

EXPLORER

Operator's Manual

67021004 - AU - 07/02

EXPLORER

EXPLORER / NAVIGATOR Operator's Manual
 for Navigator Sprayers built prior to July 2002
 Part number 67021004
 July 2002 edition

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All operators of the equipment dealt with by this publication must read this entire publication prior to operating any of the equipment. The safety section must be thoroughly read and understood.

Failure to do so may result in injury or death.

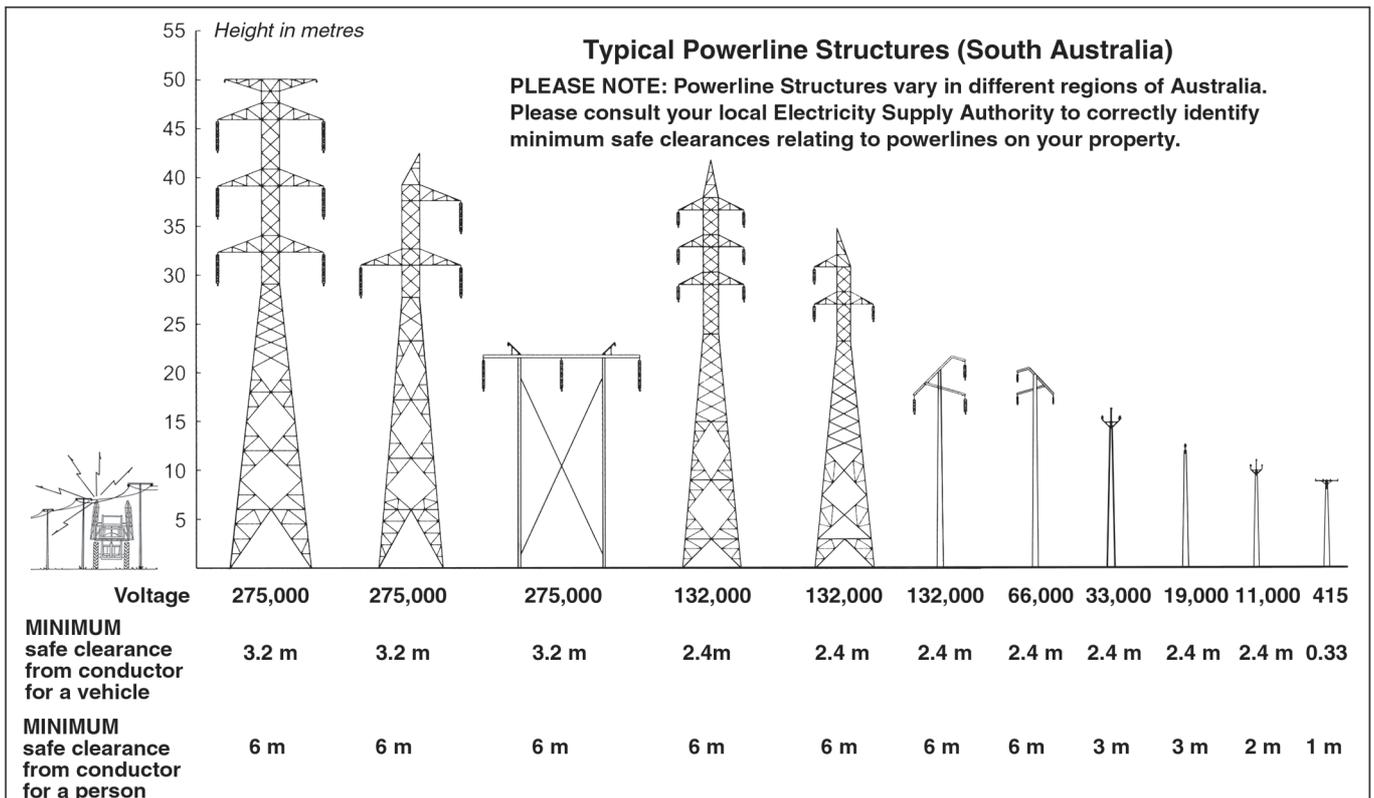
After changing chemicals or crops it is essential that the entire spraying system be flushed. This includes disconnecting hoses from the self cleaning filter and pressure relief valve and cleaning any residue and sediment found in the hoses, valve and filter.

Failure to do so may lead to potential crop damage.



WARNING!
 Operating large agricultural vehicles near powerlines, even without actually touching them, can have serious consequences!

It is your responsibility to ensure that minimum safe clearances are strictly observed. In particular when using spraying equipment it is necessary to be aware of the presence of powerlines when transporting the unit, spraying your crop, raising / tilting / lowering the boom, and when the operator is working above the vehicle. Keep in mind that during hot weather there is potential for sagging of the lines, which will affect clearance distance.



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Introduction

Congratulations on purchasing a HARDI EXPLORER sprayer. The reliability and efficiency of this sprayer depends upon your care. The first step is to take the time to carefully read this operator's manual. It contains essential information for efficient and safe operation of the HARDI EXPLORER sprayer. Additionally, all sprayer options are covered within this manual. This manual covers EXPLORER / pre-2002 NAVIGATOR with EAGLE boom or FALCON boom. An appropriate boom operator's manual is supplied with your sprayer documentation.

Thankyou for choosing HARDI and welcome to the increasing family of HARDI spraying equipment owners.

Sprayer use

The HARDI EXPLORER sprayer is for the application of plant protection and liquid fertiliser chemicals. The sprayer must only be used for this purpose. It is not allowable to use the sprayer for other purposes. If no local law demands that the operator must be certified to use spray equipment, it is strongly recommended to be trained in the safe handling of plant protection chemicals and plant protection, to avoid unnecessary risk for persons and the environment.

Identification plates

An identification plate is fitted on the frame and indicates:

Producer Name, Model, Serial Number, Date and Dealer Name (In some states the Dealer Name may not be on the plate).

Please record applicable details below:

Producers Name:

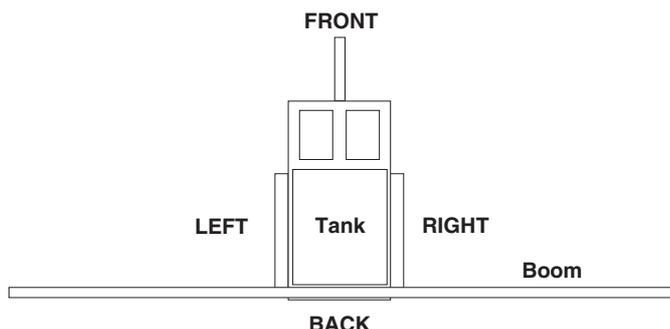
Model:

Serial Number:

Date:

Dealer Name:

Sprayer Layout



Safety

This is the safety alert symbol:

When you see the symbol in this manual or on the spraying equipment, be alert because it means **WARNING** your safety is involved.

Note the following recommended precautions and safe operating practices:

- Read and understand this operator's manual before using the equipment. It is equally important that other operators of this equipment read and understand this manual.
- You must read chemical labels and follow the instructions they contain prior to using them. Chemical labels are registered by the National Registration Authority. However each state governs the purpose for which a chemical may be used, this varies from state to state.
- Local law may demand that the operator be certified to use spraying equipment. Adhere to the law.
- Pressure test with clean water prior to using chemicals.
- Wear protective clothing.
- Rinse and wash equipment after use and before servicing.
- Depressurise equipment after use and before servicing.
- Never service or repair the equipment whilst it is operating.
- Disconnect electrical power before servicing.
- Always replace all safety devices or shields immediately after servicing.
- If an arc welder is used on the equipment or anything connected to the equipment, disconnect the power leads before welding. Remove all inflammable or explosive material from the area.
- Do not eat, drink or smoke whilst spraying or working with contaminated equipment.
- Wash and change clothes after spraying.
- Wash tools if they have become contaminated.
- In case of poisoning, immediately seek medical advice. Remember to identify chemicals used.
- Keep children away from the equipment.
- Do not attempt to enter the sprayer tank.
- Do not go under any part of the equipment unless it is secured. The boom is secure when placed in the transport brackets.
- Do not use the sprayer step unless the sprayer is connected to the tractor or the sprayer is correctly placed on a hard, flat surface.
- If any portion of this operator's manual remains unclear after reading it, contact your HARDI dealer for further explanation before using the equipment.



Description

Frame

The frame is all steel construction. It has a strong chemical and weather resistant powder coat.

Drawbar

The drawbar can be adjusted for different tow heights. An alternative Gooseneck attachment is available also.

Tyres / Wheels

Rims are heavy duty fixed centre with a new tractor type tyre fitted

Standard tyre sizes are:

14.9x24 on 2000 and 2700L

16.9x28 on 3200L

18.4x30 on 3200L with 24m boom

Suspension

Optional Tandem spring suspension is load-rated to tank size, rocker allows wheel movement as tank empties.

Tank

UV-resistant 2000, 2700 or 3200 Litre Polyethylene tank, in a purposeful design with limited sharp corners for easy agitation, emptying and cleaning.

Pump

On 2000 / 2700 units: HARDI1202 2-diaphragm pump producing 99 l/m at 540 rpm.

On 3200 unit: HARDI 1302 3-diaphragm pump producing 114 l/m at 540 rpm. Both are dry sump grease lubricated and are fitted with suction and pressure pulsators, as well as having easily accessible valves and diaphragms.

Suction valve

The black color coded suction valve allows selection of Main tank or Flush tank (where fitted).

SC operating unit (2000 / 2700L units)

12 Volt electric controls featuring reliable motor drive pressure system incorporating HARDIMATIC proportional valve for constant application rate in the same tractor gear. The distribution valves are unique Hardi solenoids with chemical resistant seals and an integrated pressure filter.

EVC-3 operating unit (3200L units)

The EVC-3 has 3 distribution valves with adjustable constant pressure valves which allow the operator to close individual boom sections without change to boom operating pressure. A switch for electric pressure adjustment is fitted along with a master on/off switch, and a HARDIMATIC valve - giving constant application rate when the number of PTO revolutions are between 300 - 600 rpm within the same gear. A pressure gauge is also fitted.

HARDI 1500 Monitor and HARDI 2500 Computerised Rate Controller (If fitted)

The operating unit is fully electrically controlled via a remote control box and additionally, if fitted, via the HARDI Monitor 1500 or the HARDI Controller 2500. The HARDI Monitor 1500 monitors and displays spraying status while the HARDI Controller 2500 allows automatic control of spraying.

Please refer to the *HARDI 1500 Monitor and HARDI 2500 Controller Instruction Book*.

Filters

A Suction Filter is fitted to ensure the sprayer will have minimal pump contamination and nozzle blockages. With the (optional) Self-Cleaning Filter the impurities that exist in the spray liquid will bypass the filter and be re-circulated back to the tank via the return flow. When the tank is empty, the impurities can be flushed out through the drain before refilling.

Booms

EXPLORER boom options are as follows:

12.5 - 16.5m FALCON and 18, 20 and 24 m EAGLE BOOMS. These are Hydraulic Lift and Manual Fold, except 24m Eagle which is Hydraulic Fold as standard.

The booms feature an integrated spring suspension system with shock absorber dampening.

Please refer to the boom manual supplied with your sprayer documentation, either the *EAGLE* or *FALCON BOOM Operator's Manual*.

HARDI foam markers

The double-sided Hardi foam marker systems are 12 volt operated. They use air under pressure added to the foam/water mix to create foam which is then dropped via the dropper at the end of the boom.

Flush tank

A 100 litre tank is fitted on 3200L unit (optional on smaller units) for the purpose of flushing the boom, controls and filters.

Hand wash tank

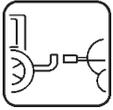
A separate 15 litre tank is fitted to ensure clean water is available for hand washing or rinsing.

Quikmix or Granni Pot Chemical Filler (If fitted)

A 60 litre mixing and transfer hopper, minimises lifting and safely transfers all chemical liquids, powders and granules to the sprayer tank.

Chemical suction probe (If fitted)

A camlock attached suction probe sucks liquid into the sprayer from a chemical container. This system also has the ability to flush the empty container.



Connection

Connect the sprayer with the tractor and adjust the tow height with the drawbar so that the trailer frame is level.

Use spacers to pack the hitch and thus prevent excessive vertical shock movement.

WARNING! The drawbar bolts must be re-tightened every 10 hours until the torque is stabilised at 365 Nm, then every 50 hours.

WARNING! The drawbar ball is designed for a 38 mm pin, which should be secured in the tractor drawbar to ensure the sprayer cannot be accidentally disconnected - use bushes to reduce slack.

WARNING! Your tractor will have decreased braking efficiency with the sprayer connected, particularly when the tank is full.

Support leg

Remove and/or turn upside down to the storage position the drawbar support leg.

WARNING! The support leg is not designed to support the trailer for extended periods if the sprayer is full of water.

Tyres

Equal pressure in all tyres is essential. Pressure should be kept as low as practical, i.e. baggy when the tank is full. For recommended pressure see *Tyre pressures* (Page 25).

NOTE! Units fitted with computers must always maintain the same tyre pressure as when calibrated.

Transmission shaft installation

Initial installation of the transmission shaft may require shortening of the shaft.

- 1 Attach the sprayer to the tractor and set the sprayer at a height allowing the shortest length of the transmission shaft with the tractor set at a turning angle.
- 2 Stop the engine and remove the ignition key.
- 3 If the transmission shaft must be shortened, pull the shaft apart. Fit the separated shaft parts to the tractor and sprayer pump and measure how much it is necessary to shorten the shaft. Mark the protection guards.

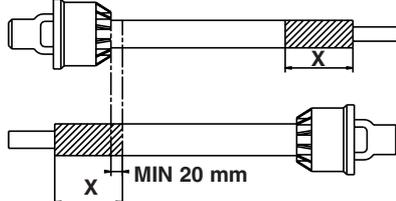


Fig 1

NOTE! The shaft must always have a minimum overlap of $\frac{1}{3}$ of the length.

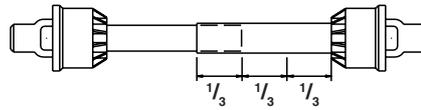


Fig 2

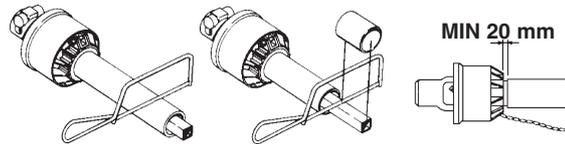


Fig 3

- 4 Shorten the two separated parts equally. Use a saw and file the profiles afterwards to remove burrs.
- 5 Grease the profiles, and assemble the male and female parts again.
- 6 Grease the tractor and sprayer pump PTO shafts.
- 7 Fit the transmission shaft to the tractor and sprayer pump PTO shafts:
Push the yoke pin and slide the yoke onto the PTO shaft. Make sure that the lock engages by pushing and pulling forwards and backwards or if applicable by tightening the allen key. Fit the chains to prevent the protection guards from rotating with the shaft.

NOTE! Please fit the female part marked with a tractor symbol towards the tractor.

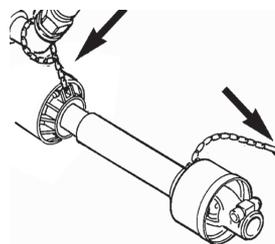


Fig 4

NOTE! To ensure long life of the transmission shaft try to avoid working angles greater than 35°.

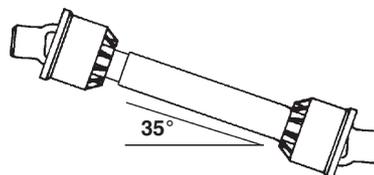


Fig 5

Connecting hydraulics

Please refer to the boom manual supplied with your sprayer documentation, either *EAGLE BOOM Operator's Manual* or *FALCON BOOM Operator's Manual* regarding connecting hydraulics and boom operation, adjustment and maintenance.

Connecting electric controls

For both the foam marker and EVC-3 Operating unit, 12 volt sockets will be required with the following fuse ratings.

Control	Box	Polarity / Wire color	Fuse (A)
	(+)	(-)	
EVC-3	Brown	Blue	8
FM	White	Black	10

The foam marker requires 12 V direct to the compressor box via the supplied cable. This cable should be connected via a 10 A fuse direct to the battery.

Ensure cables are not able to be caught in the PTO or damaged by tight turns.

Disconnecting sprayer

Always clean the sprayer inside and outside before disconnecting and parking it.

Before disconnecting from the tractor, make sure the support leg is properly fitted.

WARNING! To prevent the sprayer from tipping over, do not disconnect the sprayer from the tractor with the boom unfolded, unless the boom is supported.

Place stop wedges in front of and behind the wheels. Remember to disconnect all hoses and cables from the tractor.

WARNING! If the sprayer is parked unattended, avoid unauthorised persons, children and animals having access to the sprayer.

Before operating sprayer

Although the sprayer has had a strong and protective surface treatment applied to steel parts, bolts, etc. in the factories, it is recommended to apply a film of anti-corrosion oil (e.g. CASTROL RUSTILLO or SHELL ENSIS fluid) onto all metal parts in order to avoid chemicals discolouring the protective coating.

If this is done before the sprayer is put into operation for the first time, then it will always be easy to clean the sprayer and keep the coatings shiny for many years.

This treatment should be carried out every time the protective film is washed off.

Roadworthiness

When driving on public roads and any other areas where traffic laws apply, please ensure that the required signs and lights are fitted and working.

WARNING! Maximum driving speed is the lesser of:
 20 km/h less than the posted speed limit; and
 30 km/h; and
 The tyre manufacturers maximum speed.



Operation

Function diagram

The function diagram includes optional Hardi QuikMix or GranniPot Chemical Filler and S/C Filter.

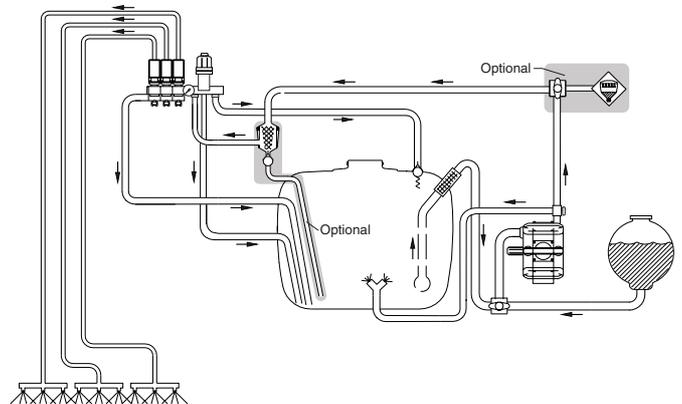


Fig 6

Valve system

Description

The black suction valve is located behind the pump, on the left hand side of the sprayer. The valve permits selection of either the main tank or flush tank.

