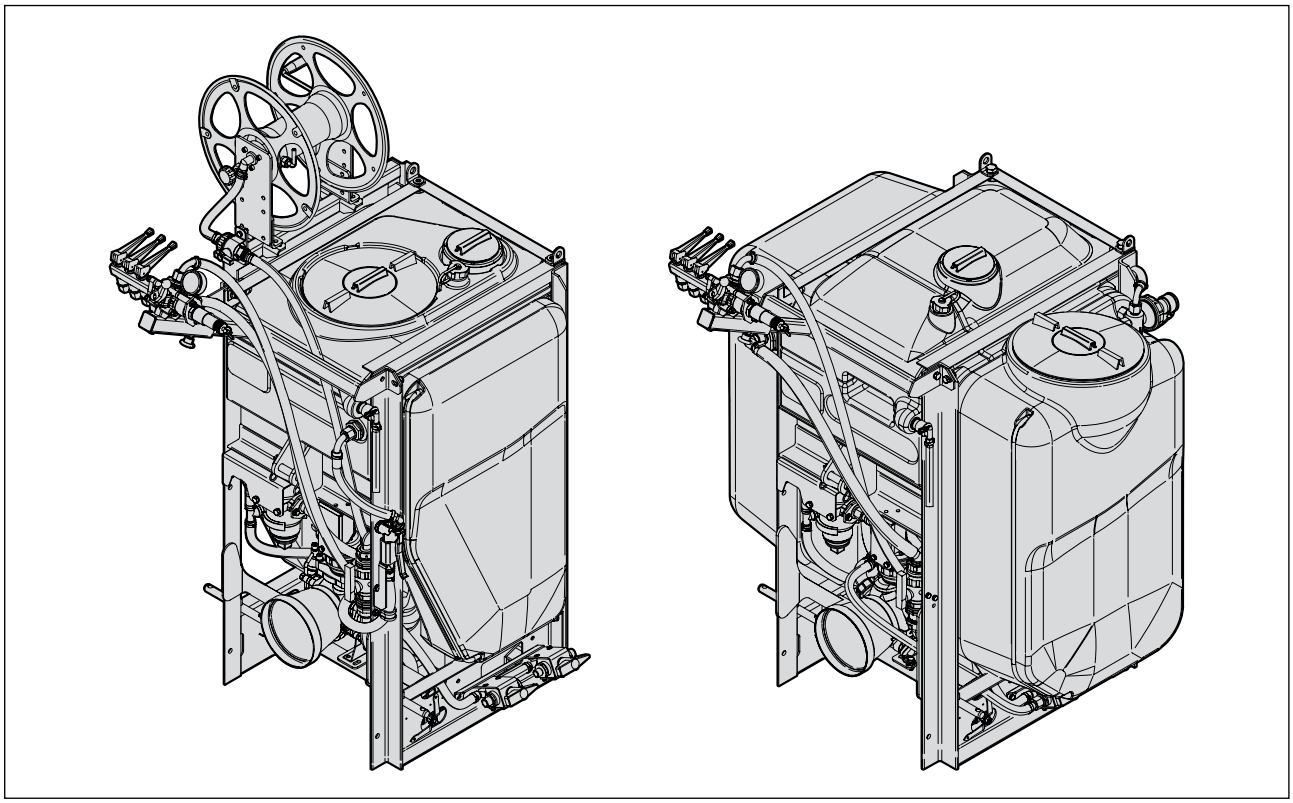
BERTHOUD®



ALTO 300/400/600/800

82.493-A ***ENGLISH***

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To be read attentively
and kept for further reference

Safety, checks and maintenance of the sprayers: see manual 82.471

Tables of NOZAL nozzles: **see manual 82.467**

BERJUST 2: **see manual 82.389**

TLP 7 boom: **see manual** 82232

RA boom: **see manual 82.354**

GC 9 boom: **see manual 82.235**

XR 12 boom: **see manual 82.396**

EC 9/12 boom: **see manual** 82388

Hopper: **see manual 82.413**

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GENERAL AND SAFETY

General safety measures.
Hitching, unhitching.
Maintenance.
Adapting the PTO shaft.
Meaning of the safety stickers.
Acceptable use of the sprayer.
Counter indications.
Warning.

See "Safety, checks, maintenance of the Sprayers": manual No. 82.471.

TECHNICAL SPECIFICATIONS
ALTO 300/400/600/800

- **CHASSIS:**
  - Steel chassis protected by polyurethane paint.
- **HITCHING:**
  - 2-point hitching on ALTO 300/400.
  - 3-point hitching on ALTO 600/800.
- **Universal PTO SHAFT.**
- **TANKS:**
  - Spraying: 300/400/600/800 litres high-density polyethylene tank with large fill opening.
  - Rinsing tank: 40 litres (ALTO 300/400) or 80 litres (ALTO 600/800).
  - 15-litre handwash tank.
- **DIAPHRAGM PISTON PUMP:**
  - BP 60/20 (20 bar - 60 l/min) for constant pressure version.
  - BP 105/20 (20 bar - 105 l/min) for D.P.M. version.
- **FILLING AND FILTRATION:**
  - Filling by manhole or external suction (optional).
  - Filtration:
    - Suction filter (filter cartridge, mesh 6/10),
    - filling filter (filter, mesh 8/10),
    - delivery filter (filter cartridge, mesh 4/10).
- **STIRRING:** hydraulic by no-sprayed liquid return to tank.
- **CONTROL:**
  - Constant pressure version:
    - ALTO 300/400/600/800.
  - D.P.M. version:
    - ALTO 600/800.
- **DISTRIBUTION:**

  BERTHOUD distribution manual control unit, including:
  - Glycerine pressure gauge, 0-25 bar, diameter 63 mm.
  - **Constant pressure version:**
    - 1 general quarter turn shutoff valve,
    - 1 manual regulating valve,
    - 2 or 3 supply shutters of the spraying boom's sections (depending on boom).
  - **D.P.M. version:**
    - 1 general quarter turn shutoff valve,
    - 1 manual regulating valve,
    - 3 supply shutters of the spraying boom's sections with multireturn units.
- **BOOMS:**
  - TLP 7 metres (see manual 82.232).
  - GC 9 metres (see manual 82.235).
  - XRT/XRS 12 metres (see manual 82.396).
  - RA 12 metres (see manual 82.354).
  - ECO 9/12 metres (see manual 82.388).
- **OPTIONS:**
  - Hose reels.
  - 0.60 m gun with 10 m of hose.
  - Filling with hydro-injector.
  - 6 metres filler hose with strainer.
  - Independent filling hopper.
  - Rinsing ball.
  - Berjust 2 (in-cab display monitor showing speed and volume/hectare).
  - Rinsing cans.
  - 1 main shutoff electric valve
  - Large diameter manometer (Ø 80).
  - RA 12 to RA 15 boom extension kit.

SOUND MEASUREMENTS

Atmospheric noise emitted by: Mounted sprayer ALTO with BP 60 or BP 105 pump

	Tractor and sprayer running	*Tractor P.T.O. disengaged, sprayer at rest*
Maximum sound pressure:		
- at product mixer level	80 dB (A)	73.5 dB (A)
- at the tractor driver's cabin,76 kW	72 dB (A)	70 dB (A)

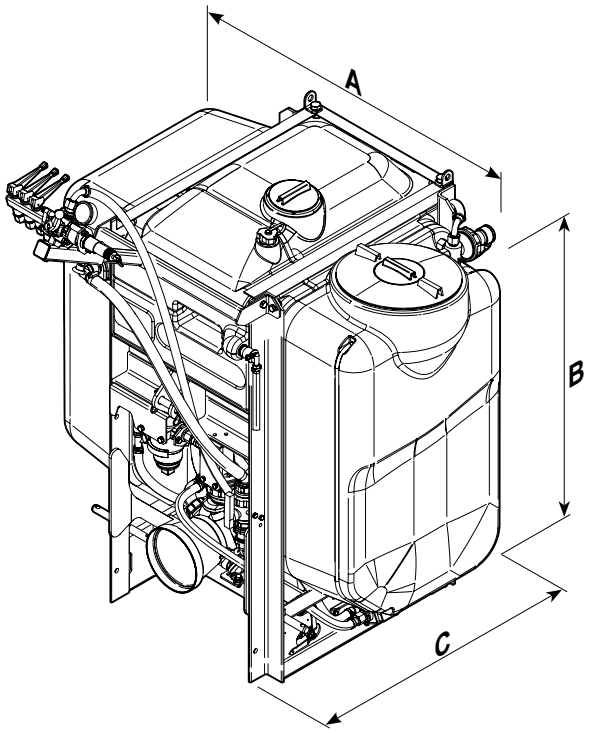
Maximum sound power:
- Tractor alone = **99.1 dB (A)**
- Tractor + sprayer = **99.8 dB (A)**

Comply with the legislation in force and use ear-protectors if necessary.

DIMENSIONS

ALTO without boom (in mm):

SPRAYERS	A	B	C
ALTO 300	780	1,640	740
ALTO 400	930	1,640	1,080
ALTO 600	1,300	1,640	1,350
ALTO 800	1,650	1,640	1,530



ALTO with boom (in mm):

SPRAYERS	BOOMS >	TLP 7	GC 9	XRT 12 XRS 12	RA 12	ECO 9	ECO 12
ALTO 300 ALTO 400	Overall width		2,600				
	Overall length		1,600				
	Overall height		1,630				
ALTO 600 ALTO 800	Overall width			2,610	2,700		
	Overall length			1,730	2,150		
	Overall height			2,200	2,540		

DESCRIPTIVE PLATE

The sprayer's identification plate is located on the chassis (see pages 9 and 10).

- The box "Type Berthoud" is made up of letters and figures.
- Example: ALT M 06 XR 12

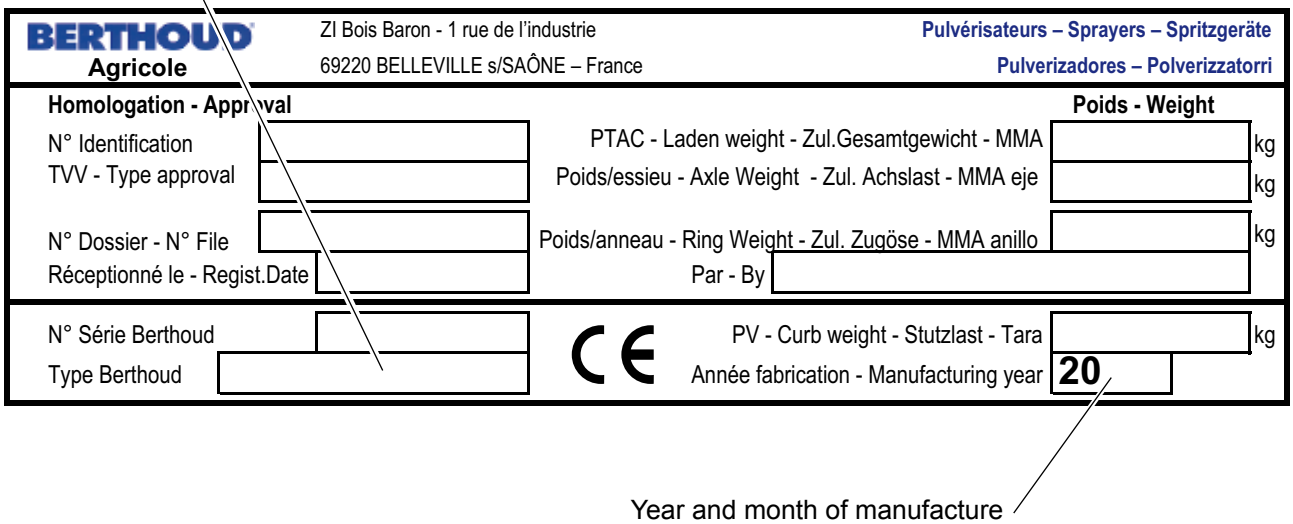
12 = width 12 metres

XR = XRT 12 and XRS 12 boom
(**TL** = TLP 7, **GC** = GC 9, **RA** = RA 12, **EC** = ECO 9-12)

06 = Rated capacity 600 litres (03 = 300 litres, 04 = 400 litres, 08 = 800 litres)

M = Manual regulation (**R** = Autoregleur regulation, **E** = Electric regulation)

ALT = ALTO

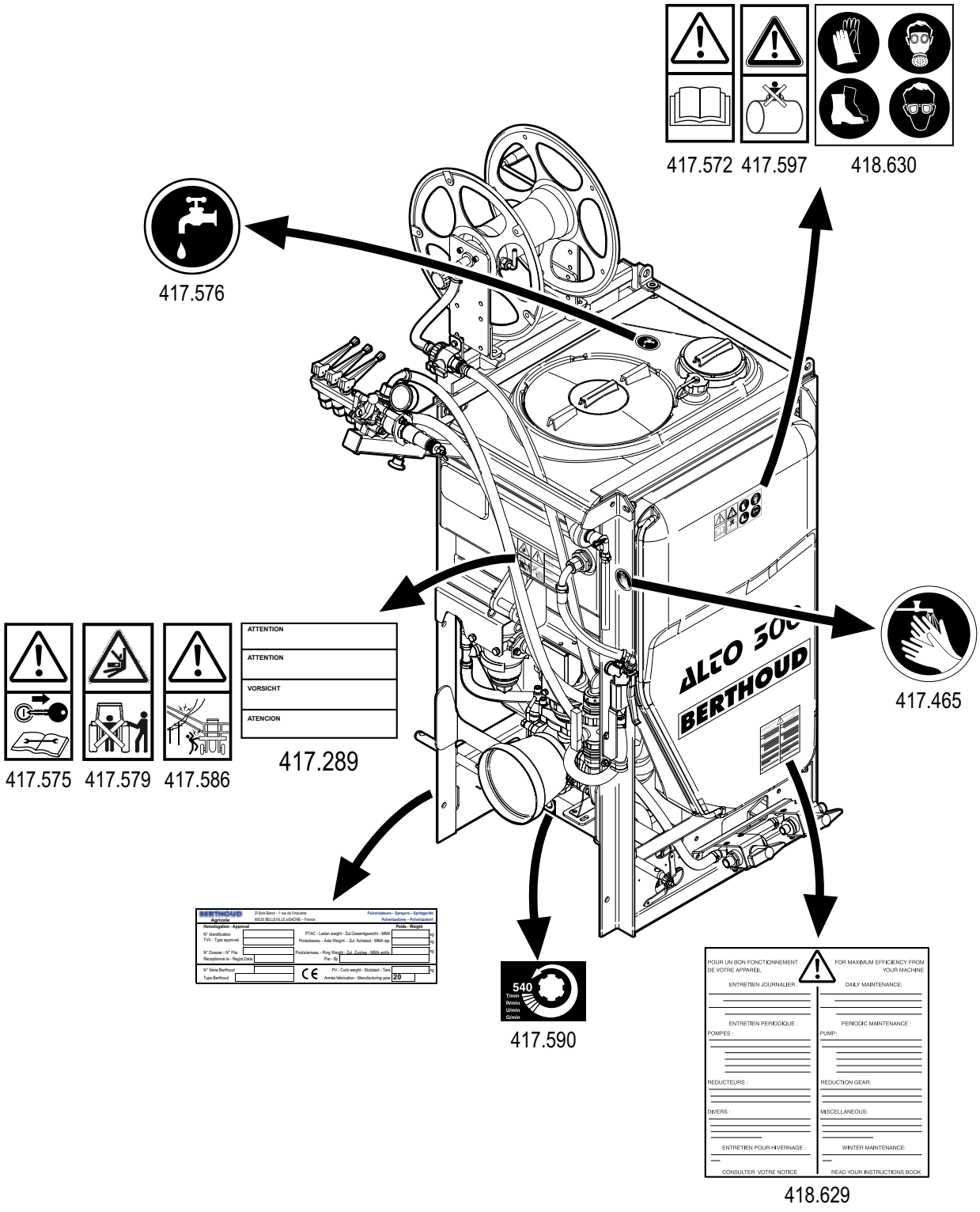


Year and month of manufacture

TABLE OF WEIGHTS

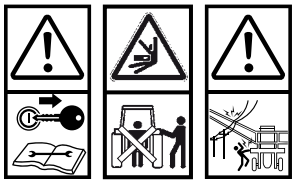
SPRAYERS	BOOMS >	TLP 7	GC 9	XRT 12 XRS 12	RA 12	ECO 9	ECO 12	Without boom
ALTO 300	Kerb weight (kg)							
	Gross vehicle weight (kg)							
ALTO 400	Kerb weight (kg)							135
	Gross vehicle weight (kg)							635
ALTO 600	Kerb weight (kg)							
	Gross vehicle weight (kg)							
ALTO 800	Kerb weight (kg)				400			
	Gross vehicle weight (kg)				1,365			

POSITION OF SAFETY STICKERS - ALTO 300/400



It is very important to keep the safety stickers in location and in good condition as they draw your attention to possible dangers and refer to the operator's manual.
Check their location on the sprayer and see their meaning in manual ***82.471 (Safety, checks and maintenance of the sprayers).***

