

3500 / 4000 EXPLORER

Operator's Manual

67023304 - AU - 04/04

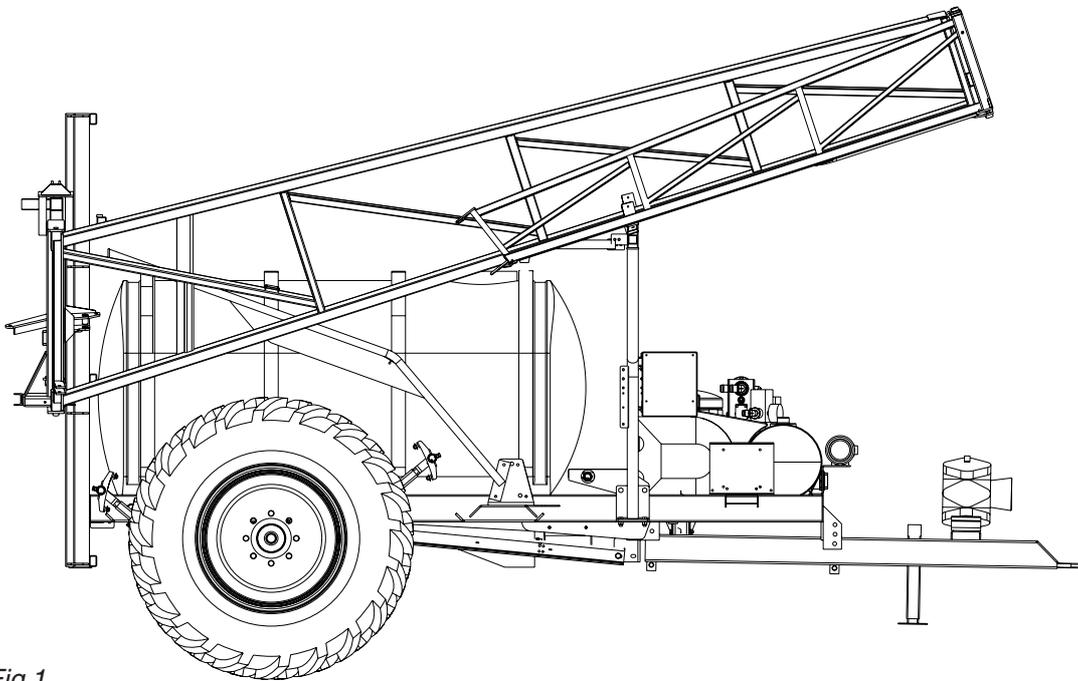


Fig 1

EXPLORER 3500 - 4000 Operator's Manual for EXPLORER 3500 and 4000L Sprayers

Part number 67023304

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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.

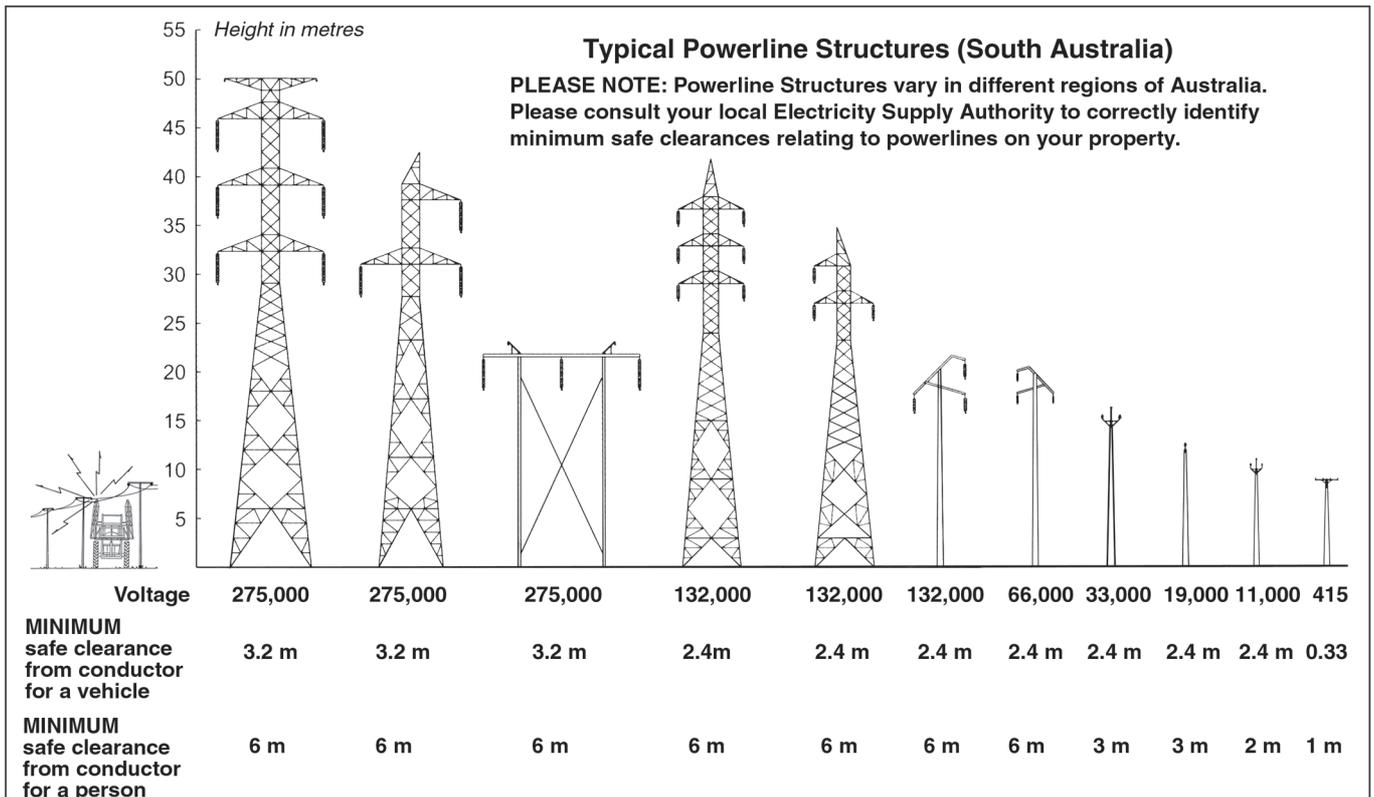


Fig 2

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Congratulations on purchasing a HARDI EXPLORER sprayer.

Introduction

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, sprayer options are covered within this manual.

This manual covers EXPLORER 3500 / 4000L with EAGLE 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 ID plate is fitted on the frame and indicates: Producer Name, Model, Serial Number and Date.

Please record applicable details below:

Producers Name:

Model:

Serial Number:

Date:

Dealer Name:

Sprayer Layout

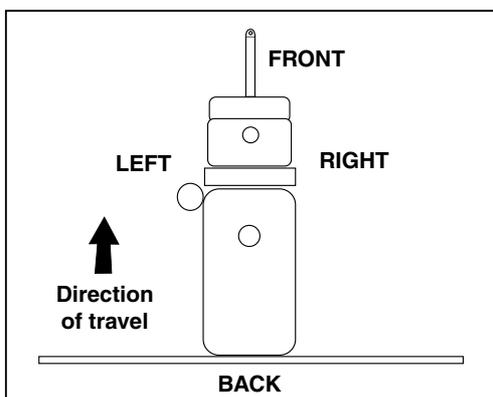


Fig 3



This is the safety alert symbol:

Safety

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.

Tyres / Wheels

Rims are heavy duty fixed centre with a new tractor type tyre fitted. Standard tyre sizes are:

18.4x30 on 3500 and 4000L

Mudguards are optional.

Suspension

Optional Tandem spring suspension is load-rated to tank size. Mudguards are optional

Tank

UV-resistant 3500 or 4000 Litre Polyethylene tank, in a purposeful design with limited sharp corners for easy agitation, emptying and cleaning. Suction is bottom-mounted, and a 65mm drain allows fast draining. A remote level indicator is standard.

Pump

On 3500 and 4000L unit: HARDI 363 / 540 rpm diaphragm pump producing 183 l/m at 540 rpm. Pumps 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.

HARDI Pilot 3880 Controller

The Pilot Controller features:

An easily connected, robust display, with internal lighting for night-time work.

An easy to use menu system with step-by-step on-display information in large easy-to-read format.

The automatic main valve enables setting the system so the main ON/OFF valve will open above a certain speed, and close below the same speed.

Alarms for low tank, incorrect dosage, excessive PTO revs, and low and high pressure.

Please refer to the *HARDI Pilot 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.

In-line filters further remove finer impurities and, finally, filters in the nozzles minimise the possibility of uneven application caused by worn or clogged spray jets.

Booms

EXPLORER boom options are as follows:

18, 20, 24 and 28m EAGLE BOOMS. These feature Hydraulic Wing Lift and Fold, with hydraulic Wing Tilt available as an option.

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

Please refer to the boom manual supplied with your sprayer documentation.

HARDI foam markers

The double-sided Hardi Cyclone foam marker systems 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 280 L flush tank is fitted on Explorer 3500 / 4000 L sprayers for the purpose of flushing the boom, controls and filters.

Hand wash tank

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

Granni Pot Chemical Filler

A 50 L mixing and transfer hopper, minimises lifting and safely transfers all chemical liquids, powders and granules to the sprayer tank.

Granni Pot Vacuum Chemical Transfer Kit (If fitted)

A camlock attached suction probe sucks liquid from a chemical container via the Granni Pot hopper into the sprayer.



Connection

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

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

- WARNING!** Drawbar bolts must be re-tightened every 10 hrs until torque is stabilised at 365 Nm, then every 50 hrs.
- 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's braking efficiency will decrease with the sprayer connected, particularly when the tank is full.

Support leg

Remove the drawbar support leg and/or turn 90 ° to the storage position .

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

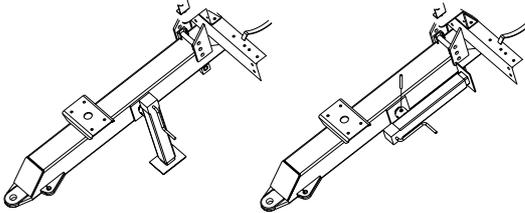


Fig 4

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 (P 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 distance it is necessary to shorten the shaft. Mark the protection guards.

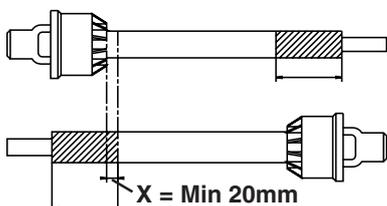


Fig 5

NOTE! The shaft must always have a minimum overlap of 1/3 of the length.

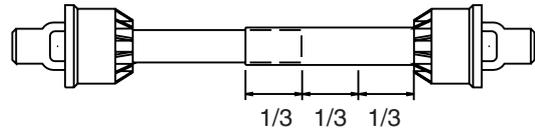


Fig 6

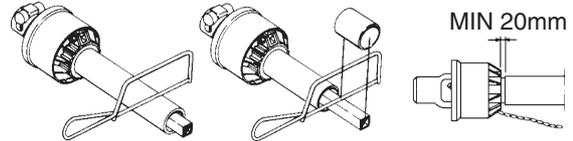


Fig 7

- 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.

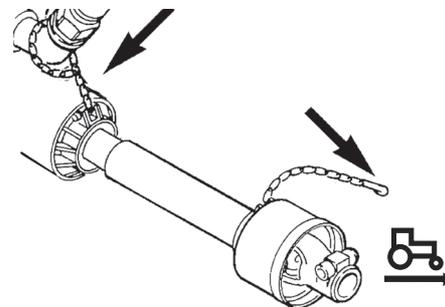


Fig 8

Tractor end - female

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

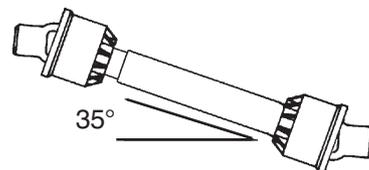


Fig 9

Connecting hydraulics

Please refer to the boom manual supplied with your sprayer documentation regarding connecting hydraulics and boom operation, adjustment and maintenance.

BEFORE OPERATING YOUR SPRAYER

Protecting your sprayer

Many plant protection chemicals are very aggressive, discolour paint, and can be extremely difficult to wash off when dried on.

It is therefore recommended that a rust preventative product be applied to all surfaces.

A protective polymer such as HARDI-COAT or a thin layer of penetrating, water-repellent rust prevention oil should be applied before putting the sprayer into service. Many suitable products are available on the market, which after application leave a protective oil film. This assists in preserving the finish of the machine and aids in future cleaning.

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.

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.

Setting up your Sprayer

Testing electrical, plumbing and hydraulic functions

Before using your sprayer for applying chemicals to your crop, it is advisable to carry out a test run with clear water to ascertain that all parts are functioning, and that there are no potentially hazardous fluid / air leaks or hose obstructions.

- 1 Set up your sprayer as described in the following chapter.
- 2 Part fill main tank with water.
- 3 Fill foam tank and flush tank using filling valve / filter system, (see P 12-13).
- 4 Run pump.
- 5 Add more water to main tank using Granni Pot chem filler functions (Refer to your granni pot book for detailed instructions).
- 6 Operate boom sections. Check for air / water leaks.
- 7 Set Pressure Equalisation (see P 9).

Connection of EC Operating Unit and Foam Marker

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

Control	Box	Polarity / Wire color	Fuse (A)
	(+)	(-)	
EC	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.

Connecting electric controls

Connection of display and control panels

Adjust angle and then tighten the holder bracket bolt.

WARNING: To avoid a short circuit, the power must be disconnected before attaching the BNC connector plugs to the connector jacks.

HP 3880 display with HP 3005 power box

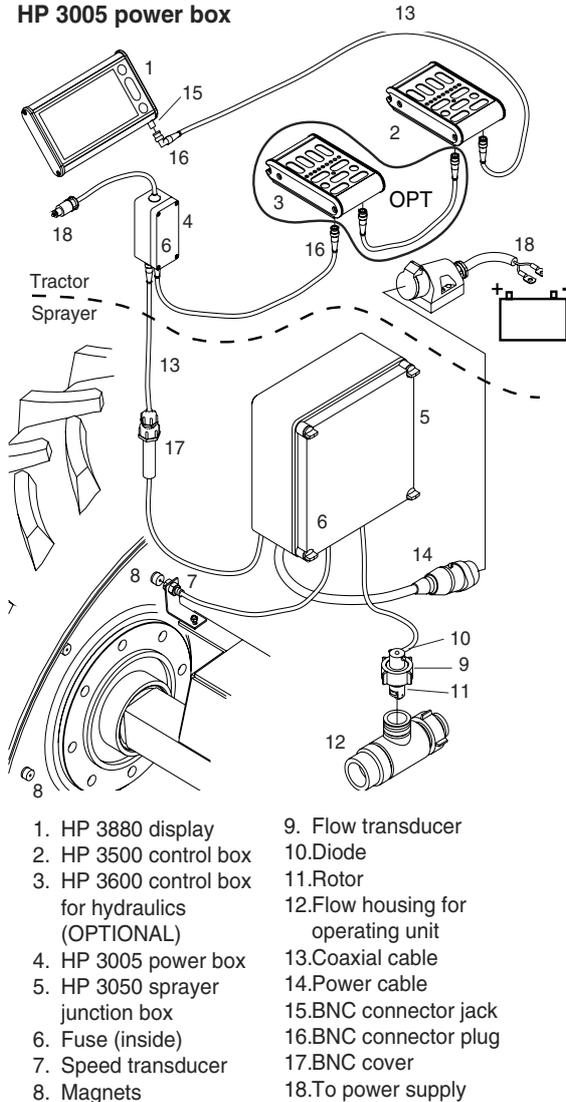


Fig 10

See Fig 11 below for typical cabin installation of controls.



Fig 11

The connectors have a bayonet fitting. To attach, locate guide groove, push and turn.

Either of the connector jacks on the control panels can be connected first.

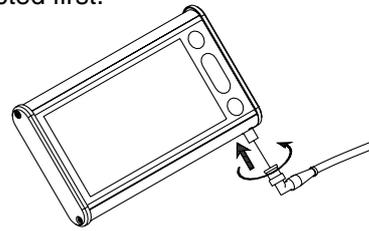


Fig 12

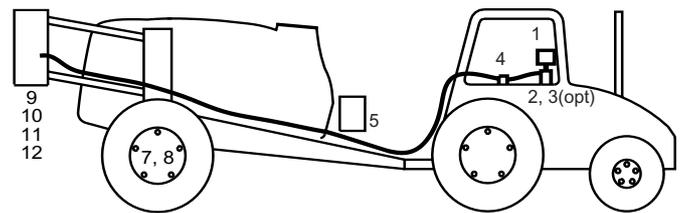


Fig 13

Adjustments of EC Operating Control Unit

Before spraying the EC operating unit is adjusted using clean water (without chemicals).