The red agitation valve is fitted at the pump, it permits operation of the agitation jets.

The blue pressure valve is only fitted if the optional QUIKMIX or GRANNI POT filler has been fitted. It is located at the front of the sprayer. It permits selection of pressure either to the operating unit or QUIKMIX filler.

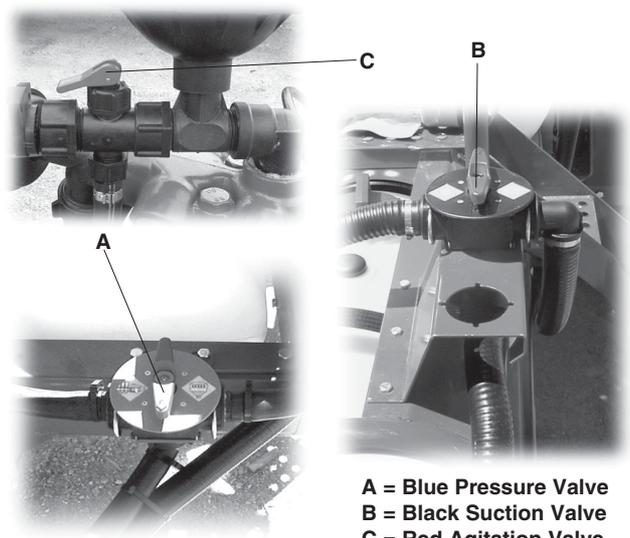


Fig 7

Symbols

The suction valve's black coloured identification disc and the pressure valve's blue coloured identification disc have symbols located on them for easy identification and operation.

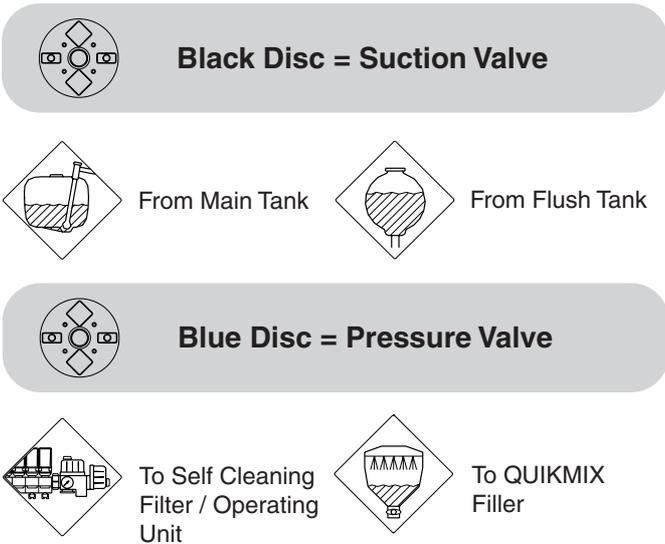


Fig 8

Black suction valve

Turn the black suction valve handle so the arrow points towards the selected tank, i.e. 'From Main Tank' or 'From Flush Tank'.

Blue pressure valve

The blue pressure valve handle can be turned so the arrow and thereby liquid is directed to 'To QUIKMIX Filler'. When spraying is to resume, turn the handle towards 'To Self Cleaning Filter / Operating Unit'.

Red agitation valve

The red agitation valve operates the agitation jets when the red lever is pushed down.

Filling of water

WARNING! Do not overfill any tank as this will cause chemical spillage out of the tank.

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

Water can be filled into the tanks in the following ways:

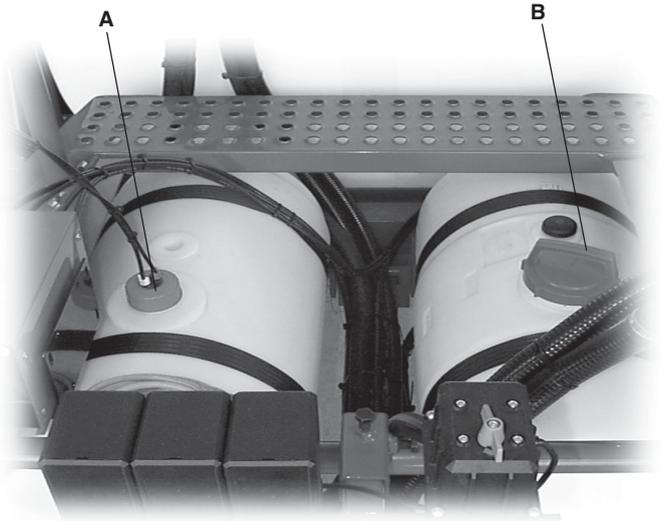
- 1 Filled through tank lids (All tanks).
- 2 Filled by external pump (e.g. Fire fighter) through a 1 1/2" camlock (Main tank only).

The main tank should normally be filled with 25% of the required spraying water, before adding the chemicals.

IMPORTANT! Always read the instructions on the chemical container.

Filling through tank lid

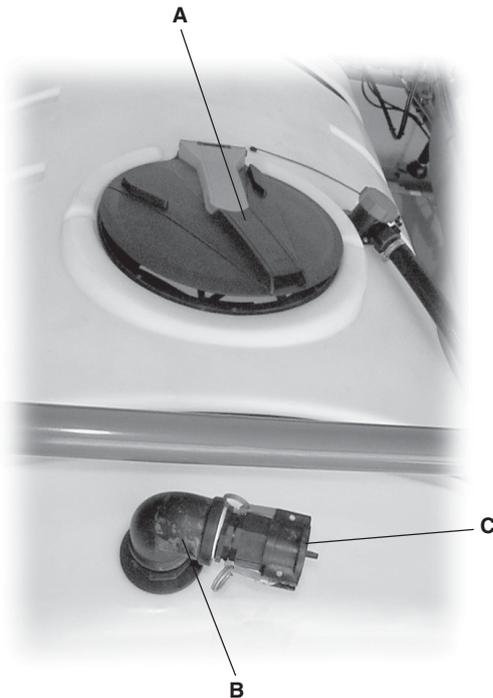
Flip open the main tank lid and fill through the strainer to prevent rust or other particles entering the tank.



A = Foam Marker Tank Lid (ARAG foam marker system shown)
B = Flush Tank Lid

Fig 9

Screw open the foam marker and flush tank lids and fill with water.



A = Tank lid
B = Camlock
C = Camlock Plug

Fig 10

An overhead tank can be used in order to obtain high filling capacity.

WARNING! Do not let the filling hose enter any tank. Keep it outside the tank, pointing towards the filling hole. If hose is placed at the bottom of the tank, and the water pump at the water supply plant stops, chemicals could be siphoned back and contaminate the water supply lines.

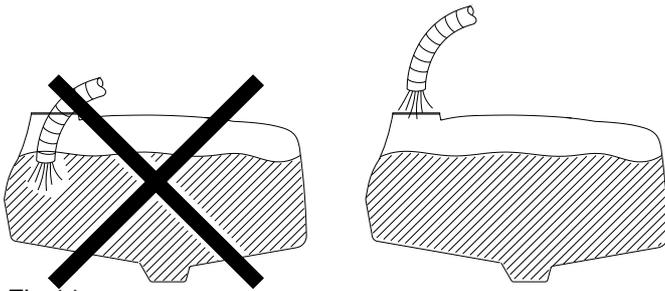


Fig 11

Filling through camlock

This system allows the operator to connect (via a 1 1/2" camlock (B Fig 10)) a hose from, for example, a fire fighter or overhead fill tank, and fill the main tank.

IMPORTANT! Keep the tank lid open when filling and watch the water level.

- 1 Remove the camlock plug (C Fig 10) from the camlock.
- 2 Connect the filling hose.
- 3 Ensure the tank lid (A Fig 10) is open.
- 4 Fill the tank by activating the valve at the filling source.

Filling clean water tank

The clean water tank has a capacity of 15 litres. The water from this tank is for hand washing, cleaning blocked nozzles, etc. Only fill this tank with clean water.

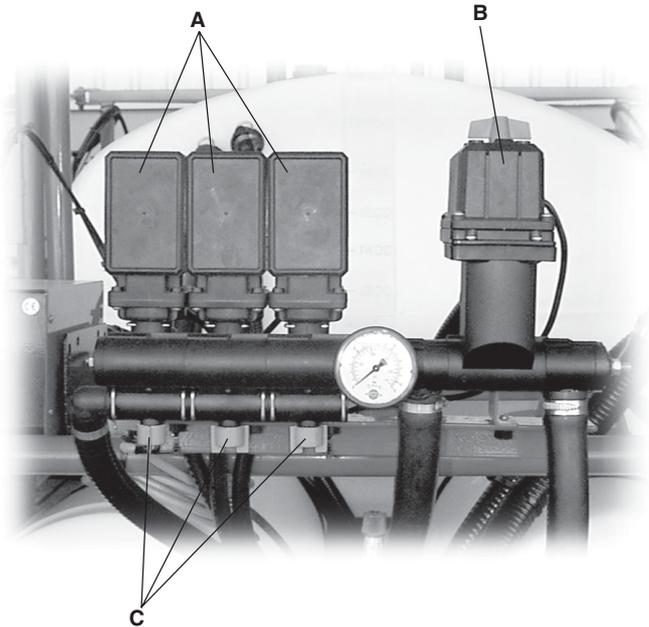


Fig 12

 **WARNING!** Although the clean water tank is only filled with clean water, it must not be used for drinking.

EVC-3 operating unit

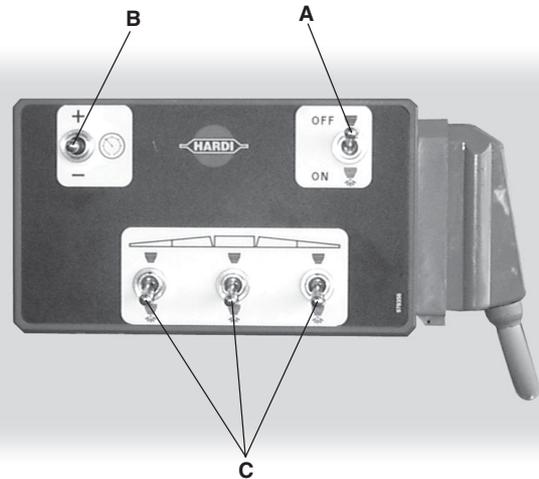
Operating unit



- A = Distribution Valves
- B = Pressure Control Valve
- C = Adjustment Screws for pressure equalisation

Fig 13

Remote control box



- A = Main On/Off Switch
- B = Pressure Control Valve Switch
- C = Distribution Valves Switches

Fig 14

Controls adjustment

Before spraying, the EVC-3 operating unit is adjusted using clean water (without chemicals).

- 1 Choose the correct nozzle for the spray job. Make sure that all nozzles are the same type and capacity. Please see the *Spray Technique* book.
- 2 Toggle the main on/off switch (A Fig 14) to the on position.

- 3 Activate all distribution valves by toggling the distribution valve switches (C Fig 14) to the open positions.
- 4 Activate the pressure control valve switch (B Fig 14) towards '-' until the pressure control valve handle (B Fig 13) stops rotating (minimum pressure).
- 5 Put the tractor in neutral and adjust the PTO revolutions to the intended travelling speed. Remember the number of revolutions of the PTO must be kept between 300 and 600 rpm.
- 6 Activate the pressure control valve switch (B Fig 14) towards '+' until the required pressure is shown on the pressure gauge.

Pressure equalisation adjustment

- 1 Close the first section of the distribution valve by toggling the relevant distribution valve switch (C Fig 14) to the close position.
- 2 Turn the relevant valve adjusting screw (C Fig 13) until the pressure gauge shows the same pressure again.
- 3 Adjust the other sections of the distribution valve in the same way.

NOTE! Hereafter adjustment of pressure equalisation will only be needed when you change to nozzles with other capacities or the nozzle output increases as the nozzles wear.

Operation while spraying

In order to close the entire boom, toggle the main on/off valve switch (A Fig 14) to the off position. This returns the pump output to the tank through the return system. The non-drip diaphragm valves ensure instantaneous closing of all the nozzles.

In order to vary operating pressure you must activate the pressure control valve switch (B Fig 14) towards '+' or '-' until the required pressure is shown on the pressure gauge.

In order to close one or more sections of the boom, toggle the relevant distribution valve switch (C Fig 14) to the close position.

The pressure equalisation ensures that the pressure does not rise in the sections which are to remain open.

NOTE! When the sprayer is put aside, the control box and the multi plug must be protected against moisture and dirt. A plastic bag may be used to protect the multi plug.

NOTE! The outputs stated in the nozzle charts are always based on the pressure measured at the nozzle, which will differ slightly from the gauge.

Filters

Filters should always be used, and their function checked regularly. The mesh size of the filter should always be smaller than the flow average of the nozzles used. Therefore, pay attention to the correct combination of filters and mesh size. The recommended suction

filter is 50 mesh - this allows good flow to the pump with little restriction. The standard self cleaning filter is 100 mesh. Refer to the following chart for correct filter recommendations.

Flat Spray Nozzle Size	Suction Filter	Self Cleaning Filter	In-Line Filter	Nozzle Filter
08-10-12-14	50	100	100	100
16-18	50	80	80	80 (50)
20 and more	30	80 (50)	50	50

Suction filter screens do wear from dirt and chemical particles. If nozzle filters continually block with chemical particles, then use the next size coarse nozzle filter.

Self cleaning filter

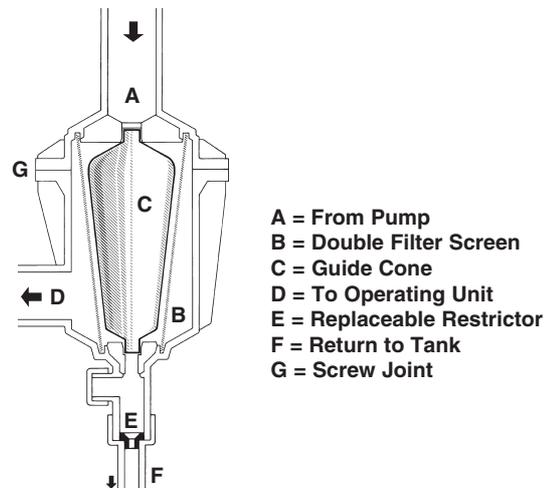


Fig 15

IMPORTANT! Note direction of restrictor in Fig 15.

Correct restrictor choice

It is important to have a large flow through the filter. This is achieved by choosing the restrictor size in relation to the liquid consumption of the spray boom and pump output.

Four restrictors are supplied.

To choose a restrictor refer to *Flow in Specifications* (Page 25).

Or use the green one (largest orifice) first.

Disconnect the hose (Fig 16) at the self cleaning filter, place the restrictor in the hose and reconnect.

If the required working pressure cannot be obtained, the restrictor is too large. Choose a smaller one; Starting with black, then white and finally red.

Cleaning

When cleaning the filter, remove all hoses and check there are no residues.

Standard filter size is 100 mesh. Sizes of 50 and 80 mesh are available and can be changed by opening the filter top (replace the strainer). Check the O-rings before reassembling the filter and replace them if damaged.

Also refer to *Self cleaning filter* (Page 17).

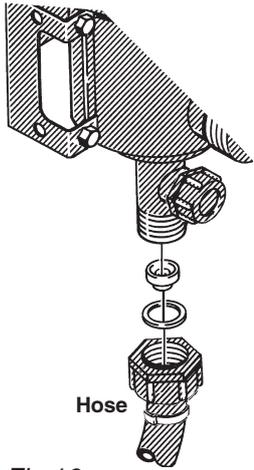


Fig 16

Filling of chemicals

Chemicals can be filled into the main tank in three ways:

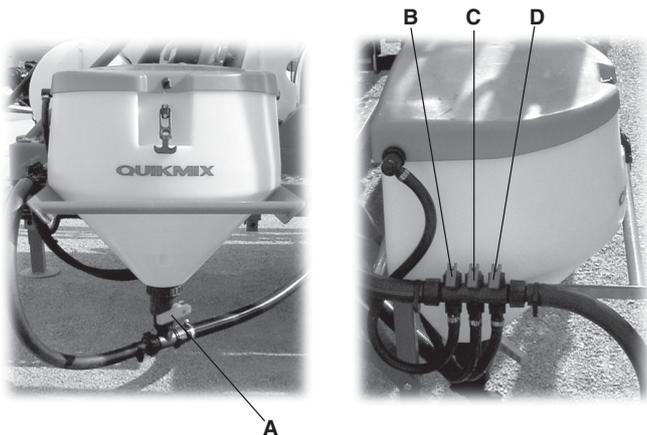
- 1 Through the tank lid.
- 2 By means of the QUIKMIX filler chemical hopper and transfer device (If fitted).
- 3 By means of the chemical suction probe (If fitted).

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

WARNING! Always use the personal protection stated on the chemical container and as a minimum - gloves, face/eye protection and coveralls.

QUIKMIX filler (If fitted)

Valve bank and bottom valve



- A = Bottom Valve
- B = Hopper Flush Nozzle Valve
- C = Container Flush Valve
- D = Hopper Swirl Nozzle Valve

Fig 17

Chemicals are filled by means of the QUIKMIX filler as follows:

Liquid chemicals

- 1 Fill the main tank at least 25% with water (unless anything else is stated on the chemical container label). See *Filling of water* (Page 8).

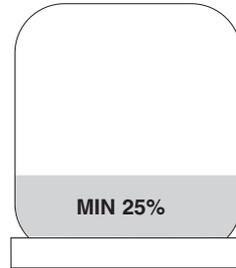


Fig 18

- 2 Ensure EVC-3 operating unit is off and turn the black suction valve handle towards 'From Main Tank'.



- 3 Turn the blue pressure valve handle towards 'To QUIKMIX Filler'. Check that the bottom valve of the filler (A Fig 19 & A Fig 17) is closed.



- 4 Engage and set the PTO at 540 rpm.
- 5 Open the filler lid.
- 6 Measure the correct quantity of chemical and fill it into the hopper.

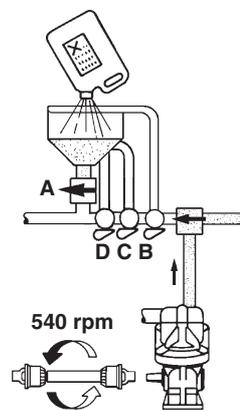


Fig 19

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

- 7 Open the bottom valve of the filler (A Fig 20 & A Fig 17) and the chemical is transferred to the main tank.
- 8 If the chemical container is empty it can be flushed with the container flushing device. Place the container over the multi-hole nozzle and press after opening the container flush valve (C Fig 20 & C Fig 17).