POSITION OF SAFETY STICKERS - ALTO 600/800



417.575 417.579 417.586

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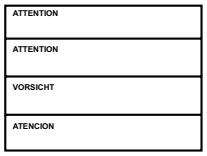

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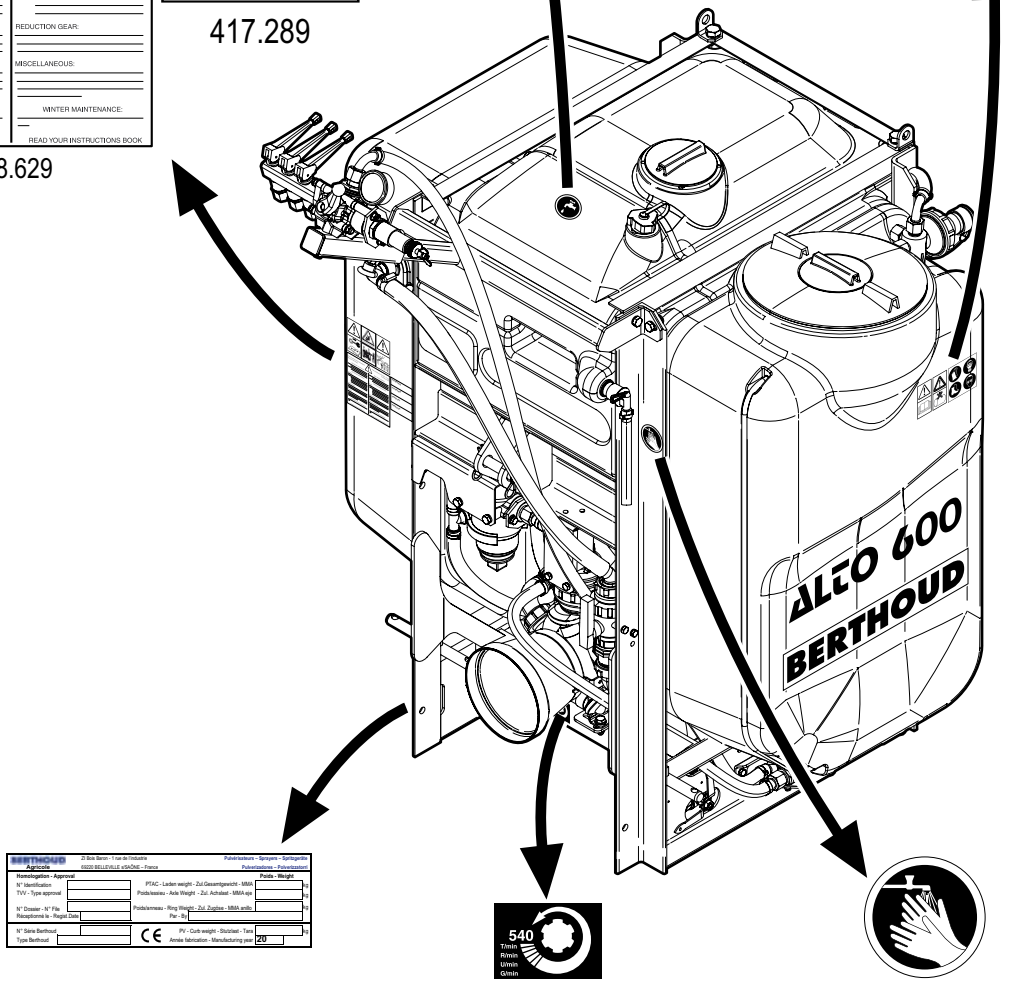
417.572 417.597 418.630



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It is very important to keep the safety stickers in location and in good condition as they draw your attention to possible dangers and refer to the operator's manual.
Check their location on the sprayer and see their meaning in manual ***82.471 (Safety, checks and maintenance of the sprayers).***

STARTING-UP THE SPRAYER

Checking power take-off speed.
Checking tractor advance speed.
Checking engine speed.
Checking flow/hectare.
Checking tractor wheel circumference.

See "Safety, checks, maintenance of the Sprayers": manual No. 82.471.

RINSING THE SPRAYER BEFORE FIRST USE

Rinse the sprayer completely with clean water, before using phytosanitary products (weed killers, insecticide or other product) in your sprayer for the first time.

- Remove the nozzles if they are fitted.
- Undo the end plugs on the pipes.
- Fill 1/5th of the volume of the tank with water.
- Spray (Refer to the **OPERATION** chapter of the pump).
- Remove and clean the filters.
- Retighten the pipe end plugs.
- Fit the nozzles.

NOTE: Any foreign particles which may be in the spraying circuit will thus be eliminated and there will be no risk of them blocking the holes in the nozzles.

CHECKS TO BE CARRIED OUT EVERY TIME BEFORE THE MACHINE IS USED

- Check the condition of the protectors on the drive shafts.
- Make sure that there is no foreign matter into the tank.
- Check the condition of the hoist as well as the boom's lifting rope.
- Check the oil levels and the greasing of the various elements (see "Lubrication and greasing" section).
- Check the cleanness of the filters:
  - Suction,
  - delivery.

CALCULATING BOOM FLOW PER MINUTE

- To obtain the desired boom flow per minute, the traditional formula is used:

$$\text{Boom flow} = \frac{\text{Volume/hectare} \times \text{width treated} \times \text{Advance speed}}{600}$$

Example: We wish to spray 500 litres/hectare with a 9 metres boom and at a calibrated tractor speed of 6.8 km/h.

We obtain: Boom flow per minute $= \frac{500 \times 9 \times 6.8}{600} = 51$ litres/minute

- It is most important that maximum pump flow should satisfy the demands made on it for the desired spraying conditions (advance speed, volume/hectare, width treated).
- The boom flow per minute should be 10 % less than maximum pump flow to ensure liquid return to the tank and thus hydraulic agitation.

Pump	Maximum pump flow	Maximum boom flow	Minimum return flow to tank
BP 60/20	60 l/min	54 l/min	6 l/min
BP 105/20	100 l/min	90 l/min	10 l/min

VALVES OF OPTIONS

With one option on the equipment:

- Put the handle of the main valve (V2) in position **b** (figure 7, page 19).

With several options:

- Put the handle of the main valve (V2) in position **b** (figure 7, page 19).
- Put the valve (1) in position **a** or the valve (2) in position **c** (see figure 1) according to the selected options.

WITH THE VALVES OF OPTIONS (figure 2)

In spraying mode:

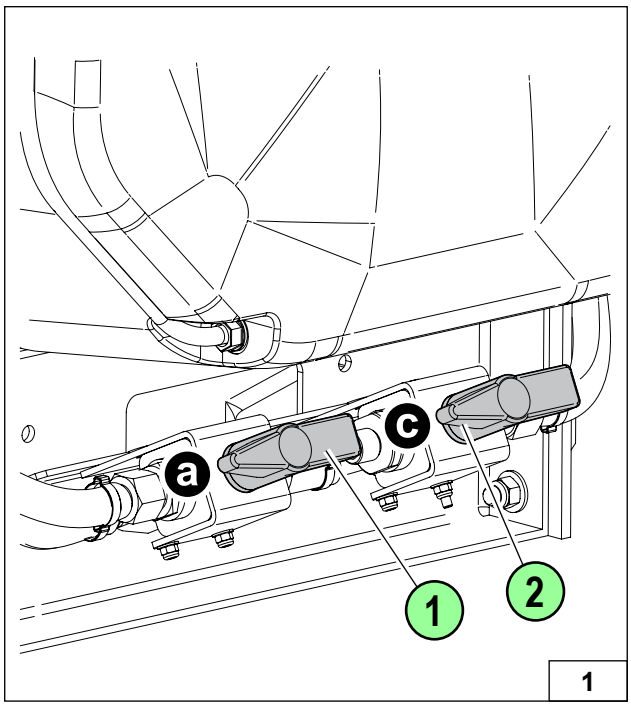
- The valve (V3) must always be in position **a** (opened).

In option mode:

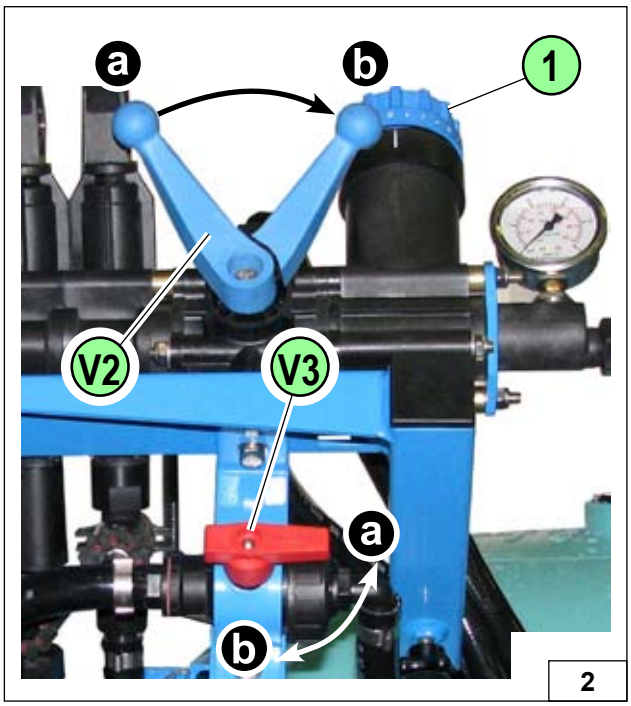
- The valve (V2) is in position **b**.
- Adjust the regulator (1) at position **1** (mini pressure).
- Put the valve (V3) in position **b** (closed).
- Adjust the regulator (1) to obtain the desired pressure.

To exit the option mode:

- Adjust the regulator (1) at position **1** (mini pressure).
- Put the valve (V3) in position **a** (opened).



1



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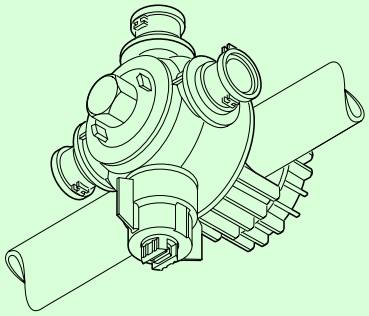
CHOICE OF NOZZLES
AND
TABLES OF FLOW RATES



**See "NOZAL nozzles"
Manual No. 82.467**

USING THE SPRAYER
CONSTANT PRESSURE VERSION
ALTO 300/400/600/800

**Berjust 2 monitor option,
see manual No. 82.389**

FILLING

- Close the drain valves.

According to the cases:

- Put the valve (V1) (figure 3) to opened position **b**.
- Put the valve (V4) (figure 4) to closed position **a**.

OPERATION WITHOUT FILLER HOSE

- Remove the lid on the top of the tank.
- Fill through the filler hole of the main tank

USING THE FILLER HOSE

- For this system to work properly, it is necessary to have some water into the main tank to prime the pump before starting it.
- Pour 30 to 50 litres of water, through the filter, into the filler hole.

NOTE: The filling flow rate can be increased considerably using the hydro-injector (1) (figure 5).

CONNECTING THE FILLER HOSE (figure 5)

Connect it directly to the hydro-injector's (1) suction hose:

- Remove the plug (2) and connect the filler hose (3).

ADJUSTING THE DISTRIBUTION UNIT (figure 6)

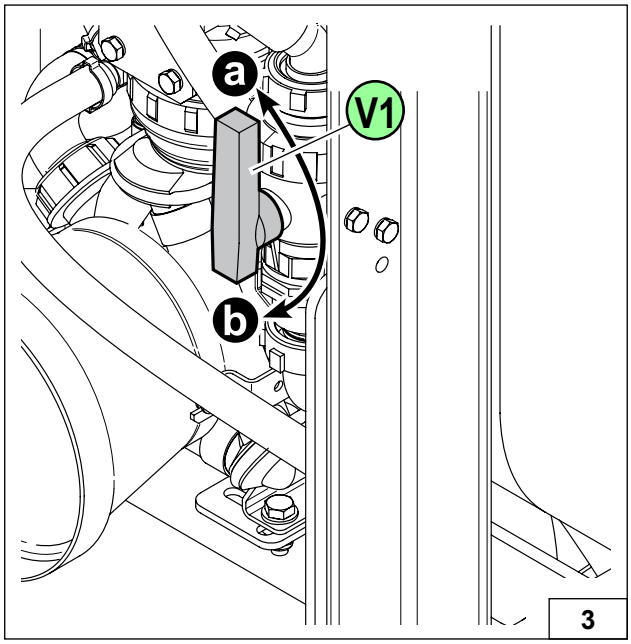
- Put the valve (V1) in position **b** (figure 3).
- Put the supply shutters (1) of the spraying boom's sections at position **b**.
- Put the handle of the main valve (V2) in position **a**.
- Adjust the pressure to the maximum using the regulator (2), for that, untighten the knurled nut (3) and screw the regulator stem (4) fully.

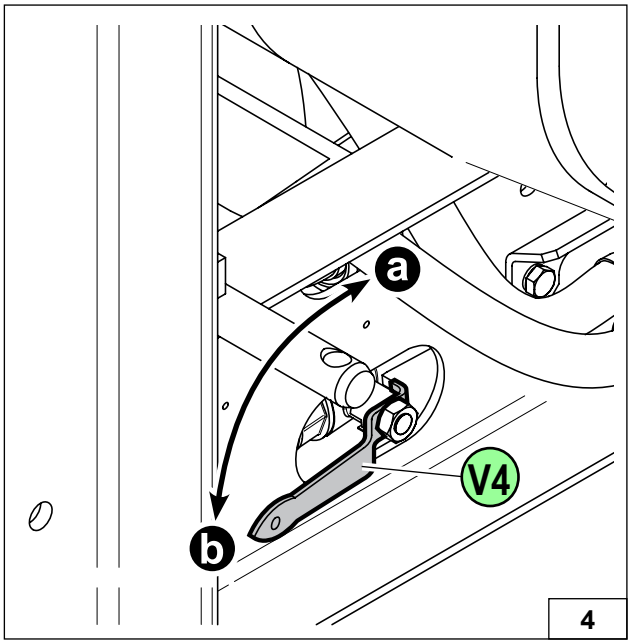
FILLING

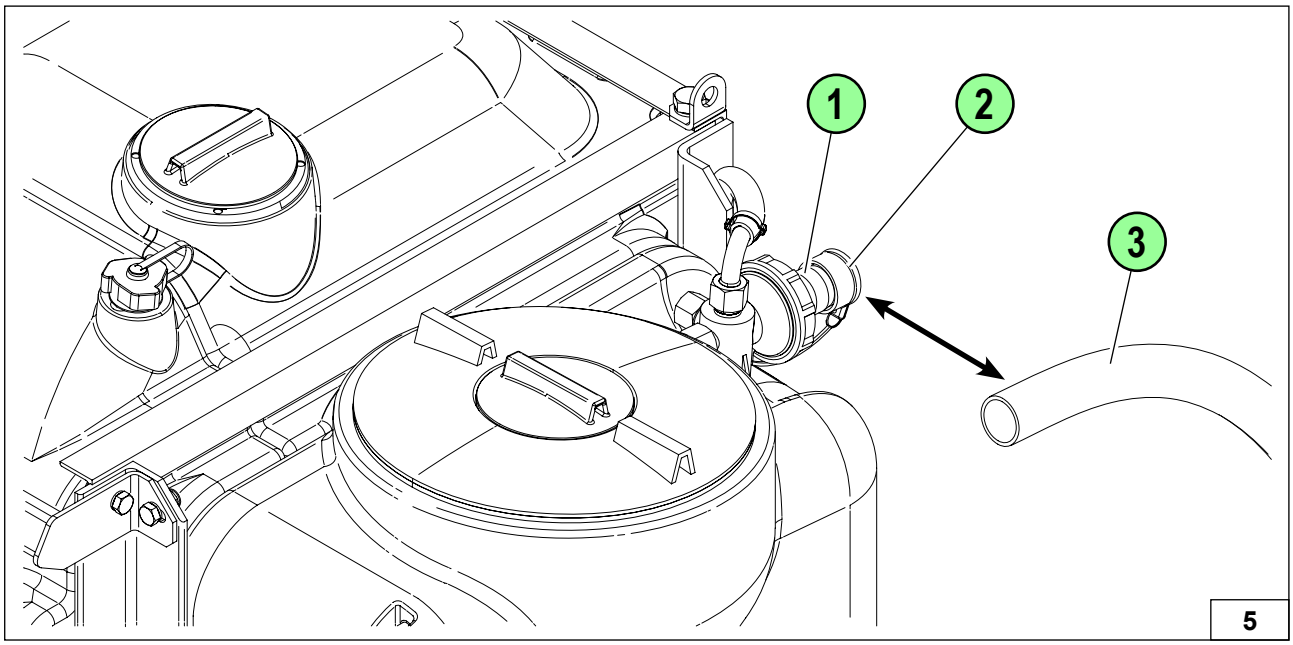
1. **Engage the tractor's power take-off** and raise its rotation speed to 540 rpm.
2. **Your tank will start to fill.** Keep the rotation speed of the power take-off at 540 rpm.

