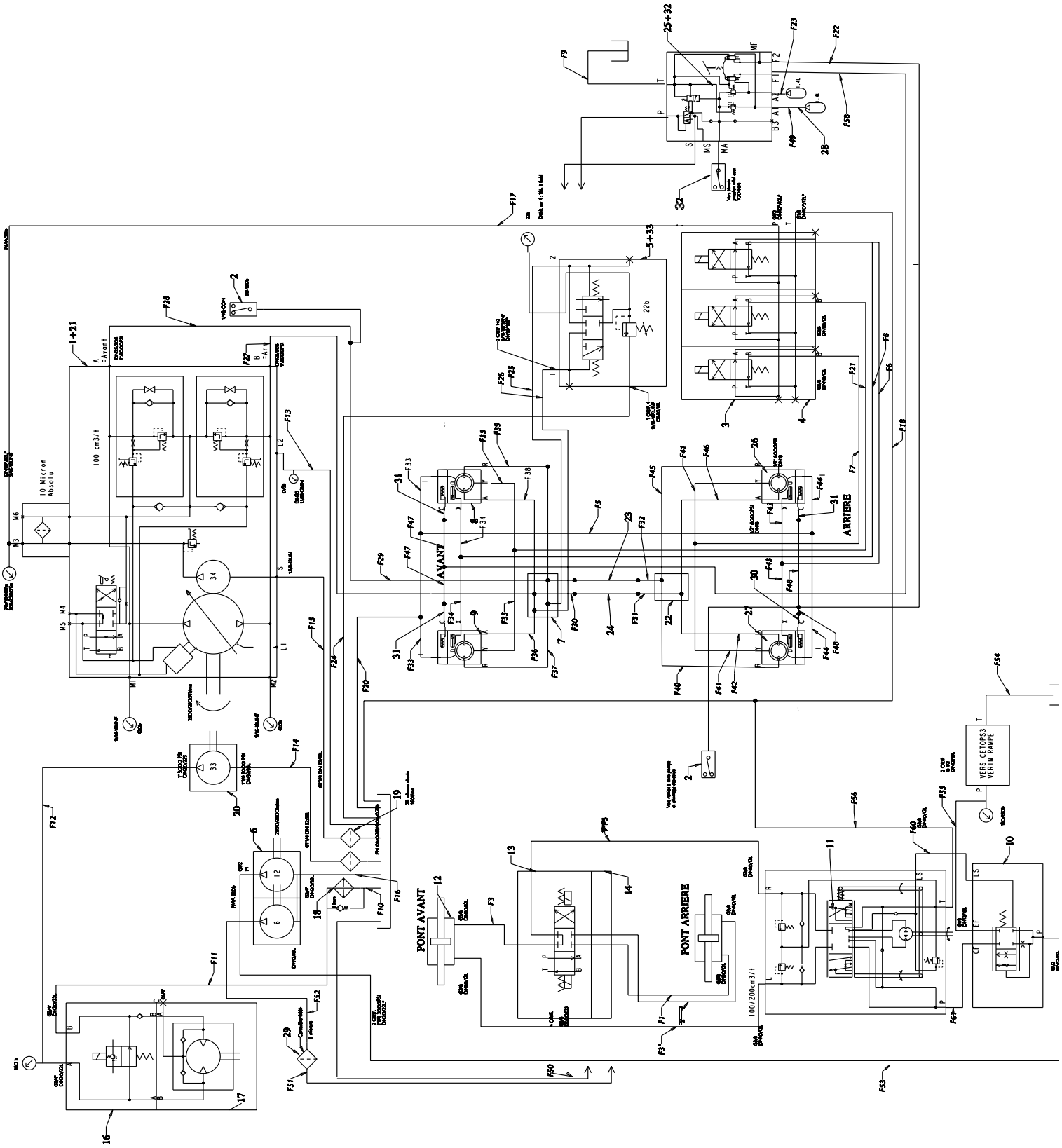
A Boom control distributor

B Boom control by-pass

C Warning control Led

D Boom relieve valve (**180 bar maxi**)

7-2-4 HYDRAULIC CIRCUIT (COMBINED BRAKE)



7-3 SPRAYING CIRCUIT

7-3-1 PUMP DOES NOT PRIME

PROBLEMS	SOLUTIONS
Incorrectly positioned valves Intake filter blocked Air taken in pump	- Check positions of valves - Clean filters - Check connections and seals. - look into pump maintenance (adjustment) or air taken in at pump - re-fit plugs

7-3-2 FOAM FORMS

PROBLEMS	SOLUTIONS
Excessive agitation	- Use an anti-foam additive - Reduce the speed of pump - Air taken in the piping - Do not use agitation

7-3-3 NO ADMIXTURE OF PRODUCTS

PROBLEMS	SOLUTIONS
Incorrectly positioned valves	- Check positions valves.
Insufficient pump delevery	- Accelerate the pump - Clean suction filter
Suction filter clogged	- Check connections and seals

7-3-4 INCORRECT SPRAYING

PROBLEMS	SOLUTIONS
Suction and delivery filters clogged	- Clean filters
Faulty pump	- Check turbine and adjustments.
Crushed piped	- Replace pipe
Foreign body at suction end	- Clean suction circuit
Air taken in	- Tighten the corresponding connections - Check the pipe porosity. - Check seals - Check filters - Check the valves - check nozzles wear- check spray pressure gauge - check speed rotation pump
Pressure drop	- Position valve N° 3 on "No agitation"
Pressure increase	- Nozzles blocked- filters blocked - Check the pressure gauge and the pipe of pressure gauge.