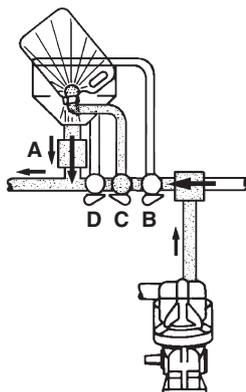


Fig 20

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

- 9 Engage the hopper flushing device by opening the hopper flush valve (B Fig 21 & B Fig 17).
- 10 Close the valve again when the hopper is flushed.

IMPORTANT! The lid should be closed when flushing the hopper.

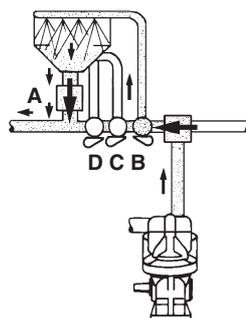


Fig 21

IMPORTANT! The hopper flushing device is using spray liquid for rinsing the hopper of concentrated chemical. Therefore the filler must always be cleaned together with the rest of the sprayer when the spray job is done.

- 11 Close the bottom valve of the filler and the filler lid again.
- 12 Turn the blue pressure valve handle towards 'To Self Cleaning Filter / Operating Unit'. Keep the PTO engaged so the spray liquid is continuously agitated until it has been sprayed onto the crop.



Powder chemicals

- 1 Fill the main tank at least 50% with water (unless stated otherwise on the chemical container label). See *Filling of water* (Page 8).

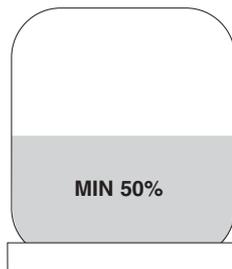


Fig 22

- 2 Ensure EVC-3 operating unit is off and turn the black suction valve handle towards 'From Main Tank'.



- 3 Turn the blue pressure valve handle towards 'To QUICKMIX Filler'. Engage and set the PTO at 540 rpm.



- 4 Open the bottom valve of the filler (A Fig 23 & A Fig 17) and open the filler lid.
- 5 Engage the hopper flushing device and hopper swirl device by opening their respective valves (B Fig 23 & B Fig 17) and (D Fig 23 & D Fig 17).
- 6 Measure the correct quantity of chemical and sprinkle it into the hopper as fast as the flushing device can flush it down.
- 7 Close all flush and swirl valves (B, C & D Fig 23 & B, C & D Fig 17) once the hopper is flushed.

IMPORTANT! The hopper flushing device uses spray liquid for flushing the hopper of concentrated chemical. The filler must always be cleaned together with the rest of the sprayer when spraying is done.

- 8 Close the bottom valve of the filler (A Fig 23 & A Fig 17) and the filler lid again.

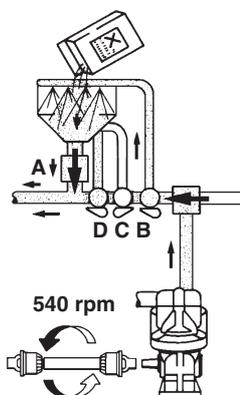


Fig 23

- 9 Turn the blue pressure valve handle towards 'To Self Cleaning Filter / Operating Unit' to mix the spray liquid. Keep the PTO engaged so the spray liquid is continuously agitated until it has been sprayed onto the crop.



Chemical suction probe (If fitted)

This system is designed to transfer liquid chemicals direct from container to tank, with the possibility of flushing the container when empty.

The probe is attached via two different size camlocks on the sprayer. Both camlocks have dust covers which must be refitted after use. The probe is not factory calibrated (due to variation of pumps) and should be stored in a clean environment.

Operating suction probe - with pump running

- 1 Attach the probe via the two camlocks. Ensure EVC-3 operating unit is off and main tank contains about 25% of the required spraying water.
- 2 Turn on probe suction by turning on the additional probe valve.
- 3 Suck up the required amount of chemical.
- 4 Turn the black suction valve handle towards 'From Main Tank'.



To flush container

With the probe still attached and the pump running:

- 1 Turn the additional green pressure valve handle towards the probe camlock.
- 2 Rinse the container.
- 3 Turn the additional green pressure valve handle towards 'O'.
- 4 Suck out the remaining liquid as before.

CAUTION! This probe is used with undiluted chemicals. Always refer to chemical manufacturers label for safety instructions.

CAUTION! The suction probe uses spray liquid for rinsing containers of concentrated chemical. Always rinse the chemical containers with clean water before disposal.

IMPORTANT! Always run clean water through the pump and system after using the probe.

Safety precautions

Always be careful when working with crop protection chemicals.

Personal protection

Dependant on which type of chemical is used, the following protective clothing / equipment should be used:

- Gloves
- Waterproof boots
- Headgear
- Respirator
- Safety goggles
- Chemical resistant coverall

At all times avoid direct contact with the chemicals.

Badly contaminated clothing must not be worn in the cab of the tractor.

Protective clothing / equipment should be used when preparing the spray liquid, during the spraying work and when cleaning the sprayer. Also follow the recommendations on the chemical label.

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

Always clean the sprayer carefully and immediately after use.

Do not mix non compatible chemicals in the tank.

Always clean the sprayer before changing to another chemical.

Hardi foam markers (General Notes)

Please refer to your Foam Marker Operators Manual for detailed instructions.

Ensure the system is clean. Add clean water to the tank first, then foam concentrate according to label.

For good quality foam note the following:

- Mix contents after adding foam
- Use clean water, preferably rain water
- Do not use dam water or bore (hard) water
- Do not use water containing salt or minerals
- Drain residues if more than a week old
- Flush the system to prevent it gumming up
- Use water with a temperature above 13° C
- Store concentrate in a frost free area

Cold operating conditions decrease foam quality, leading to blowouts where the foam spurts out of the generator.

Remote control box

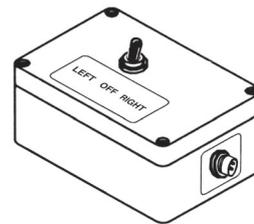


Fig 24

Operation

- 1 Add water (see *Filling of water* (Page 8) and concentrate to the tank and close the lid.
- 2 Check that the on/off switch is at Off position. Connect power supply.
- 3 Flick the on/off switch to the left or right side depending on where foam is required. This starts the compressor and production of foam.
- 4 Where a fuse is fitted to the remote control box, the holder unscrews for replacement of the fuse.
- 5 Some foam marker systems may have an additional Blob interval control switch fitted to the remote control box. Blob interval can then also be adjusted by holding the interval switch to the left for fewer blobs or to the right for more blobs.

Maintenance

 **WARNING!** The foam marker tank is under pressure. To allow air to escape before adding foam or water, or when working on the system, undo the lid slowly.

The system must be kept clean to ensure foam is of good quality. Drain and flush when:

- Quality of foam produced is poor
- Preparing for off-season storage
- Residues are more than a week old
- Impurities are seen in the tanks

System drain and flush

- 1 Open the drain tap below the tank.
- 2 Flush the tank with clean water.
- 3 Check the filter is clean.
- 4 Close the drain tap.
- 5 Add 7 litres of clean (preferably hot) water.
- 6 Start the compressor and pump liquid through the system.
- 7 Repeat points 5 and 6 if necessary.

CAUTION! Do not clean the compressor box with a high pressure cleaner.

CAUTION! Always relieve the tank pressure after using the sprayer / foam marker.

HARDI Monitor 1500 and HARDI Controller 2500 (If fitted)

The HARDI Monitor 1500 and HARDI Controller 2500 are coupled into the EVC-3 remote control box.

Please refer to the *HARDI Monitor 1500 and HARDI Controller 2500 Instruction Book* for all functions of the HM 1500 or HC 2500.

Boom

Please refer to the boom manual supplied with your sprayer documentation, either the *EAGLE BOOM Operator's Manual* or *FALCON BOOM Operator's Manual* regarding entire operation of the boom.

 **WARNING!** Operate the boom only after reading the operator's manual.

 **DANGER!** When folding and unfolding the boom, be sure that no person or objects are in the operating area of the boom, and strictly observe minimum safe clearance from overhead electrical wires (p2).

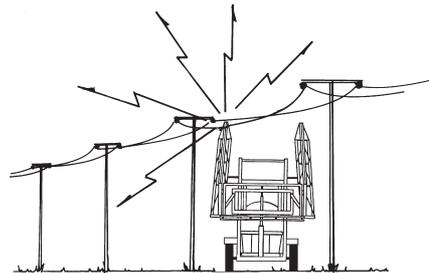


Fig 25

Spray technique

See the *Spray Technique* booklet.

NOTE! A calibrated sprayer is a safe sprayer.

Flush tank

The incorporated 100 litre flush tank can be used for diluting and flushing.

Diluting

Infield diluting of remaining spray liquid residues in the spraying circuit, for spraying the liquid into the field before cleaning the sprayer.

- 1 Empty the sprayer as much as possible. Turn the black suction valve handle towards 'From Flush Tank'.



- 2 Ensure the EVC-3 operating unit is off.
- 3 Engage and set the pump at approximately 300 rpm.
- 4 When flushing water corresponding to approximately 10 times the spray liquid residue (see *Technical residue* (Page 15)) has been used, turn the black suction valve handle towards 'From Main Tank' and operate all the EVC-3 operating unit valves, so all hoses and components are flushed.



- 5 Spray all the liquid into the field you have just sprayed.
- 6 Repeat points 3 - 7 until the flush tank is empty.

Flushing

To flush the pump, operating unit, spray lines, etc. in case of a stop in spraying before the main tank is empty (e.g. beginning to rain, etc.):

- 1 Turn the black suction valve handle towards 'From Flush Tank'.



- 2 Engage the pump and spray water from the flush tank into the field until all tubes / nozzles are flushed with clean water.
- 3 Disengage the pump.

WARNING! Always clean the tank manually with a brush, especially if crops sensitive to the chemical just sprayed are going to be sprayed afterwards.

Technical residue

Inevitably a quantity of spray liquid will remain in the system (which cannot be sprayed properly on the crop) as the pump takes in air when the tank is about to be empty.

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

	RESIDUE (litres)
Dilutable Residue*	15
Total Residue**	41

* Residue in the main tank, possible to dilute with water from the flush tank

** Total residue in the tank and spraying circuit on standard sprayer
Variations due to different ground inclinations, etc.

The dilutable residue must be diluted 10 times with clean water and sprayed into the crop just sprayed, before cleaning the sprayer - see *Cleaning* (Page 16).

Draining tanks

Main tank drain valve

Pull the string at the left hand side of the tank to open the drain valve. The valve is spring-loaded but can be kept open by pulling the string out and upwards in the V-shaped slit.

To release and close the drain valve again, pull the string downwards, release it and the valve will close automatically.

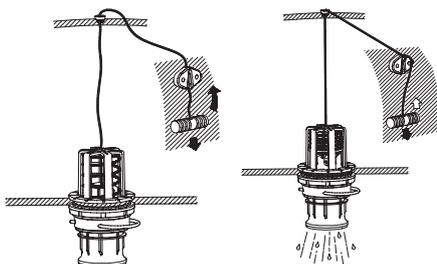


Fig 26

If draining a residue (e.g. liquid fertiliser) into a container, a 2 1/2" snap coupler with hose can rapidly be connected to the drain valve, and the liquid let safely out.

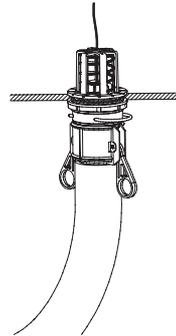


Fig 27

Flush tank

To avoid algae developing in the flush tank always drain the flush tank when the sprayer is not in use for a long period.

Foam marker tank

Do not store with pressure in the foam marker tank - loosen the cap.

If the sprayer is to stand a few days it is recommended to drain the foam marker tank to avoid mixed foam from becoming inactive, as once mixed, foam deteriorates rapidly.



Maintenance

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

IMPORTANT! Always read carefully through individual paragraphs regarding maintenance jobs before starting the job. If any portion remains unclear or requires facilities which are not available, then for safety reasons please leave the job to your HARDI dealer's workshop.

NOTE! For maintenance of the boom, please refer to your boom operator's manual, either the *EAGLE BOOM Operator's Manual* or *FALCON BOOM Operator's Manual*.

To effectively maintain the sprayer you must:

- 1 Perform **Cleaning** of the entire sprayer after spraying is completed - Refer to *Cleaning*. Specific cleaning also forms part of the service and maintenance intervals - Refer *Service and maintenance charts* (Page 18).
- 2 **Lubricate** the sprayer according to the service and maintenance interval reached - Refer to *Lubrication* in the *Service and maintenance charts* (P18).
- 3 Perform **Service and maintenance** jobs according to the service and maintenance interval reached - Refer *Service and maintenance charts* (P18).
- 4 Perform **Occasional maintenance** as needed after inspection - Refer *Occasional maintenance* (P18).
- 5 Immediately fit **Replacement parts** for parts that are worn or broken - Refer to *Replacement Parts* (P 26).

Cleaning Guidelines

Read the entire chemical label. Take note of any specific instructions regarding recommended protective clothing, appropriate cleaning products and deactivating agents, etc. If cleaning procedures are given, follow them closely. Read detergents and deactivating agents labels.

Be familiar with local legislation regarding disposal of chemical washings, mandatory decontamination methods, etc. Contact the appropriate body, e.g. Dept of Ag. Chemical washings can usually be sprayed out on a suitable area such as a crop etc that is suitable for the chemical in the tank solution.. Seepage or runoff of residues into streams, water courses, ditches, wells, springs, etc must be avoided.

Cleaning starts with calibration, as a well calibrated sprayer will ensure a minimal amount of remaining spray liquid.

It is good practice to clean the sprayer immediately after use, thereby rendering the sprayer safe and ready for the next chemical application. This also can significantly prolong the life of the spraying system components.

It is sometimes necessary to have spray liquid in the tank for short periods, eg. during breaks, overnight, or until the weather becomes suitable for spraying again.

Unauthorised persons and animals must not have access to the sprayer under these circumstances.

If any of the spray, cleaning or de-activation products used are corrosive, we recommend coating all metal parts of the sprayer, before and after use with a suitable rust inhibitor.

REMEMBER! Clean sprayers are safe, ready for use, and cannot be damaged by chemicals.

NOTE! If the sprayer is cleaned with a high pressure cleaner or fertiliser has been used, lubrication of the entire sprayer is recommended - including the boom.



WARNING! Do not enter the tank, nor allow any other person to enter the tank!

CLEANING PROCEDURES

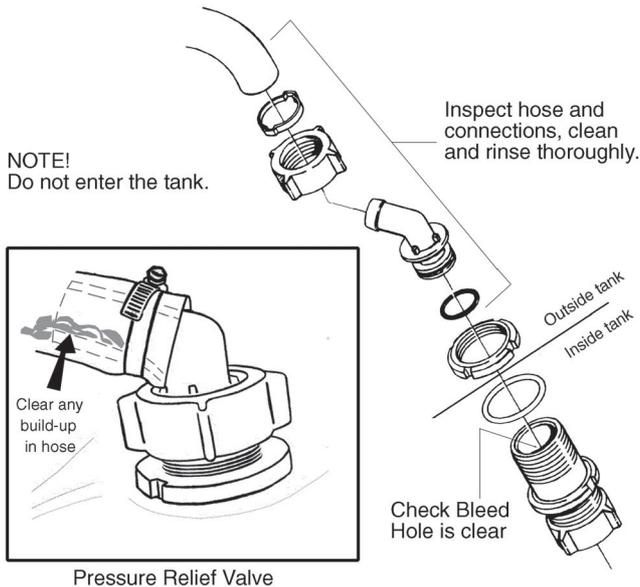
REMEMBER! It is essential that the water in the Flush Tank, which is used to clean your sprayer, is clean and free of contamination. Back-flow due to poor seals in hose connections, leaking valves and O-rings, incorrect plumbing setup or fittings, poor filling technique or spillages of chemicals may all cause contamination.

Good maintenance and spray operator technique will prevent accidental recontamination of the system during the cleaning process. If Flush Tank contamination has occurred, emptying and refilling Flush Tank several times with clean water will be needed before proceeding with general cleaning of the system.

Always refer to the chemical label of the product (s) you have been using and strictly adhere to the cleaning instructions included. Note that different chemicals have different properties, cleaning requirements and appropriate solutions (e.g bleach, cloudy ammonia etc) required to clean / de-activate the chemicals used.

- 1 Ensure that all spray solution contained in the tank is completely used on an appropriate crop before cleaning procedures are commenced.
- 2 Select and use the appropriate protective clothing. Select a detergent or cleaning solution suitable for cleaning and suitable deactivating agents if necessary. (refer chemical label)
- 3 Flush and clean the sprayer and tractor externally. Use detergent or other cleaning agent if necessary.
- 4 Remove nozzles, tank filters, nozzle filters and suction filters and clean with appropriate solution as noted on chemical label (Refer to *Filters* (Page 17) for procedures). Be careful not to damage the mesh. Re-fit the suction filter top. Re-fit the nozzles and filters when the sprayer is completely clean.
- 5 Inspect pressure relief valve (mounted on main tank - see diagram below), and ensure it is thoroughly cleaned, rinsed and free of any residues. Ensure that the bleed hole is clear of debris and the pressure relief valve is bypassing fluid back to the main tank during normal spray operations.

- 6 Inspect delivery hose to pressure relief valve, clear away any build-up and ensure that the hose and connections are thoroughly cleaned and rinsed.



- 7 Remove, clean, flush and drain all hoses.
 8 Clean Quikmix hopper (if fitted). Clean, flush and drain delivery hose from Quikmix to main tank.
 9 Carefully clean lid area with particular attention to the basket and underside of the lid.
 10 With the pump running, thoroughly flush the inside of the main tank (remember the tank roof and lid area). If rinse nozzles are not fitted use pressure cleaner etc to clean internal tank surface with appropriate cleaning solution. Flush and operate all components and any equipment that has been in contact with chemicals. Before opening the distribution valves and spraying the liquid out please identify a suitable method of disposing of any contaminated tank rinsing solution.
 11 After spraying the liquid out, stop the pump and fill at least 75% of the main tank with clean water. Note that some chemicals require tank to be completely filled. In all cases always observe chemical label requirements. Add appropriate detergent and/or deactivating agent if required, e.g. Washing Soda or Triple Ammonia as directed on the chemical label.

NOTE! If a cleaning procedure is given on the chemical label, it must be followed. Some chemicals require rinsing with very large amounts of clean water in order to ensure residual chemical is at a safe level.