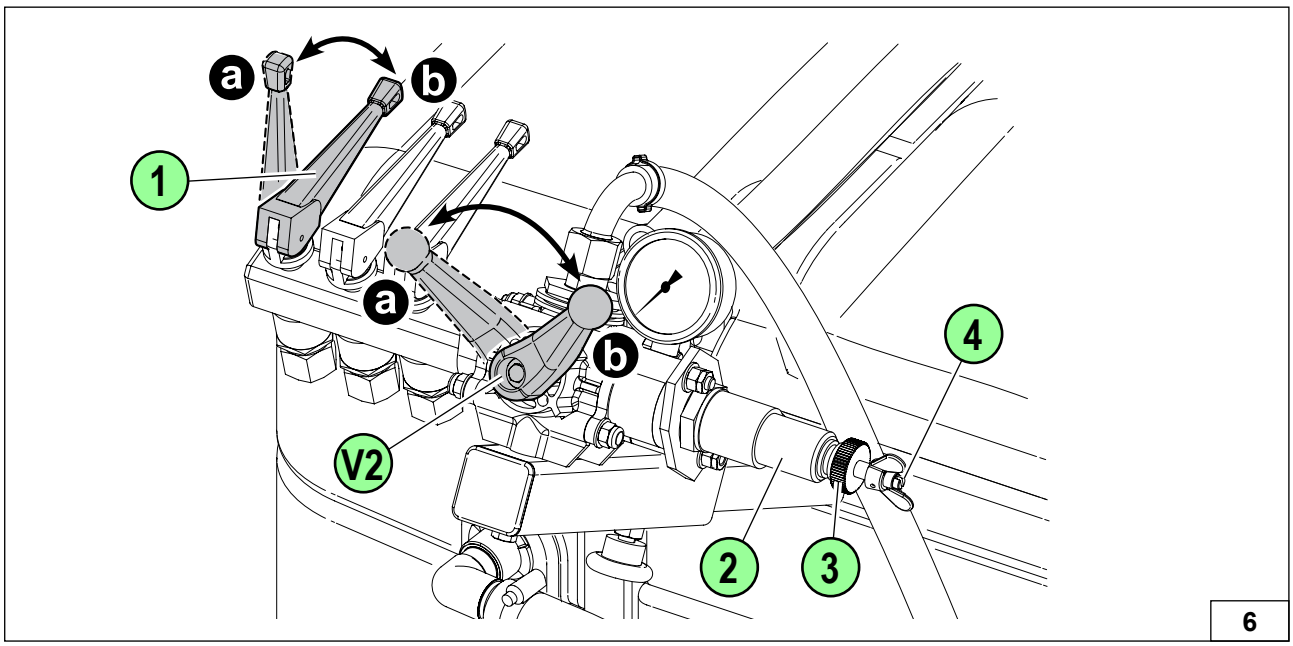
WHEN FILLING IS COMPLETE

- Reduce the engine speed (to idle).
- Take the hose (3) (figure 5) out of the water point. This has the effect of emptying it.
- Remove the hose (3) from the hydro-injector (1).
- Refit the plug (2).


a
V1
b
3


a
V4
b
4


1
2
3
5


a
b
1
a
b
V2
4
2
3
6

SPRAYING

POWER TAKE-OFF SPEED

- With the power take-off connected (following filling), increase its speed to 540 rpm by bringing the needle of the rev counter opposite the mark (R) *(see manual **No. 82.471**).*

ADJUSTING THE VOLUME/HECTARE

In order to program your volume/hectare

- You need to know, for the gear chosen, the forward speed in km/h, at 540 rpm at the power take-off *(see manual **No. 82.471**).*
- Bearing in mind the required volume/hectare, refer to the rate chart of the selected nozzle(s) *(see nozzle manual **No. 82.467**).*
  - In the column corresponding to the forward speed in km/h, find: the nozzle and pressure which will enable the required volume/hectare to be obtained.

    Example:

    - Speed in km/hour: 6 km/h
    - Volume/hectare: 260 litres/ha
    - Selected nozzles: ALUMINE AFX (0.50 m spaced).

    Possible choice:

    - ALUMINE AFX BLUE ..... 3.5 bar, 256 litres/ha

TO OBTAIN REQUIRED VOLUME/HECTARE

- Fit the chosen nozzles.
- Put the handle of the main valve (V2) in position ⓑ (figure 7).
- Increase the power take-off speed to 540 rpm.
- Display on the pressure gauge (1) the pressure previously read from the flow rate table, using the screwed rod (4) on the regulator (2) and lock with the knurled nut (3) (figure 7).
- From now on, you can work.

SPRAYING CONTROL

- Put the valve (V1) in position ⓑ (figure 3, page 17).
- Put the supply shutters (1) (figure 8) of the spraying boom's sections at position ⓐ.
- Put the handle of the main valve (V2) in position ⓑ.

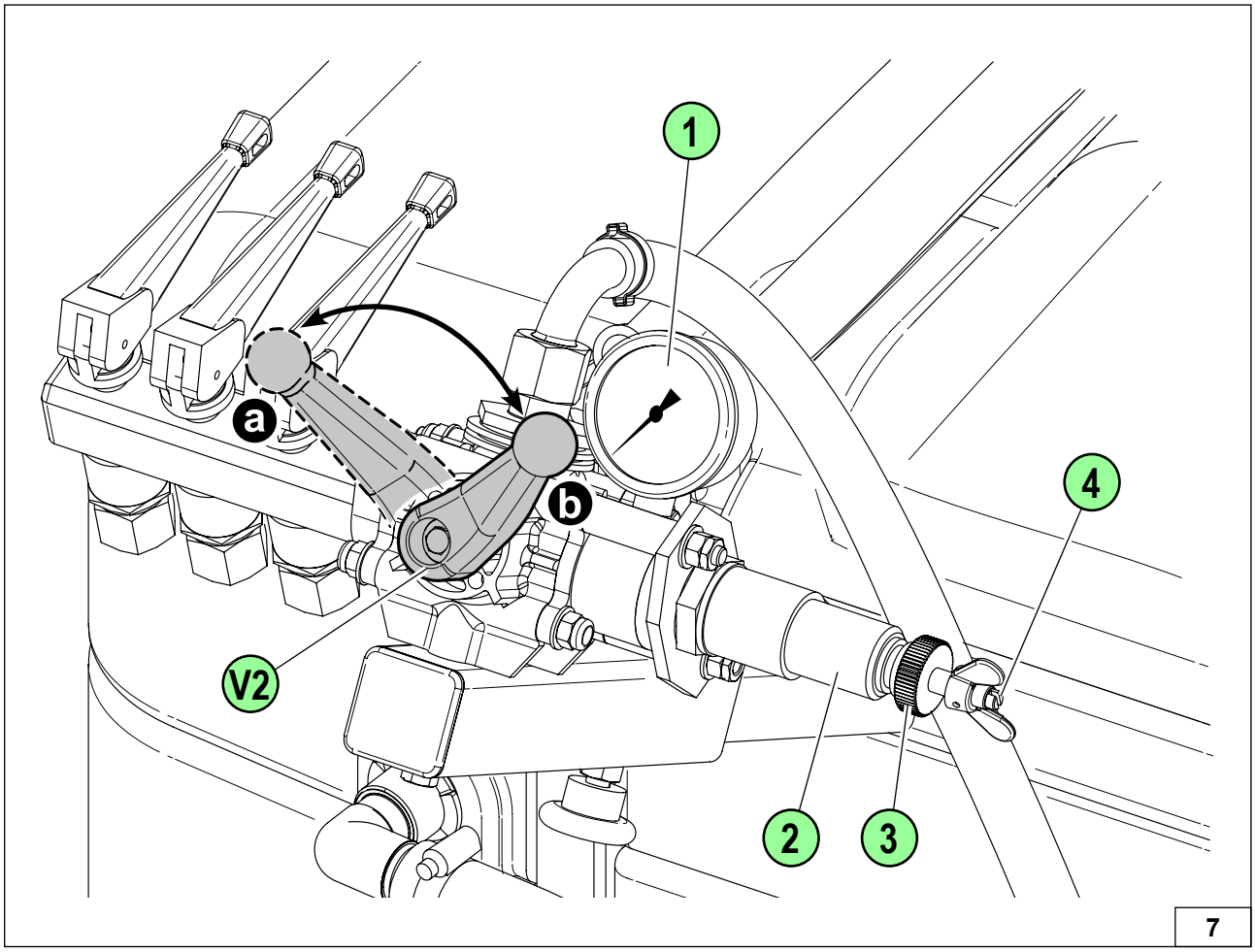
TO STOP THE SPRAYING

Closure of one or more sections:

- Close the shutter or shutters by putting them in position ⓑ (figure 8).

Total closure:

- Leave the supply shutters in "opened" position ⓐ and adjust the main valve (V2), putting its handle in position ⓐ (figure 8).



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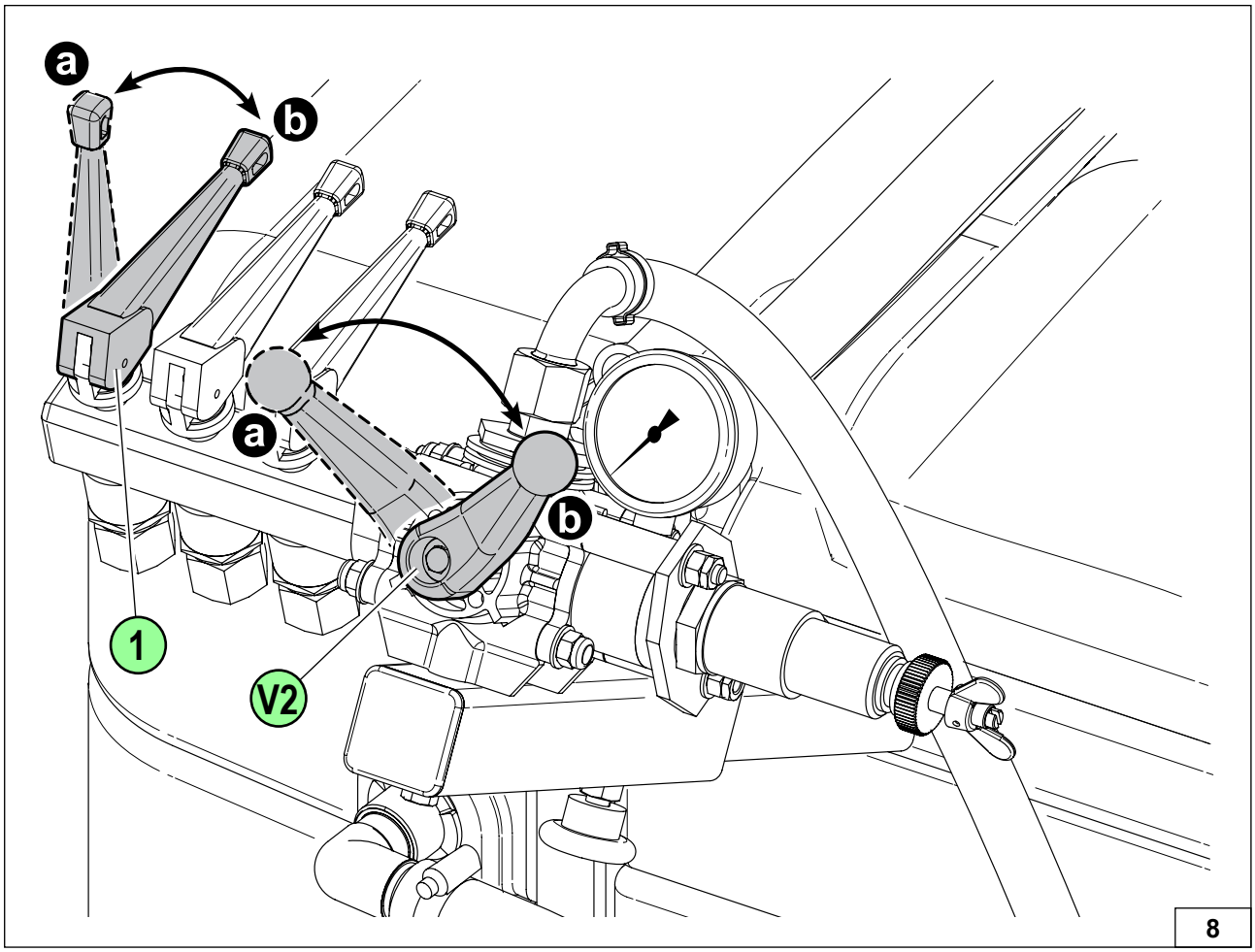


8

RINSING THE EQUIPMENT

RINSING THE SPRAYING CIRCUIT WITH THE RINSING TANK

- Sprayer off.

- Disengage the power take-off.
- Supply shutters (1) in position ⓐ (figure 9).
  - Handle of the main valve (V2) in position ⓑ (figure 9).
  - Handle of the valve (V1) in position ⓐ (figure 10).
- Engage the power take-off to idle at **150 rpm max** until the rinsing tank is empty.

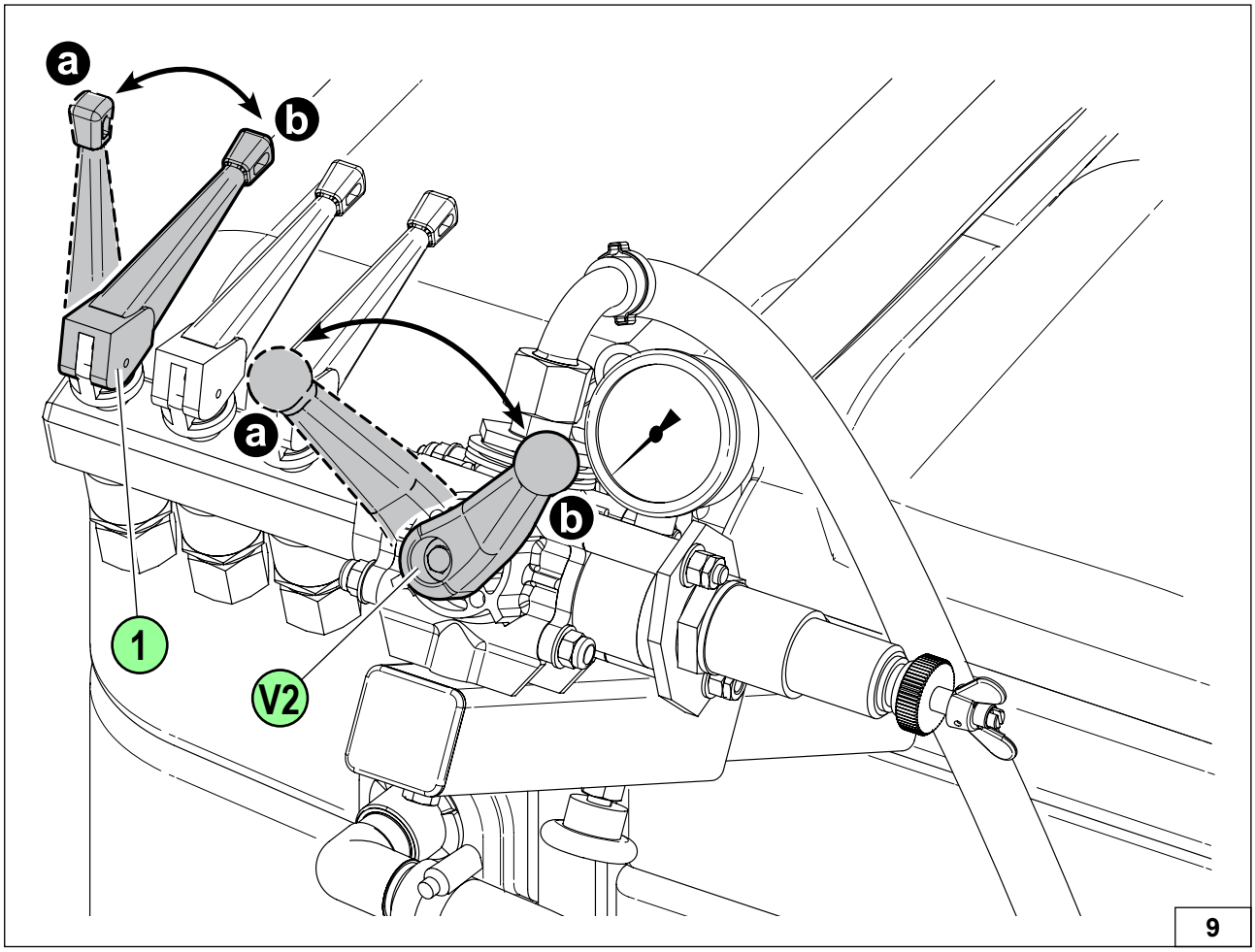
This operation is not enough when changing the chemical products.

RINSING THE SPRAYING CIRCUIT WITH THE MAIN TANK

For the chemical product changing.

- Sprayer off.

- Put 300 litres of clear water with a cleaning product (ALL CLEAR type) into the main tank.
- Supply shutters (1) in position ⓐ (figure 9).
  - Handle of the main valve (V2) in position ⓑ (figure 9).
  - Handle of the valve (V1) in position ⓑ (figure 10).
- Engage the power take-off to idle at **150 rpm max** until the main tank is empty.