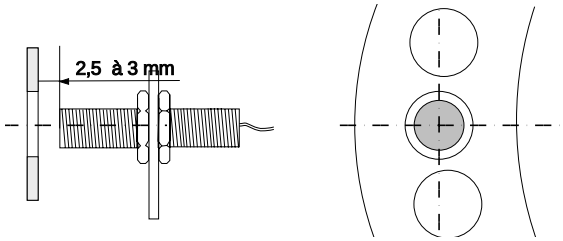
7-3-5 NO SPRAYING

PROBLEMS	SOLUTIONS
Pump does not prime	- See section ‘’Pump does not prime”
No pressure	- Check positions of valves - Check filters (suction and delivery). - Inappropriate nozzles - Check condition of safety valve - Check the calibrated nozzles
Remote valves not working	- Check the electrical supply (voltage and reversed polarities) - Check fuses *(FT1..FT8)* and *(FR1 FR11)*. - Check for mechanical jamming of valves.
Nozzles blocked	- Clean nozzles and spray circuit

7-3-6 VOLUME/HA CANNOT BE OBTAINED

PROBLEMS	SOLUTIONS
Faulty limit switch of the regulating valve	- Adjustment of the manual ‘’volume-regulating” valve
Filters	- Clean filters - Match the filter mesh to the spraying
Incorrect volume/ha	- Adjust the machine speed - Check programming of the REGULOR IV. - Check flow meter ans speed sensor
Inappropriate nozzles	- Select semi-continuous ou continuous circulation - Check the semi-continuous ou continuous valve - Match the nozzles to the flow per ha

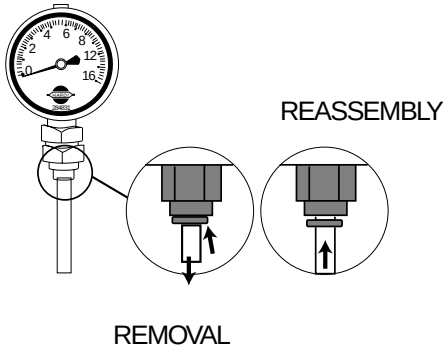
7-3-7 WHEEL SENSOR



- Check sensor / disc distance, 3mm maximum
- Check for disc distortion.
- Check for wheel distortion (wheel bearing)

7-3-11 PRESSURE GAUGE

PROBLEMS	SOLUTIONS
False reading Does not rest to zero	**N.B. : The operator may be splashed with liquid unexpectedly** - Check pressure gauge and circuit- Bleed the circuit - Bleed the circuit with clean water - Replace by a new pressure gauge if necessary



8- LIST OF MAIN PARTS

Code	Designation
	Engine
CA75AA8003	Oil filter cartridge (BF6M1012C-BF6M1013)
288012	Oil filter cartridge (BF4M1012C)
CA75AA8007	Diesel filter cartridge (BF4M1012C-BF6M1012C)
278267	Diesel filter cartridge (BF6M1013)
278465	Filter element for prefilter
218033	Prefilter O ring
278013	Alternator belt (BF4M1012C-BF6M1012C-BF6M1013)
278015	Fan belt (BF4M1012C- BF6M1012C-BF6M1013)
278419	Fan belt (BF6M1013)
278017	Water pump belt (BF4M1012C-BF6M1012C)
278420	Water pump belt (BF6M1013)
278255	Air intake filter r (BF4M1012C- BF6M1012C)
278422	Air intake filter (BF6M1013)
278256	Safety air filter (BF4M1012C- BF6M1012C)
278423	Safety air filter (BF6M1013)
278274	Water température detector
268156	Oil pressure detector
268276	Stop engine solenoid
268129	Alternator 12V 95A
268277	Starter
	Cab
278238	Active carbon filter
278284	Air conditioning deshydrator filter
	Steering ; automatic re-alignment
268055	Rear wheel alignment sensor
268122	Front wheel alignment sensor
268123	Cable for wheel alignment sensor
782832	Hydraulic distributor
268570	Pedal
73004401	Printed circuit equipped
	Hydraulic equipment
CA75AA8002	Hydrostatic pump filter cartridge
786769	Hydraulic suction filter cartridge
BO40DJ7250	Hydraulic reservoir plug
	Fuses
268127	Autofuse 2A
268417	Autofuse 3A
268330	Autofuse 5A
268027	Autofuse 7,5A
268160	Autofuse 10A
268028	Autofuse 15A
268418	Autofuse 20A
268313	Autofuse 25A

Code	Designation
268139	Microfuse 10A
268163	Microfuse 2A
268428	Slow blow fuse (5x20) 1A
	Chassis and boom
268382	Electric actuator for ladder
962709	Blue paint
962711	Aerosol blue paint
962701	Aerosol grey paint
	Valves
841059	3 way S93 Manifold valve
841062	3 way S67 Manifold valve
741065	Manifold stickers
BA30DI7192	Seal for Manifold valve
726490	Complete drain valve