NOTE! To understand how to activate each function using the Pilot controller, please carefully read your Pilot Operators Manual for detailed instructions

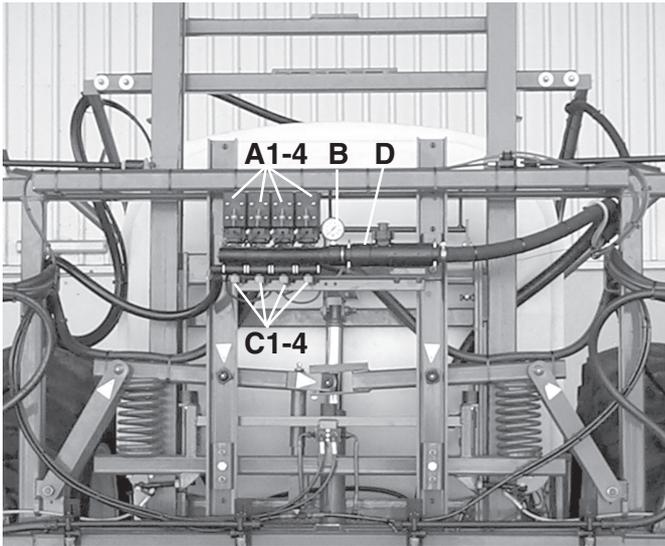
1. Choose the correct nozzle for the spray job by turning the TRIPLET nozzle bodies. Make sure that nozzles are the same type and capacity. See "Spray Technique" book for selection guidelines.
2. Turn main ON/OFF switch to ON.
3. Activate distribution valves so all sections are turned ON.
4. Activate Pressure regulation switch **C** until emergency handle (3 Fig 15) stops rotating (min pressure).
5. Put the tractor in neutral and adjust the P.T.O. and thereby the number of revolutions of the pump corresponding to the intended travelling speed. Remember the number of revolutions on the P.T.O. must be kept between 300-600 rpm.
6. Pressure regulation switch **C** is activated until the required pressure is shown on the pressure gauge.

Adjustment of Pressure Equalisation

1. Close the first section distribution valve.
2. Turn the first adjusting screw (C1 Fig 14) until the pressure gauge again shows the same pressure.
3. Adjust the other sections of the distribution valve in the same way.

NOTE! After initial adjustment of Pressure Equalisation, further adjustment will only be needed when:

1. You change to nozzles of different capacities.
2. The nozzle output increases as the nozzles wear.



A = Distribution Valves
 B = Flow Transducer
 C = Adjustment Screws for pressure equalisation

Fig 14

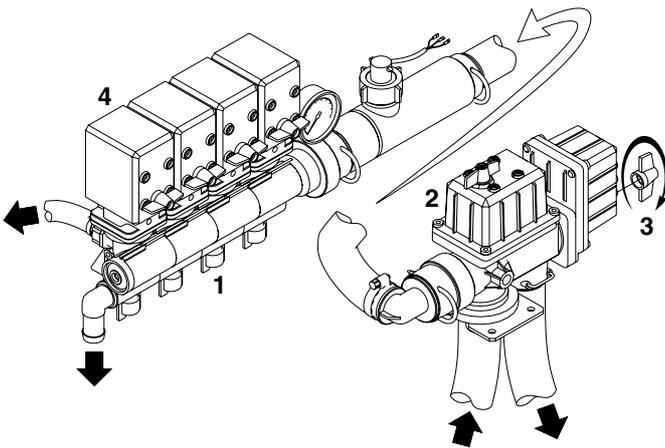


Fig 15

Operating the Control Unit while spraying

In order to close the entire boom, toggle the main ON/OFF switch to the OFF position. This returns the pump output to the tank through the return system.

The diaphragm Non-drip valves ensure instantaneous closing of all nozzles.

In order to close one or more sections of the boom, switch the relevant distribution valve to off position. Pressure equalisation ensures that the pressure does not rise in the sections which are to remain open.

When the sprayer is stored, 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.

Emergency Operation of EC Unit

The main ON/OFF and section valves can be manually operated about 30 seconds after HP 3500 control panel has last been used.

The pressure regulation valve can be operated when the current to HARDI PILOT has been disconnected.

In case of power failure it is possible to operate all functions of the operating unit manually. First disconnect the multi plug from the control box. Now manually turn the emergency control knobs.

The problem may be due to a blown fuse.

Fuse replacement:

HP 3005 power box

Fuse (HARDI ref. no. 268417) 3 Amp. Quick acting

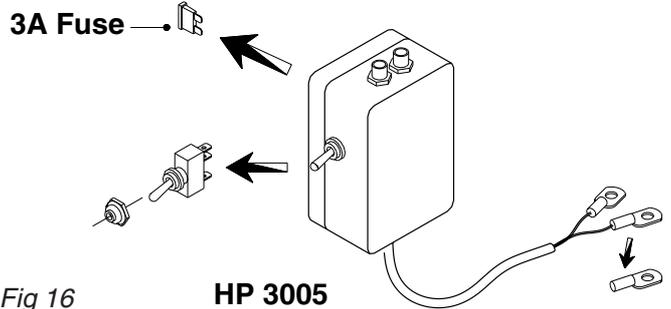


Fig 16

HP 3050 sprayer junction box

Fuse (HARDI ref. no. 261605) 25 Amp. Quick acting

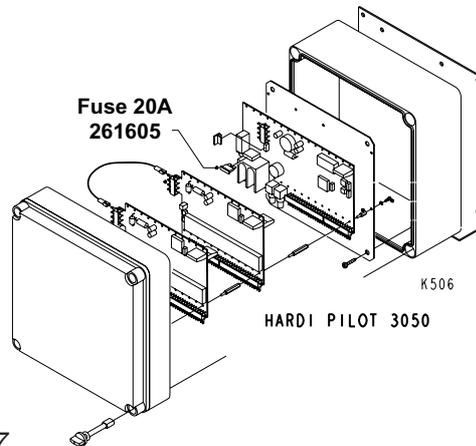


Fig 17

Remote pressure gauge (if fitted)

The remote pressure gauge measures the working pressure in the boom tubes as close to the nozzles as possible. This pressure reading will always be slightly lower than the reading at the operating unit pressure gauge (D Fig 14).

The outputs stated in the nozzle charts are always based on the pressure measured at the nozzle. Always adjust pressure when calibrating and spraying according to readings at the Remote pressure gauge.



OPERATION

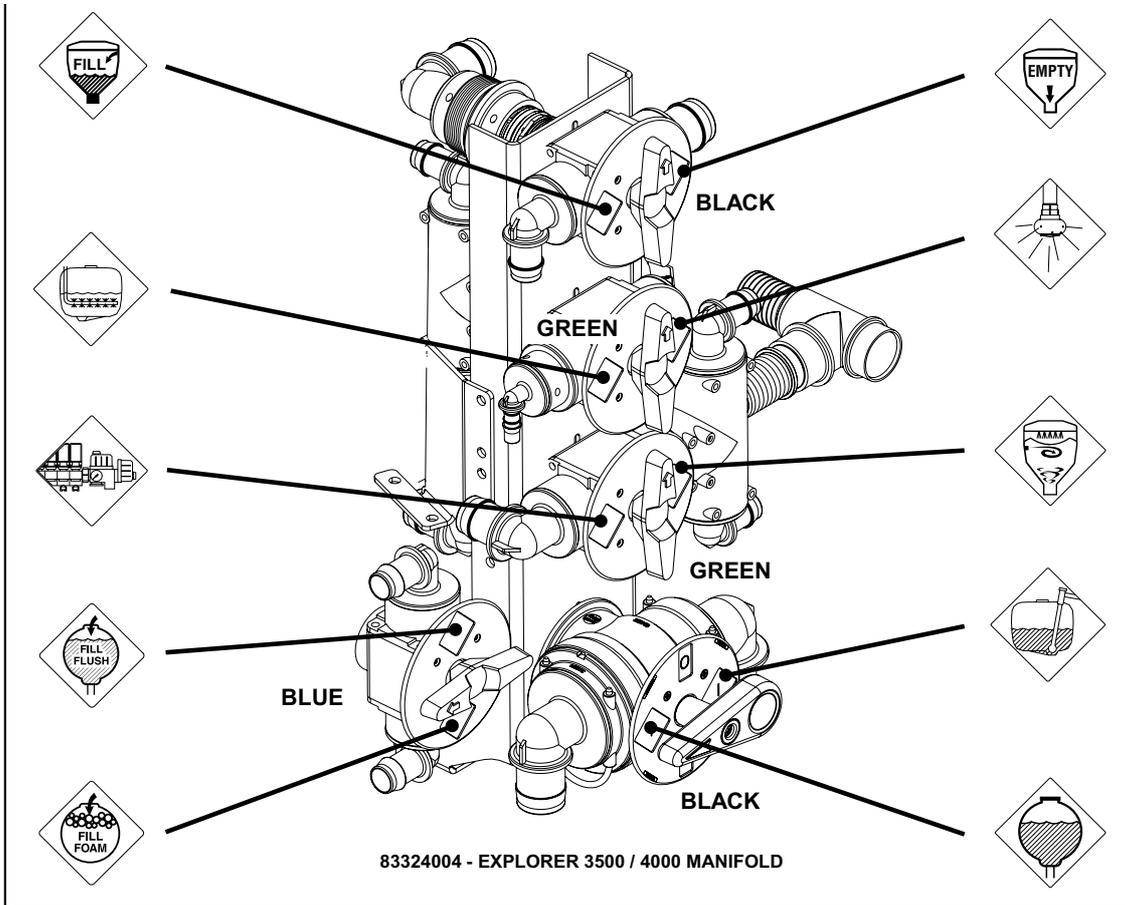


Fig 18

BLACK - Suction:
Granni Pot Fill / Granni Pot Empty

GREEN - Pressure:
Main Tank Agitation / (Opt) Tank Rinse

GREEN - Pressure:
To Distribution (Spray) / To Chem Fill

BLUE -
Fill Flush Tank / Fill Foam Tank

BLACK - Suction:
From Main Tank / From Flush Tank

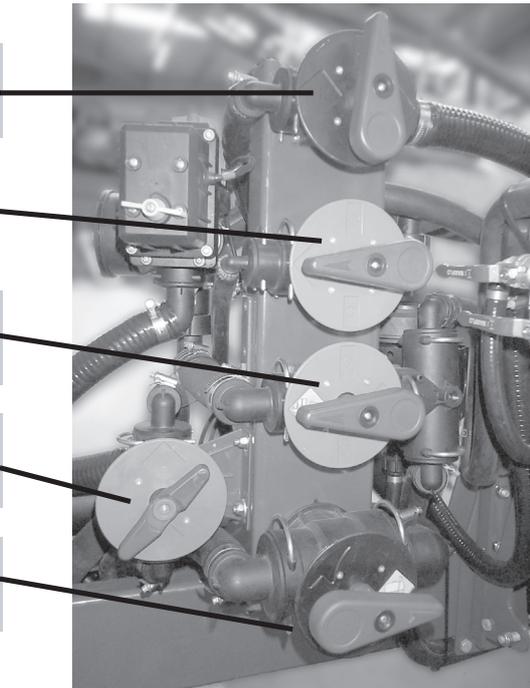


Fig19

Operation: Filling your Sprayer

Filling tanks with 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). (Flush and Foam Tank filling is controlled with the Blue Manifold Valve).
An optional high capacity self-priming Banjo pump can be mounted on your Explorer for fast filling.

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.

WARNING! When using a high capacity pump for filling always remove tank lids to prevent over-expansion and possible tank rupture.

Filling through tank lids

Flip open the main tank lid (Fig 21) and fill through the strainer to prevent rust or other particles entering the tank.

Screw open the cylindrical foam marker tank lid (A Fig 22) and adjacent wrap-around flush tank lid (B Fig 22) and fill with water.

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 23)

Filling clean water tank

The clean water tank (Fig24) 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.

WARNING! Although the clean water tank is only filled with clean water, it must never be used for drinking, due to the risk of accidental contamination.



Fig 21

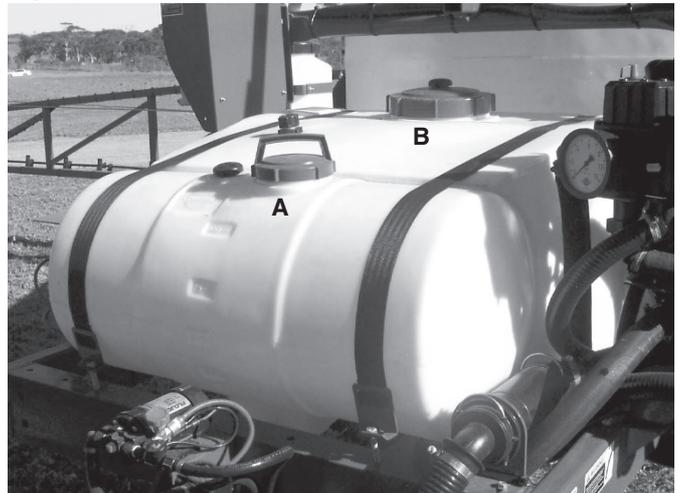


Fig 22

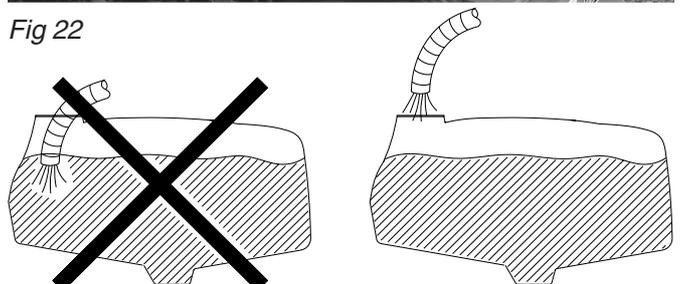


Fig 23



Fig 24

Filling through Manifold Valves

This system allows the operator to connect, via a 1 1/2" camlock (B Fig 25) a hose from, eg. 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 cover from the camlock fitting on valve (E Fig 25) at the front of the Fill Filter (A Fig 25).
- 2 Connect the filling hose from the water supply to the camlock (B Fig 25).
- 3 During filling procedure keep Suction Valve (C Fig 25) turned OFF.
- 4 Ensure the tank lid/s are open to prevent over-expansion and possible rupture of the tanks.
- 5 To select which tank to fill, turn handle on the blue FILL valve (D Fig 25) to align with the icon indicating the required tank (Main tank or Flush tank).
- 6 Open the valve at the filling filter (E Fig 25).

IMPORTANT! To avoid backflow always return the FILL manifold handle to the OFF position after completing the filling process.

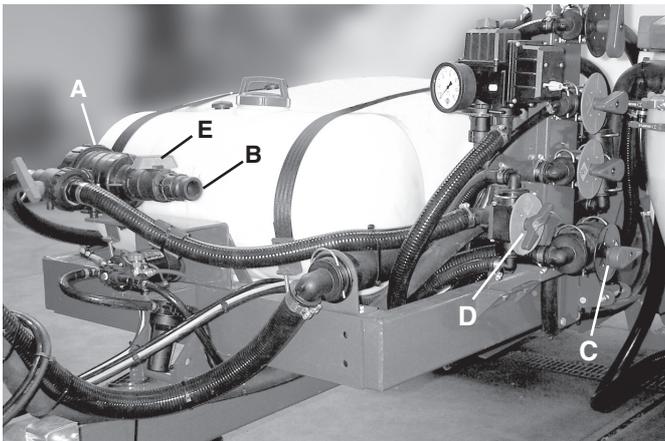


Fig 25

- 7 Remember to re-fit the camlock cover to the fill filter when filling is completed (Fig 26).



Fig 26

Operation: Adding Chemicals



SAFETY PRECAUTIONS

Always be careful when working with crop protection chemicals.

PERSONAL PROTECTION

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

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

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



Fig 27

This equipment should be worn to avoid poisoning, burns and irritation to your eyes, skin and internal organs.

Contaminated clothing should be removed, and care must be taken not to contaminate the inside of the tractor cab.

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 thoroughly before changing to another chemical.

ADDING CHEMICALS

⚠ WARNING! AGRICULTURAL CHEMICALS CAN BE DANGEROUS.

Read chemical labels and follow directions for use, storage, disposal of containers and first aid.

⚠ IMPORTANT! Carefully read your Granni Pot Operators Manuals and follow directions for Use, Cleaning, Decontamination and Storage.

⚠ CAUTION! The Granni Pot hopper flushing device uses spray liquid for rinsing the hopper of concentrated chemical. Keep the lid closed when flushing the hopper. The filler must always be cleaned together with the rest of the sprayer when the spray job is done.

Tips for Adding Dry Chemical Concentrates

Fill the main tank at least 50% with water (unless otherwise stated on chemical container label).

Measure correct quantity of chemical and sprinkle it into the hopper as fast as the flushing device can flush it down.

NOTE! Some dry chemicals are readily blended into a stable solution, while others will not remain in suspension for extended periods. If particles have a tendency to settle, keep the PTO engaged so the spray liquid is continuously agitated until it has been sprayed onto the crop.

This will prevent blockages in the sprayer system and promote even application of the chemical.

Tips for Adding Liquid Chemical Concentrates

NOTE! The scale on the Granni Pot hopper can only be used if the sprayer is parked on level ground, and is a guide only. It is recommended to use a measuring jug for best accuracy when measuring concentrated liquid chemicals.

Drum Rinse feature

Empty chemical containers can be flushed with the container flushing device. Place the container over the multi-hole nozzle and press down to activate rinse jets.