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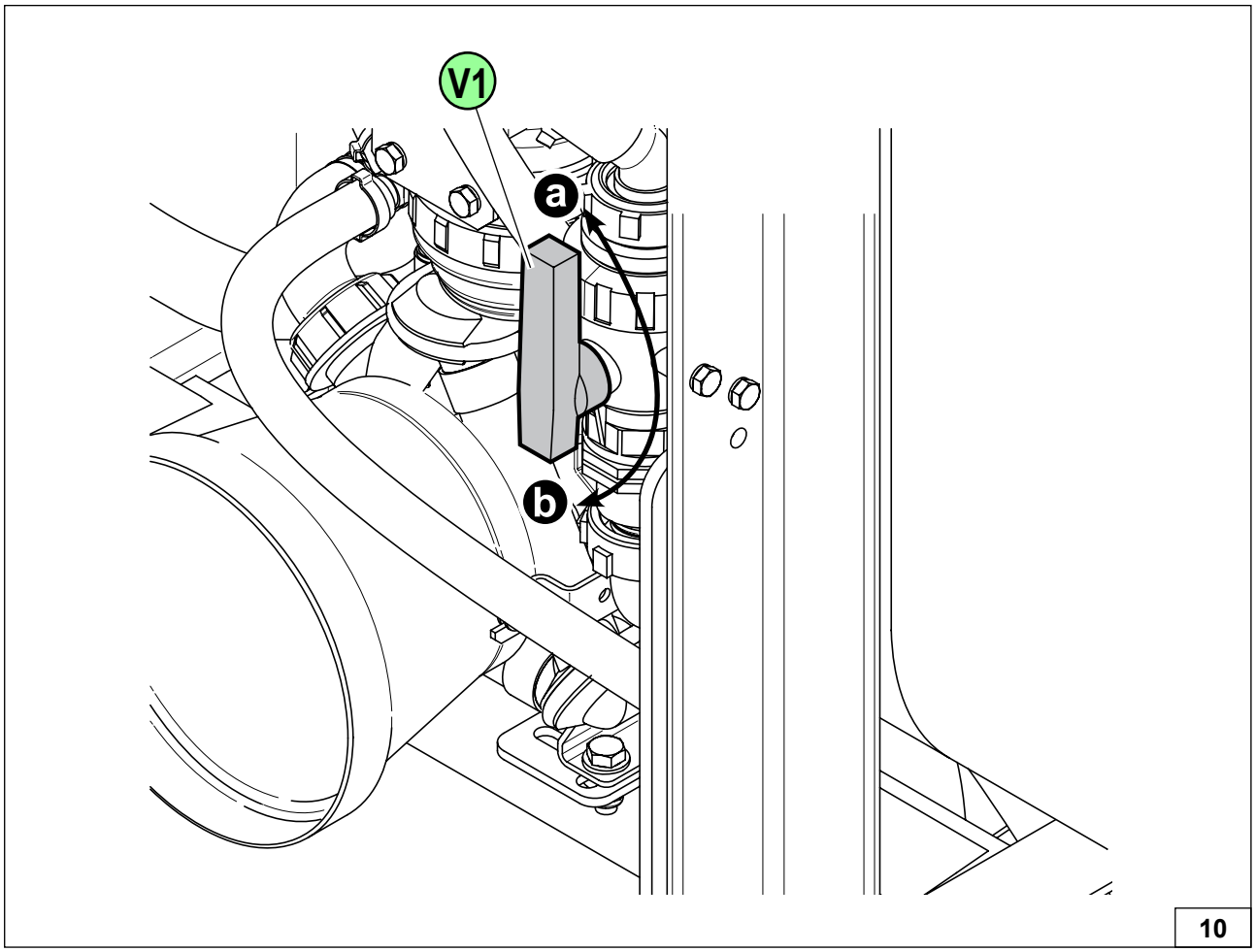
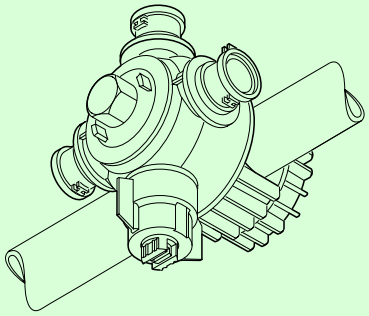


10

CHOICE OF NOZZLES
AND
TABLES OF FLOW RATES



See "NOZAL nozzles" manual No. 82.467

USING THE SPRAYER
D.P.M. VERSION
ALTO 600/800

Berjust 2 monitor option, see manual No. 82.389

ADJUSTMENT OF THE COMPENSATED RETURN

DEVICE WITH MANUAL CONTROL

- The "ALTO" distribution unit is composed of shutters (1) (figure 11) for each boom section. These "3-way" shutters supply each boom section when they are in the "opened" position ⓐ and return to the tank when they are in the "closed" position ⓑ.
- Return to the tank is calibrated by means of multireturns.
- The setting of the multireturns to the tank is set using the table below because this will depend on nozzle type used and the number of nozzles per boom section.

DEVICE WITH ELECTRIC CONTROL

- The "ALTO" distribution unit is composed of motorised shutoff valves (1) (figure 12) for each boom section. These valves supply each boom section when they are in the "opened" position (spraying) and return to the tank when they are in the "closed" position.
- **Setting the compensated return:**

  Valve (V2) in position ⓐ. Display a pressure by using the regulating valve (V), set the valves at closed position, set switch (3) at low position and switch (4) at high position on the control box, then adjust the micrometer screw (2) in order to obtain the same pressure as for spraying.

TABLE FOR SETTING OF MULTIRETURN UNITS (Crown wheel with red numbers)

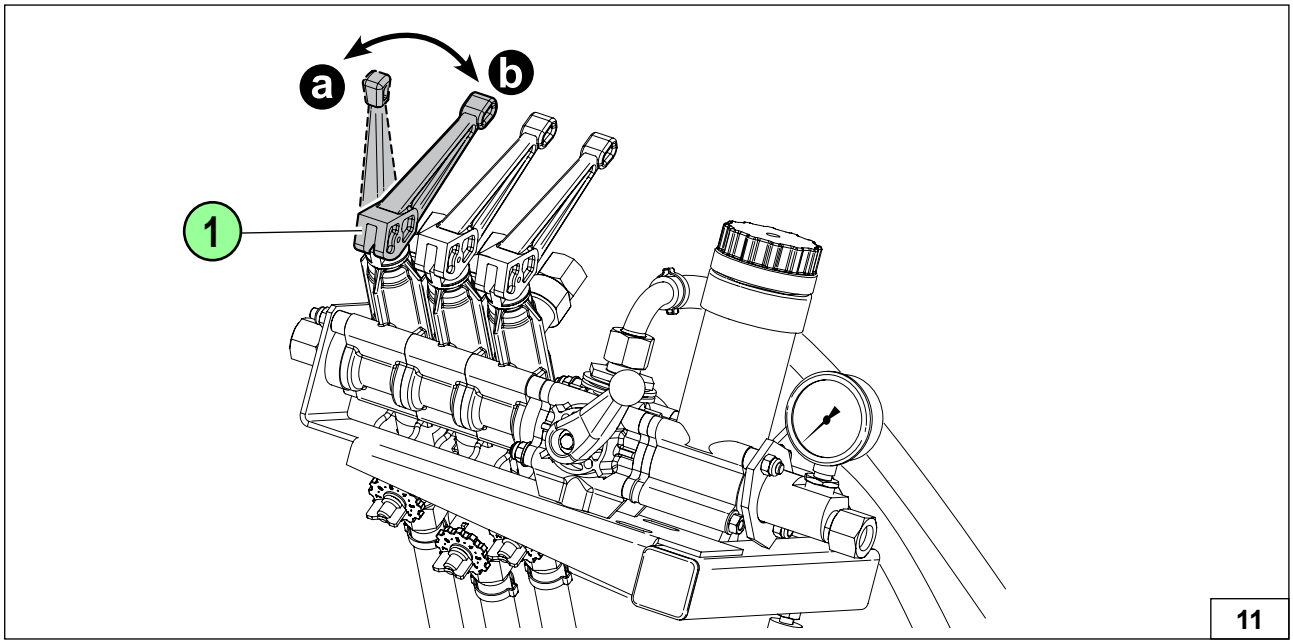
NOZZLE TYPE	6 nozzle section Position of crown wheel	7 nozzle section Position of crown wheel	8 nozzle section Position of crown wheel	9 nozzle section Position of crown wheel	10 nozzle section Position of crown wheel	12 nozzle section Position of crown wheel	15 nozzle section Position of crown wheel	18 nozzle section Position of crown wheel
AFX/RFX/ALX/KWIX/RRX/ARX - green 80°	1.7	2.0	2.2	2.4	2.5	2.8	3.1	3.5
AFX/RFX/ALX/KWIX/RRX/ARX - yellow 80°	2.2	2.4	2.6	2.8	3.0	3.3	3.7	4.1
AFX/RFX/ALX/KWIX/RRX/ARX - blue 110°	2.8	3.0	3.3	3.5	3.7	4.1	4.6	5.1
AFX/RFX/ALX/KWIX - red 110°	3.3	3.5	3.8	4.2	4.3	4.8	5.4	6.0
AFX/RFX/ALX/KWIX - brown 110°	3.7	4.0	4.3	4.6	4.9	5.4	6.1	6.8
AFX/RFX/ALX/KWIX - grey 110°	4.1	4.4	4.8	5.1	5.4	6.0	6.8	7.6
AFX/RFX/ALX/KWIX - white 110°	4.8	5.2	5.6	6.0	6.4	7.0	8.0	8.9
INOX 6/10 - white propeller	0.7	0.8	0.8	1.1	1.2	1.4	1.7	2.0
INOX 8/10 - white propeller	0.9	1.1	1.3	1.4	1.6	1.8	2.2	2.5
INOX 10/10 - white propeller	1.2	1.4	1.6	1.8	1.9	2.2	2.5	2.8
INOX 12/10 - white propeller	1.5	1.8	2.0	2.2	2.3	2.6	2.9	3.2
INOX 15/10 - white propeller	1.9	2.1	2.3	2.5	2.6	2.9	3.3	3.6
INOX 18/10 - white propeller	2.3	2.5	2.7	2.9	3.1	3.4	3.8	4.2
INOX 15/10 - black propeller	2.7	2.9	3.1	3.3	3.5	3.9	4.4	4.9
INOX 18/10 - black propeller	3.1	3.4	3.6	3.9	4.1	4.6	5.2	5.7
INOX 20/10 - black propeller	3.4	3.7	4.0	4.2	4.5	5.0	5.7	6.3
INOX 25/10 - black propeller	3.7	4.0	4.3	4.6	4.9	5.4	6.1	6.7
INOX 30/10 - black propeller	4.2	4.6	5.0	5.4	5.6	6.3	7.0	7.8
KWIX 3 threads - yellow	2.2	2.4	2.6	2.8	3.0	3.3	3.7	4.1
KWIX 3 threads - blue	2.8	3.0	3.3	3.5	3.7	4.1	4.6	5.1
KWIX 3 threads - red	3.3	3.5	3.8	4.2	4.3	4.8	5.4	6.0
KWIX 3 threads - brown	3.7	4.0	4.3	4.6	4.9	5.4	6.1	6.8
KWIX 3 threads - grey	4.1	4.4	4.8	5.1	5.4	6.0	6.8	7.6
KWIX 3 threads - white	4.8	5.2	5.6	6.0	6.4	7.0	8.0	8.9

SETTING THE MULTIRETURN UNITS (figure 13)

- Slacken nut (2), turn crown wheel (3) and place selected mark in front of index (1); tighten nut (2).

Example:

If red AFX/RFX/KWIX nozzles are used and if your sprayer is equipped with a 24 metres boom (4 sections of 12 nozzles), you must place the multireturn units at position 4.8.



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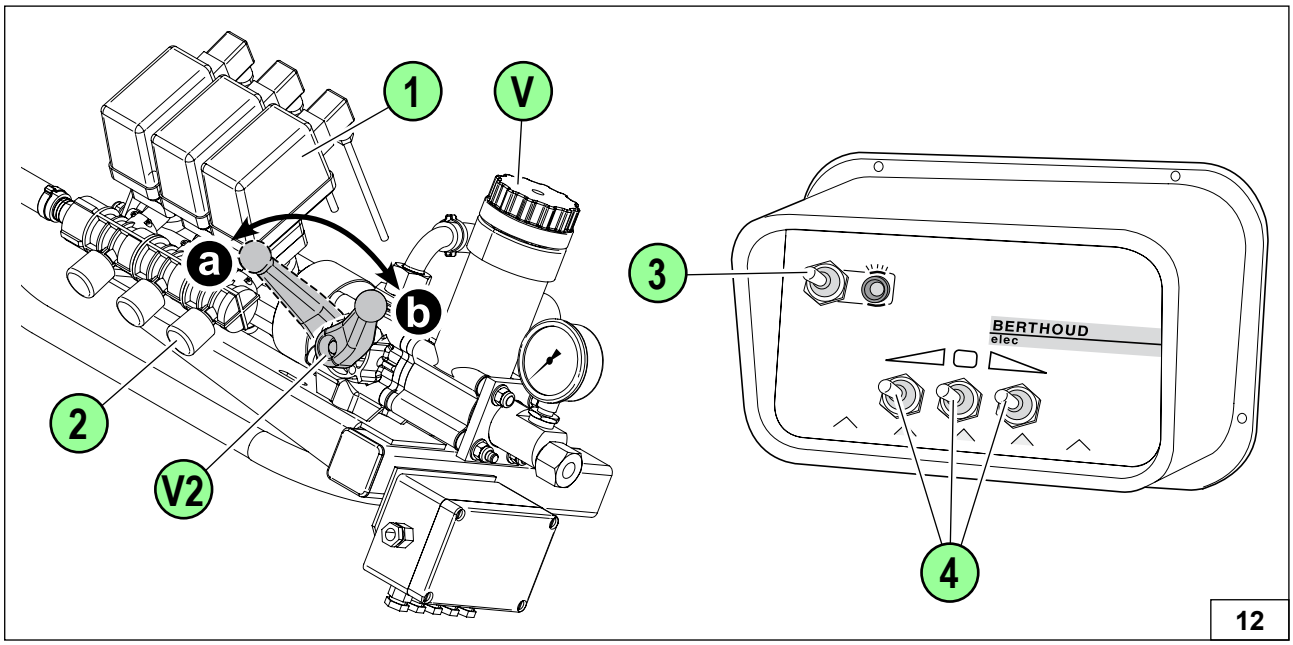

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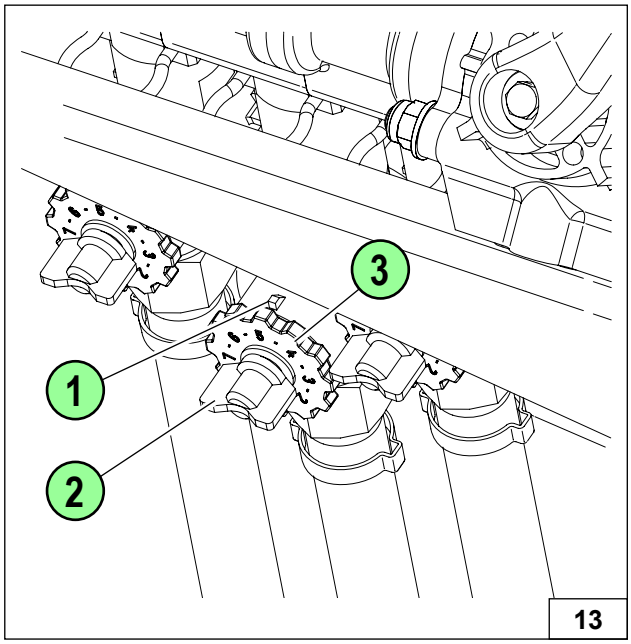


13

FILLING

ALTO 600/800 (figure 14):
- Put the valve (V1) to closed position **a**.
- Put the valve (V4) to closed position **a**.

USING THE FILLER HOSE

- For this system to work properly, it is necessary to have some water into the main tank to prime the pump before starting it.
- Pour 30 to 50 litres of water, through the filter, into the filler hole.

NOTE: The filling flow rate can be increased considerably using the hydro-injector (1) (figure 15).

CONNECTING THE FILLER HOSE (figure 15)

Connect it directly to the hydro-injector's (1) suction hose:
- Remove the plug (2) and connect the filler hose (3).

ADJUSTING THE DISTRIBUTION UNIT AND THE CONTROL VALVES

With manual control block:

- Put the valve (V1) in position **b** (figure 14).
- Put the handle of the main valve (V2) in position **a** (figure 16).
- Put the handle of the valve (1) in position **c** (figure 17).
- Make sure that the valve (V3) located under the block is in closed position **b** (figure 18).