- 12 Start the pump and operate all controls, enabling the liquid to come in contact with all the components. Leave the distribution valves until last. Some detergents and deactivating agents work best if left in the tank for a short period. Check the label.
 13 Remove end plugs from boom tubes while pump is not running, then flush with clear water to ensure thorough removal of residue. Replace end plugs.

- 14 Drain the tank and let the pump run dry. Flush the inside of the tank, again letting the pump run dry.
 15 Stop the pump. If the chemicals used have a tendency to block nozzles and filters, remove and clean them now. Check also for sediment on the pressure side of the self cleaning filter safety valve.
 16 Re-fit all the filters and nozzles and repeat steps 10 to 14 using clean water before storing the sprayer. If from previous experiences, it is noted that the solvents in the chemicals are particularly aggressive, store the sprayer with the tank lid open.

Filters

Clean filters ensure:

- Sprayer components such as valves, diaphragms and operating unit are not hindered or damaged during operation.
- Nozzle blockages do not occur whilst spraying.
- Long life of the pump. A blocked suction filter will result in pump cavitation.

The main filter protecting sprayer components is the suction filter at the top of the tank. Check it regularly.

Nozzle filters

Check and clean.



Fig 28

Suction filter

To service the suction filter:

- 1 Unscrew the red cap (A Fig 29).
- 2 Lift the filter (C Fig 29) from the housing.

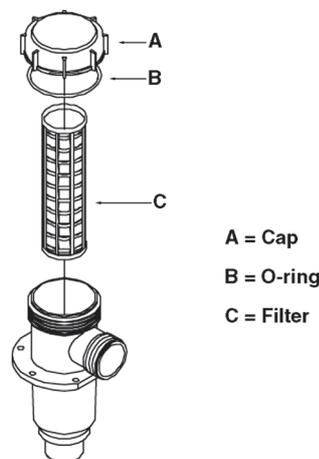


Fig 29

To reassemble:

- 1 Place the filter into the housing.
- 3 Ensure the O-ring (**B** Fig 29) on the red cap is in good condition and lubricated.
- 4 Refit the red cap (**A** Fig 29).

Self cleaning filter

- 1 Unscrew the filter nut (**A** Fig 30) and open the filter.
- 2 Check the filter gauze (**C** Fig 30), clean if necessary and check there are no residues on any part of the filter/hoses.
- 3 Lubricate the O-ring (**B** Fig 30).
- 4 Re-assemble the filter.

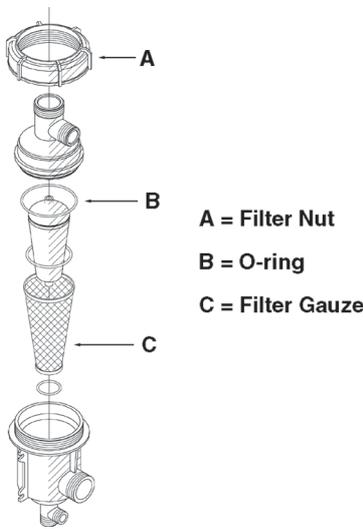


Fig 30

In-Line filters (If fitted)

If the boom is equipped with In-Line filters, unscrew the filter bowls to inspect and clean a filter. Lubricate O-rings.

Alternative filters are available. Refer to *Filters* (Page 10) and *Filters* (Page 25) in the *Specifications* section.



Fig 31

Service and maintenance charts

Service and maintenance intervals for EXPLORER.

10 Hours or Daily (Whichever occurs first)

1 Suction filter

Clean.

2 Self cleaning filter

Check and clean gauze if necessary.

3 In-Line filter

Clean.

4 Nozzle filters

Clean.

5 Spraying circuit

Fill with clean water, operate all functions and check for leaks, use higher spray pressure than normal. Check nozzle spray patterns visually using clean water.

6 Lubrication

Lubricate all of the PTO shaft.

50 Hours or Weekly (Whichever occurs first)

Do all previous +

7 Wheel bolts and nuts

Re-tighten (Refer *Torque settings* (Page 25)).

8 Drawbar bolts

Re-tighten (Refer *Torque settings* (Page 25)).

9 Tyres

Check pressure (Refer *Tyre pressures* (Page 25)).

10 Transmission shaft

Check the function and condition of the transmission shafts protection guards. Replace possible damaged parts immediately.

11 Lubrication

Lubricate the entire sprayer:

Pump - Grease bearings

Support leg - Oil base pivot & Grease handle

Drawbar - Grease any moving sections

Suspension - Grease rockers

Boom - Refer to the boom operator's manual supplied with your sprayer documentation

200 Hours or Monthly (Whichever occurs first)

Do all previous +

12 Wheel bearings

Check and adjust if necessary.

13 Hoses and tubes

Check all hoses and tubes for possible damage and proper attachment. Renew damaged hoses or tubes.

1000 Hours or Yearly (Whichever occurs first)

Do all previous +

14 Wheel bearings

Dismantle, check, grease and adjust.

15 Transmission shaft

Renew protection guard.

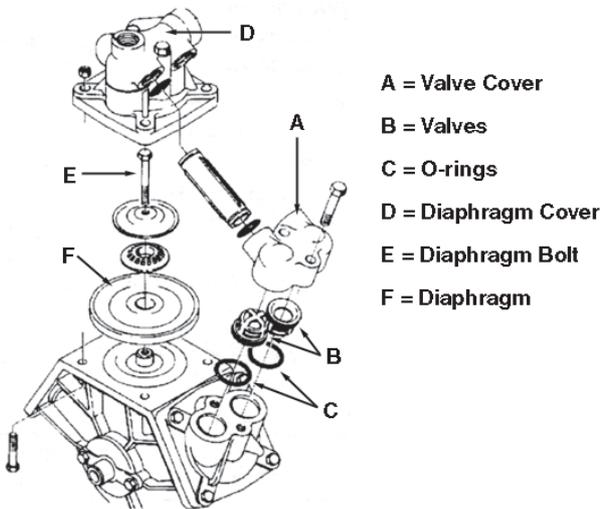
Occasional maintenance

1202 or 1302 pump

NOTE! It is recommended that if one or more diaphragms and/or valves need replacing they all should be replaced.

Changing valves

- 1 Remove the valve covers (**A** Fig 32). Before changing the valves (**B** Fig 32) note their orientation so they are replaced correctly. It is recommended to use new O-rings (**C** Fig 32) when changing or checking the valves.



- A = Valve Cover
- B = Valves
- C = O-rings
- D = Diaphragm Cover
- E = Diaphragm Bolt
- F = Diaphragm

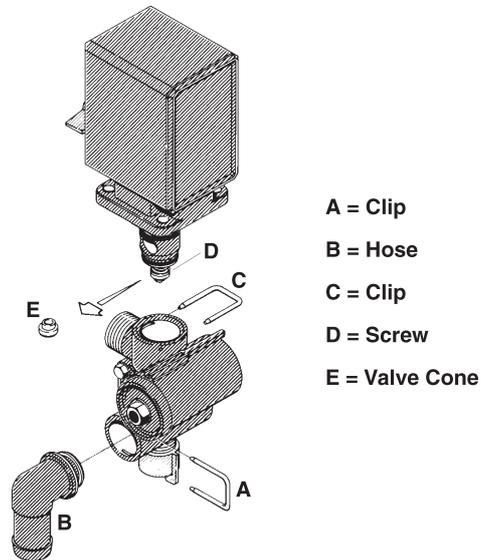
Fig 32

Changing diaphragms

- 1 Remove the diaphragm covers (**D** Fig 32).
- 2 Remove the diaphragm bolts (**E** Fig 32).
- 3 The diaphragms (**F** Fig 32) may now be changed.
- 4 If fluids have reached the crankcase, re-grease the pump thoroughly. Also check the drain hole at the bottom of the pump is not blocked.
- 5 Reassemble with torque settings as shown in *Torque settings* (Page 25).

EVC-3 operating unit valve cone

Periodically check the distribution valves for proper sealing. Do this by running the sprayer with clean water and opening all distribution valves.



- A = Clip
- B = Hose
- C = Clip
- D = Screw
- E = Valve Cone

Fig 33

- 1 Cautiously remove the pressure equalization device clip (**A** Fig 33) and pull out the hose (**B** Fig 33). When the housing is drained, there should be no liquid flow through the pressure equalization device. If there is any leakage, the valve cone (**E** Fig 33) must be changed.
- 2 Remove the clip (**C** Fig 33) and lift the motor housing off the valve housing.
- 3 Then unscrew the screw (**D** Fig 33) and replace the valve cone (**E** Fig 33).
- 4 Reassemble in opposite sequence.

Tubes and 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

Therefore, in case of leaks:

Do not over-tighten. Disassemble, check condition and position of the O-ring or gasket, clean, lubricate and reassemble. The O-ring is lubricated **all the way round** before fitting on to the nozzle tube. Use non-mineral lubricant.

For **radial** connections (Fig 34), only hand tighten them.

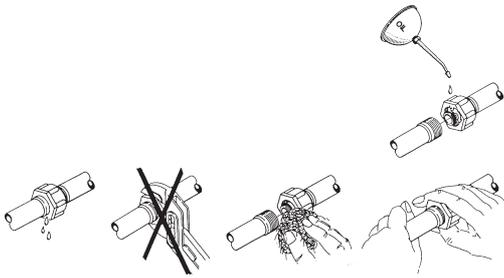


Fig 34

For **axial** connections (Fig 35), a little mechanical leverage may be used.

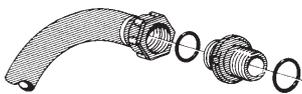


Fig 35

Level indicator

The level indicator should be checked regularly. When the tank is empty, the floater should rest on the stop pin on the rod, and the O-ring at the indicator should be positioned at the top position line (A Fig 36).

If any deviation is found, pull out the plug (B Fig 36), loosen the screws (C Fig 36) and adjust the length of the cord.

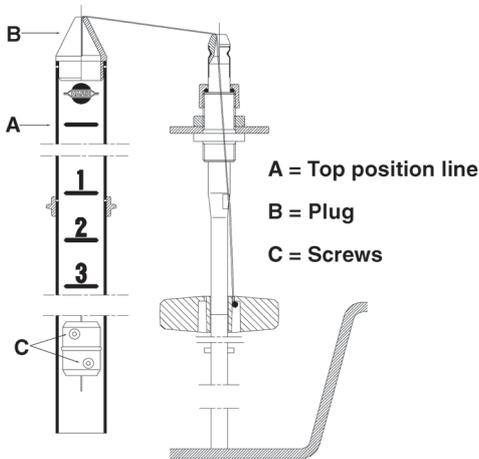


Fig 36

Drain valve seal

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

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

WARNING! Use an eye/face protection mask when dismantling the tank drain valve.

- 1 Make sure the tank is empty and clean.
- 2 The valve must be closed and the string loose.

- 3 Pull out the clip (A Fig 37) and pull down the connecting piece (B Fig 37). The entire valve assembly can now be pulled out.
- 4 Check the cord and valve flap assembly (C Fig 37) for wear, replace the seal (D Fig 37) and reassemble.
- 5 Assemble the valve assembly again using a new valve seat (E Fig 37). Lubricate the O-rings (F Fig 37) before assembly.
- 6 Fit the clip (A Fig 37) again.

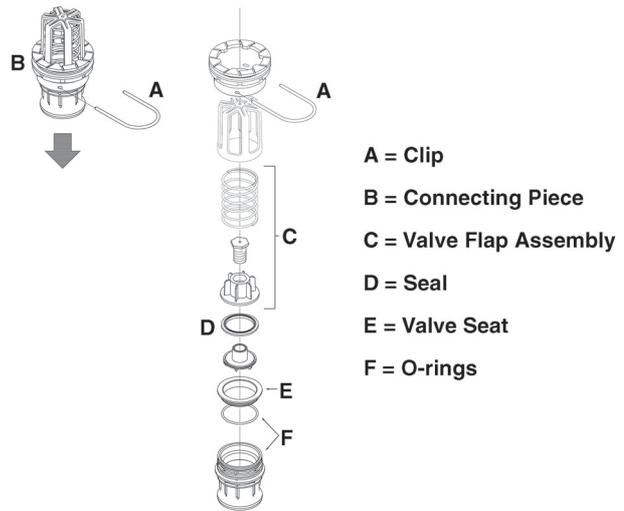


Fig 37

NOTE! Check function of valve with clean water before filling chemicals into the tank.

Tyres

Should it be necessary to replace tyres, follow the following rules when doing so. If uncertain about any aspect, have a specialist do the job:

- Always clean and inspect the rim before mounting.
- Always check that the rim diameter corresponds exactly to the rim diameter moulded on the tyre.
- When fitting new tubed tyres always fit new tubes. Always use tubes of recommended size and of good condition.
- Inspect inside the tyre for dirt or foreign bodies and remove them if installing a tube.
- Do not use tubes in tubeless tyres.
- Tyres with irreparable damages must never be used.
- Always inspect inside the tyre for cuts, penetrating objects or other damage. Damages must be repaired before installing a tube.
- Before mounting always lubricate both tyre beads and rim flange with an approved lubricating agent or equivalent anti-corrosion lubricant. Never use petroleum based greases and oils because they may result in damage to the tyre. Using the appropriate

lubricant the tyre will never slip on the rim.

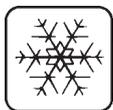
- Always use specialised tools as recommended by the tyre supplier for mounting the tyres.
- Make sure that the tyre is centred and the beads are perfectly seated on the rim. Otherwise danger of bead wire tear can occur.
- Inflate the tyre to 100 - 130 kPa (14.5 - 19 psi) then check whether both beads are seated perfectly on the rim. If any of the beads do not seat correctly, deflate the assembly & re-centre the beads before starting inflation of the tyre. If the beads are seated correctly on the rim, inflate the tyre to a maximum of 250 kPa (36 psi) until they seat perfectly on the rim.
- Never exceed the maximum mounting pressure moulded on the tyre.
- After mounting tyres adjust inflation pressure to operation pressure recommended by the tyre manufacturer. *Tyre pressures* (Page 25) can be used as a guide.



WARNING! Non observance of mounting instructions will result in the bad seating of the tyre on the rim and could cause the tyre to burst, leading to serious injury or death.

CAUTION! Never mount or use damaged tyres or rims!

CAUTION! Use of a damaged, ruptured, distorted, welded or brazed rim is not acceptable.



Storage

When the spraying season is over, you should devote some extra time to the sprayer.

If chemical residues are left in the sprayer for long periods, it can reduce the life of the individual components.

Preparation before off season storage

To preserve the sprayer and protect the components, carry out the following off season storage program.

- 1 Clean the sprayer completely - inside and outside as described in *Cleaning* (Page 16). Make sure that all valves, hoses and auxiliary equipment have been cleaned with detergent and flushed with clean water, so no chemical residues are left in the sprayer.
- 2 Renew damaged seals and repair leaks.
- 3 Empty the sprayer completely and let the pump work for a few minutes. Operate all valves 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 flushing tank. Ensure the foam marker is rinsed and drained.
- 4 If the sprayer is not stored in a frost free place, pour in a mixture of Ethylene Glycol based anti-freeze and

water at the ratio for the desired temperature protection. Volume of mixture should be about 1% of tank volume. Run the sprayer and circulate the anti-freeze in the pump, controls and boom lines.

- 5 Lubricate all lubricating points regardless of intervals stated.
- 6 When the sprayer is dry remove rust from possible scratches or damages in the powder coat and touch up with paint.
- 7 Remove the Glycerine filled gauges and store them in a frost free vertical position.
- 8 Apply a thin layer of anti-corrosion oil to metal parts, hoses and tyres. Suggested products for protecting your equipment are SHELL ENSIS fluid, or one of the CASTROL RUSTILLO range, eg DW901 1M1. There are many factors that affect the selection of protective oils, such as temperature, humidity and exposure to UV, salt and chemicals. Your local oil product dealer will be able to advise on the best specific formula for your local conditions.
- 9 Fold the boom to transport position and relieve pressure from all hydraulic functions.
- 10 All electric plugs and sockets are to be stored in a dry plastic bag to protect them against damp, dirt and corrosion.
- 11 Remove any control boxes and the optional HARDI Monitor 1500 and Controller 2500 (if fitted) from the tractor and store them inside where it is dry and clean.
- 12 Wipe the hydraulic snap-couplers clean and fit the dust caps.
- 13 Apply grease onto all hydraulic ram piston rods that are not fully retracted in the barrel, to protect against corrosion.
- 14 Chock up wheels to prevent moisture damage and deformation of tyres. Tyre blacking can be applied to the tyre walls to preserve the rubber.
- 15 To protect against dust the sprayer can be covered by a tarpaulin. Ensure ventilation to prevent condensation.

Preparation after off season storage

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

- 1 Remove the cover.
- 2 Remove the support from the wheel axle and adjust the tyre pressure.
- 3 Wipe off the grease on the hydraulic ram piston rods.
- 4 Fit the pressure gauges again (seal with teflon tape).
- 5 Connect the sprayer to the tractor including hydraulics and electrics.
- 6 Check all hydraulic and electric functions.
- 7 Empty any anti-freeze from the tank (If used).
- 8 Rinse the entire liquid circuit of the sprayer with clean water.
- 9 Fill with clean water and check all functions.



Troubleshooting

In cases where breakdowns have occurred, some common factors are generally found to be responsible:

- Minor leaks on the suction side of the pump, which will reduce the pump capacity or stop the suction completely.
- A clogged suction filter will hinder or prevent suction so that the pump does not operate satisfactorily.
- Clogged up pressure filters will result in increasing pressure at the pressure gauge but lower pressure at the nozzles.
- Foreign bodies stuck in the pump valves results in these valves not closing tightly against the valve seat. This reduces pump efficiency.
- Poorly reassembled pumps, especially diaphragm covers, will allow the pump to suck air, resulting in reduced or no capacity
- Hydraulic components that are contaminated with dirt result in rapid wear to the hydraulic system.

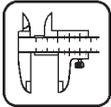
Therefore **always** check:

- 1 Suction, pressure and nozzle filters are clean.
- 2 Hoses for leaks and cracks, paying particular attention to the suction hoses.
- 3 Gaskets and O-rings are present and in good condition.
- 4 Pressure gauge is in good working order (Correct spray dosage depends on it).
- 5 EVC-3 operating unit functions properly. Use clean water to check.
- 6 Hydraulic components are maintained, clean and free from leaks (Refer to the boom manual supplied with your sprayer documentation, either the *EAGLE BOOM Operator's Manual* or *FALCON BOOM Operator's Manual*).