⚠ WARNING! Do not press on the multi-hole nozzle after opening the GRANNI POT lid unless it is covered by a container - to avoid spray hitting you.

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



Fig 28

Hardi has supplied a safety device to prevent the drum rinse nozzle from accidentally being activated. (Note! If your Granni Pot does not have this device installed, please contact your Hardi dealer).

- 1 The 'wings' on the drum rinse nozzle must be aligned so the Safety Device will prevent them being pushed down, see Fig 29.
- 2 To rinse out chemical containers, the wings need to be rotated until the gap aligns with the device, allowing the nozzle to be pushed down with the inverted container, and the rinse function to be activated (See Fig 30). Empty Granni Pot of dilute chemicals.



Fig 29



Fig 30

⚠ WARNING! Residual fluid may be released if drum nozzle is pressed (Fig 31) **even well after previous use.** After cleaning, return the drum rinse nozzle to Safety position (Fig 29).



Fig 31

HOW TO ADD CHEMICALS TO YOUR SPRAYER

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

- 1 Through the tank lid. **Please note!** This method is not recommended due to increased risks of: inaccuracy in dosage, falls and strain injuries when carrying containers up onto the sprayer platform, and also spillage and contamination.

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

- 2 By means of the GRANNI POT chemical hopper and transfer device (If fitted).

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

- 3 By means of the Granni Pot Vacuum Kit (If fitted).

Adding Chemicals with HARDI Granni Pot™ and Manifold Valves.

There are three methods described below for adding crop protection chemicals to the main tank of your sprayer using these new Hardi features.

NOTE: It is recommended to use the first of the following three methods to add chemicals to your sprayer main tank. It is the simplest and safest method.

By using this method, your full attention can be directed at the potentially hazardous chemicals you are handling during operation of the Granni Pot chemical filler.

Note: This method minimises the risk of overfilling the tanks or overdiluting the spray solution.

A) Adding Chemicals to a Partially-Filled Main Tank:

- IMPORTANT!** Ensure the EC operating unit is off.
- Fill the Flush Tank, then fill the Main Tank to around 25% of required spray volume (unless otherwise stated on chemical container label). (Filling, P12-13).
- With FILL handle (E Fig 32) OFF, align the Pressure handle (B Fig 32) with the icon indicating CHEM FILL.
- Align Suction valve (A Fig 32) with MAIN TANK. This means liquid from the Main Tank will be used to mix with chemical concentrate in the GRANNI POT, and the spray solution will be used to flush the concentrate from the GRANNI POT hopper.
- Follow GRANNI POT Operators Manual directions.
- After adding the required chemicals, you can flush the GRANNI POT hopper with clean water. Align the Suction handle (A Fig 32) to FLUSH TANK.
- IMPORTANT!** Return the Suction handle (A) to MAIN TANK, and Pressure (B) to DISTRIBUTION (Spray). Continue filling the Main Tank with tractor running.

Re-fit camlock plug to fill filter when all filling is completed.

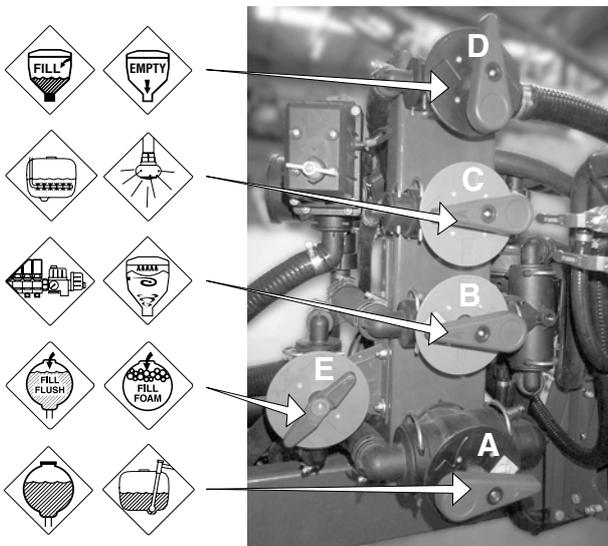


Fig 32

CAUTION! To prevent backflow and contamination ALWAYS return valves to OFF / quadrant position after use.

B) Adding Chemicals After Filling Tanks:

WARNING! This method may result in overfilling, leading to spillage and contamination; or over-diluting spray solution in the Main Tank, reducing its efficacy.

- IMPORTANT!** Turn the EC operating unit off.
- Fill all tanks as described, allowing space in the main tank for the addition of chemical / water mixture (Filling P 12-13). Turn FILL handle (E Fig 32) OFF.
- Align Pressure valve (B Fig 32) with the icon indicating the CHEM FILL.
- Turn the Suction valve (A Fig 32) to MAIN TANK. This means liquid from the Main Tank will be used to mix with chemical concentrate in the Granni Pot. Follow GRANNI POT Operators Manual directions.
- After adding chemicals, flush the hopper with clean water (Suction valve (A Fig 32) to FLUSH TANK.
- Return Suction valve (A) to MAIN TANK, and Pressure valve (B) to DISTRIBUTION (Spray).

Re-fit camlock plug to fill filter when all filling is completed.

C) Adding Chemicals at the Same Time as Filling the Main Tank via the Flush Tank:

WARNING! This method requires you to be constantly alert!

You need to carefully watch and control fluid levels in the Flush tank while operating the GRANNI POT as there is increased risk of contamination, overfilling and accidental spillage.

- IMPORTANT!** Turn the EC operating unit off.
- Partially fill Main Tank, then fill Flush Tank (P 12-13).
- Turn the pressure valve (B Fig 32) to align with the icon indicating the CHEM FILL.
- Align Suction valve (A Fig 32) with FLUSH TANK. This means that, as the Flush Tank is being topped up from your water supply, its contents will be used to mix with chemical concentrate in the Granni Pot, the mixture then transferring to the Main Tank.
- Follow GRANNI POT Operators Manual directions. **NOTE!** Watch level of fluid in Flush Tank. Keep fluid level consistent by adjusting the FILL handle (E Fig 32) between FLUSH TANK and OFF.
- After adding chemicals, with the Suction valve (A Fig 32) remaining at FLUSH TANK, flush the GRANNI POT with clean water.
- Turn Pressure valve (B Fig 32) to DISTRIBUTION (spray), and return Suction valve (A) to MAIN TANK. Open primary filling valve to MAIN TANK to complete filling.

Re-fit camlock plug to fill filter when all filling is completed.

Vacuum Transfer Kit for Granni Pot (If fitted)

This system is designed to transfer liquid chemicals direct from a container (eg. Enviro drum, 25L drum, etc) to the calibrated Granni Pot hopper, then to the tank.

Please see your Vacuum Granni Pot Operators Manual for detailed instructions for use.

To use Granni Pot Vacuum Transfer System:

- 1 Before transferring chemical concentrate ensure EC operating unit is off and main tank contains about 25% of the required spraying water.
- 2 Follow instructions in Vacuum Granni Pot Op Manual.
- 3 Suction valve (D Fig 33) on your Explorer manifold assembly is used when drawing chemicals from the drum into the Granni Pot (FILL) and when transferring from hopper to Main Tank (EMPTY) .
- 4 See P14 for tips on using the drum rinse nozzle safely for flushing chemical containers.

CAUTION! The drum rinse nozzle uses spray liquid for rinsing containers. Always rinse chemical containers with clean water before disposal.

- 5 The Vacuum Transfer hose must be flushed thoroughly after use to remove residual concentrate. Store in a clean environment.
- 6 Always return valves to OFF / quadrant position after filling is completed, to prevent backflow (and possible contamination of tanks or spillage from overflow).
- 7 Remember to re-fit camlock cover/s after chemical transfer is completed.

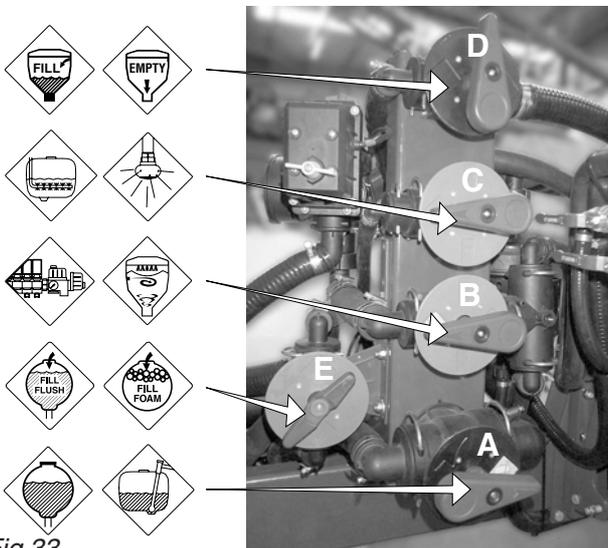


Fig 33

FILTERS

Filters should always be used, and their function checked regularly.

Mesh size should always be smaller than the flow average of the nozzles used. Therefore, pay attention to the correct combination of filters and mesh size. Recommended suction filter is 50 mesh - this allows good flow to the pump with little restriction. 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
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

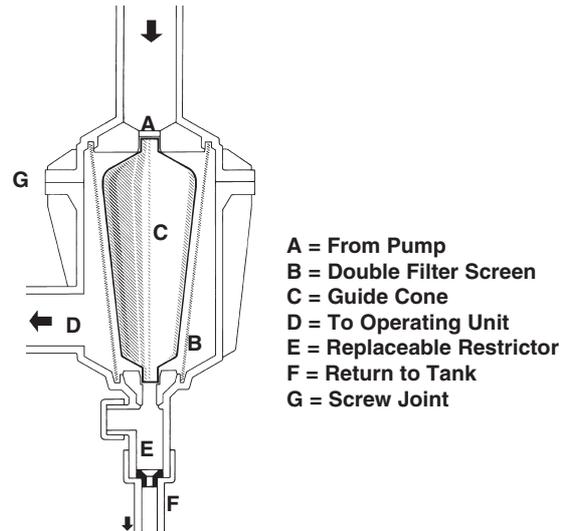


Fig 34

IMPORTANT! Note direction of restrictor (E Fig 34).

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* (P 32), or use the green one (largest orifice) first.

Disconnect the hose (Fig 35) 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 (start with black, then white and finally red).

Cleaning

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

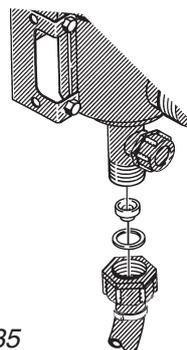


Fig 35

Standard filter size is 100 mesh. 50 and 80 mesh are available and can be changed by opening the filter top (replace the strainer). Check O-rings before reassembling the filter and replace them if damaged. Also refer to *Self cleaning filter* (P 22).

CYCLONE FOAM MARKER

Please refer to your Cyclone 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.

Operation

- 1 Add water (see *Filling of water* (Page 12-13) and concentrate to the tank and close the lid.
- 2 Check that the Pilot display shows that the Foam Marker is OFF (A Fig 36). Connect power supply.
- 3 Press Foam Marker arrow key (B Fig 37) briefly to turn on, then press opposite arrow to change sides if required.
- 4 Within 10 seconds of activating either side, foam quantity can be changed with the % key (C Fig 37).
- 5 Press arrow for more than 2 seconds to turn it off. After the first start, the foam marker, if active, will be switched off and on together with the main valve.

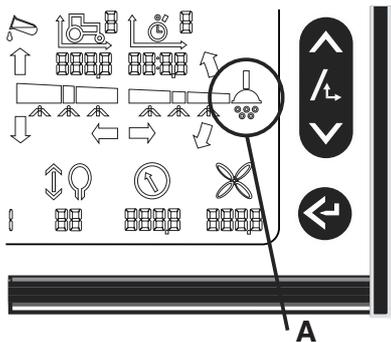


Fig 36

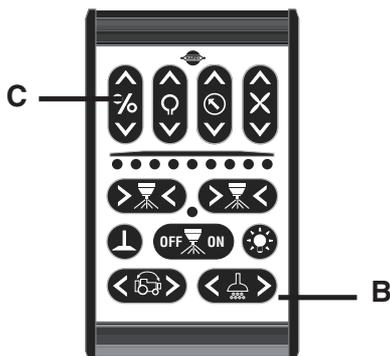


Fig 37

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

Foam Marker System Drain and Flush

- 1 Remove pin to release suction hose fitting at base of tank.
- 2 Flush the tank with clean water.
- 3 Check the filter is clean.
- 4 Carefully re-fit suction hose and secure with pin.
- 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.

PILOT CONTROL PANEL AND DISPLAY

HARDI Pilot 3880 data processor / display and HP 3500 Control panel

The HARDI Pilot 3880 DPE has data and power connection with the junction box with one coaxial cable, while the HP 3500 Control panel is used to operate the EC operating unit, and foam marker.

An optional HP3600 control panel may be fitted to operate boom hydraulics.

Please refer to the *HARDI Pilot Instruction Book* for all functions of the Pilot.

BOOM OPERATION

Please refer to the boom manual supplied with your sprayer documentation, eg the *SPB/SPC EAGLE BOOM Operator's Manual*, regarding entire setup, operation and maintenance 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 (See Fig 2, Page 2).

SPRAY OPERATION

NOTE! A calibrated sprayer is a safe sprayer. See the *Hardi Spray Technique* book supplied with your sprayer.

FLUSHING TANKS

The incorporated 280 litre flush tank can be used for diluting and flushing.

Diluting Spray Liquid

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 (A Fig 38) towards FLUSH TANK.
- 2 Ensure the EC 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*) has been used, turn the black suction valve (A Fig 38) to MAIN TANK. Operate all EC 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.

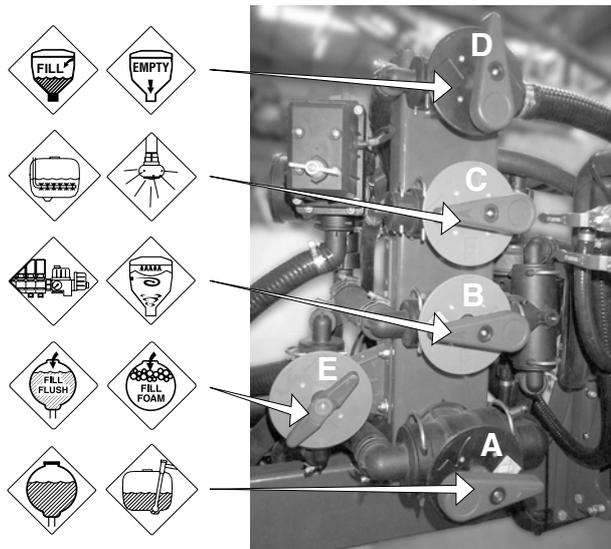


Fig 38

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 (A Fig 38) to FLUSH TANK.
- 2 Engage the pump and spray water from the flush tank into the field until all tubes / nozzles are flushed.
- 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.

Dilutable Residue*	15 Litres
Total Residue**	41 Litres

* 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.

Dilutable residue must be diluted 10 times with clean water and sprayed into the crop just sprayed, before cleaning the sprayer - (see Cleaning P 19).

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.

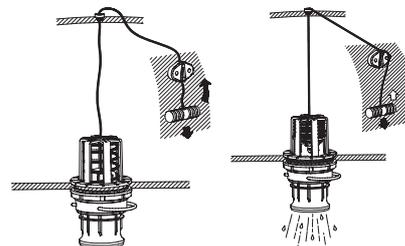
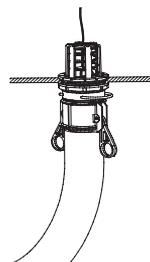


Fig 39



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

Fig 40

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 22).
- 2 **Lubricate** the sprayer according to the service and maintenance interval reached - Refer to *Lubrication* in the *Service and maintenance charts* (Page 21).
- 3 Perform **Service and maintenance** jobs according to the service and maintenance interval reached - Refer *Service and maintenance charts* (P 22).
- 4 Perform **Occasional maintenance** as needed after inspection - Refer *Occasional maintenance* (P24).
- 5 Immediately fit **Replacement parts** for parts that are worn or broken - Refer to *Replacement Parts* (P 33-50) for drawings which will assist in identifying parts required.



CLEANING

- 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 (see *Spraying Technique* book).
- 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! Never allow any other person to enter the tank!

There is a high risk of being overcome by lack of fresh air, fumes created from even a small amount of chemical residue, or a panic attack triggered by being confined in a small space.

Poisoning, skin, eye, airway and gastric irritation, choking, drowning, electrocution or injury if using power tools, or other serious consequences can result if this advice is ignored.

In the event of a person being discovered in difficulty inside a sprayer tank, do not enter the tank to attempt a rescue as it is likely you will become an additional casualty. Call emergency services for advice and assistance. Use a hook, long tool, crane, etc to assist the person to the tank lid opening and out of danger.



WARNING! Always use Personal Protective Equipment when cleaning or servicing your sprayer

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.

IMPORTANT! If Flush Tank contamination has occurred, or is suspected, emptying and refilling Flush Tank several times with clean water will be needed before proceeding with general cleaning of the system.

WARNING! 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 22) 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.