With motorised valves:

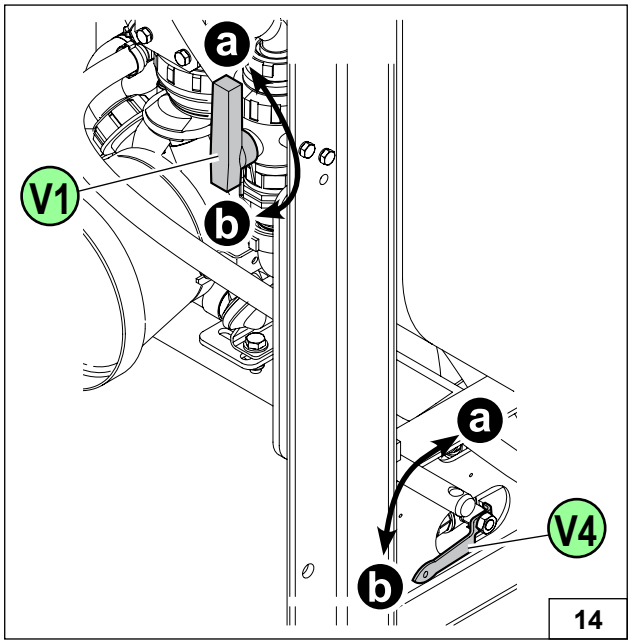
- Put the valve (V1) in position **b** (figure 14).
- Put the handle of the main valve (V2) in position **a** (figure 19).

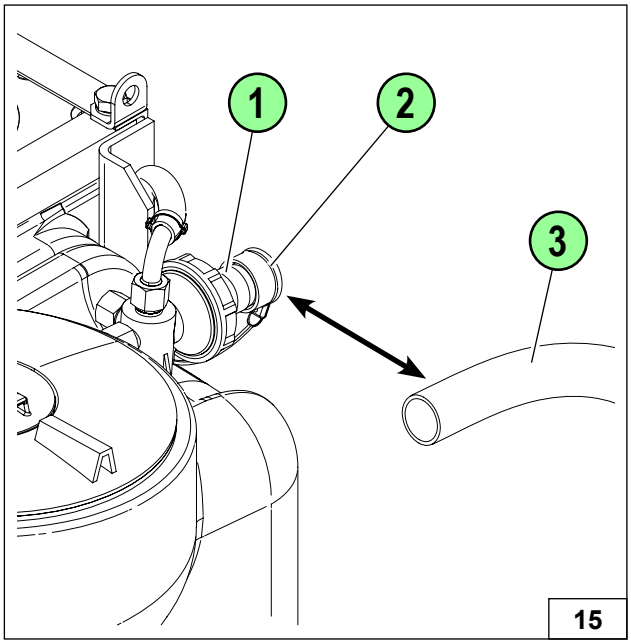
FILLING

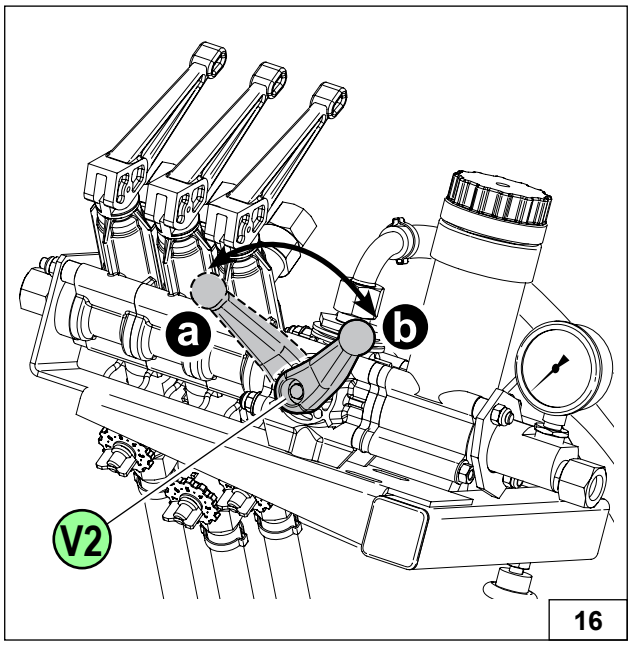
1. **Put the filler hose (3) (figure 15) into the liquid to be suck.**
2. **Engage the tractor's power take-off** and raise its rotation speed to 540 rpm.
3. **Your tank will start to fill.** Keep the rotation speed of the power take-off at 540 rpm.
   - According to the equipments, during the filling you can aspire mixtures:
     - With the incorporation hopper, (see page 34),
     - or with the filling stick.

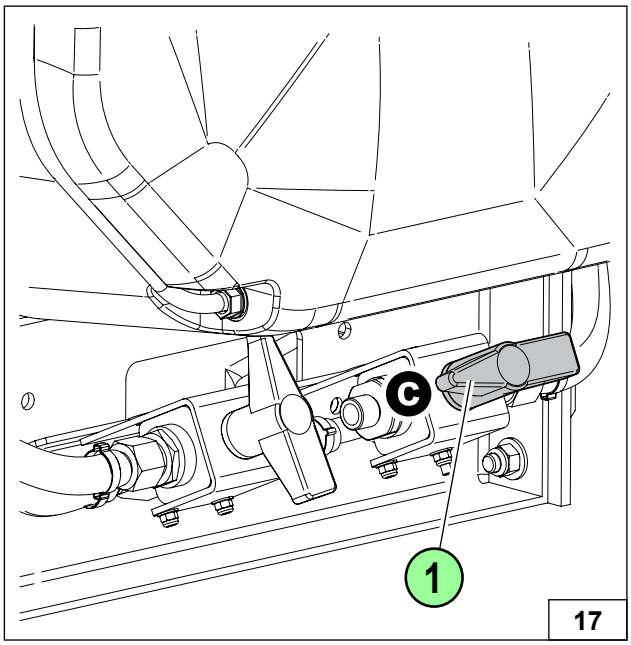
WHEN FILLING IS COMPLETE

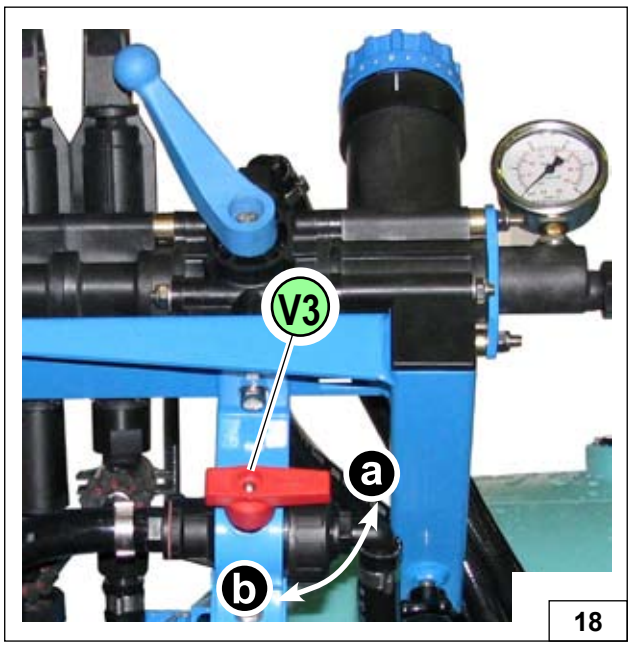
- Reduce the engine speed (tick-over).
- Take the hose (3) (figure 15) out of the water point. This has the effect of emptying it.
- Remove the hose (3) from the hydro-injector (1).
- Replace the plug (2).

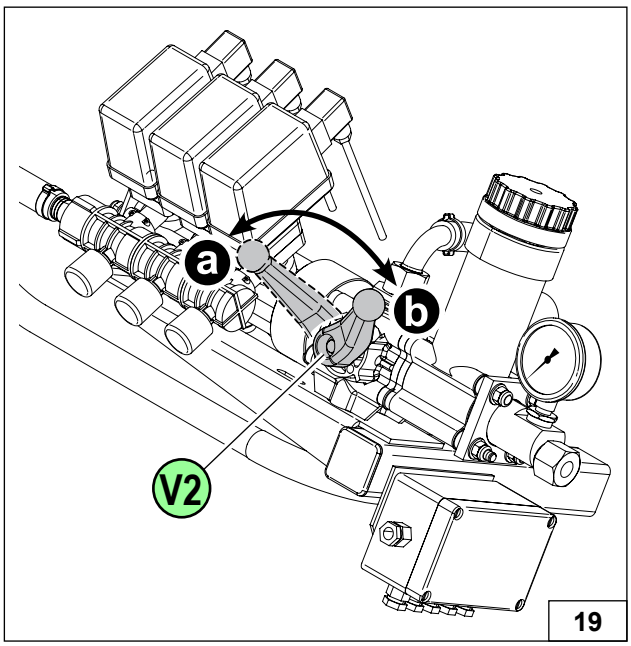

a
V1
b
a
V4
b
14


1
2
3
15


a
b
V2
16


c
1
17


V3
a
b
18


a
b
V2
19

SPRAYING

- Make sure that the drain valve (V4) is closed, see the beginning of chapter "Filling", page 26 (and figure 14 page 27).

POWER TAKE-OFF SPEED

- With the power take-off connected (following filling), increase its speed to 540 rpm by bringing the needle of the rev counter opposite the mark (R) *(see manual **No. 82.471**).*

ADJUSTING THE VOLUME/HECTARE

In order to program your volume/hectare

- You need to know, for the gear chosen, the forward speed in km/h, at 540 rpm at the power take-off *(see manual **No. 82.471**).*
- Bearing in mind the required volume/hectare, refer to the rate chart of the selected nozzle(s) *(see nozzle manual **No. 82.467**).*

TO OBTAIN REQUIRED VOLUME/HECTARE

- Fit the chosen nozzles.
- Adjust the multireturn units (manual) or the compensated return (electric) according to the type and number of nozzles on the boom sections (see page 24).
- Adjust the valves (see below).
- Increase the power take-off speed to 540 rpm.
- On the manometer, display the pressure read previously on the flow table by using the manual control valve (V) (figures 20 or 21) or the electric control valve switch (1) (figure 23) and (4) (figure 24).
- From this moment you can start spraying and you will obtain a **FIXED VOLUME/HECTARE** dose within a wide range of power take-off speeds and therefore engine speeds.

SPRAYING CONTROL

Manual control version:

- Put the valve (V1) in position **b** (figure 14, page 27).
- Put the supply shutters (1) of the spraying boom's sections at position **b** (figure 20).
- Put the handle of the main valve (V2) in position **b**.
- ***With options:*** Put the valves (1) and (2) in position **b** (figure 22).

Electric control version:

- Put the valve (V1) in position **b** (figure 14, page 27).
- Put the handle of the valve (V2) in position **b** (figure 21).
- ***With options:*** Put the valves (1) and (2) in position **b** (figure 22).
- Power up the control box (1) (figure 24) by lowering the switch (2), then lower the switches (3).

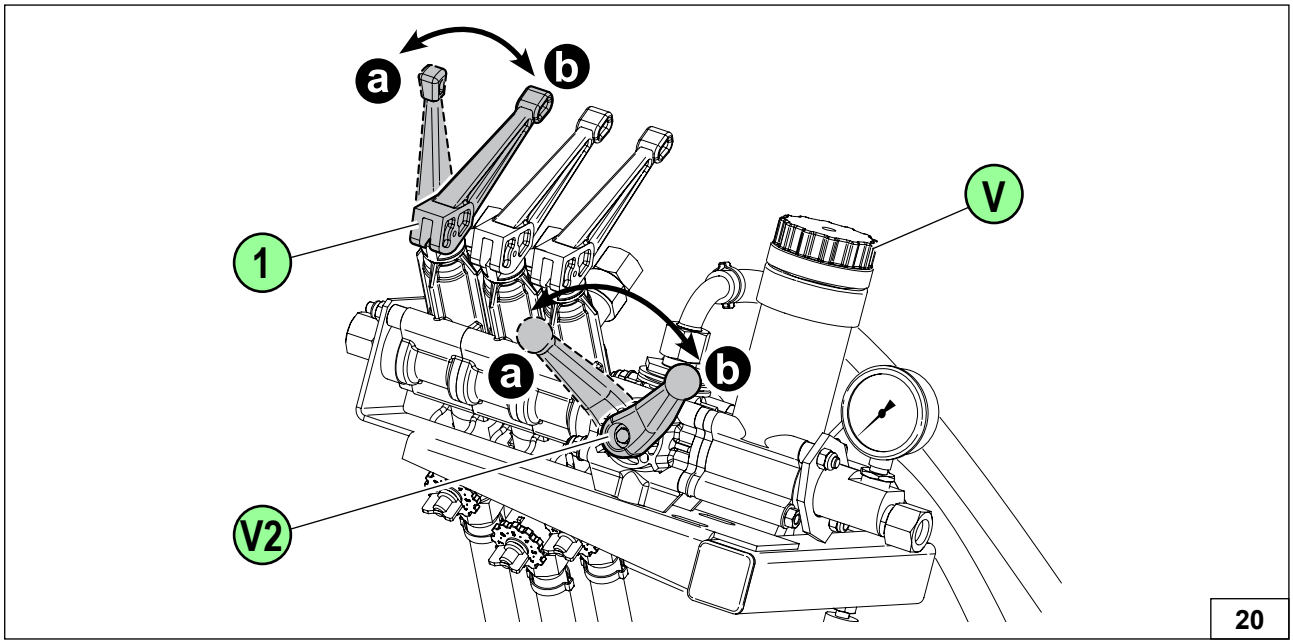
TO STOP THE SPRAYING

Manual control version (figure 20):

- Leave the supply shutters in "opened" position **a** and adjust the main valve (V2), putting its handle in position **a**.
- All the liquid comes out of the top of the valve and goes back to the tank via the hydro injector, thus keeping the spray well mixed, but without passing through the regulating valve.

Electric control version (figure 24):

- PARTIAL STOP: Lift switches (3) corresponding with the spraying sections you want to cut off.
- COMPLETE STOP: Lift up switch (2).



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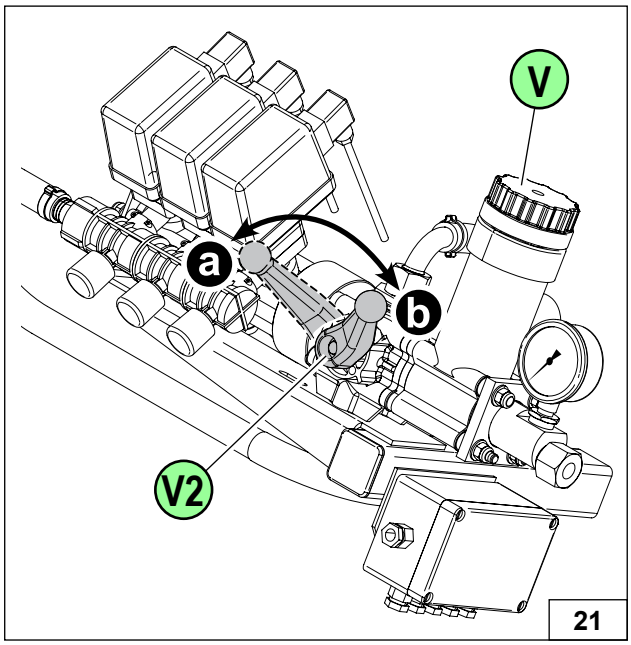

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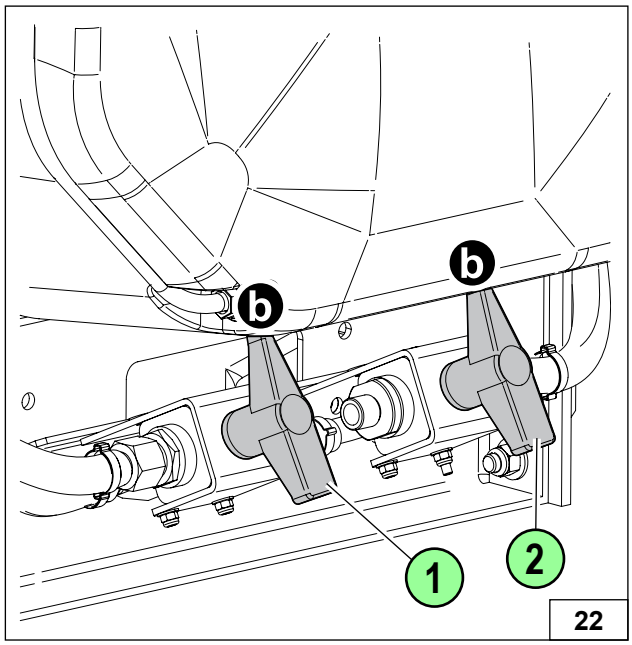

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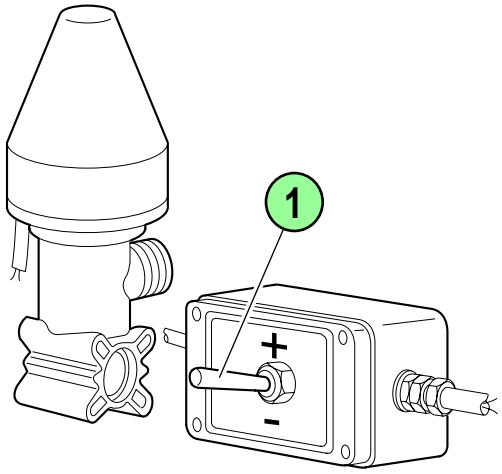
D.P.Elec



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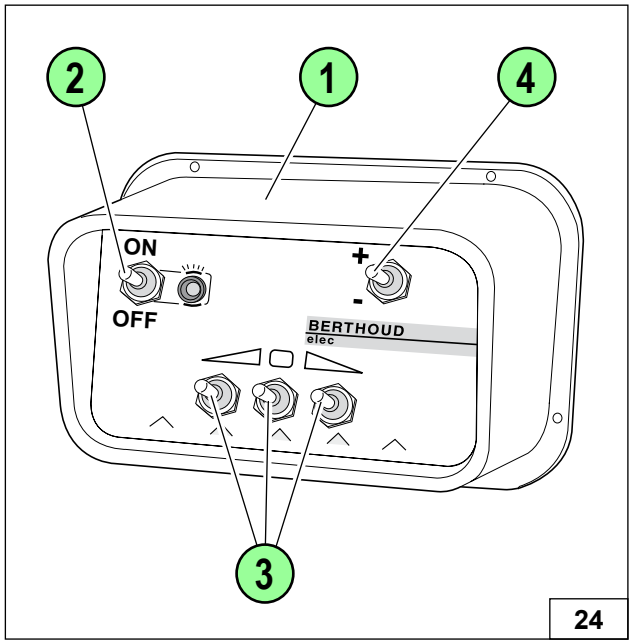


24

RINSING THE EQUIPMENT

RINSING THE SPRAYING CIRCUIT WITH THE RINSING TANK

- Sprayer off.