Problem	Probable cause	Control / Solution	
LIQUID SYSTEM			
No spray from boom when turned on	Air leak on suction line	Check if suction filter O-ring is sealing Check suction tube and fittings Check tightness of pump diaphragm and valve covers	
	Air in system	Fill suction hose with water for initial prime	
	Suction / pressure filters clogged	Clean filters Check suction pipe is not obstructed or placed too near the tank bottom	
Lack of pressure	Incorrect assembly	Restrictor nozzle in self cleaning filter not fitted or incorrectly aligned Pressure relief valve spring loose Too little distance between suction pipe and tank bottom	
		Pump valves blocked or worn	Check for obstructions and wear
		Defect pressure gauge	Check for dirt at inlet of gauge
Pressure dropping	Filters clogged	Clean all filters. Fill with cleaner water If using powders, make sure agitation is on	
	Nozzles worn	Check flow rate and replace nozzles if it exceeds 10%	
	Tank is air tight	Check vent is clear	
	Sucking air towards end of tank load	Lower pump rpm	
Pressure increasing	Pressure filters beginning to clog	Clean all filters	
Formation of foam in main tank	Air is being sucked into system	Check tightness/gaskets/O-rings of all fittings on suction side	
	Excessive liquid agitation	Reduce pump rpm Check safety valve for self cleaning filter is tight Ensure returns inside tank are present Use foam damping additive	
Liquid leaks from bottom of pump	Damaged diaphragm	Replace. See <i>Changing valves</i> and <i>Changing diaphragms</i> (Page 19)	

EXPLORER

Problem	Probable cause	Control / Solution
EVC-3 operating unit		
Operating unit not functioning	Blown fuse(s)	Check mechanical function of microswitches Use cleaning/lubricating agent if switches do not operate freely
		Check motor (450 - 500 mA MAX) Change motor if over
	Wrong polarity	Brown = positive (+) Blue = Negative (-)
	Valves not closing properly	Check valve seals for obstructions Check microswitch plate position Loosen screws holding plate a ½ turn
	No power	Wrong polarity Check that Brown is (+), Blue is (-) Check printed circuit board for dry solder joints or loose connections Check fuse holder is tight around fuse
Foam marker		
Compressor will not start	Poor power supply	Check battery (must be 12 V) and wiring Use the HARDI electric distribution box
	Blown fuse	Change external fuse
	Defective relay	Open compressor box and check relay for corrosion
No liquid to foam generator	Blown fuse	Open compressor box and check fuse located on printed circuit board
	Solenoid valve not opening	Check wiring at printed circuit board for corrosion or loose connections
	Filter blocked	Dismantle and clean
Foam quality inconsistent	Recommendations not followed	See <i>Foam marker Operators Manual</i>
Blob interval inconsistent	Adjustment valve gummed up	Flush system
Foam liquid in air lines	Non-return valve in line gummed up	Dismantle and clean



Specifications

1 Nm = 0.738 lbf-ft

1 bar = 100 kPa = 14.5 psi

Torque settings

BOLT	TORQUE (Nm)
Wheel studs	
18 mm	466
20 mm	490
Axle U-bolts	
5/8" UNF	189
Drawbar bolts	
M20	370
1202 / 1302 pump	
Valve cover bolts	60
Diaphragm cover bolts	70
Diaphragm bolt	60
General bolts	
M12	77
M16	190

Filters

MESH	COLOR	GAUZE SIZE (mm)
30	Green	0.58
50	Blue	0.30
80	Red	0.18
100	Yellow	0.15

Temperature

Operating temperature range

2° - 40° C (36° - 104° F)

Pressure

Operating pressure for pressure relief valve

12 bar

MAX Pressure on the pressure manifold

20 bar

MAX Pressure on the suction manifold

7 bar

Flow

EVC-3

Bypass flow under the EVC-3 pressure adjusting motor (Pressure motor adjusted for full pressure):

0-1 l/m

Self Cleaning Filter

Bypass flow for each restrictor (Pressure @ 3 bar):

Green - 37 l/m

Black - 26 l/m

White - 18 l/m

Red - 13 l/m

Agitators

Flow for agitators @ 3 bar:

2.5 mm - 16 l/m

3.0 mm - 25 l/m

(This is a combined flow from both agitators)

Dimensions

Always measure actual sprayer dimensions.

Width, Height and Length are dependant on the boom, tyres and drawbar fitted - they are subject to variation.

Materials and recycling

Tank HDPE

Hoses PVC

Valves Mainly glass-filled PA

Fittings PA

When the equipment has completed its working life, it must be thoroughly cleaned. The tank, hose and synthetic fittings can be incinerated at an authorised disposal plant. The metallic parts can be scrapped. Always follow local legislation regarding disposal.



Replacement Parts

This section is to be used to help identify the replacement part numbers of many common parts on the EXPLORER sprayer - it is not as comprehensive as the *Spare Parts* manual at your HARDI dealer.

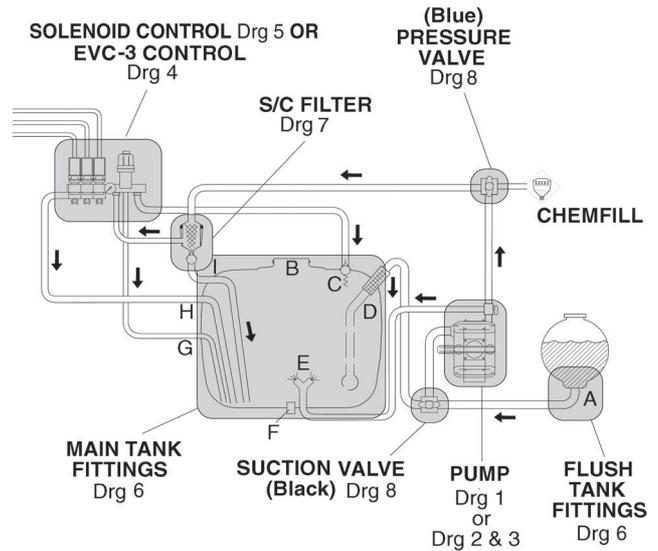
So if a part is not covered in this section, or is difficult to determine, you will need to contact your HARDI dealer.

Every part illustrated in this section has a number or is shown as part of a group of parts in a numbered kit.

This number is the HARDI replacement parts number for the part or kit of parts.

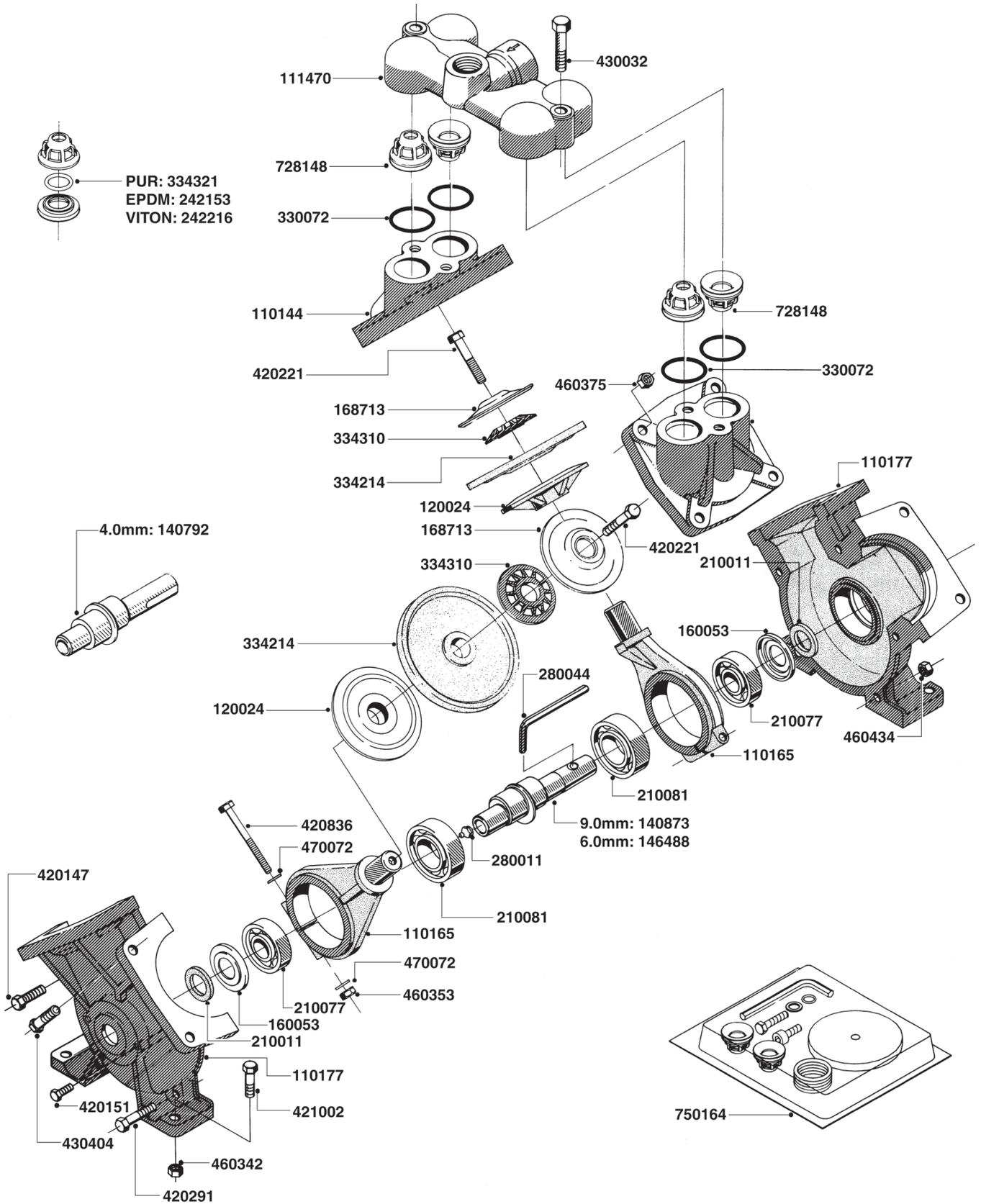
Note that drawing numbers used in this section do not represent any HARDI parts drawing numbers - they are simply used for cross-referencing within this manual.

Title	Drawing	Page
1202 Pump	Drg 1	27
1302 Pump	Drg 2	28
Pump Fittings and Dampers	Drg 3	29
EVC-3 Operating Unit	Drg 4	30
Solenoid Control	Drg 5	31
Tank Fittings	Drg 6	32
Self Cleaning Filter	Drg 7	33
Valves	Drg 8	34
Hand Wash Tank	Drg 9	35
Tandem / Single Axle Chassis	Drg 10	36
Boom Attachment	Drg 11	37
Mudguards and Mounting Kit	Drg 12	38
Wheel Hub and Suspension	Drg 13	39
Transport, Platform and Hand Rails	Drg 14	40
Storm Foam Marker	Drg 15	41
Storm Compressor & Directional Valve	Drg 16	42

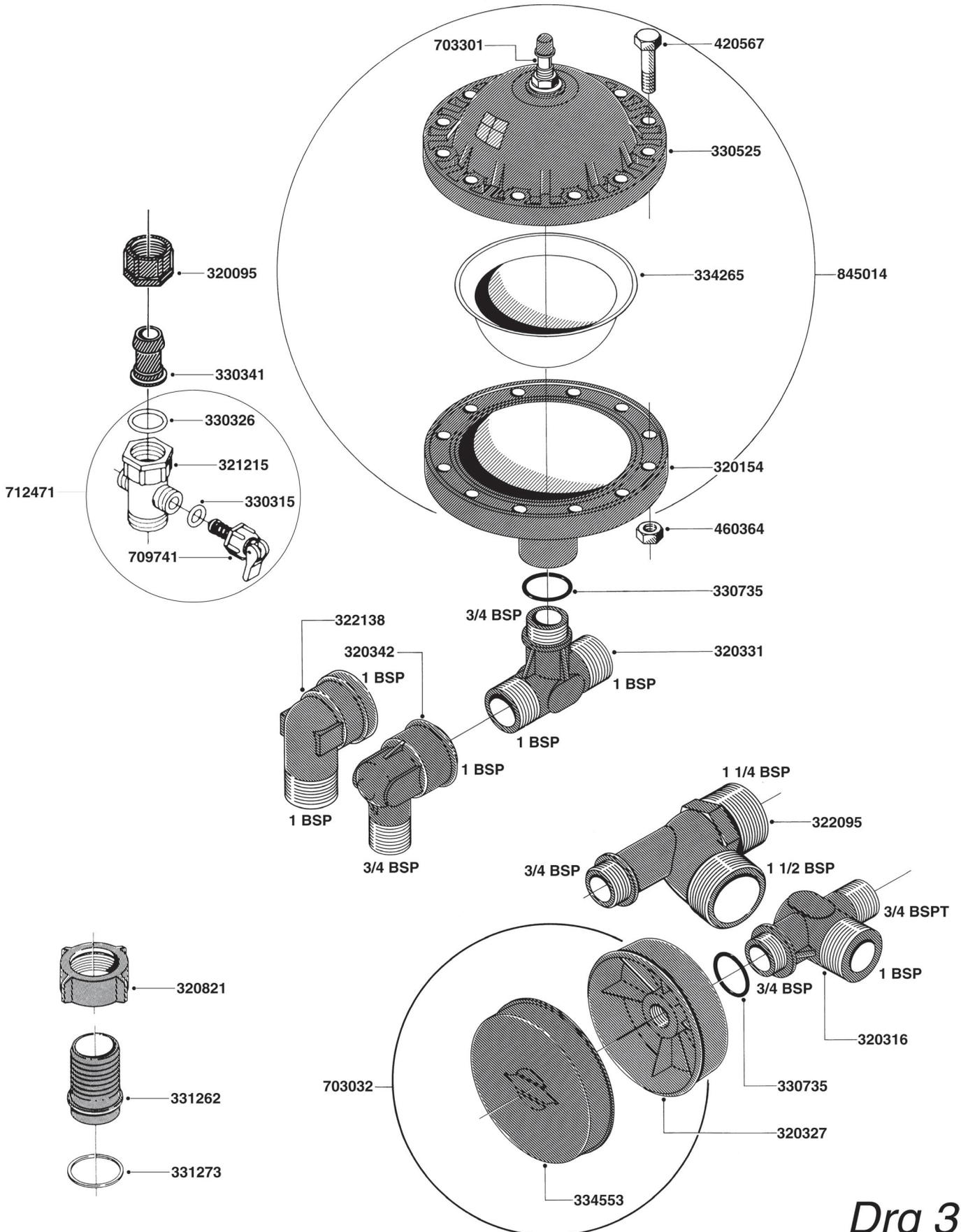


- A = Flush Tank Fittings
- B = Main Tank Lid
- C = Pressure Relief Valve
- D = Suction Filter
- E = Agitation
- F = Tank Drain
- G = Pressure Bypass to Tank
- H = Pressure Equalisation Return
- I = Return to Main Tank