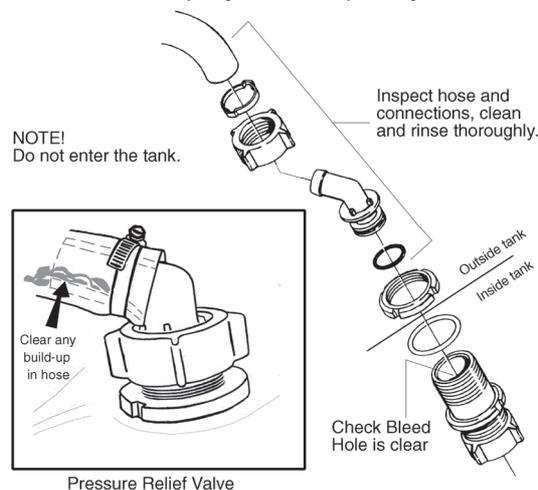


Fig 41

- 5 Inspect pressure relief valve (mounted on main tank - see Fig 41), 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 Granni Pot hopper. Clean, flush and drain delivery hose from hopper to main tank, and Vacuum Transfer hose (where applicable).
- 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.



WARNING! Always use Personal Protective Equipment when cleaning or servicing your sprayer



LUBRICATION

Store lubricants in a clean dry and cool place - preferably at constant temperature - to avoid contamination from dirt and condensed water. Keep oil filling jugs, hoppers and grease guns clean, and clean the lubricating points thoroughly before lubricating.

Avoid long periods of skin contact with oil products.

Recommended lubrication intervals and lubricants are as follows:

LUBRICATING POINT	LUBRICANT
Ball bearings 	A Universal Lithium grease NLGI #2 SHELL RETINAX A CASTROL LM GREASE
Slide bearings 	B Lithium Grease with Molybdenumdisulphide and Graphite SHELL SAS 4000 CASTROL MOLYMAX
Oil lube points 	C Engine Oil

— Grease (A or B)
 — Lubrication Interval (Hours)

— Oil (C)
 — Lubrication Interval (Hours)

Pump

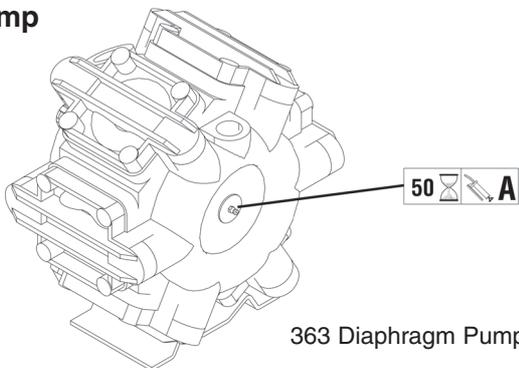


Fig 42

Transmission shaft

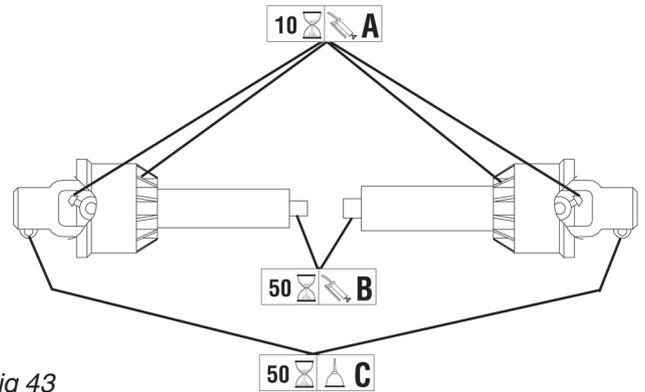


Fig 43

Support leg

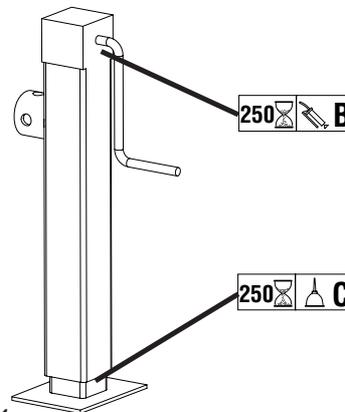


Fig 44

Wheel bearings

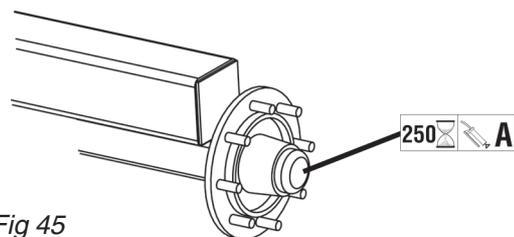


Fig 45



WARNING! Always use Personal Protective Equipment when cleaning or servicing your sprayer

SERVICE AND MAINTENANCE SCHEDULE

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 32)).

8 Drawbar bolts

Re-tighten (Refer *Torque settings* (Page 32)).

9 Tyres

Check pressure (Refer *Tyre pressures* (Page 32)).

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.

10 Hours / Daily Service

1 Suction filter (on front left side of chassis)

To service the suction filter:

- 1 When Main Tank is empty, pull the steel clip (A Fig 46) out.
- 2 Lift suction hose fitting (B Fig 46) from the housing.
- 3 The filter guide and filter (C Fig 46) can now be removed.

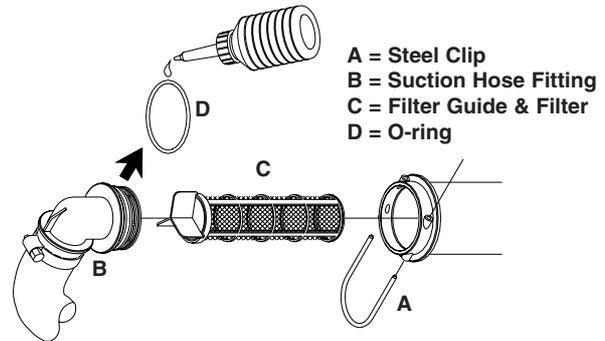


Fig 46

To reassemble:

- 1 Press the guide onto the filter end.
- 2 Place filter into the housing with the guide facing up.
- 3 Ensure the O-ring (D Fig 46) on the hose fitting is in good condition and lubricated.
- 4 Refit suction hose (B Fig 46) and steel clip (A Fig 46).

2 Self cleaning filter

Read Self cleaning filter section of Operators Manual.

- 1 Unscrew the filter nut (A Fig 47) and open the filter.
- 2 Check the filter gauze (B Fig 47). Clean and check there are no residues on any part of the filter hoses. For Replacement Parts, see Pages 38-39 .
- 3 Lubricate the O-ring (C Fig 47).
- 4 Reassemble the filter.

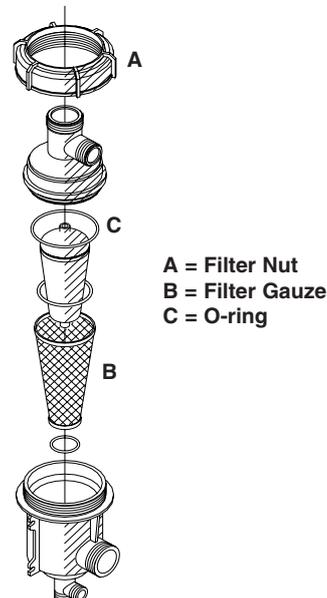


Fig 47

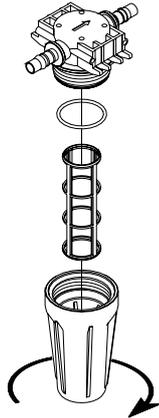


Fig 48

3 In-Line filters (If fitted)

If the sprayer is equipped with In-line filters, unscrew the filter bowl to inspect and clean a filter. Lubricate O-rings.



Fig 49

4 Nozzle filters

- 1 Remove the nozzle.
- 2 Clean the nozzle, filter and filter gasket.
- 3 Check parts for deterioration. Replace if necessary.
- 4 Refit filter and nozzle. Repeat for each nozzle.

Alternative filters are available. Refer to *Filters*, (Page 16) and *Filters*, (Page 38-39).

Further details can be obtained through your local Hardi dealer or on the Hardi website www.hardi.com.au

50 Hours / Weekly Service

6 Wheel studs and nuts

Tighten wheel studs and nuts as follows with the following torque wrench settings:

Wheel hub to rim plate: 490 Nm (362 lbf-ft)

Rim plate to rim: 310 Nm (230 lbf-ft)

Tightening sequence:

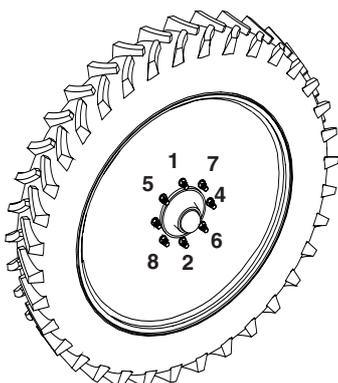


Fig 50

7 Draw bar bolts

The draw bar bolts must be tightened as follows:

- 1 Jack up chassis so there is no load on the drawbar.
- 2 Tighten chassis bolts (under flush tank) (A Fig 51) - 370 Nm (270 lbf-ft).
- 3 Tighten hitch bolts (B Fig 52) - 370 Nm (270 lbf-ft).

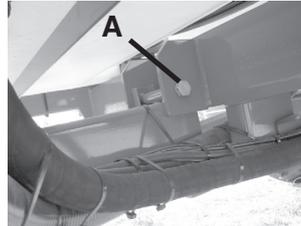


Fig 51

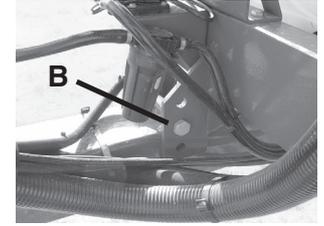


Fig 52

8 Tyres

Check tyre pressures against the table below, and the Load Limit table on page 32.

TYRE	PRESSURE (kPa)	
	Road (Max)	Work (Recommended)
12.4 x 46	240	145-155
18.4 x 38	240	145-155
18.4 x 30	200	145
23.1 x 30	200	145

WARNING! Over-inflated tyres may explode and cause severe damage or personal injuries.

9 Transmission shaft

Check function and condition of the transmission shaft's protection guards.

Replace any damaged parts immediately.

250 Hours / Monthly Service

10 Wheel bearings

Check for play in the wheel bearings:

- 1 Place stop wedges in front of and behind the left hand wheel and jack up the right hand wheel.
- 2 Rock the right hand wheel to discover possible play in the bearings.
- 3 If there is any play, support the wheel axle to prevent the trailer from falling down from the jack.
- 4 Remove the hub cap (A Fig 53) and cotter pin (B Fig 53). Turn the wheel and tighten castelated nut (C Fig 53) until slight resistance in wheel rotation is felt.
- 5 Loosen castelated nut until first notch - horizontal or vertical - is aligned with cotter pin hole in the shaft.
- 6 Fit a new cotter pin and bend it.
- 7 Fill the hub cap with fresh grease and press it on to the hub again.
- 8 Repeat the procedure on the left hand wheel.

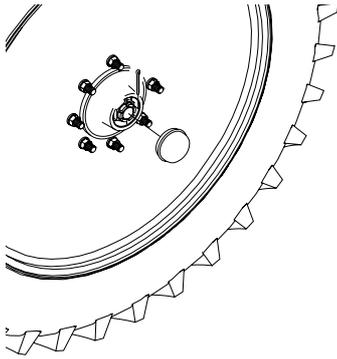


Fig 53

11 Hoses and tubes

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

1000 Hours / Yearly Service

12 Wheel bearings

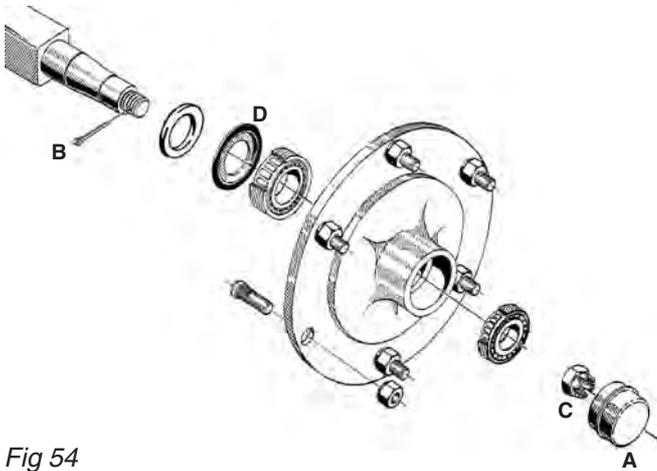


Fig 54

Check the condition of the bearings the following way:

- 1 Place stop wedges in front of and behind the left hand wheel and jack up the right hand wheel.
- 2 Support the trailer with axle stands.
- 3 Remove the wheel.
- 4 Remove the hub cap (A Fig 54), cotter pin (B Fig 54) and castle nut (C Fig 54).
- 5 Pull off wheel hub. Use a wheel puller if necessary.
- 6 Check roller bearings for discoloration and wear - renew if worn or damaged.
- 7 Assemble the hub and bearings using a new sealing ring (D Fig 54).
- 8 Fill the hub and bearings with fresh grease before fitting to the shaft.
- 9 Fit castelated nut. Rotate hub and tighten the castelated nut until a slight rotation resistance is felt.
- 10 Loosen the castelated nut again until the first notch is aligned with the cotter pin hole in the shaft.

NOTE! The shaft has a vertical and a horizontal cotter pin hole. Use the one first aligned with the notch when loosening the castelated nut.

Occasional maintenance

Maintenance and renewal intervals for the next points depend very much on conditions under which sprayer operates, and are therefore impossible to specify.

363 pump

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

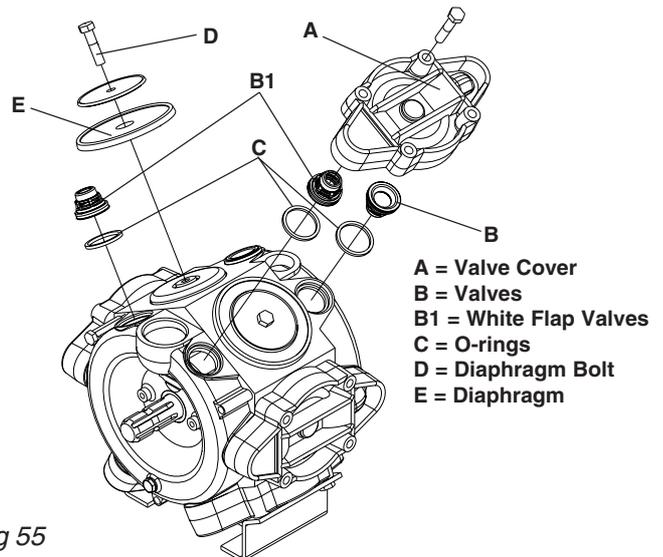


Fig 55

Changing valves

- 1 Remove the valve covers (A Fig 55). Before changing the valves (B Fig 55 & B1 Fig 55) note their orientation so they are replaced correctly.
- 2 The two white flap valves (B1 Fig 55) must be placed in the valve openings as shown. It is recommended to use new O-rings (C Fig 55) when changing or checking the valves.

Changing diaphragms

- 1 With the valve covers removed as explained above, remove the diaphragm bolts (D Fig 55).
- 2 The diaphragms (E Fig 55) may now be changed.
- 3 If fluids have reached the crankcase, re-grease the pump thoroughly. Ensure the drain hole at the bottom of the pump is clear.

NOTE! When tightening diaphragm cover it must be ensured that diaphragm is **in neutral or out**. If the diaphragm is in negative, the edge of the diaphragm is not seated correctly in the diaphragm cover. This will damage the diaphragm which will not seal correctly after being re-assembled. Rotate the pump until the diaphragm is neutral or out.

- 4 Reassemble with torque settings as in *Torque* (P 32).

EC operating unit valve cone

Ball seat check / renewal, EC On / Off valve

If the main ON / OFF valve does not seal properly (indicated by dripping nozzles when main ON / OFF valve is closed), the ball and seat should be checked.

Remove the 2 bolts fixing the main ON / OFF pressure valve unit to the bracket, unscrew the union nut A and pull the valve away from the distribution valves.

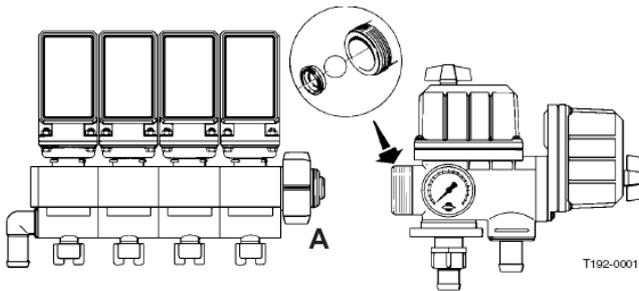


Fig 56

Check the ball for sharp edges and scratches, and check the ball seat for cracks and wear.

Replace if necessary. See *Replacement Parts*.

Cone check / renewal, EC distribution valve

Periodically check the distribution valves for proper sealing. Do this by running the sprayer with clean water and open on / off valve and all distribution valves.