- Disengage the power take-off.

Manual control version:

- Set the manual regulating valve (V) at position **12**, or use the switch (1) (figure 27) to increase the pressure, thereby closing the electric regulating valve.
- Supply shutters (1) in position **a**, (figure 27).
- Valve (V2) in position **b** (figure 27).
- Valve (V1) in position **a** (figure 25).
- ***With options:*** Valve (1) in position **a** and valve (2) in position **b** (figure 26).

Electric control version:

- Fully close the regulating valve (V) or use the switch (4) (figure 28) to increase the pressure, thereby closing the electric regulating valve.
- Valve (V1) in position **a** (figure 25).
- ***With options:*** Valve (1) in position **a** and valve (2) in position **b** (figure 26).
- Valve (V2) in position **a** (figure 28).
- Control switches (2) and (3) lowered (figure 28).

- In both cases, engage the power take-off to idle at **150 rpm max** until the rinsing tank is empty.
- Put the manual or electric regulating valve back at its initial position.

This operation is not enough when changing the chemical products.

RINSING THE SPRAYING CIRCUIT WITH THE MAIN TANK

For the chemical product changing.

- Sprayer off.

- Put 300 litres of clear water with a cleaning product (ALL CLEAR type) into the main tank.

Manual control version:

- Set the manual regulating valve (V) at position **12**, or use the switch (1) (figure 27) to increase the pressure, thereby closing the electric regulating valve.
- Supply shutters (1) in position **b**, (figure 27).
- Valve (V2) in position **b** (figure 27).
- Valve (V1) in position **a** (figure 25).
- ***With options:*** Valve (1) in position **a** and valve (2) in position **b** (figure 26).

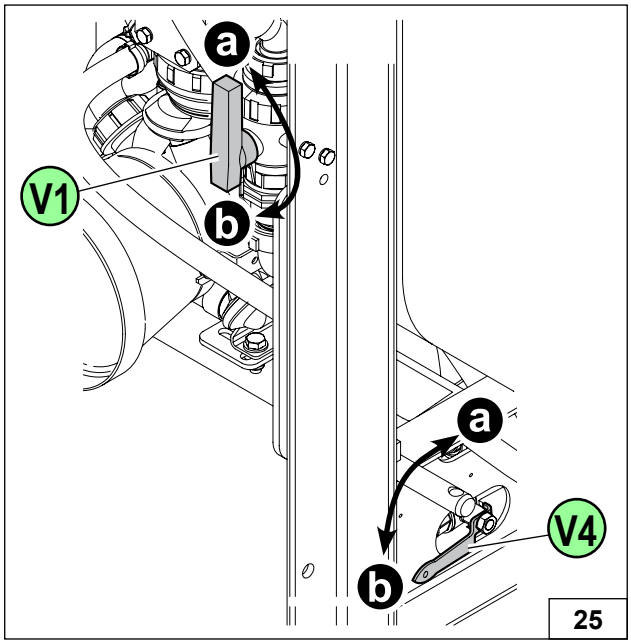
Electric control version:

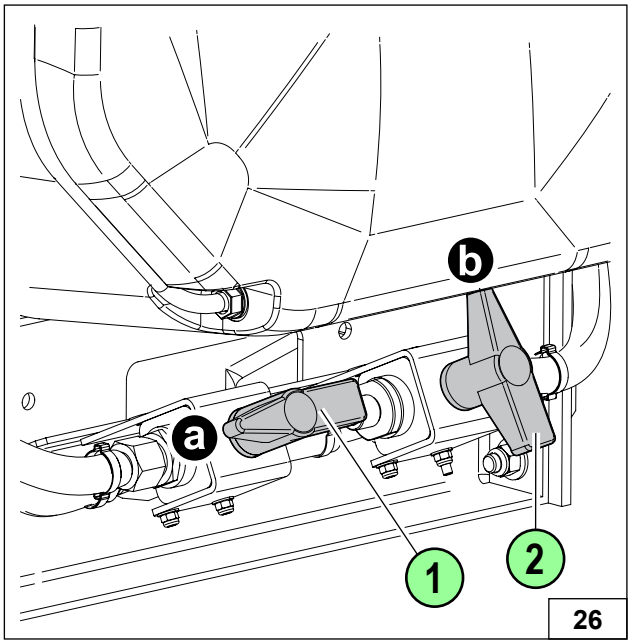
- Fully close the regulating valve (V) or use the switch (4) (figure 28) to increase the pressure, thereby closing the electric regulating valve.
- Valve (V1) in position **b** (figure 25).
- ***With options:*** Valve (1) in position **a** and valve (2) in position **b** (figure 26).
- Valve (V2) in position **a** (figure 28).
- Control switches (2) and (3) lowered (figure 28).

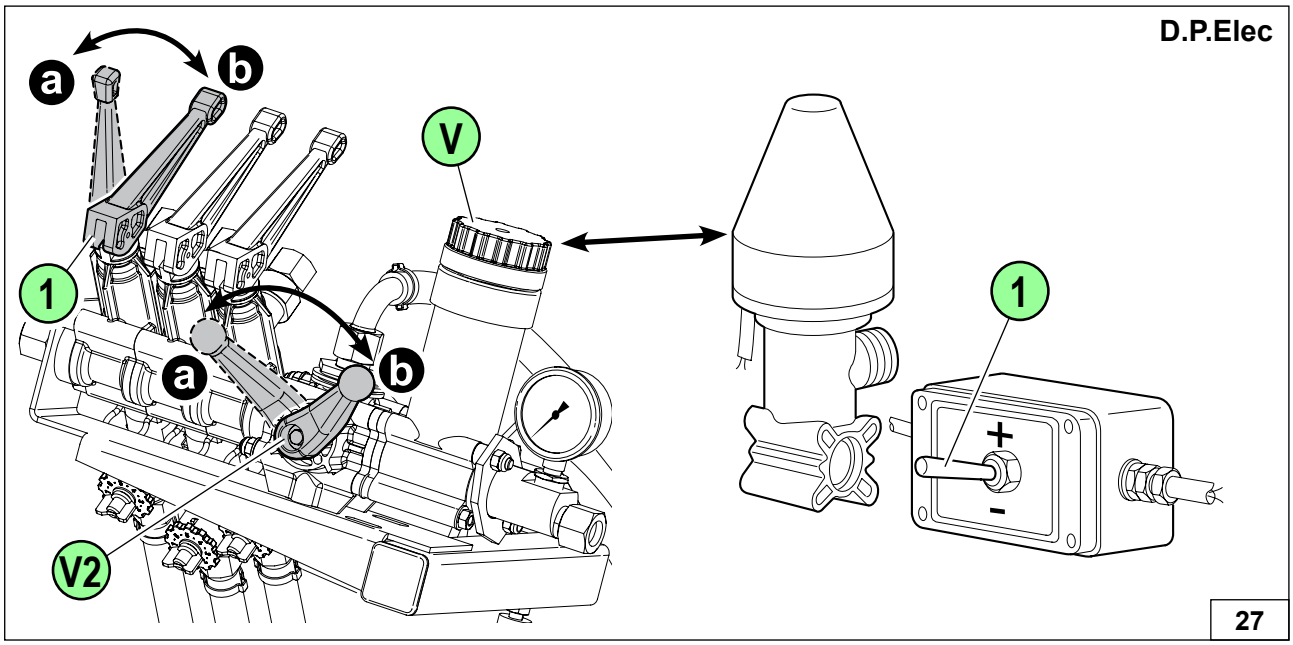
In both cases:

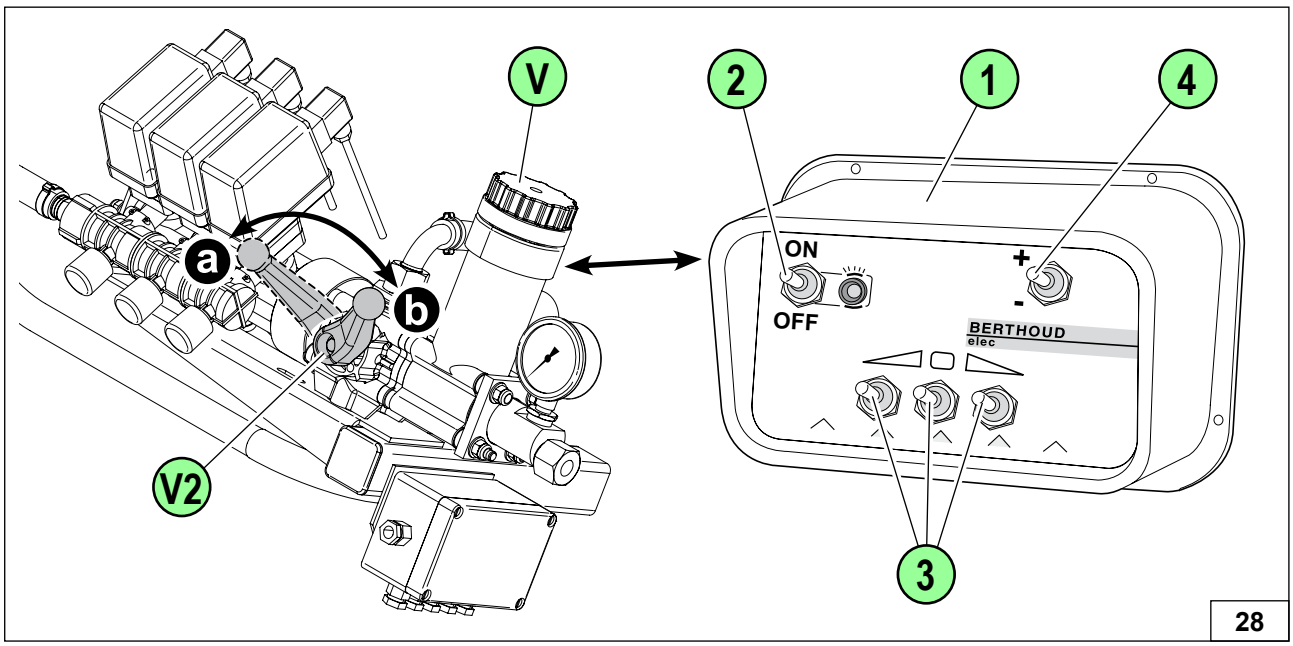
- Engage the power take-off to idle at **150 rpm max** until the main tank is empty.
- Put the manual or electric regulating valve (V) back at its initial position.

After rinsing the spraying circuit,
drain the main tank with the valve (V4) (figure 25).


a
V1
b
a
V4
b
25


b
a
1
2
26


D.P.Elec
a
b
V
1
a
b
V2
1
+
-
27


V
a
b
V2
2
1
4
ON
OFF
+
-
BERTHOUD
elec
3
28

OTHER SPRAYER FUNCTIONS

INCORPORATION HOPPER - ALTO 300/400/600/800

- This permits introduction, during water filling of the sprayer, of powders or liquid treatment products. This equipment gives an excellent mixing of the product with the water and makes spraying operations easier.

OPERATION (figure 31)

- Connect the hopper's piping (6) to the valve (1) located on the sprayer.
- Dip the filling stick (4) into the tank of your sprayer.
- Hook the top of the filling stick under the edge of manhole.
- Fill the tank partly, (approx. 100 litres, see filling operation, pages 16 and 26).
- Lift the cover of the hopper.
- Fill the hopper with phytosanitary products.
- Adjust valves:

Manual control version:

- Put the valve (V1) in position b (figure 25 page 31).
- Valve (V2) in position a (figure 29).
- Valve (1) in position a (figure 31).

Electric control version:

- Put the valve (V1) in position b (figure 25 page 31).
- Valve (V2) in position a (figure 30).
- Valve (1) in position a (figure 31).

In both cases:

- Engage the tractor's power take-off and increase its speed to 540 rpm.
- To rapidly empty the hopper:
  - Replace the cover,
  - open the valve (5) in position b (figure 31).

- The product is draw up into and incorporated in the sprayer's tank.

RINSING THE HOPPER

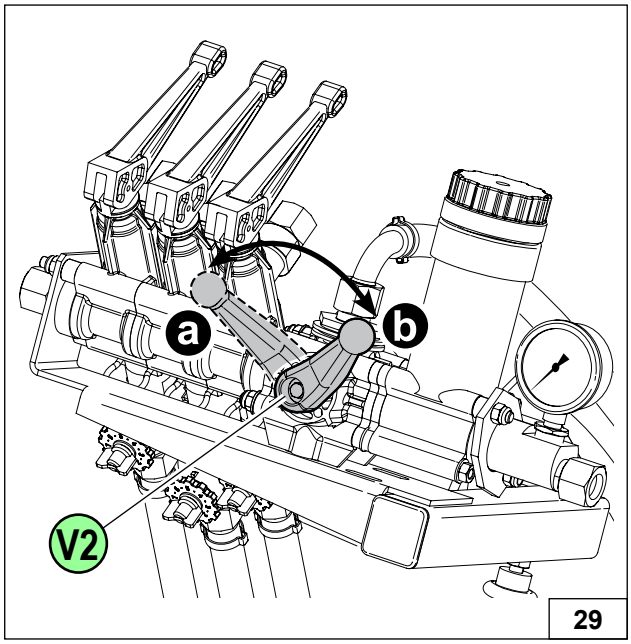
- Open the valve (2) in position a (figure 31) which actuates the rinsing boom (1) (figure 32).

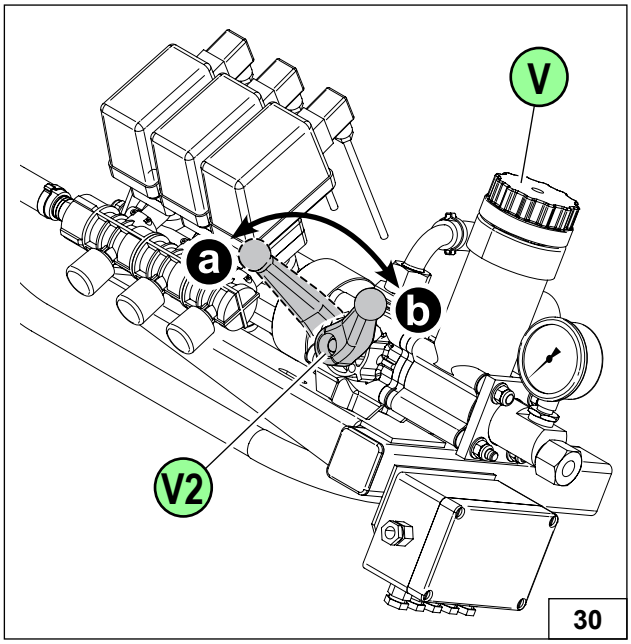
RINSING THE CANS

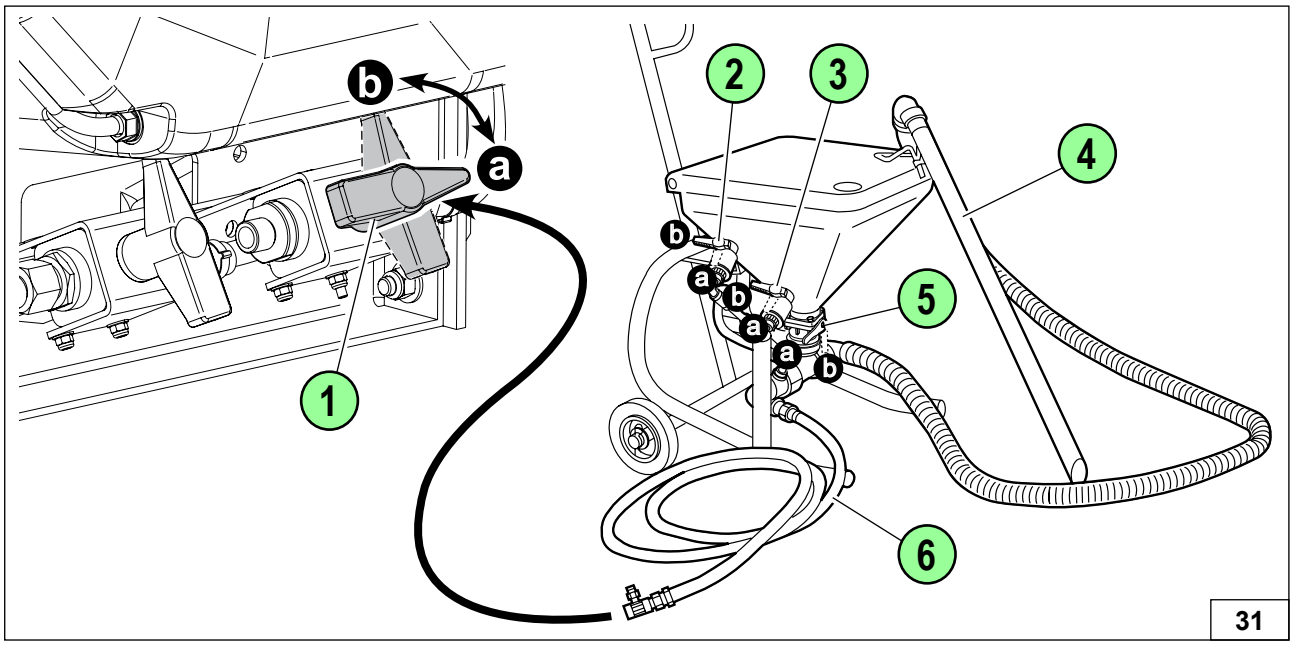
- Position the product can on part (2) (figure 32).
- Open the valve (3) in position a (figure 31) to actuate the cleaning nozzle (3) (figure 32).