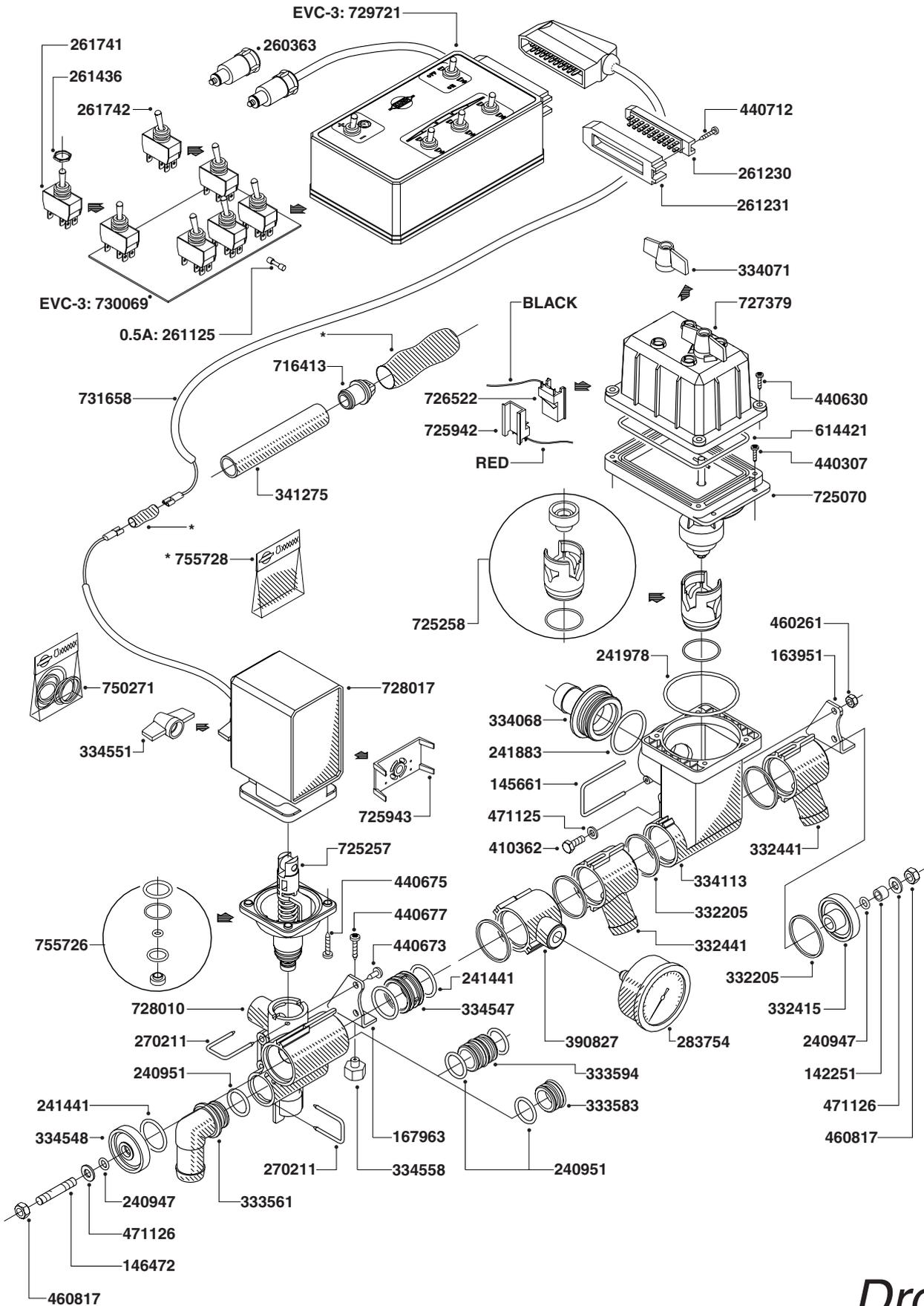
For detail, see Drg 6



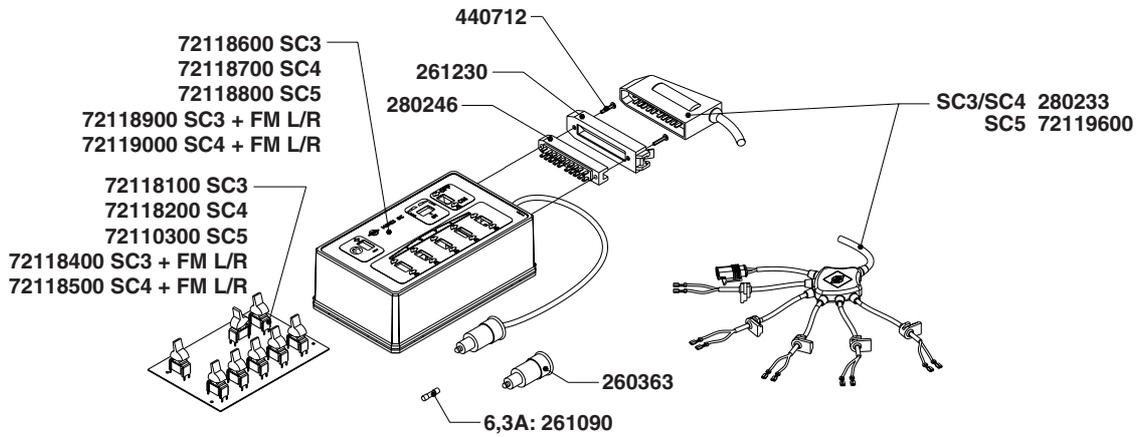
Drig 1
1202 Pump



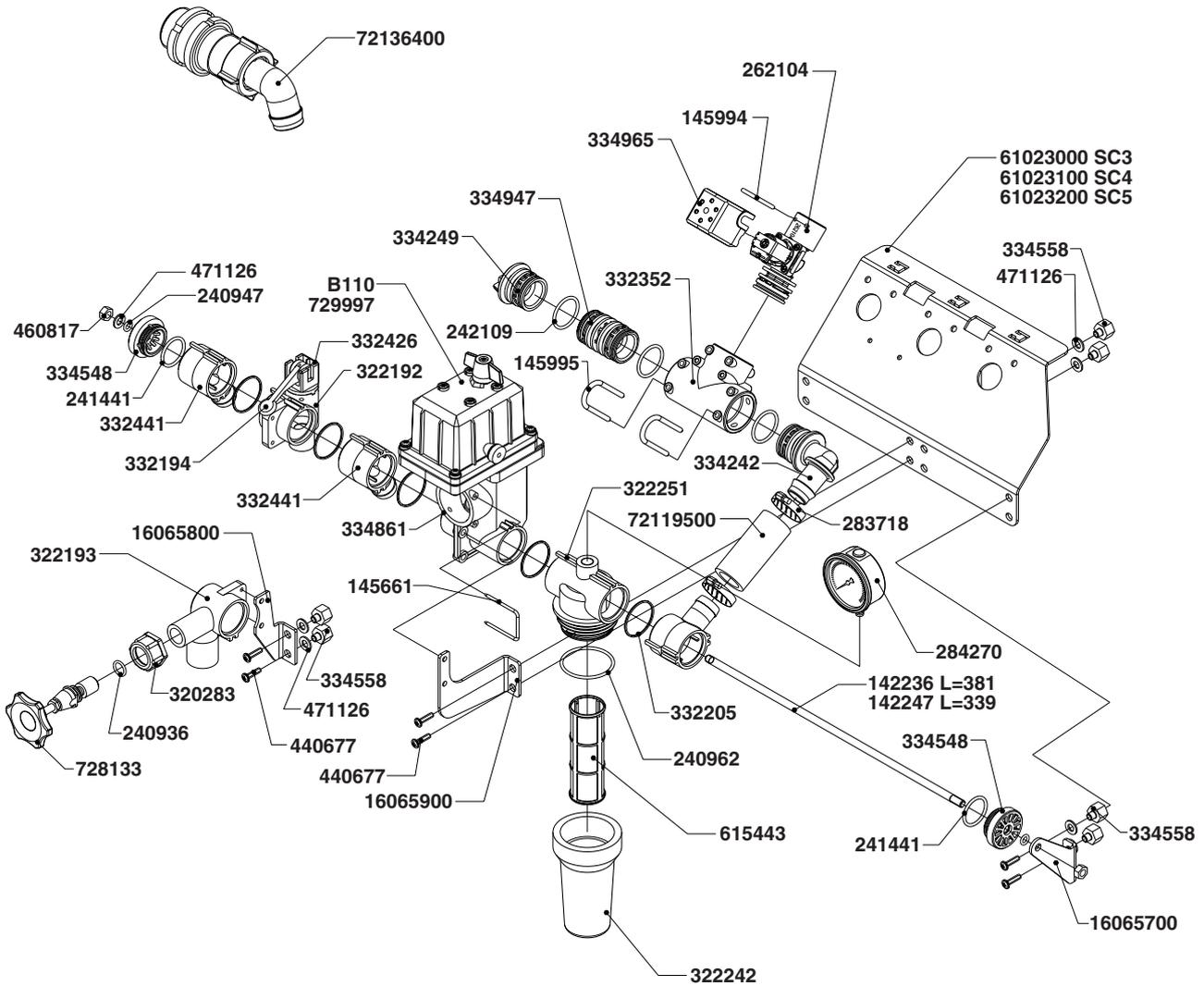
Drp 3
Pump Fittings and Dampers



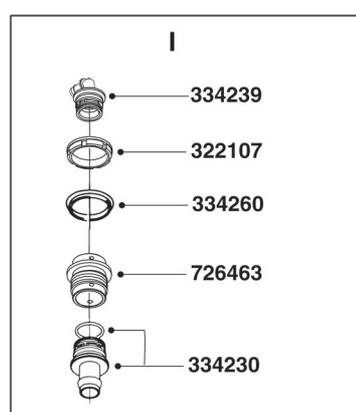
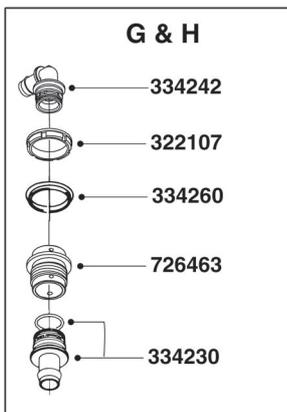
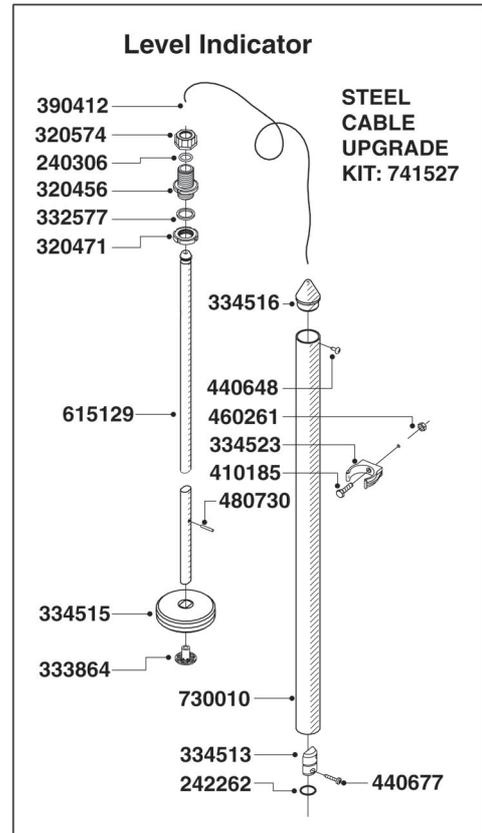
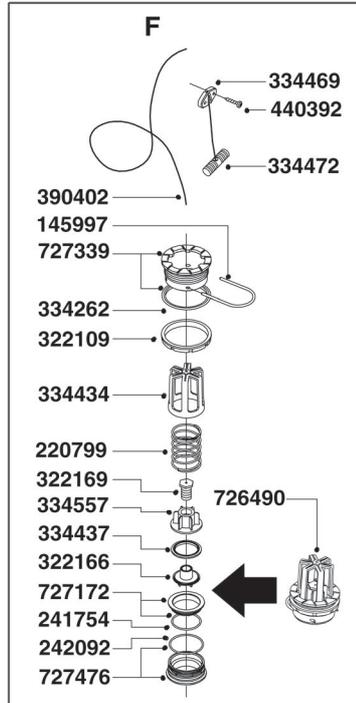
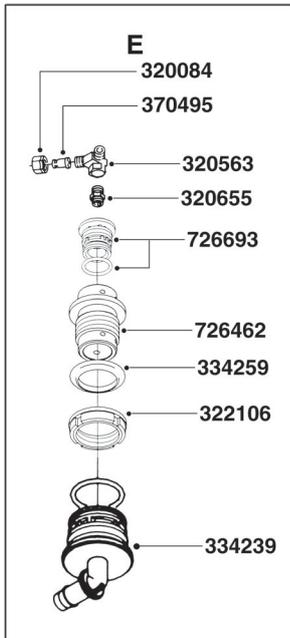
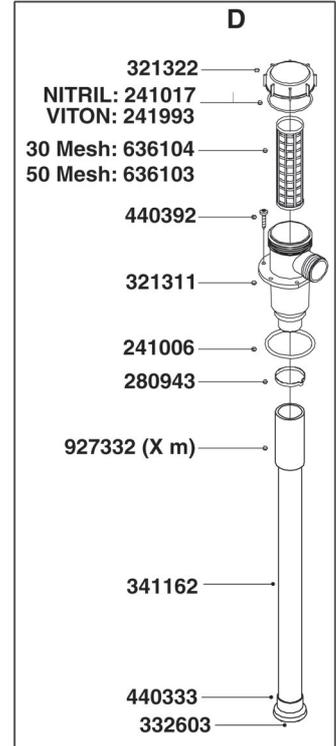
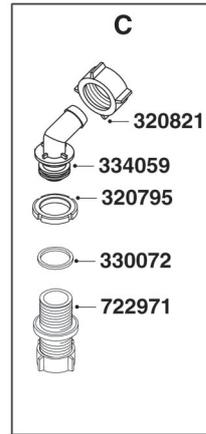
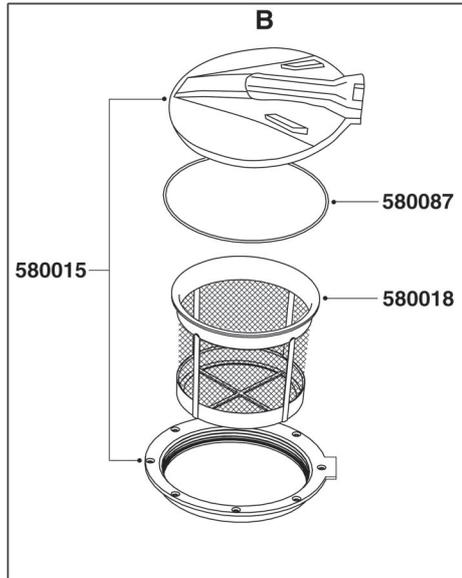
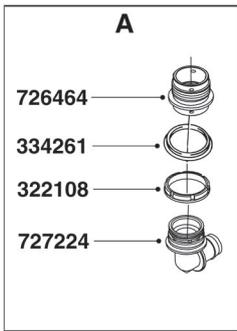
Drp 4
EVC Operating Unit