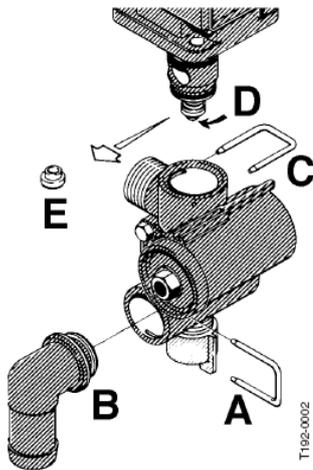


Fig 57

- 1 Cautiously remove the Clip (A Fig 57) and pull out Hose (B Fig 57) from the pressure equalisation device.
- 2 When the housing is drained, there should be no liquid flow through the pressure equalisation device. If there is any leakage, valve cone (E Fig 57) must be changed.
- 3 Remove Clip (C Fig 57) and lift the EC motor housing off the valve housing.
- 4 Then unscrew the screw (D Fig 57).
- 5 Replace the valve cone (E Fig 57).
- 6 Reassemble in reverse order.

Transmission shaft

Shield renewal

The replacement of defective shields is done as follows:

- 1 Push down on the universal cross cover and press in the tabs with a screwdriver. Maintain pressure until all three tabs are released.

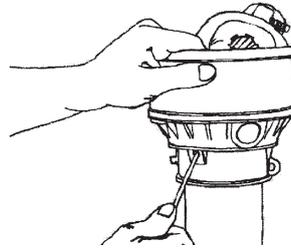


Fig 58

- 2 Remove the nylon bearing and pull off the protection

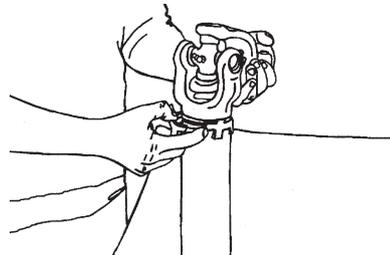


Fig 59

- 3 Grease the protection tube bearing groove on the inner yoke.

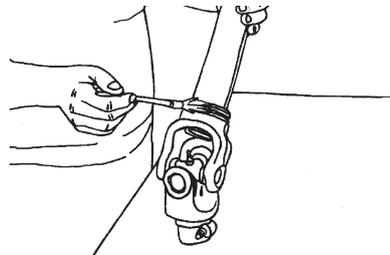


Fig 60

- 4 Slide on the shield tube and fit the bearings tabs into the slots.

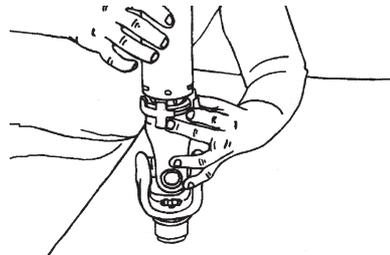


Fig 61

- 5 Slide the universal cross cover over the protection tube and align the grease nipple with the grease channel on the bearing. Press the universal cross cover onto the tabs until they lock.

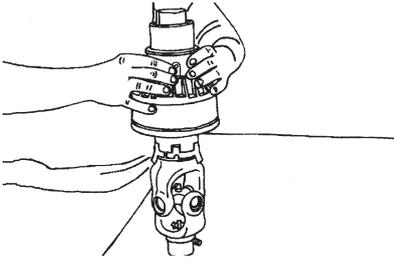


Fig 62

- 6 Check alignment and locking of the tabs by tapping the universal cross cover lightly.

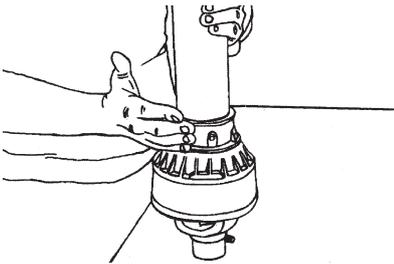


Fig 63

Constant velocity joint shielding renewal

- 1 Remove the screws holding the two halves of the shield together.

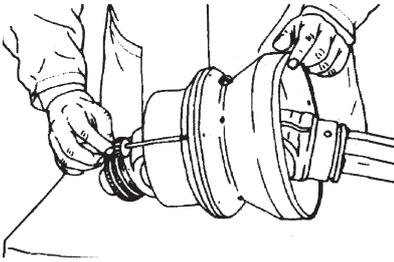


Fig 64

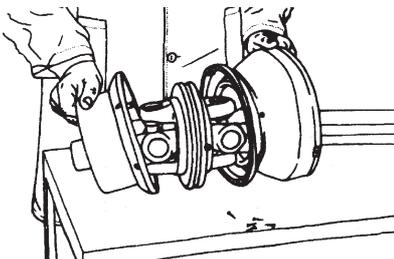


Fig 65

- 3 Lubricate the bearing surfaces on the central body of the joint. Align the two halves of the shield and secure with the screws.

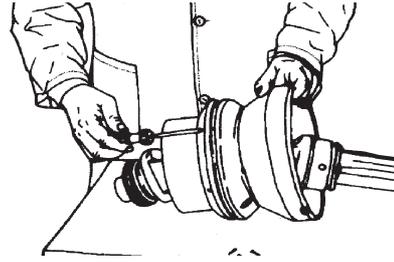


Fig 66

NOTE! Use only genuine spare parts to service the transmission shaft. For any other service or repair jobs on the transmission shaft contact your HARDI dealer.

Shock absorbers

If the shock absorbers loose their efficiency or start leaking oil, they should be replaced.

Level indicator

The level indicator should be checked regularly. When the tank is empty, the floater should rest on the stop pin at the bottom of the rod inside the tank, and the O-ring at the sight gauge indicator should be positioned at the top position line (A Fig 67).

If any deviation is found, pull out the plug (B Fig 67), loosen the screws (C Fig 67) and adjust the length of the cord.

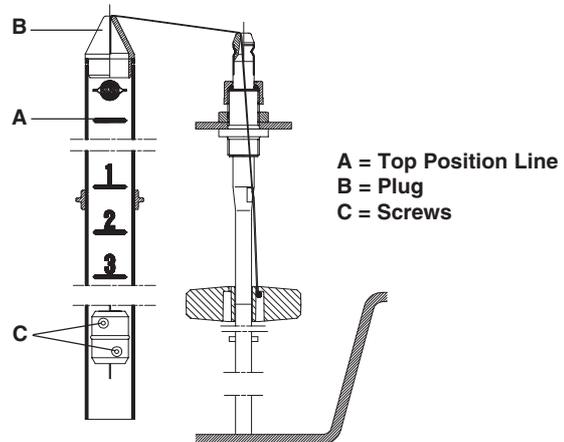


Fig 67

Cord renewal

If the cord on the level indicator has to be changed, the float guide pole must be removed:

- 1 Remove the tank drain valve (Refer *Drain valve seal, next page*) and loosen the fitting holding the pole in position.
- 2 Pull the pole down through the drain valve hole until it is free in the top of the tank.
- 3 Pole can now be taken out of tank through filling hole.

⚠ DANGER! Do not attempt to enter the tank - the float pole can be removed from outside the tank!

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.

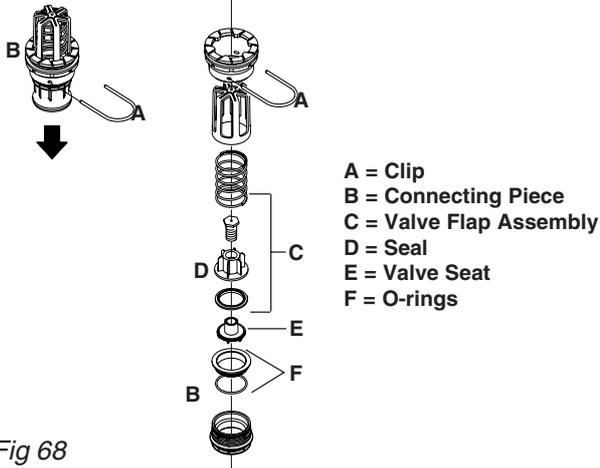


Fig 68

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

- 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 68) and pull down the connecting piece (B Fig 68). The entire valve assembly can now be pulled out.
- 4 Check the cord and valve flap assembly (C Fig 68) for wear, replace the seal (D Fig 68) and reassemble.
- 5 Assemble the valve assembly again using a new valve seat (E Fig 68). Lubricate the O-rings (F Fig 68) before assembly.
- 6 Fit the clip (A Fig 68) again.

Hoses and fittings

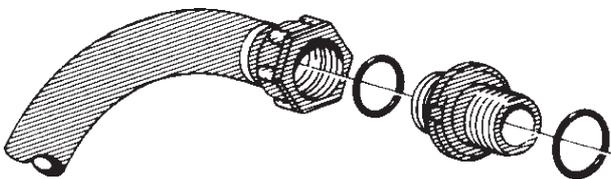


Fig 69

Poor seals are usually caused by missing, damaged, dry, deformed or incorrectly seated O-rings or gaskets or foreign bodies.

Therefore, in case of leaks, **do not over-tighten**.

For **radial** connections, only hand tighten them.

- Disassemble, check condition and position of O-ring or gasket, clean, lubricate and reassemble.
- Lubricate O-ring **all the way round** before fitting on to the nozzle tube. Use non-mineral lubricant.

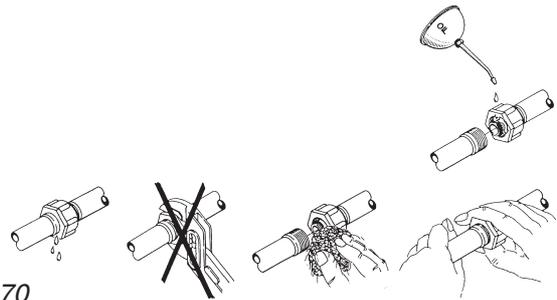


Fig 70

For **axial** connections: a little mechanical leverage may be used.

Tyres

Should it be necessary to replace tyres, use these rules when doing so, or 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 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.
- Inspect inside the tyre for cuts, penetrating objects or other damage. Repair before installing 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 an appropriate lubricant means 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 not, deflate the assembly & re-centre the beads before starting inflation. 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 max mounting pressure moulded on the tyre.
- After mounting tyres adjust inflation pressure to operation pressure recommended by the tyre manufacturer. *See Tyre pressures and Load limits (P 32).*

WARNING! Bad seating of the tyre on the rim could cause the tyre to burst, leading to serious injury or death.

CAUTION! Never mount or use damaged tyres or rims!

CAUTION! Using damaged, ruptured, distorted, welded or brazed rims is not acceptable and may be the cause of serious injury.



Storage

When the spraying season is over, you should devote some extra time to the sprayer. Chemical residues left in the sprayer for long periods, it can reduce the life of the individual components.

Preparation for 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 19). 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 stored in a frost-prone area, 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 lube points regardless of intervals stated.
- 6 When 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 DW9011M1. 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 against damp, dirt and corrosion.
- 11 Remove any control boxes and the HARDI Pilot 3880 from the tractor and store them inside where it is dry and clean.
- 12 Wipe hydraulic snap-couplers clean and fit dust caps.

- 13 Apply grease onto all hydraulic ram piston rods not fully retracted into the barrel, to protect against corrosion.
- 14 Chock up wheels to prevent moisture damage and deformation of tyres. Tyre black can help preserve the rubber.
- 15 To protect against dust the sprayer can be covered by a tarpaulin. Ensure ventilation to prevent condensation.

Preparing your sprayer for use 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:

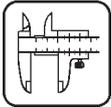
- Minor leaks on the suction side of the pump, which will reduce the pump capacity or stop the suction completely.
- A clogged suction filter will hinder or prevent suction so that the pump does not operate satisfactorily.
- Clogged up pressure filters will result in increasing pressure at the pressure 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, the correct size and in good condition.
- 4 Pressure gauge is in good working order (Correct spray dosage depends on it).
- 5 EC 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, eg the *SPB/SPC EAGLE 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 24)	

Problem	Probable cause	Control / Solution
EC 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
363 540 rpm pump	
Valve cover bolts	78
Diaphragm bolt	80
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

EC

Bypass flow under the EC 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.

Tyre pressures

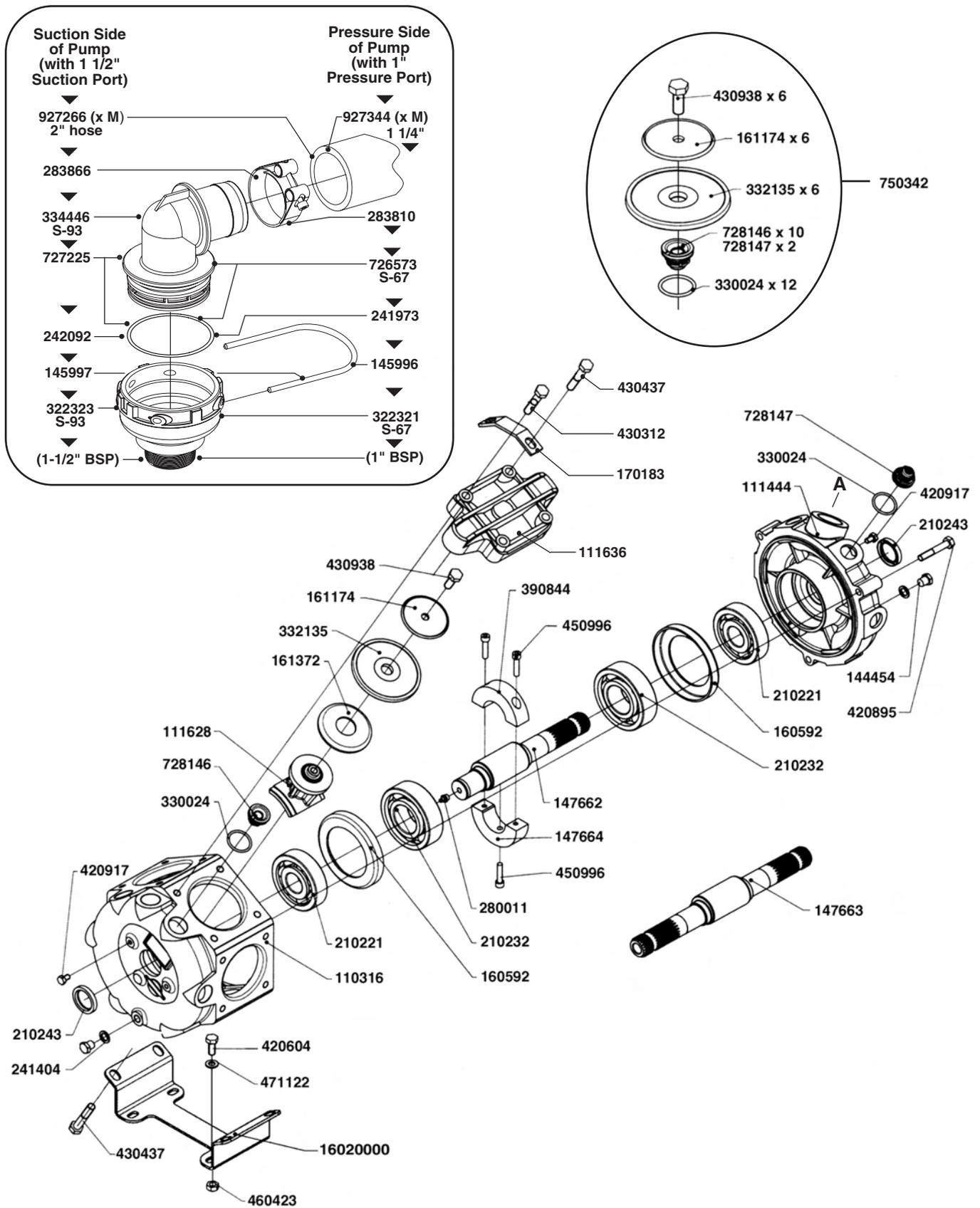
TYRE	MAX PRESSURE (kPa)	
	Road	Work
23.1 x 30	200	150
18.4 x 34	200	150
18.4 x 30	200	150
18.4 x 28	200	150
14.9 x 24	250	150
11.2 x 24	300	200
11.0 x 16	300	200
15R x 22.5	300	200