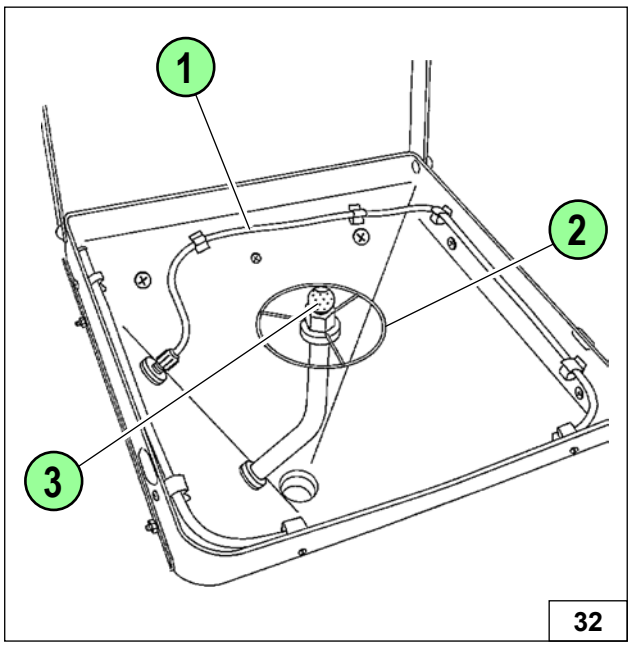
AFTER THESE OPERATIONS

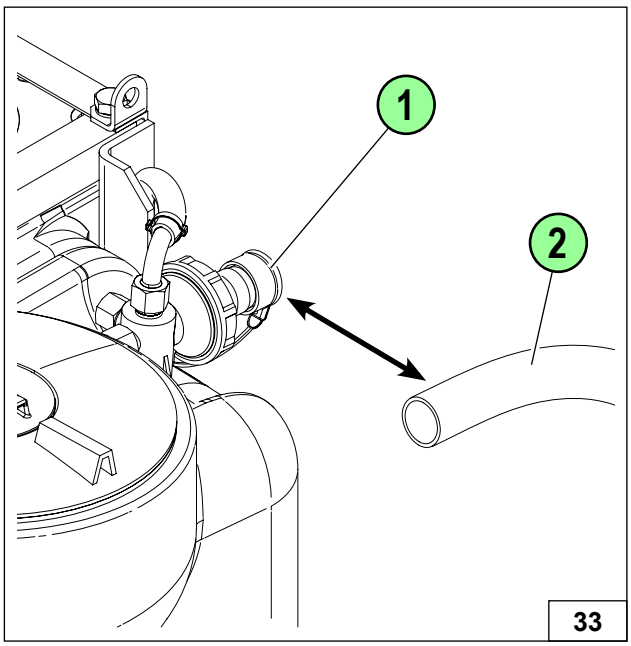
- Adjust:
  - Valve (1) in position b (figure 31).
- You can now finish the tank's filling.
- After the filling operation (figure 33):
  - Remove filler hose (2),
  - refit the plug (1).


a
b
V2
29


V
a
b
V2
30


b
a
1
2
3
4
5
6
31


1
2
3
32


1
2
33

HEIGHT OF THE BOOM

- A working height between 50 cm and 60 cm above the surface treated is recommended. This height is defined by the nozzle spray angle and spacing.
- There is a risk of drift with greater heights.

STIRRING

HYDRAULIC STIRRING

- The pump has a fixed flow rate. This flow permits the boom's supply, the excess returning to the tank by the regulator. It is this excess flow that ensures the hydraulic stirring.

DRAINING THE TANK

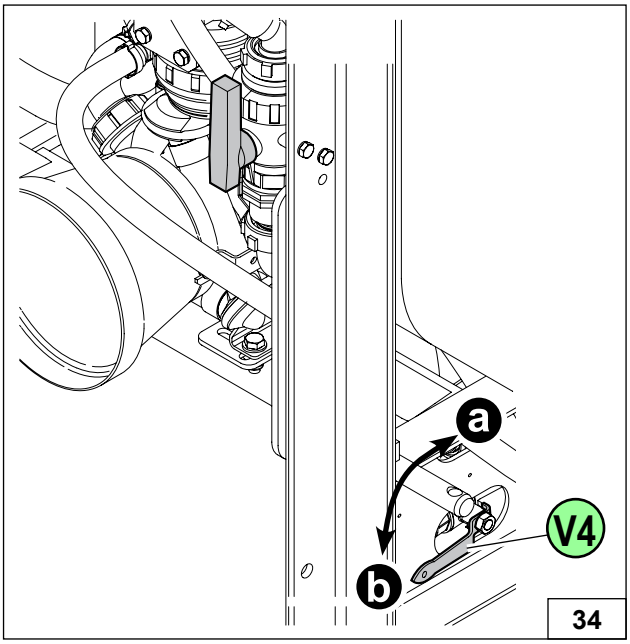
- According to the various cases, put the valve (V4) in position ⓑ (figure 34).

HANDWASH TANK

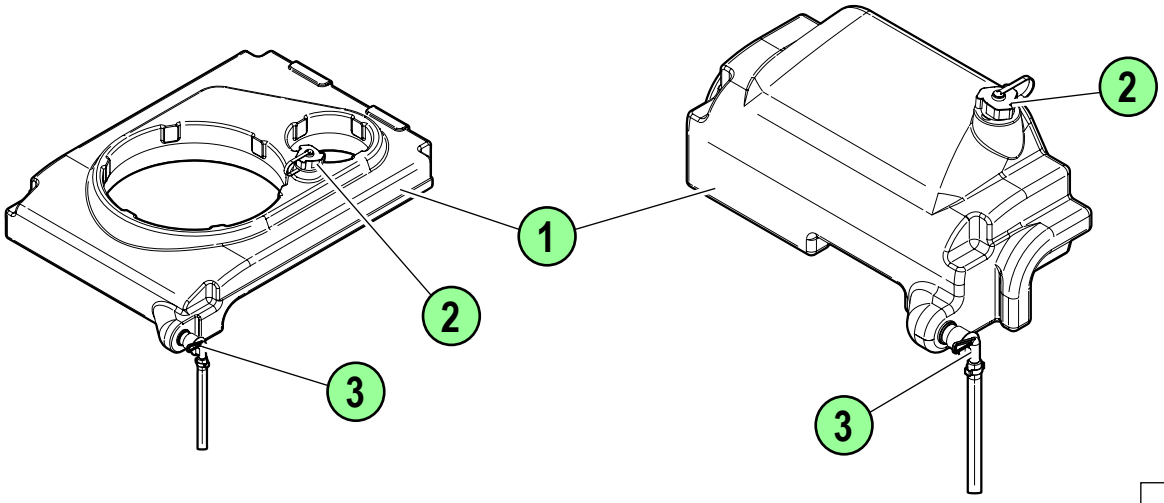
- Hygiene and comfort: a 15-litre clean water tank (1) (figure 35), allows you to wash your hands or any other part of your body (face, eyes,...) that may have come in contact with the product.
- Positioned in front of the sprayer, the tap (3) is easily accessible.
- Washing, by opening the tap (3) more or less according to the required flow rate.
- It is ESSENTIAL for the handwash tank to be filled with clean water, through the plug (2), without any pressure.

RINSING TANK

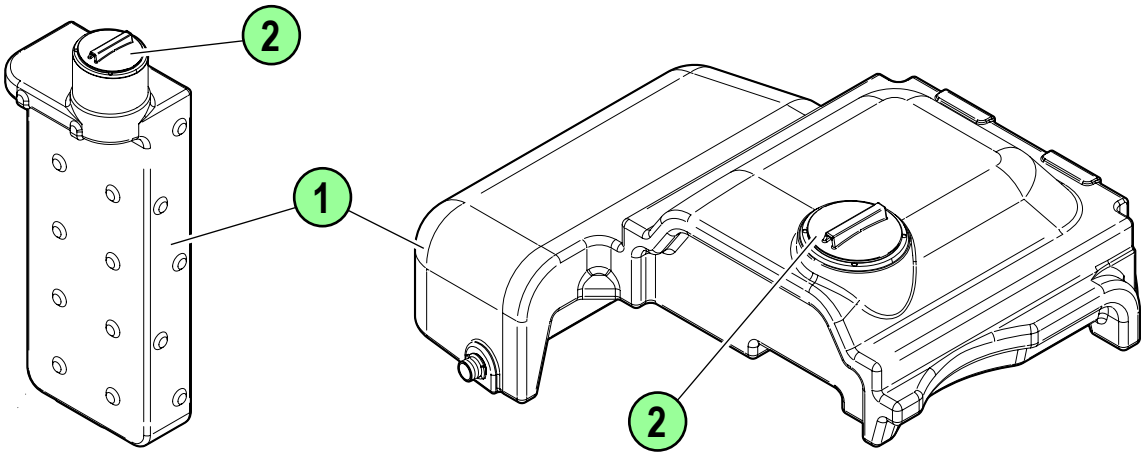
- A 40-litre (ALTO 300/400) or 80-litre (ALTO 600/800) clear water tank (1) (figure 36), independent of the main tank, permits the rinsing of this one.
- It is ESSENTIAL for the rinsing tank to be filled with clean water, through the lid (2), without any pressure.



ALTO 300/400 **ALTO 600/800**



ALTO 300/400 **ALTO 600/800**



RINSING CANS

- Position the product can on part (1) (figure 37).
- Actuate the handle (2) to clean the can.

RINSING THE MAIN TANK (OPTIONAL)

- 1 rinsing ball (ALTO 300/400) or 2 rinsing balls (ALTO 600/800) installed inside the tank, ensures this function (figure 38).

Note: Put the valve (1) (figure 39) in position ⓐ (refer to the various rinsing phases, pages 20 and 30).

SAFETY VALVE

- Valve (S) (figure 40) is located between the pump and the tank.
- It is adjusted to 15 bar pressure.
- The function of this valve is to prevent any overpressure resulting from a mishandled use (liquid hammer).

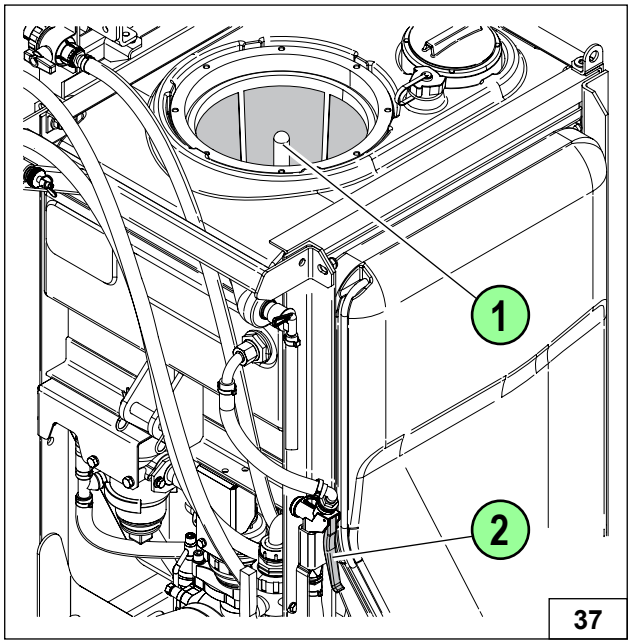
SUCTION FILTER

- Unscrew the nut (E) (figure 41) to reach the filter cartridge (mesh 6/10) to clean it or change it.

DELIVERY FILTER

- It is located between the pump and the distribution unit.
- Provides additional filtration.
- To remove the filter cartridge (mesh 4/10), unscrew the filter body (1) (figure 42) using a 27 mm wrench (wrench not supplied with the machine).
- **The filter cartridge needs to be cleaned after each application. Grease the seals.**

Reminder: ***The original factory-installed filter cartridge mesh is 4/10 (mesh 8/10 is available separately for liquid fertilizer).***



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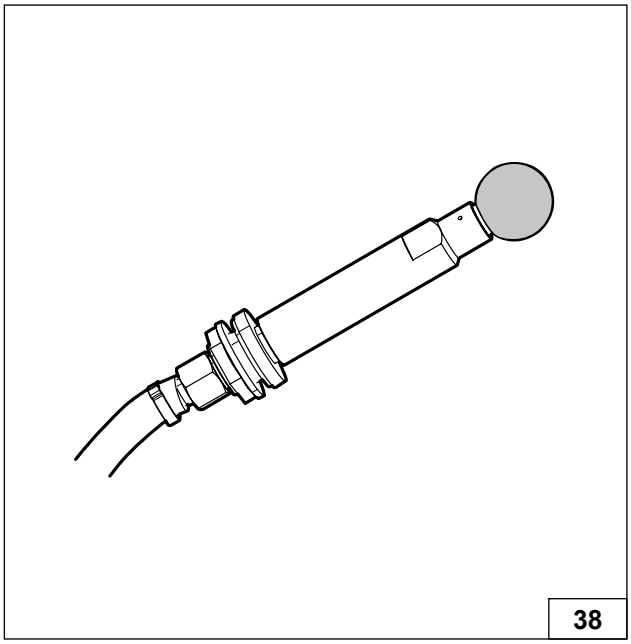
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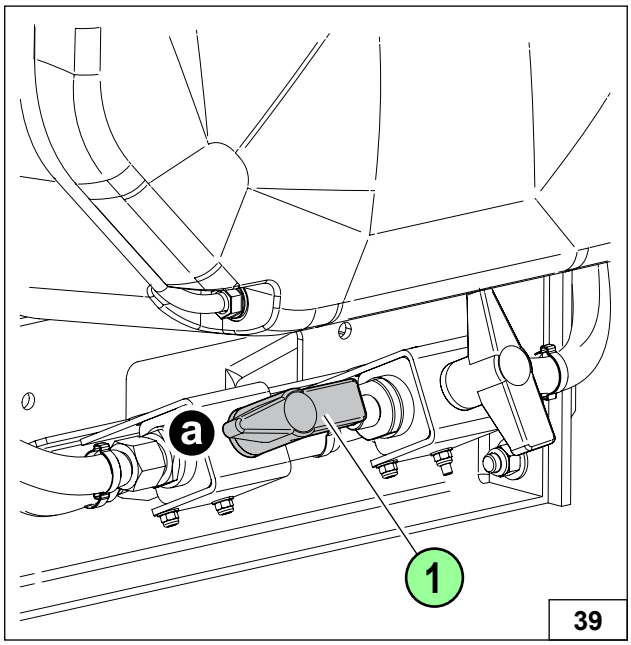

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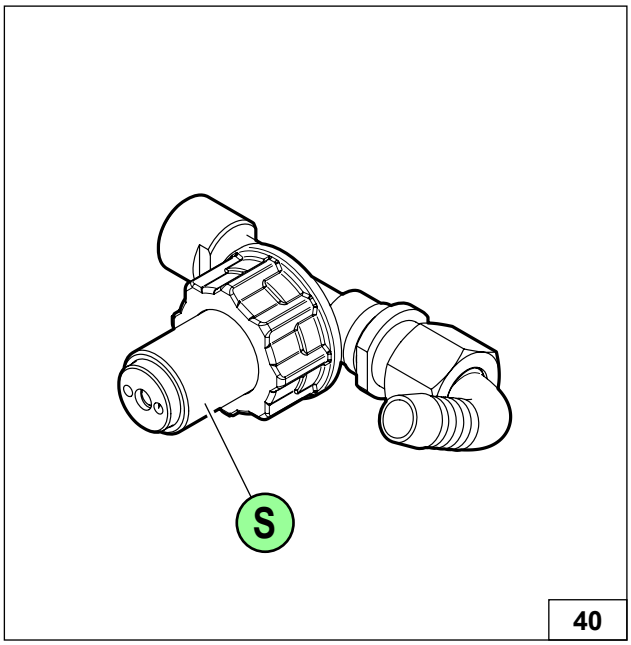