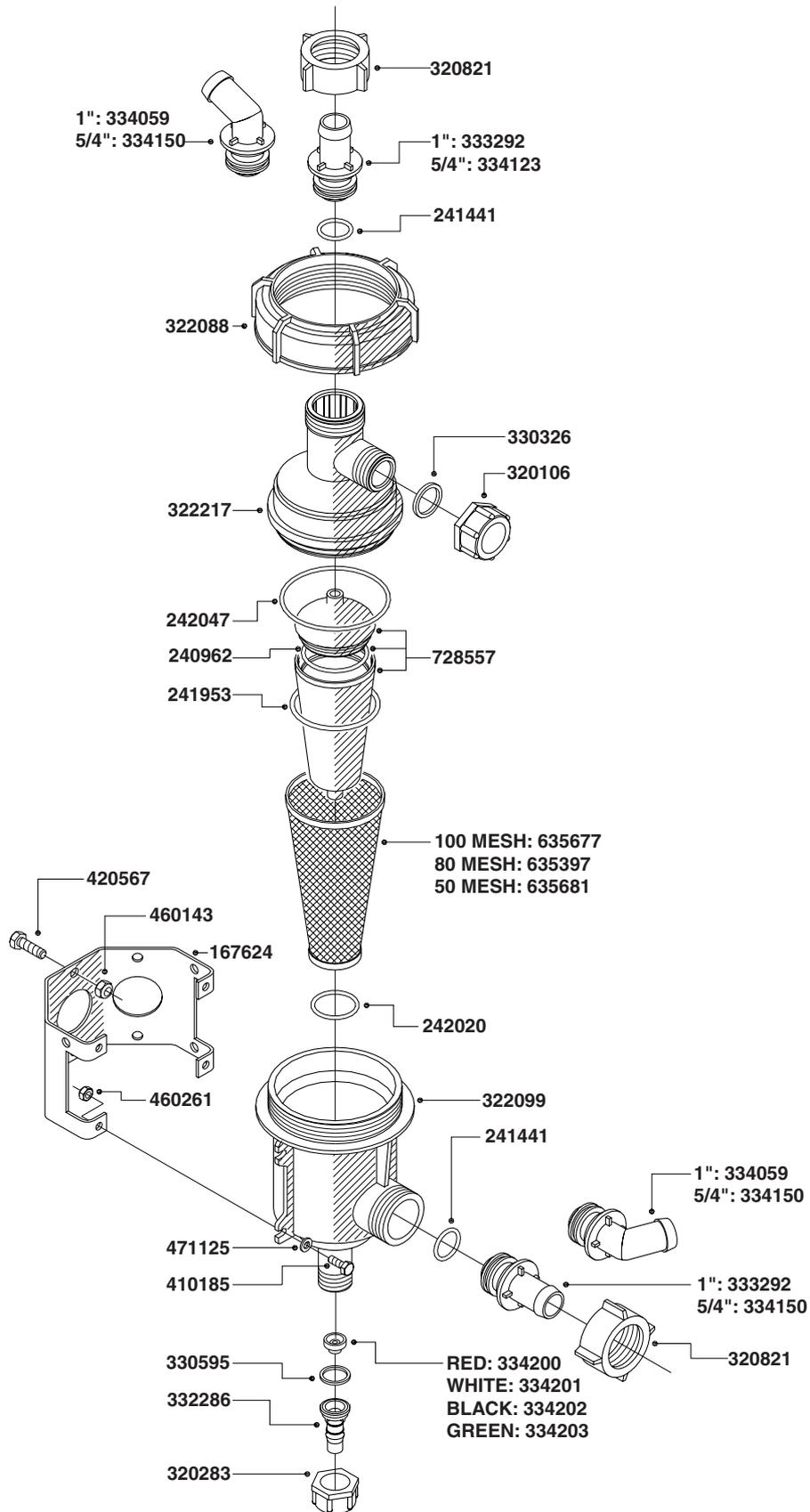


11 BAR

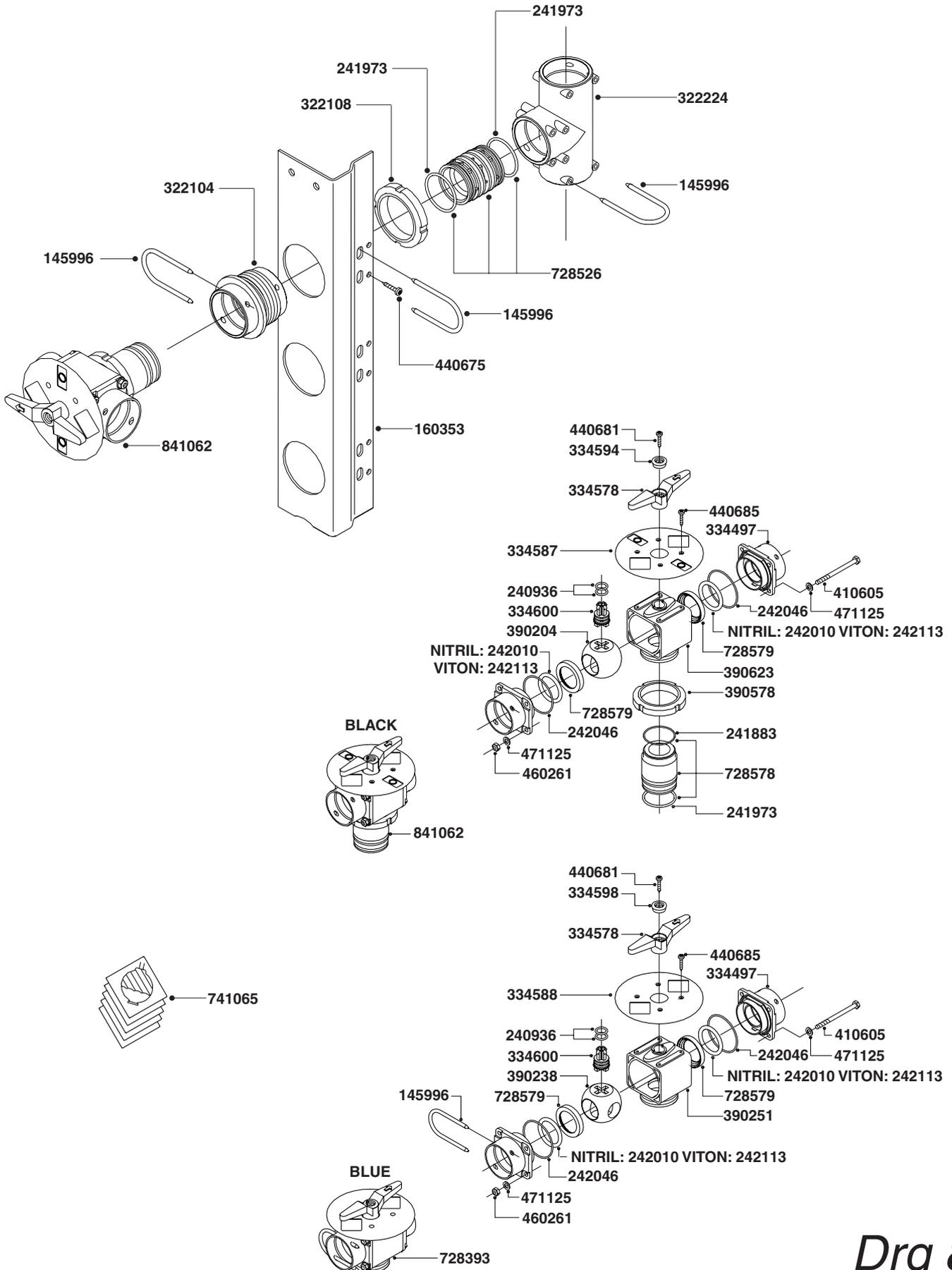


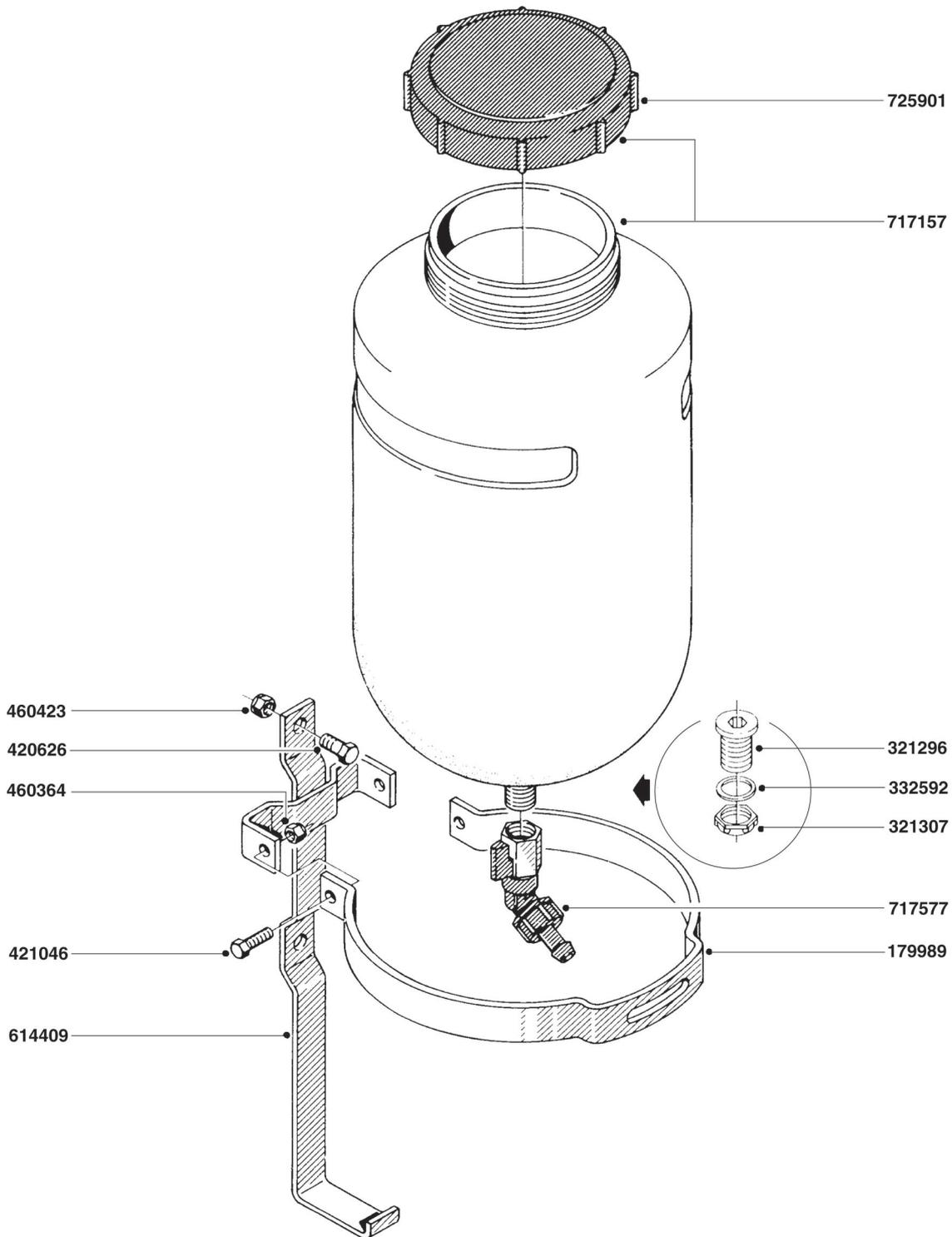
Drg 5
Solenoid Control



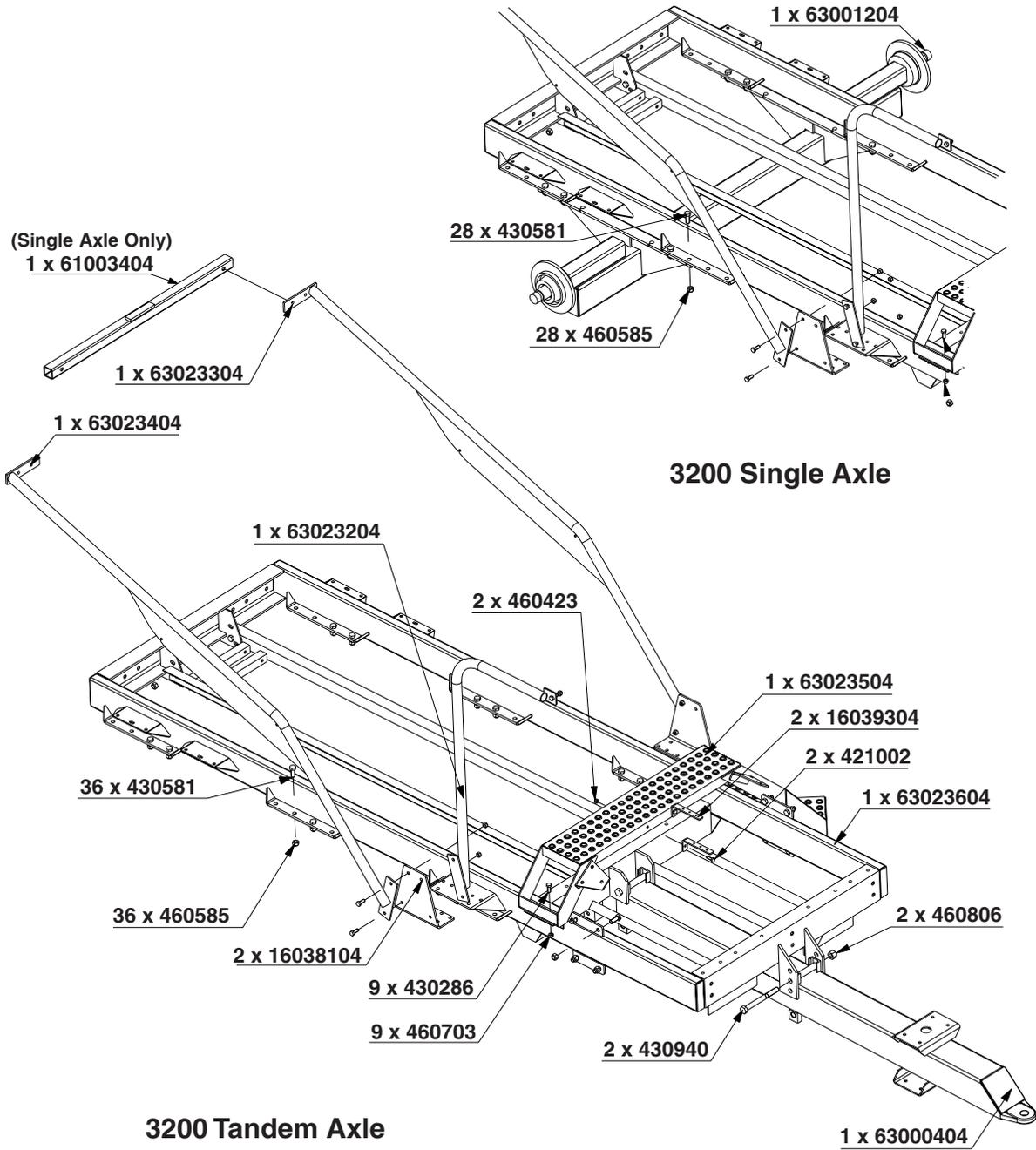


Drp 7
Self-Cleaning Filter





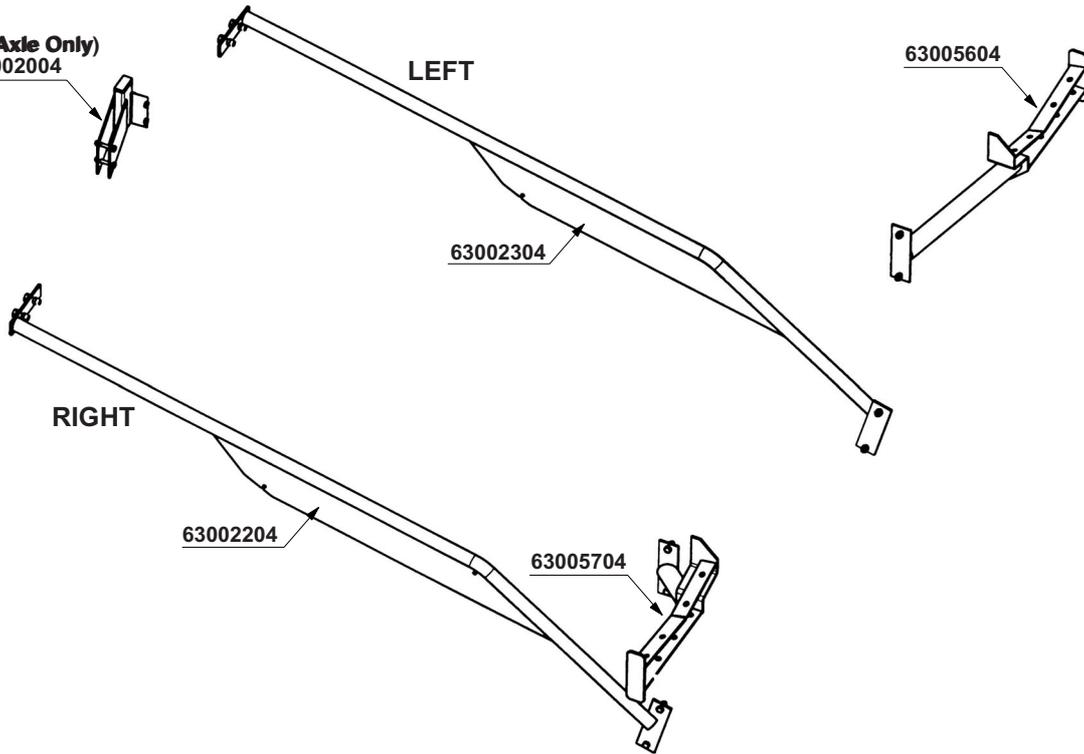
Drg 9
Hand Wash Tank



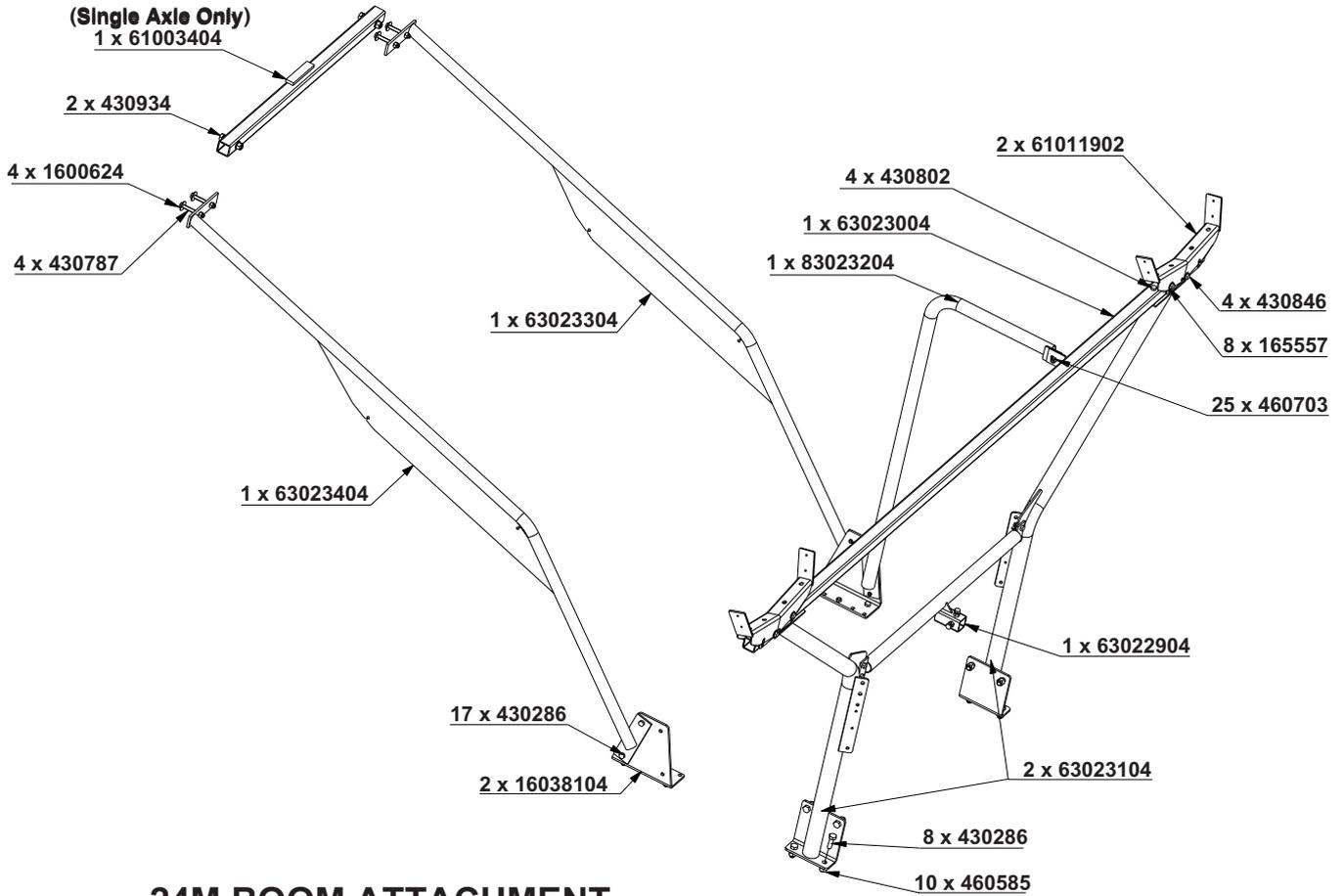
Drq 10
Explorer Tandem and Single Axle Chassis

12-20M BOOM ATTACHMENT

(Single Axle Only)
63002004



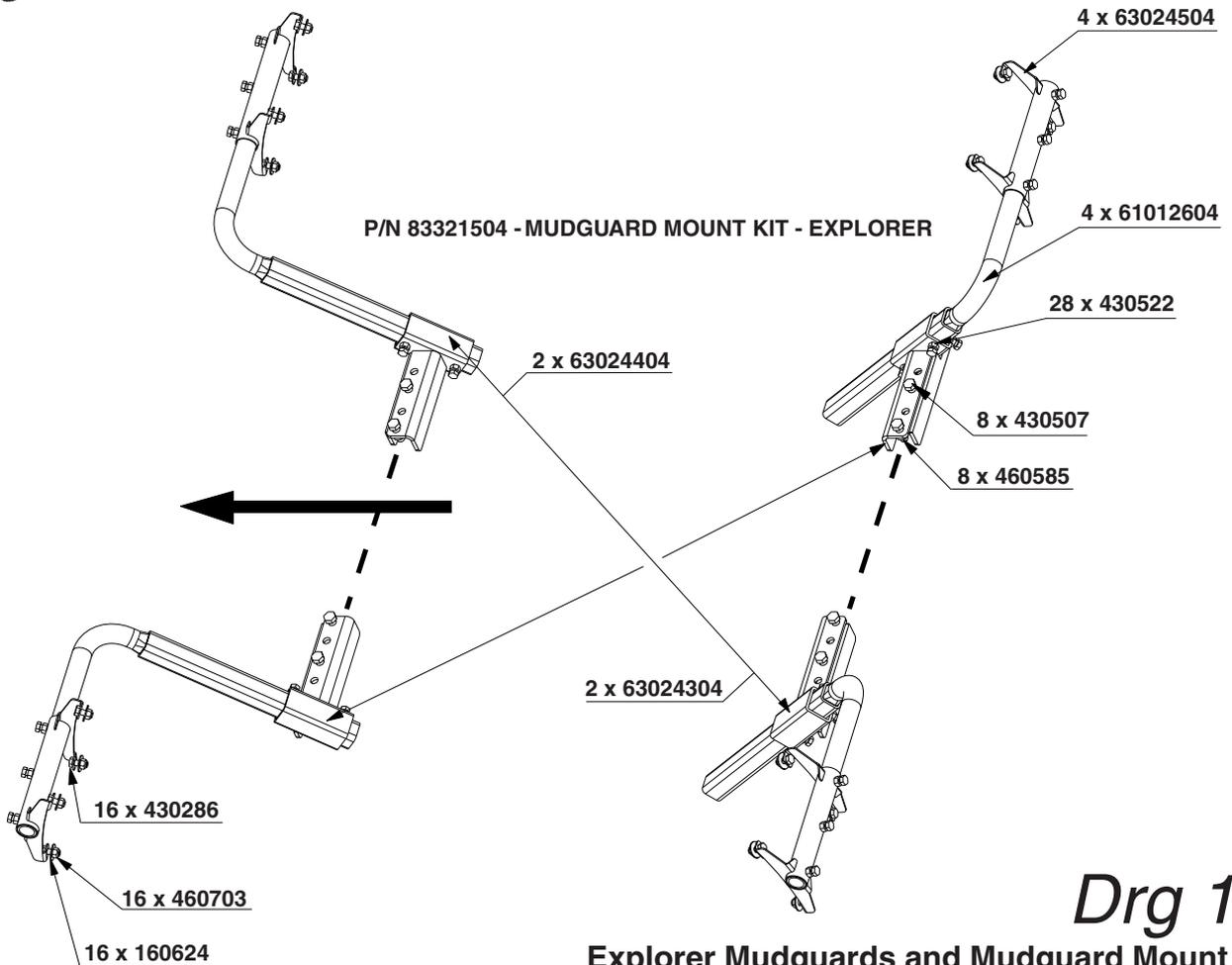
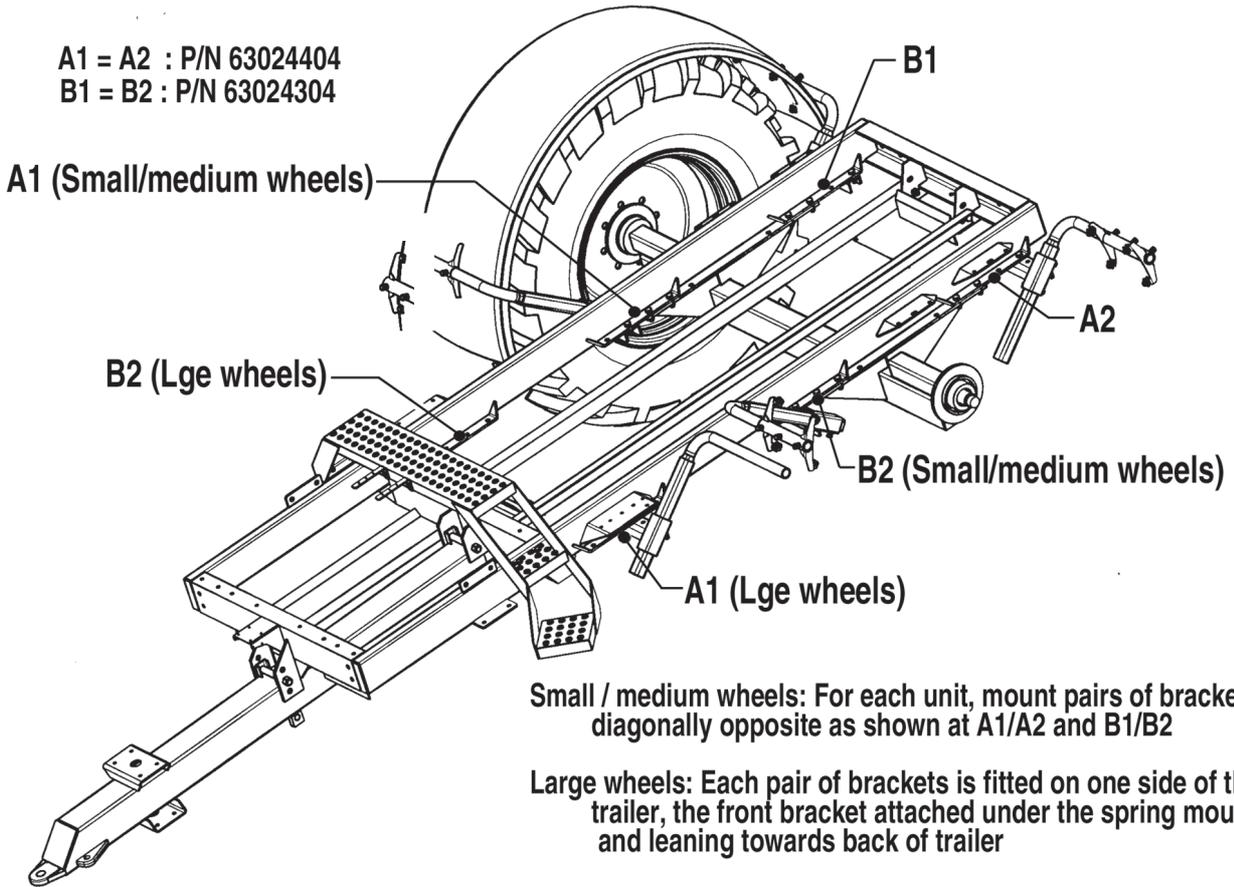
(Single Axle Only)
1 x 61003404