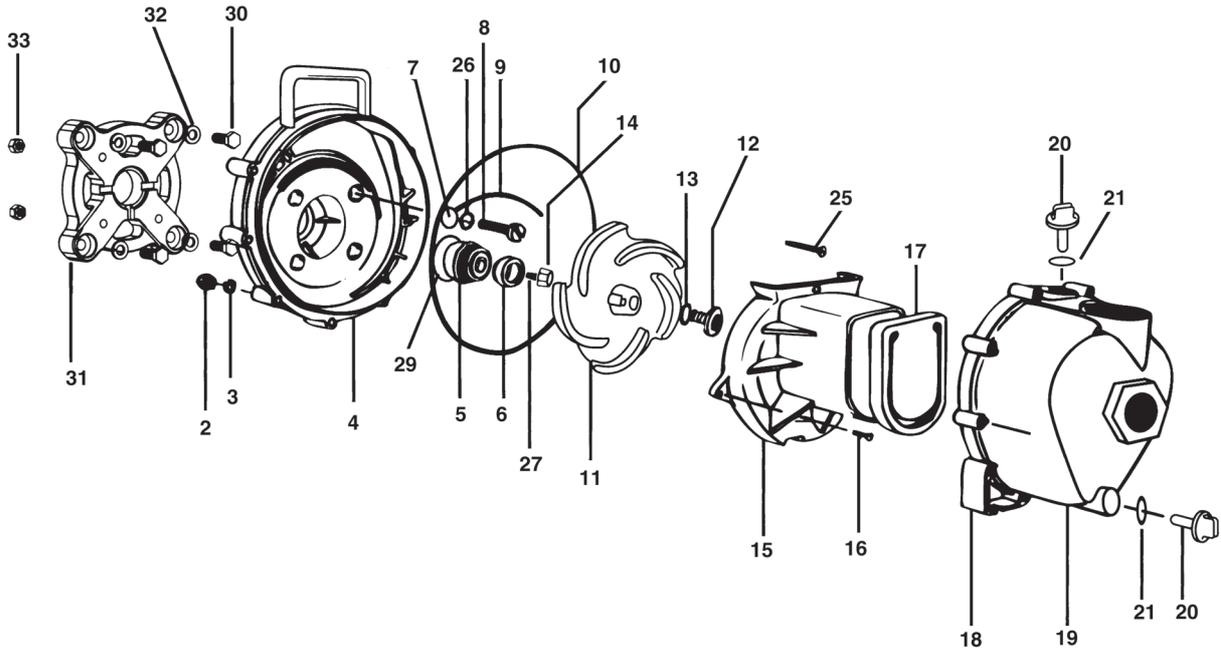
Replacement Parts

Drawing	Page
Drg 1 363 540 rpm pump	33
Drg 2 363 1000 rpm pump	34
Drg 3 Banjo pump (Opt)	35
Drg 4 Unit EC Divided	36
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3500 / 4000 EXPLORER



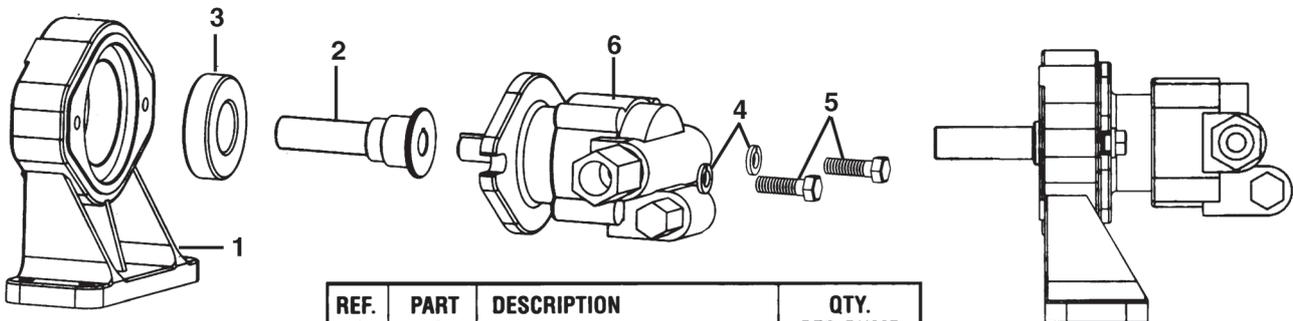
Drq 2
363 1000 rpm Pump



NO.	DESCRIPTION	PER	PART #
2	Body Nuts SS	10	V07019
3	Lock Washer SS	10	V07018
4	Poly Pump Rear Bracket	1	12703A
5 & 6	FKM (viton type) Seal Assembly+	1	12713V
7	Screw Heads "O" Ring+	4	12717V
8	Stainless Steel Rear Bracket Bolts	4	BF107
9	O-Ring Segment+	1	12754V
10	Body O-Ring+	1	12719AV
11	5 Vane Poly Pump Impeller+	1	12772
12	Impeller Bolt SS	1	12765A
13	Impeller Bolt Gasket+	1	12774VA
14	Impeller Hex Nut	1	12775A
15	Poly Pump Volute	1	12702A
16	Volute Screws SS	2	12725
17	FKM (viton type) Poly Pump Check Valve+	1	12705V
18	Poly Pump Body	1	12712AV
19	Body Screws SS	10	12720

NO.	DESCRIPTION	PER	PART #
20	Prime / Drain Plug	2	12777
21	Prime / Drain Plug O-Ring+	2	UV15163V
25	Upper Volute Screw SS	1	12900
26	Rear Bracket Washer SS	1	12901
27	Impeller Key	1	12902A
29	O-Ring for Seal Assembly+	1	12710V
30	Bolt for 56C Frame Adapter	8	17704
31	56C Frame Adapter	1	12046
32	Lock Washer For 56C Frame Adapter	8	V20018
33	Nut For 56C Frame Adapter	4	V10119
N/S	Base Plate	1	17701
N/S	Impeller Removal Bolt +	1	12099
N/S	Repair Kit	1	12000AED

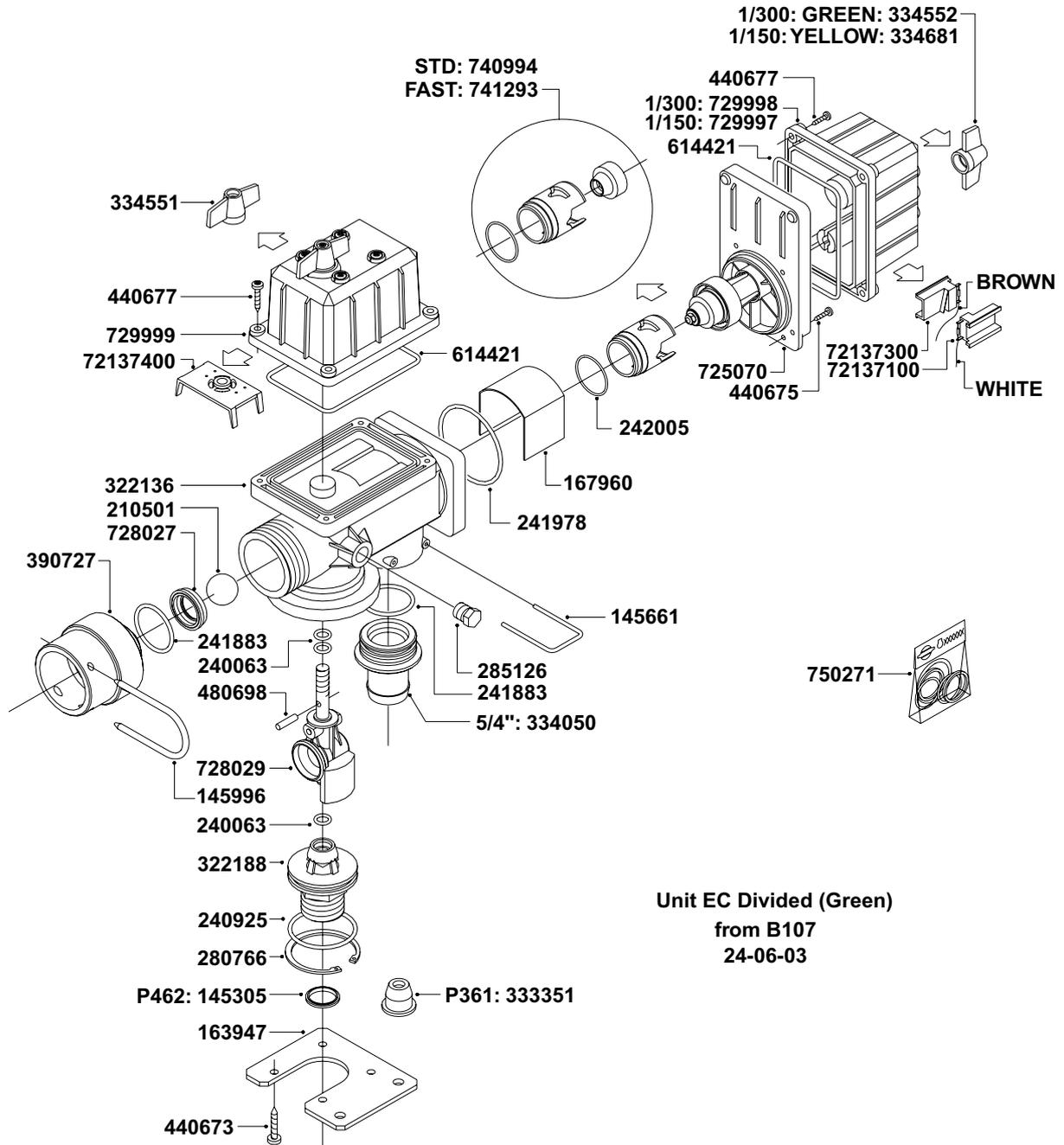
All Items Shown with a "+" Included In Repair Kit



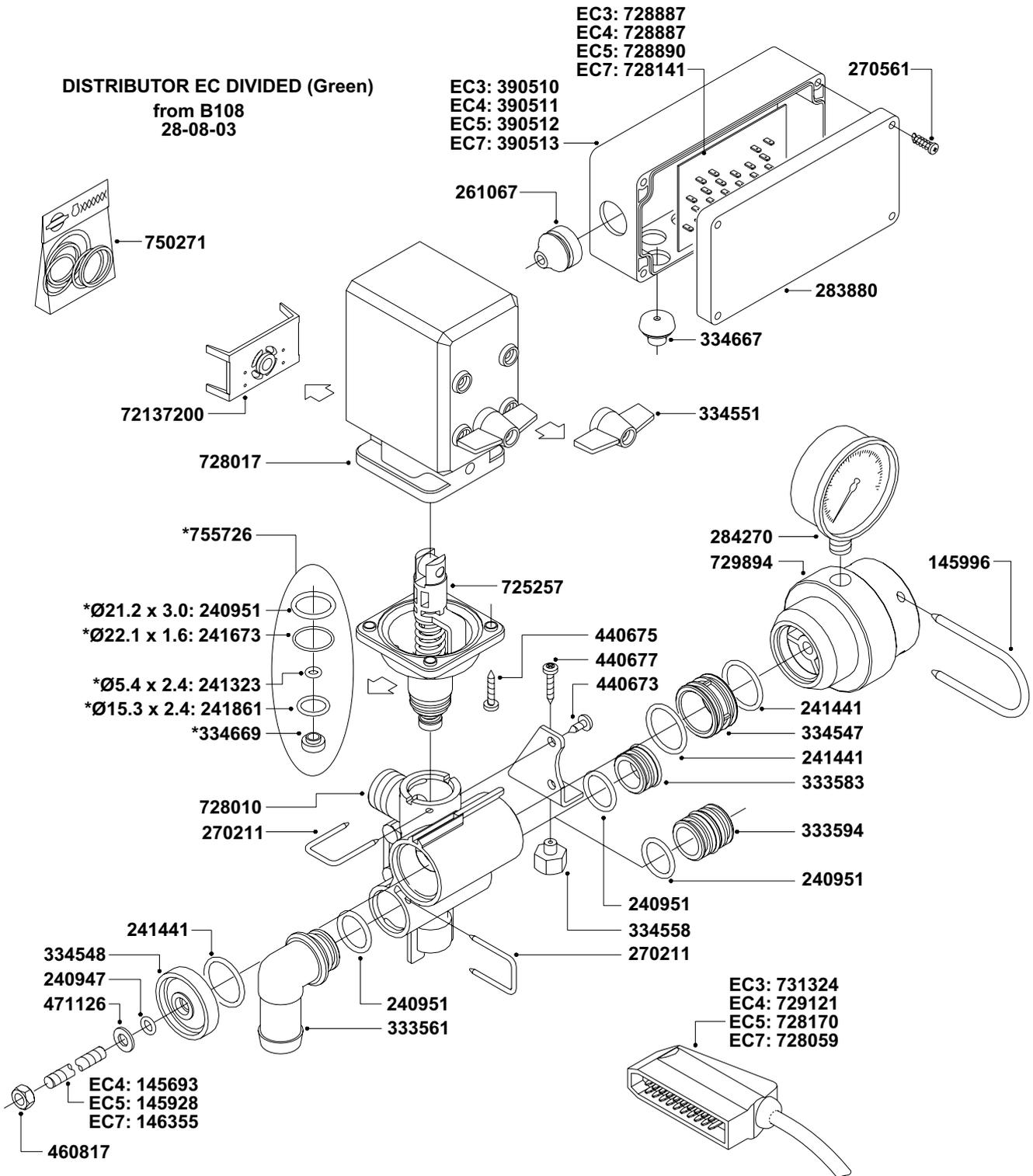
REF. NO.	PART NO.	DESCRIPTION	QTY. PER PUMP
1	12049B	Hydraulic Pedestal Housing	1
2	12055B	Adapter Shaft	1
3	17056	Bearing	1
4	V20018	3/8" Lockwasher	2
5	18010SS	3/8" - 16 x1.25" HHCS	2
6	HY1013	Gresen Hydraulic Motor	1
7	12600B	Complete Hydraulic Assembly	1

Complete Assembly
12600B

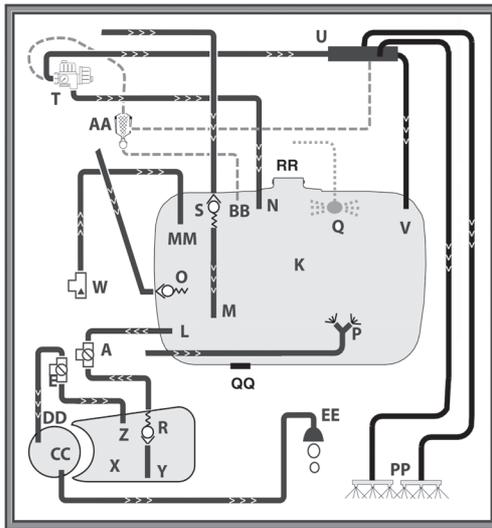
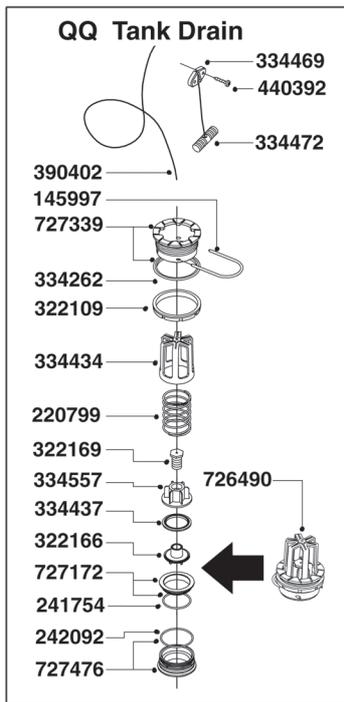
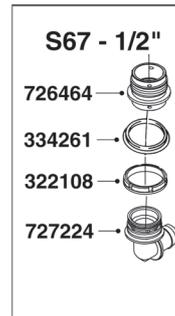
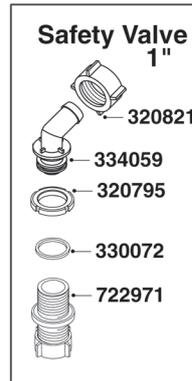
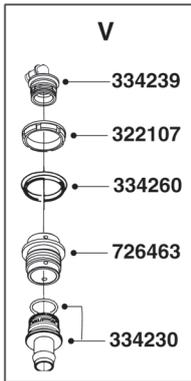
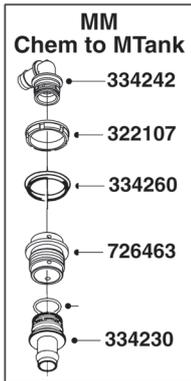
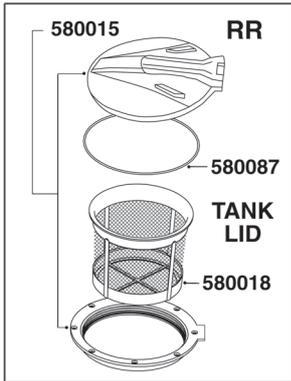
Drg 3 Banjo Pump (Optional)



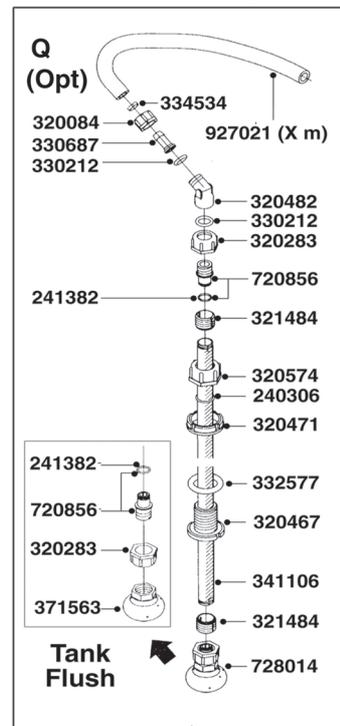
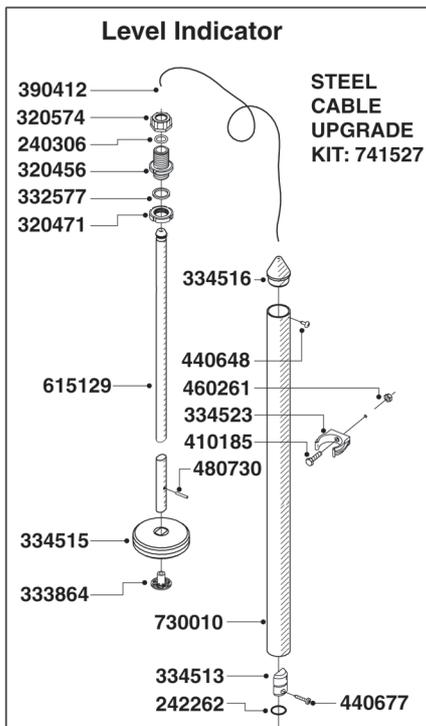
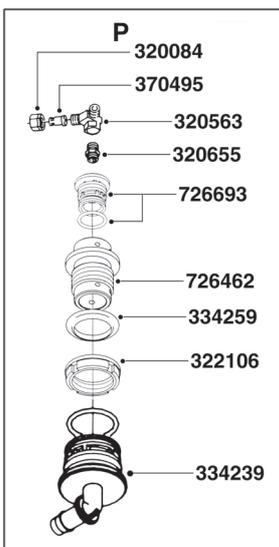
Drq 4
Unit EC Divided