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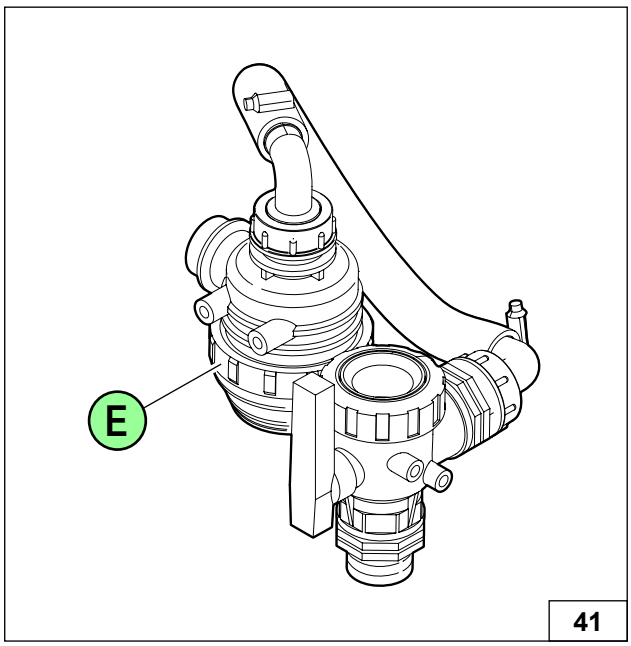

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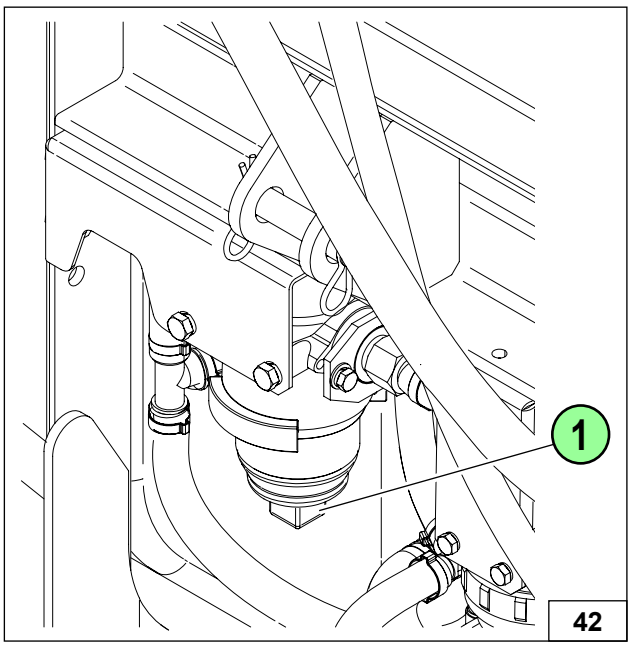

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MAINTENANCE OF THE SPRAYER

See "Safety, checks, maintenance of the Sprayers": manual No. 82.471

PRACTICAL RECOMMENDATIONS FOR THE SERVICING OF YOUR SPRAYER

- By cleaning your sprayer regularly during and at the end of treatment seasons:
  - You will avoid spraying chemical residues on the crops,
  - You will ensure a good distribution of the product, while eliminating total or partial blockage of the nozzles,
  - You will increase your sprayer's life.

Carry out the sprayer's maintenance operations with the tractor's engine switched off, the ignition off and the power take-off disengaged.

CHECKS BEFORE SPRAY SEASON

Filter:
- Make sure that the suction filter is clean and in good condition.

Pipes:
- Look for any leaks, check for kinks in the pipes.

Seals and fittings:
- Check to ensure that nuts and connectors are tightened, change the seals if necessary.

Pump:
- Check the oil level.

Nozzles:
- To change the nozzles once per year or when their flow rate is 10 to 15% greater than their initial flow rate. To do this, use the FLOW TEST - BERTHOUD reference 765.241, or the FLOW RATE GAUGE - BERTHOUD reference 778.887.

Tank:
- Check that there is no foreign matters inside the tank.

FOAMING INTO THE TANK

- If this occurs, reduce the PTO revs or add an anti-foaming additive to the contents of the tank when filling.

Do not add fuel oil to the spraying mixture as an anti-foaming agent.

NOZZLES OR FILTERS DIRTY

- Clean and rinse dirty filters or nozzles using a brush and water.

  To do this, use the brush/wrench BERTHOUD reference 779.354.

Never blow into a nozzle.

LAST FILLING OPERATION

- When filling the tank for the last time, add only the amount of water and chemical necessary to spray the remaining area.

MAINTENANCE AFTER OPERATION

- It is important to rinse the outside of the spray as well as the tractor. This cleaning operation should be repeated during the day between applications of different products.

PROCEDURE

- Remove the filters.
- Fill the tank to 20 % full with water and add detergent (ALL CLEAR reference 771.053, 1-litre can or 778.886, 5-litre can).
- Operate the sprayer for a short period.
- Rock the sprayer by moving the tractor forward and backward with a view to agitation water into the tank.
- Leave mixture to act for 12 - 24 hours.
- Start the agitation and move the tractor forward and backward several times, then drain using the drain valve.
- Put some clean water in tank.
- Unscrew a nozzle (remove insert and plug) at the end of each boom element.
- Rinse with clean water.
- Remove all nozzles and filters, and clean them.
- Reassemble.
- See chapter "Servicing the boom".

WINTER STORAGE

- The sprayer should be wintered in a clean condition *(see above)*.
- Rinse the circuit completely (with a cleaning product).
- Drain the tank.
- Rinse with clear water.
- Completely drain the liquid circuit, making sure that the pump is not operated too long without water (2 minutes maximum).
- Protect against the frost, using sufficient antifreeze into the tank (glycol or coolant).
- Start the pump slowly.
- Operate all the valves so as to protect the pump, valves, control valve, filters and pipes.
- Start spraying so as to supply antifreeze onto the boom. When the antifreeze reaches the nozzles, stop the spraying and disengage the power take-off.
- Grease all mechanical parts that can be rust.
- Deoxidize the contacts on the power plugs (BERTHOUD reference 765.065 the KF F2 aerosol).
- Clean the outside of the machine. Paint the mechanical parts exposed (BERTHOUD reference 769.077 for the blue paint aerosol or 778.890 for the green paint aerosol).
- Garage the machine out of the sunlight and protected against inclement weather and on flat, load-bearing ground.

PROTECTION AGAINST OXIDISING AGENTS

- Before treatment using liquid fertilisers it is advisable to protect the equipment and boom with diesel oil in order to prevent rusting or oxidation of paint work.
- After service, the equipment can be cleaned down with a high-pressure jet to remove all traces of dust and diesel oil.

SERVICING THE BOOM

- After each use, rinse the piping thoroughly, operating the machine for several minutes with clear water.
- Drain the piping, particularly if there is a risk of frost.
- After cleaning the boom with a high-pressure jet, grease the ram shafts to prevent all risk of corrosion.
- Keep the hinges on the arms and the uprights on the fixed frame greased.
- Touch up the paintwork as necessary.

For further information about the spray boom, refer to its technical documentation located in the blue information pouch provided with the sprayer.

LUBRICATION AND GREASING

CHECK THE PUMP OIL LEVEL

- BP 60/20 pump (figure 43)

- Through the level plug (1).
  If there is not enough oil, remove the stirrups (2), the bell assembly (3) and the plug (4).
  The oil must be flush with the bottom edge of the sump hole.
- **Oil capacity for a BP 60/20 pump = 0.40 litre.**

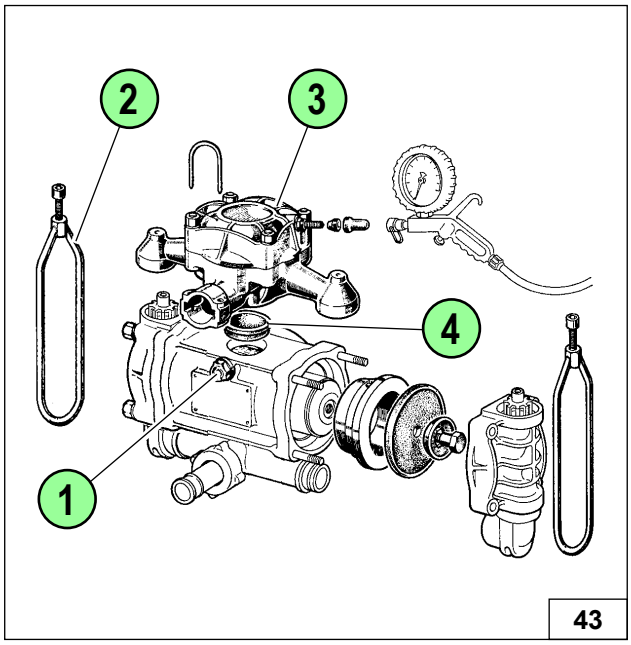
- BP 105/20 pump (figure 44)

- The level must reach the notch on the gauge (2).
  If there is a lack of oil, withdraw the rubber stopper (1) and top up.
- **Empty the oil:**
  Withdraw the stopper (1) and tip the pump over.
- **Oil capacity for a BP 105/20 pump = 0.50 litre.**

We recommend SAE 30 oil
2-litre can, BERTHOUD reference 769.286

- Grease all the points equipped with a grease nipple (universal joint, hubs, etc.)

Grease MOBILUX EP2 or ELF EPEXA 2



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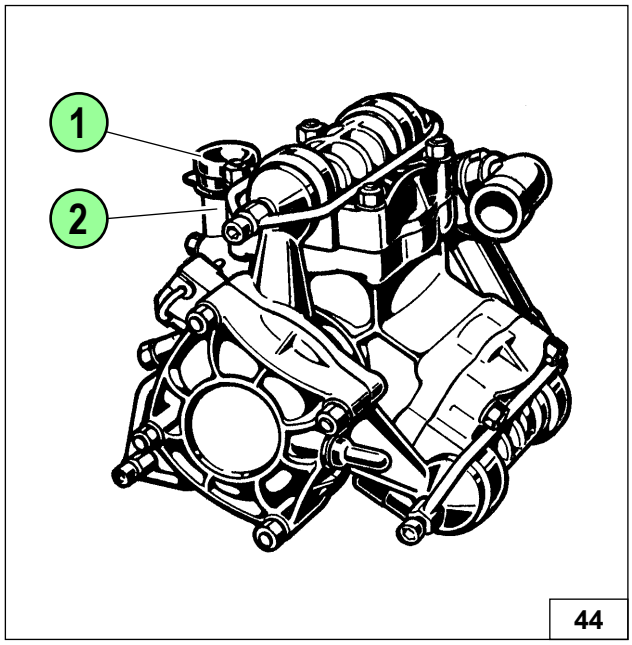

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- Important recommendations:

- *It is preferable to carry out drainage when the sprayer has just been in operation. The oil is more fluid and flows more easily.*
- *To grease a point equipped with a lubricating nipple, clean the latter first.*
- *For components not equipped with lubricating nipples, remove the used grease.*
- *We recommend that you always use the same oil and grease.*
- *When lubricating the PTO shaft, take care to comply with the manufacturer's instructions.*

Change the oil during each spraying campaign

MAINTENANCE DIAGRAM

SPRAYING CIRCUIT

SPRAYING CIRCUIT OF AN ALTO EQUIPMENT

DESIGNATION OF SPRAYING CIRCUIT REPERES of page 49

1 - Handwash tank (15 litres capacity).

2 - Rinsing tank (40 or 80 litres capacity).

3 - Main tank (300, 400, 600 or 800 litres capacity).

4 - Filler hose with strainer (optional).

5 - Hydro-injector (optional).

6 - Rinsing ball (optional).

7 - Drain valve.

8 - Valves of options.

9 - Suction filter group.

10 - BP 60/20 or BP 105/20 pump.

11 - "Berjust 2" control box.

12 - Independent incorporation hopper (optional).

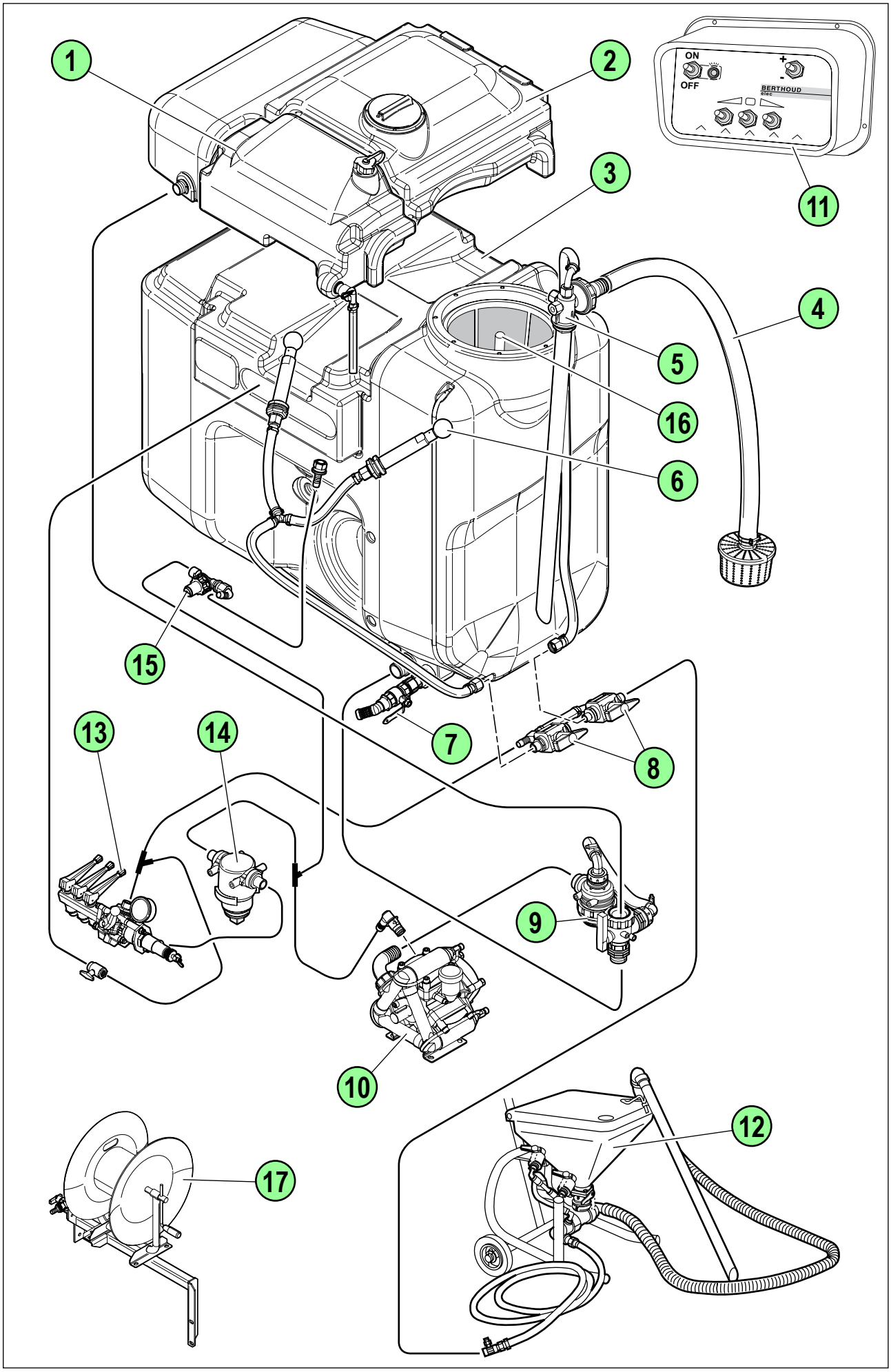
13 - Manual unit of 3 supply shutters with main valve (1/4 turn) and regulator.

14 - Delivery filter.

15 - Safety valve

16 - Rinsing cans.

17 - Hose reel.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BERTHOUD

REMEMBER YOUR PARAMETERS

Fill-in the boxes below so that you can remember the values programmed, the brand of nozzles, and their colours.

NOZZLE 1

nozzle:

NOZZLE 2

nozzle:

NOZZLE 3

nozzle:

NOZZLE 4

nozzle:

NOZZLE 5

nozzle:

NOTE:

At the start of each treatment season, check the real flow-rates of your nozzles.

Wheel circumference:

Number of pulses:

NOTE ON THE TREATMENTS CARRIED OUT DURING THE SEASON

Date	Field	Treatment	Product	Dose	Volume l/ha	Nozzle	Pressure	Speed km/h

Because of our policy of constant product improvement,
we reserve the right to modify product specifications or design without prior notice.

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