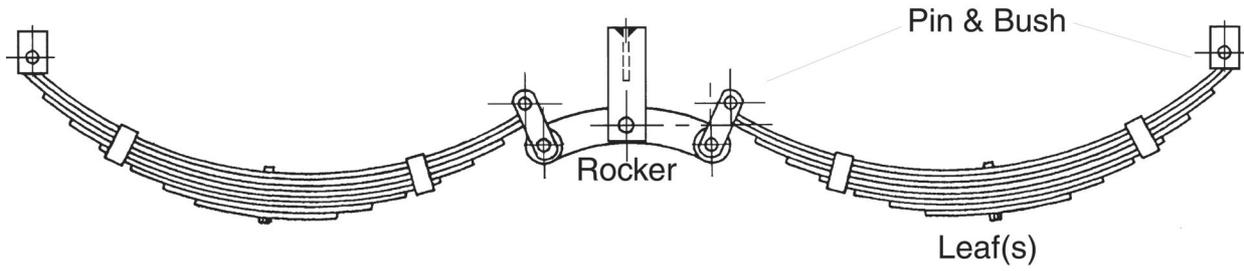
24M BOOM ATTACHMENT

Drg 11
Explorer Boom Attachment

A1 = A2 : P/N 63024404
 B1 = B2 : P/N 63024304

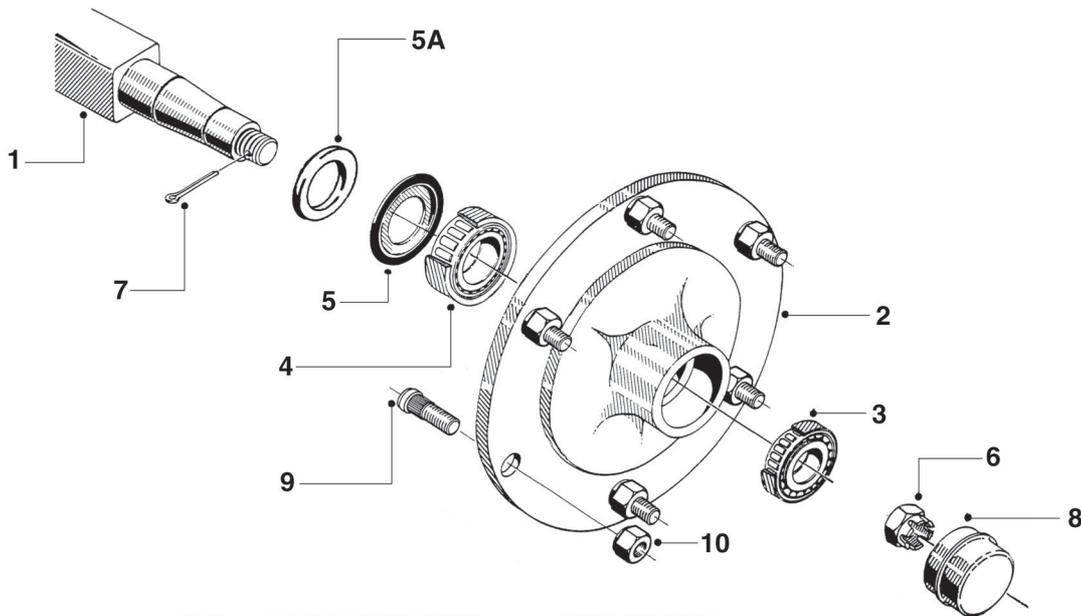


Drg 12
Explorer Mudguards and Mudguard Mount Kit



NAVIGATOR
2000 - 3400 litre
Trailer

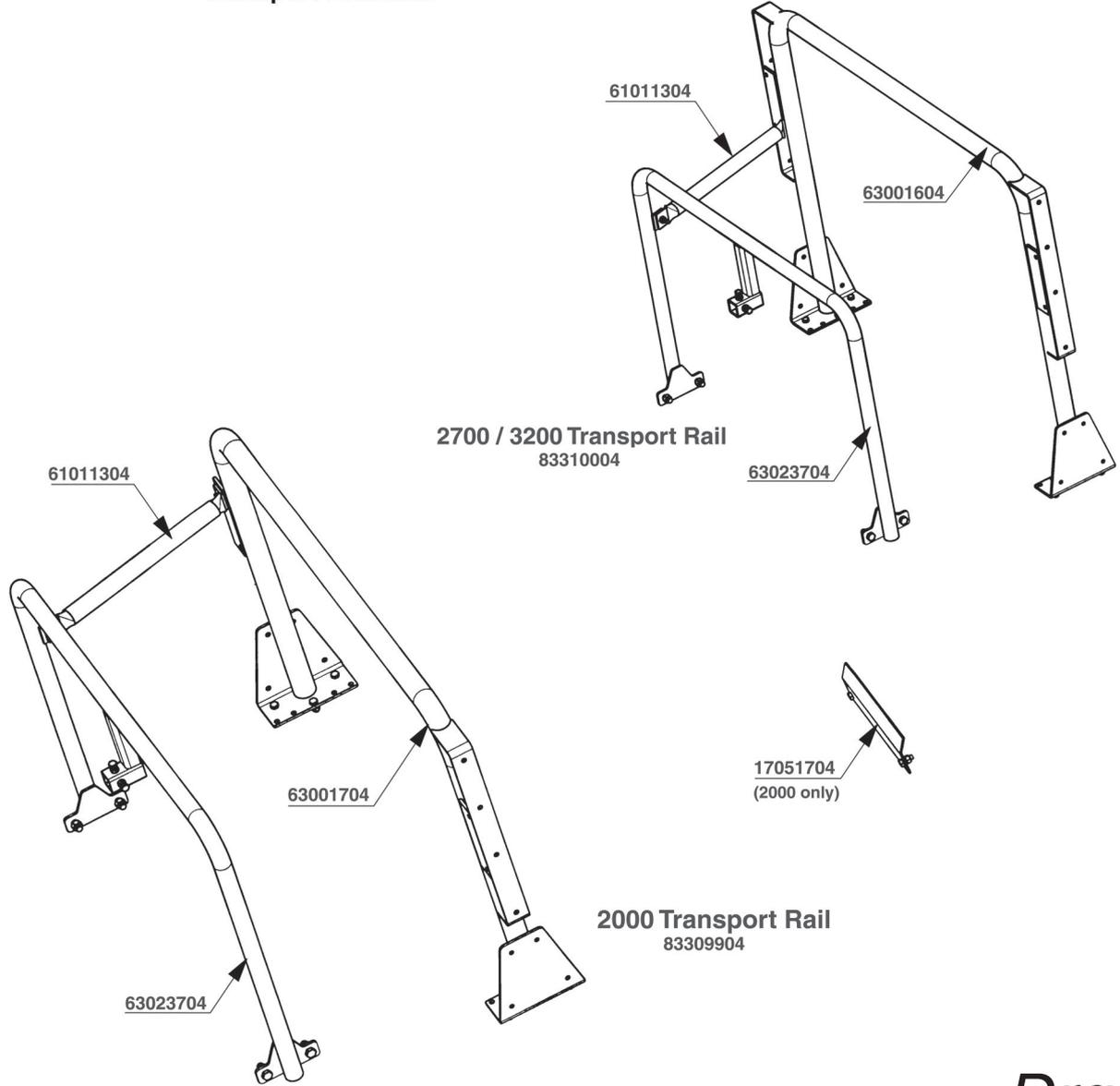
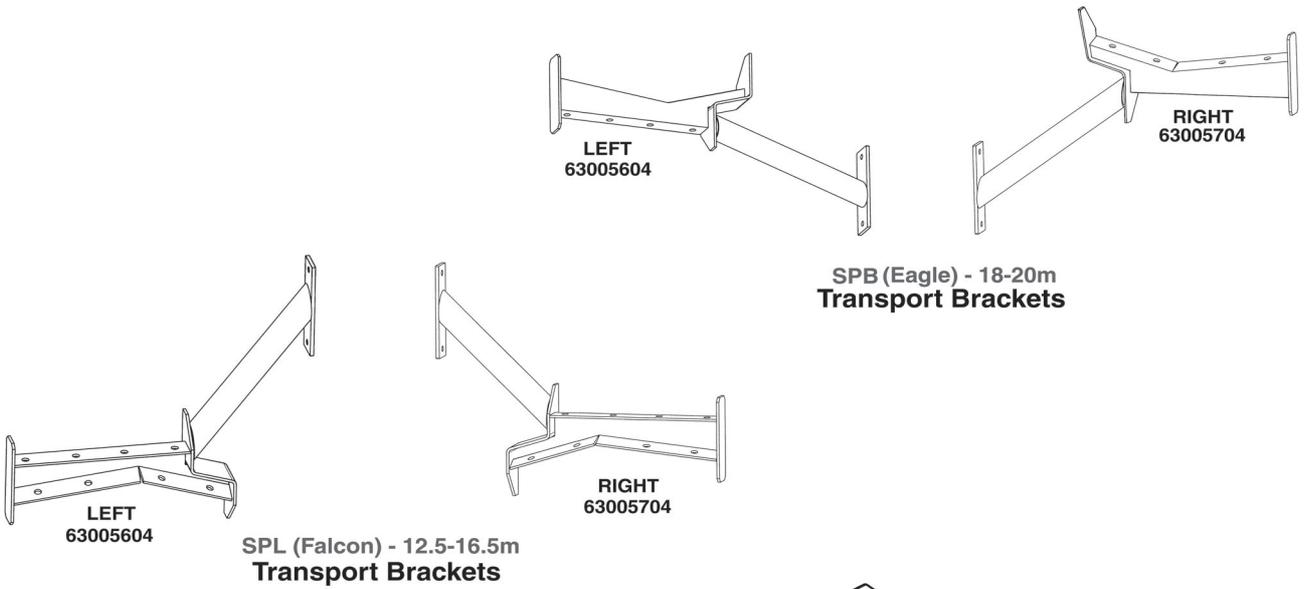
PART NUMBERS	DESCRIPTION
H1993 5916720	9 Leaf 60 x 6 Tandem Rocker Assembly
5916720-20	Pin / Bush Kit
5916720-21	Pin / Bush / Rocker Kit



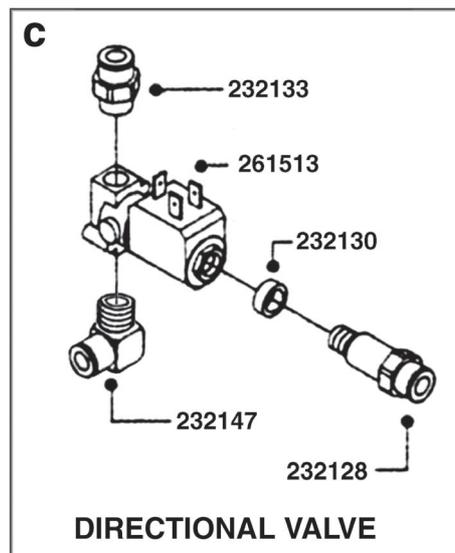
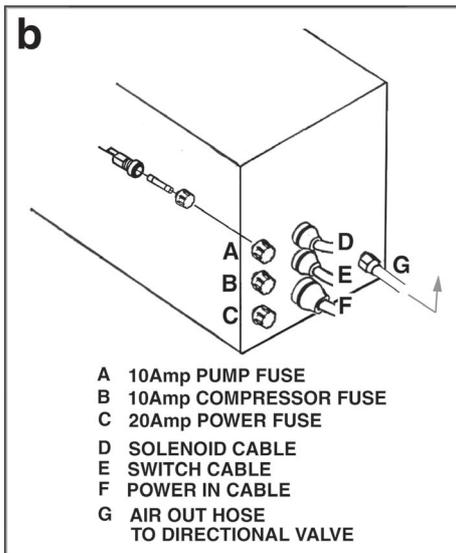
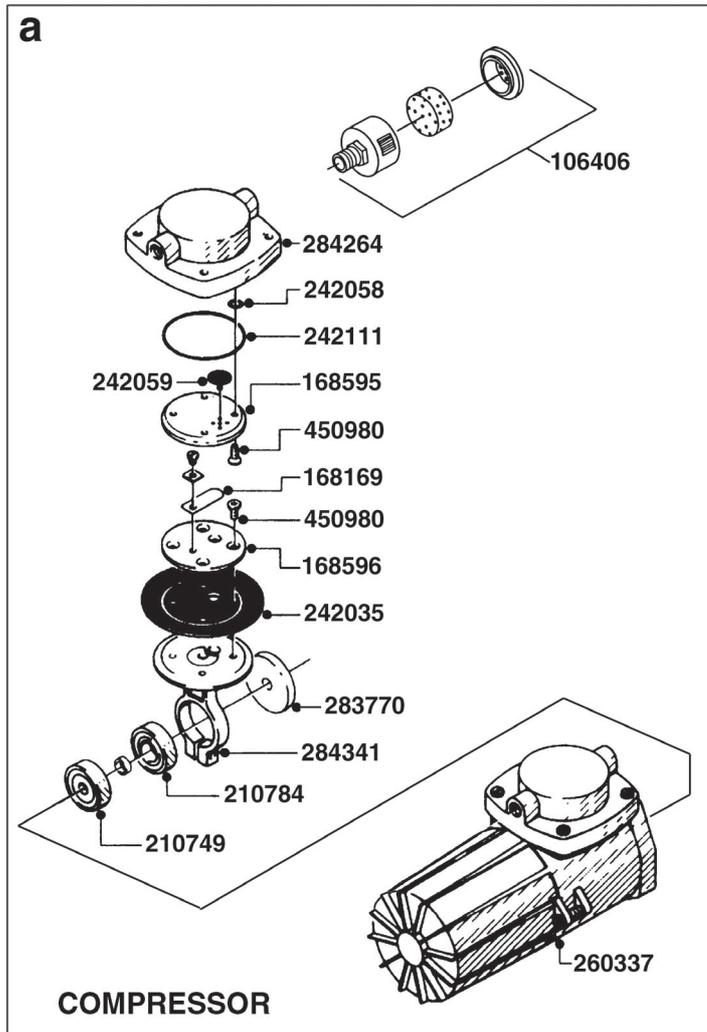
ITEM	PART DESCRIPTION	PART NUMBER	
		50 mm	60 mm
1	Stub	5916360-2	5916371-2
2	Hub	5916360-7	5916371-7
3	Outer Bearing	5916360-5	5916371-5
4	Inner Bearing	5916360-9	5916371-9
5	Seal	5916360-4	5916371-4
5A	Seal Ring	5916360-13	5916371-13
6	Axle Nut	5916360-11	5916371-11
7	Split Pin	5916360-3	5916371-3
8	Grease Cap	5916360-12	5916371-12
9	Wheel Stud	5916360-6	5916371-6
10	Wheel Nut	5916360-8	5916371-8

TANDEM WHEELS
2700: 50 mm
3400 / 4200: 60 mm

Drp 13
Hubs and Suspension



Drg 14
2000/2700/3200 Explorer Transport, Platform and Hand Rails



Drg 16

Storm Marker Compressor and Directional Valve