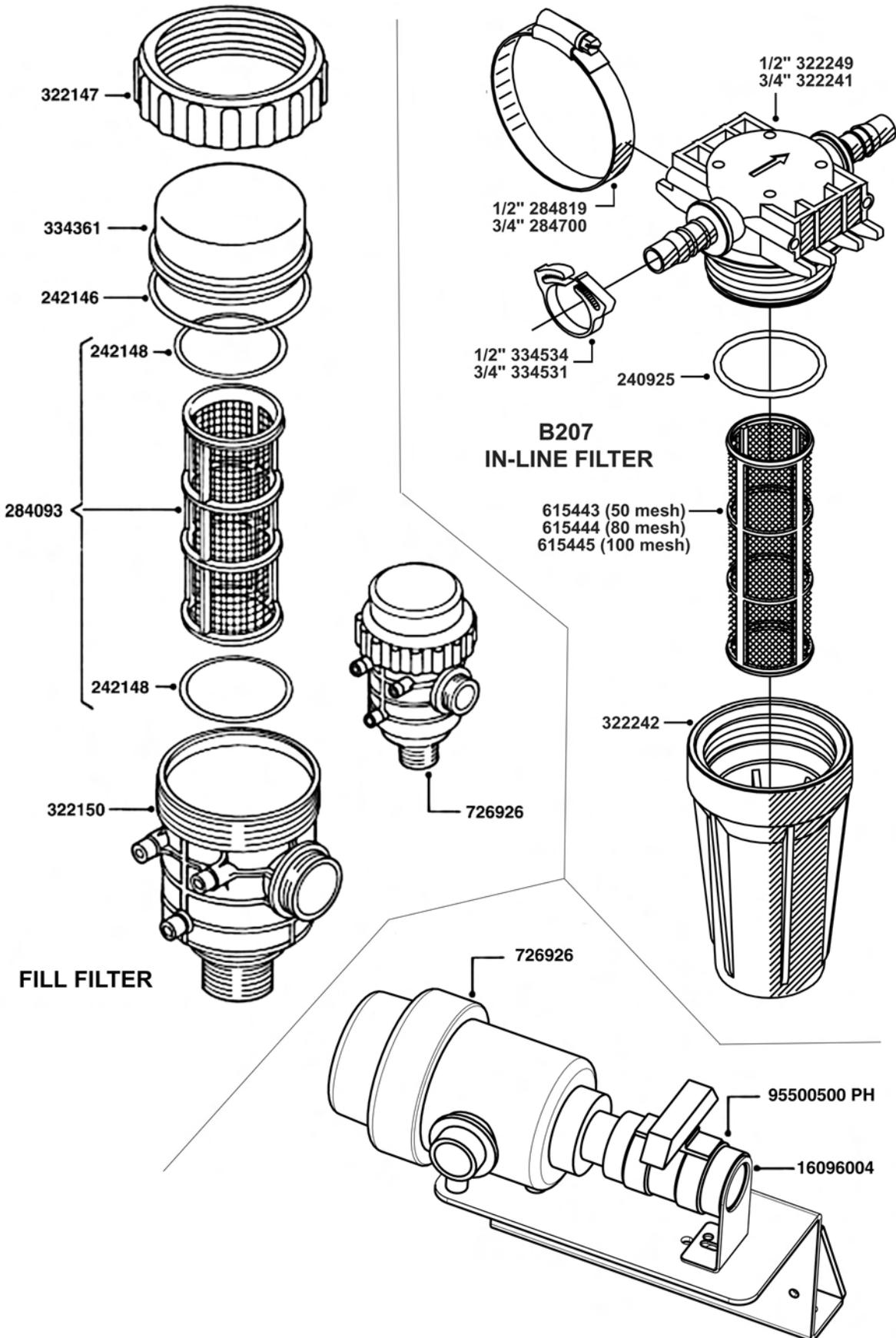
Drq 5
Distributor EC Divided



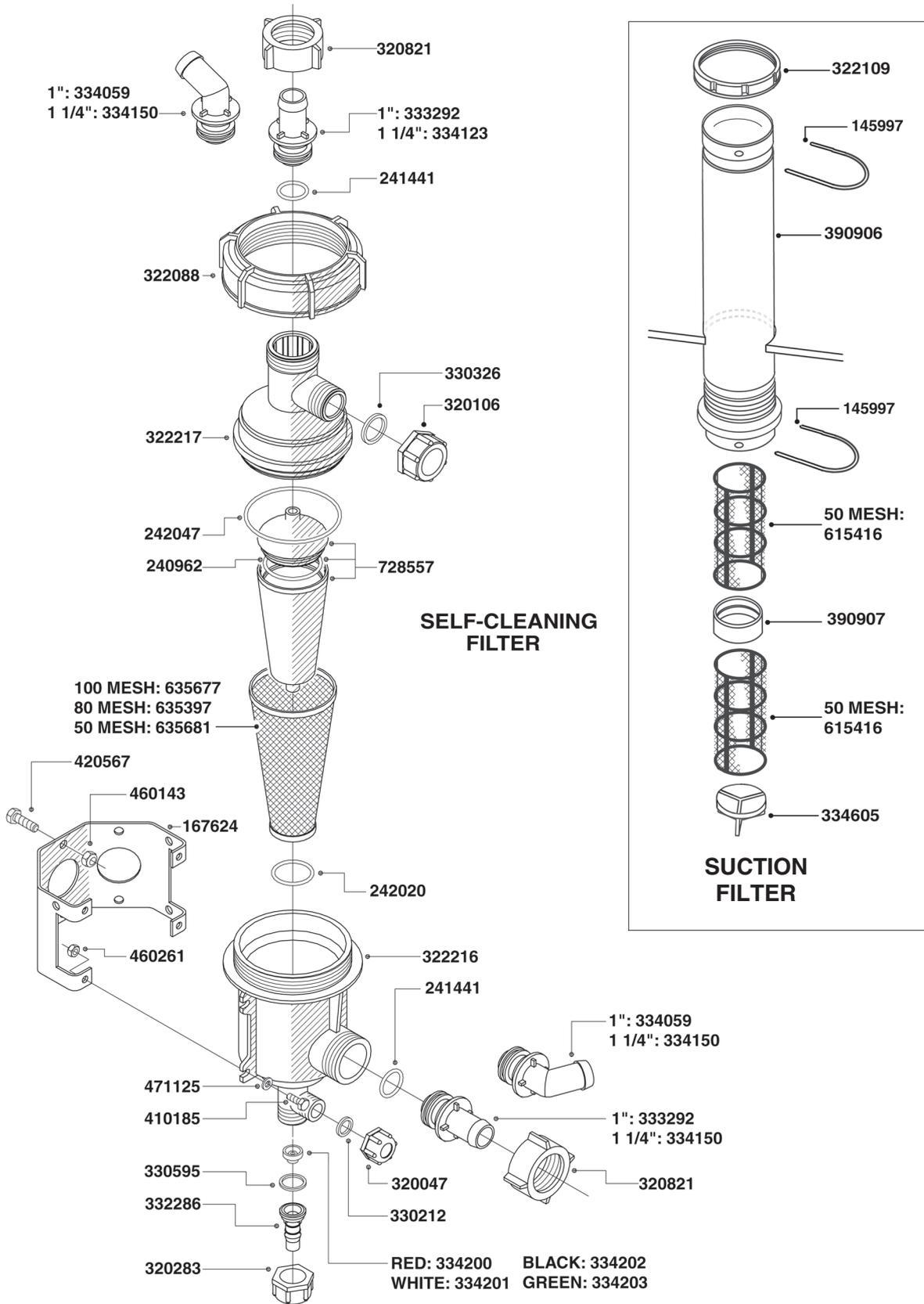
**See Page 11 for Detailed Plumbing Diagram



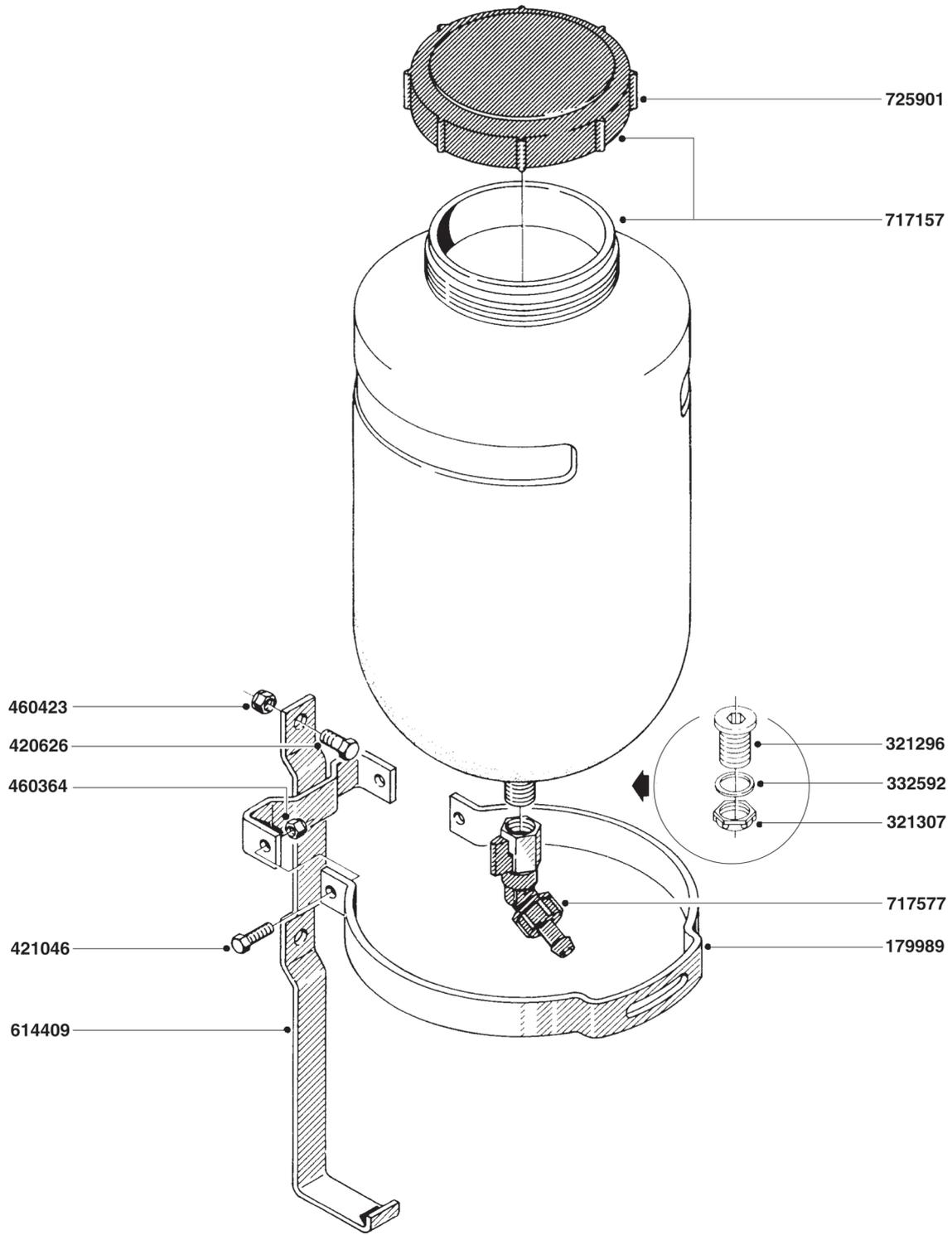
Drg 6
Main Tank Fittings



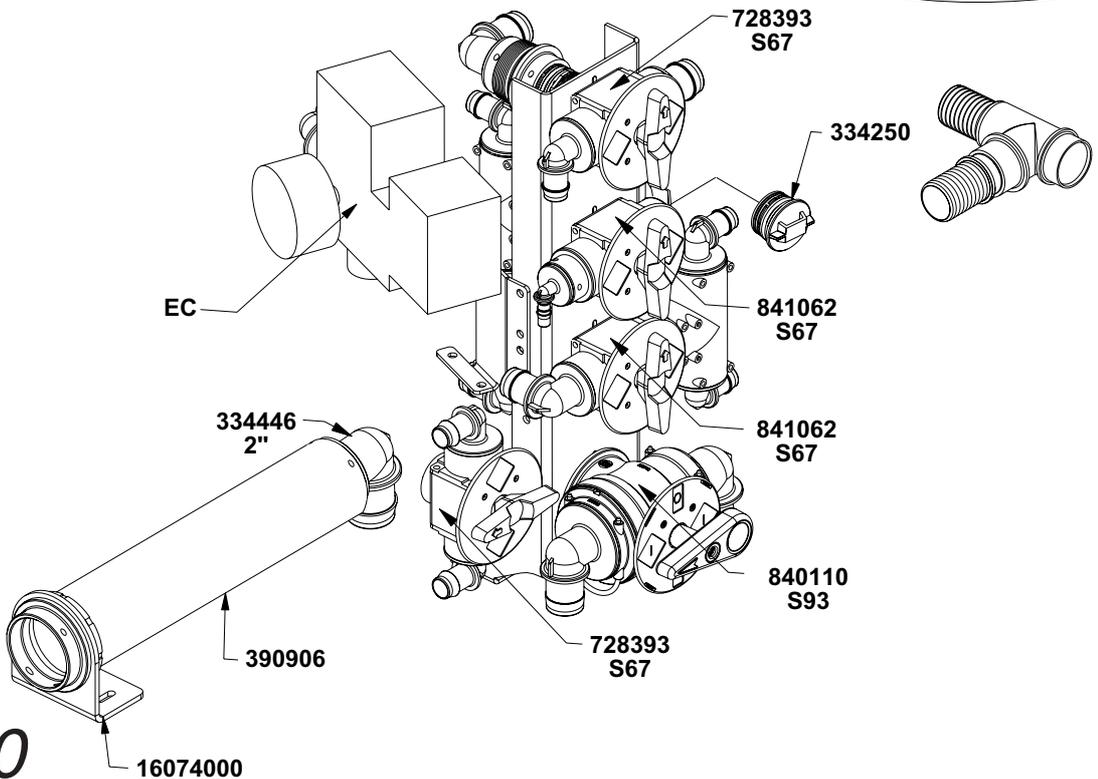
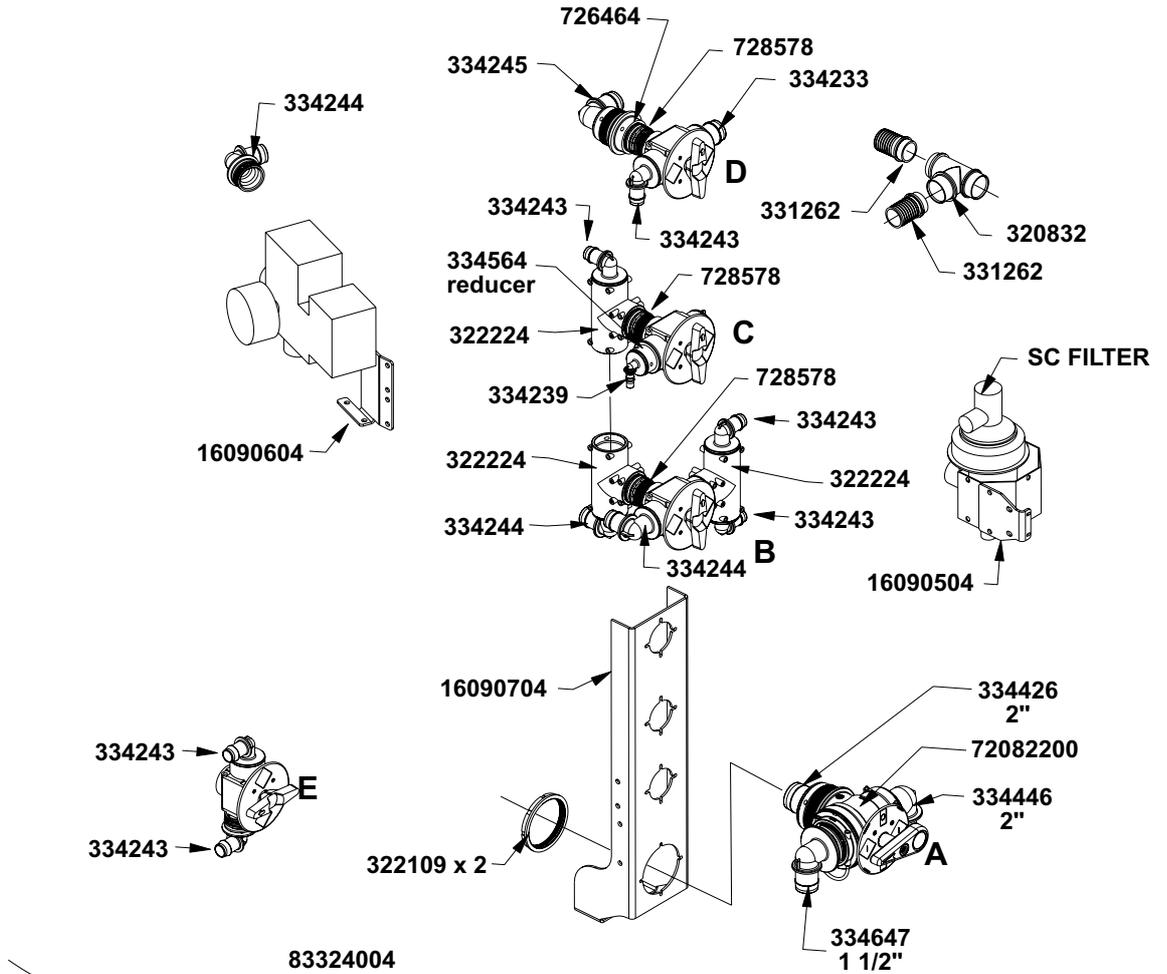
Drp 7
In-Line and Fill Filter



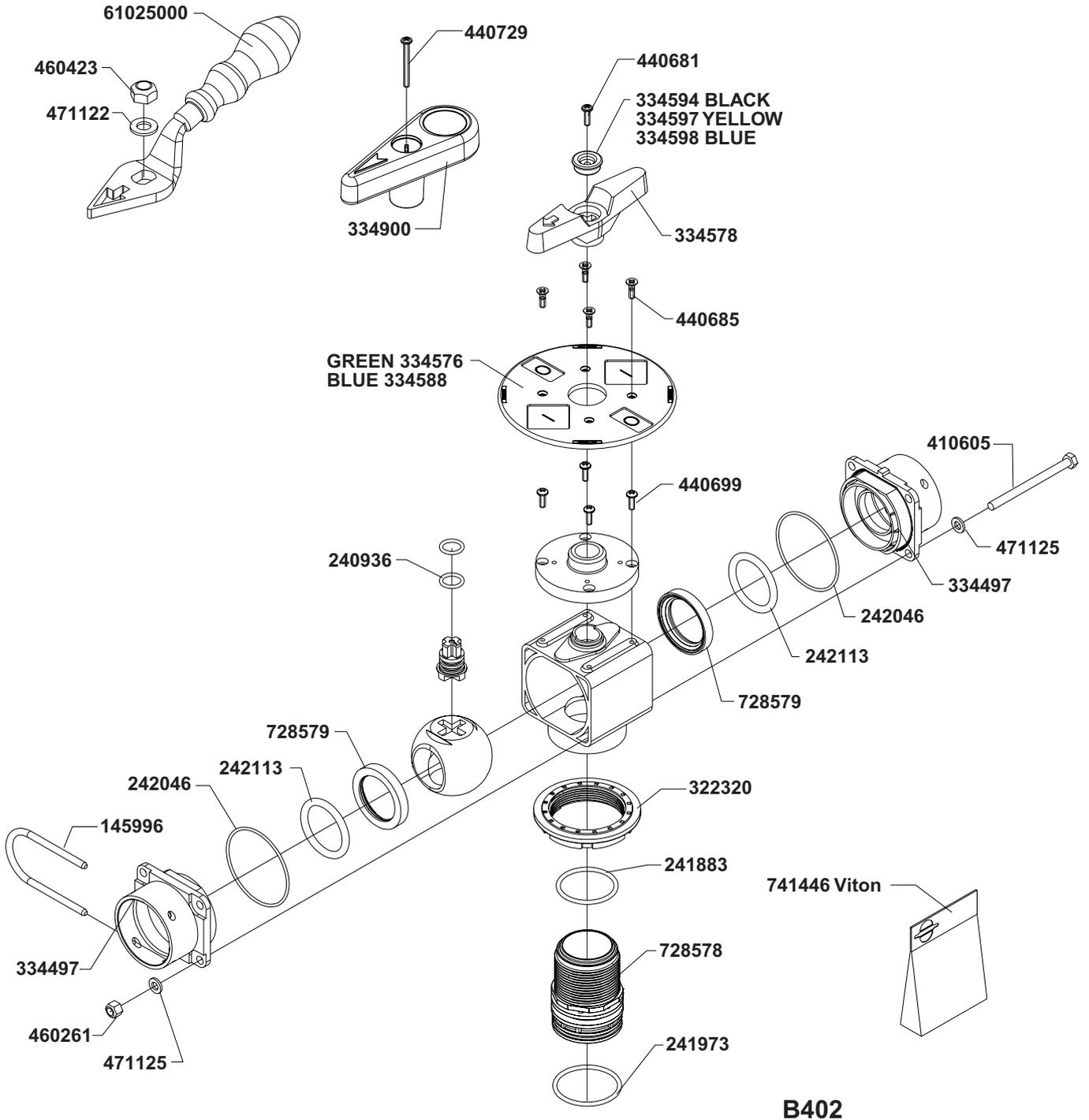
**Drp 8
Filters**



Drig 9
Hand Wash Tank



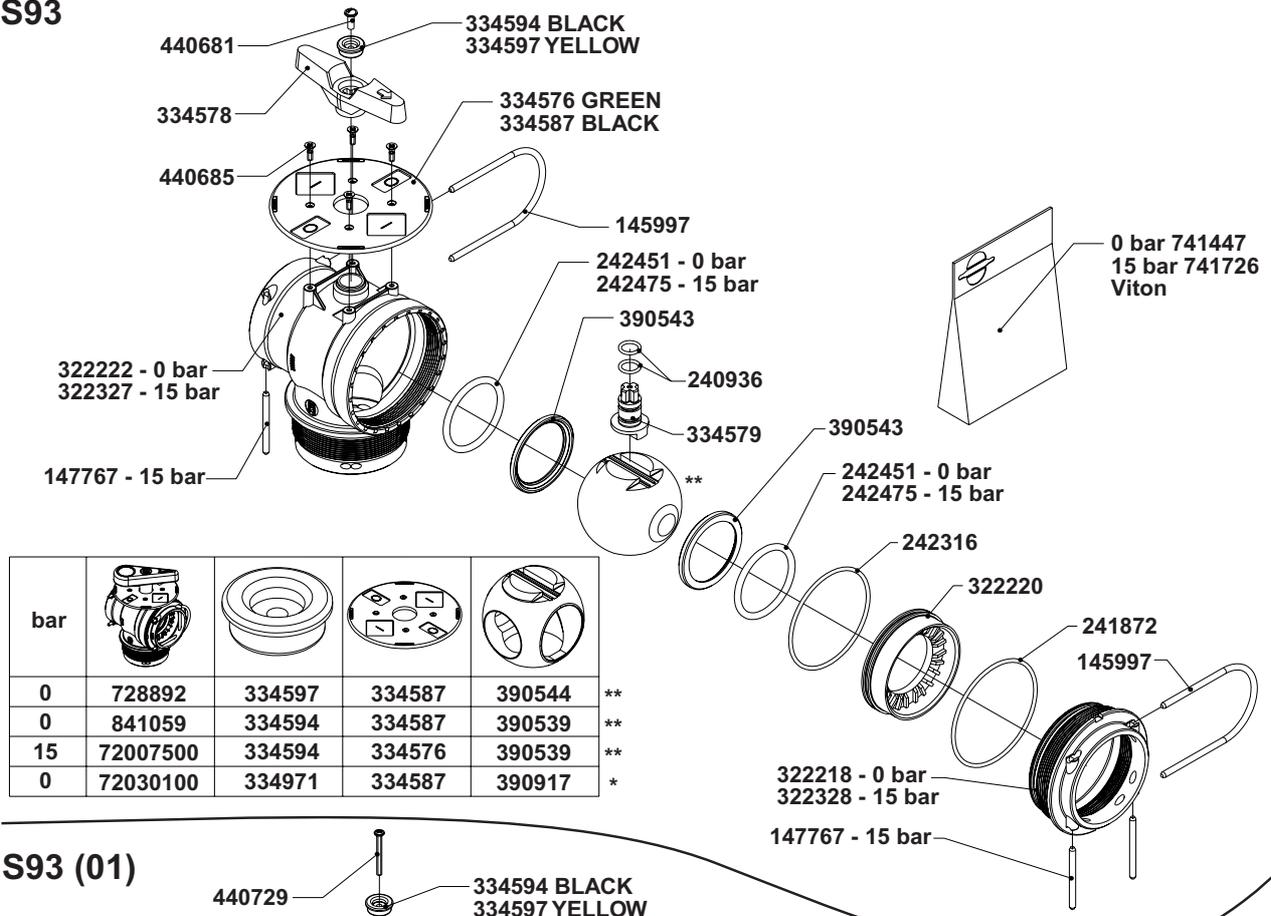
Drq 10
Explorer 35 00 / 4000 Manifold



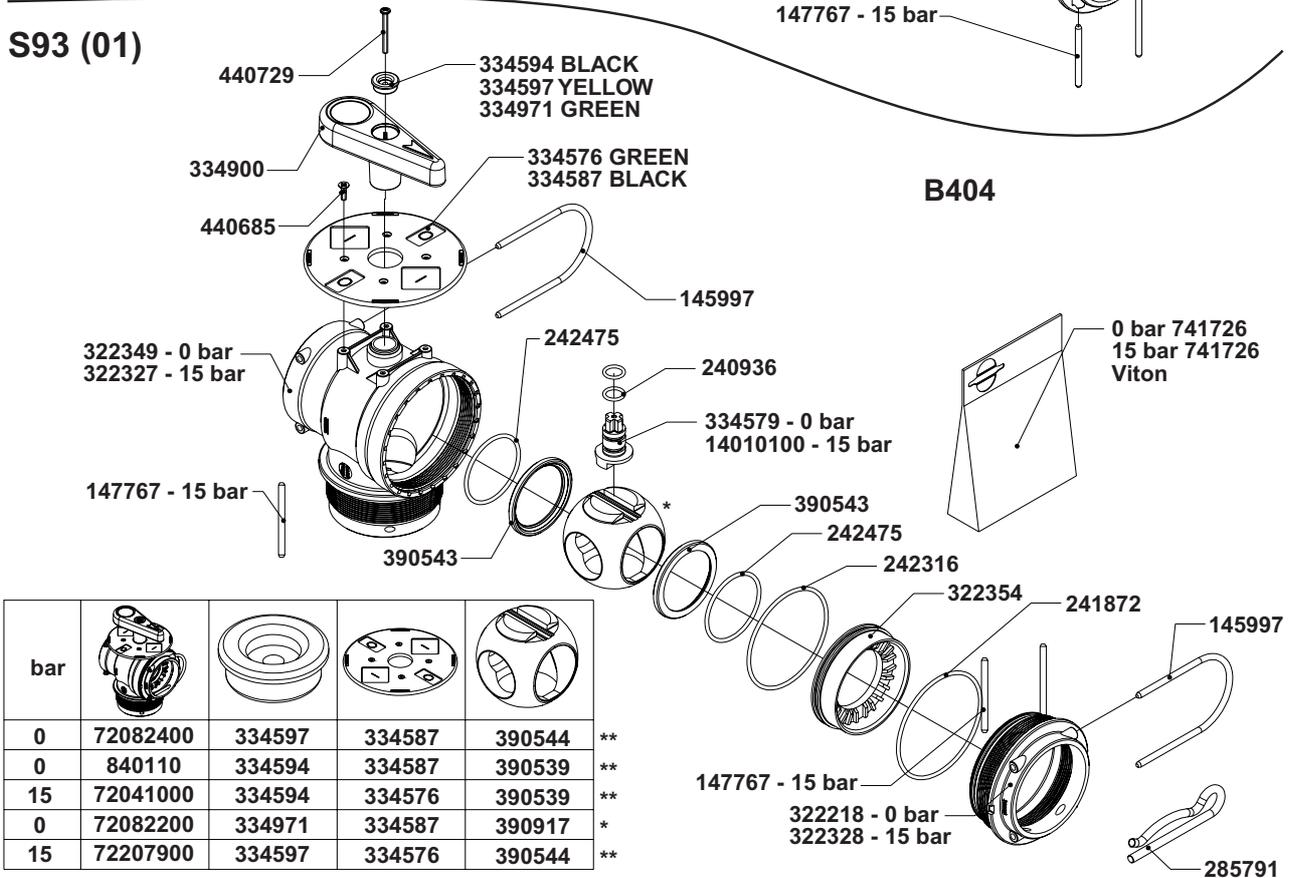
728393	334598	334588	390238	390777		334600
841062	334597	334576	390204	390623		334600
840062	334594	334576	390965	390623		334600
72172100		33501100	391039	390623	391023	14026500
72172200			391039	390623		334600

Drq 11
S67 Manifold

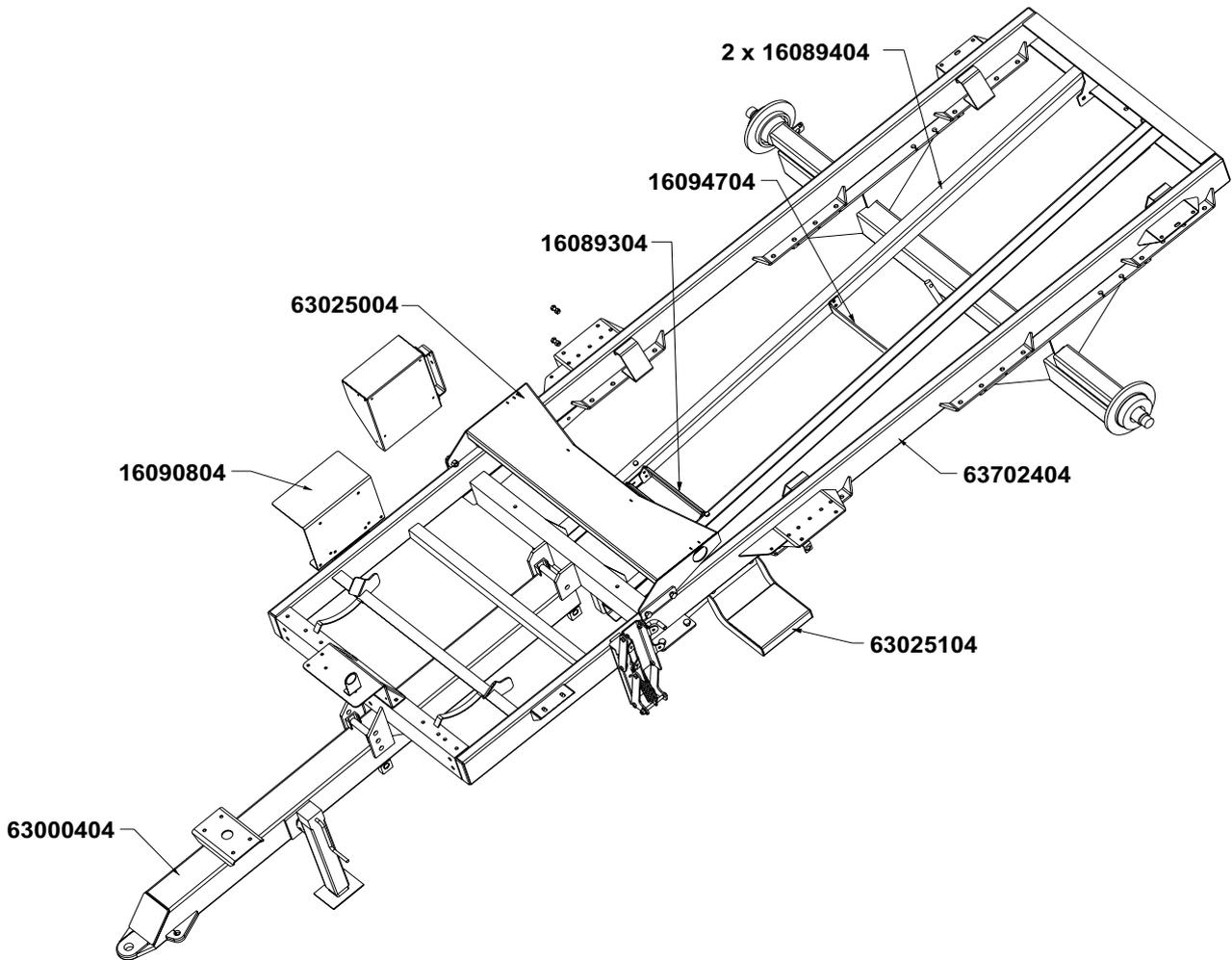
S93



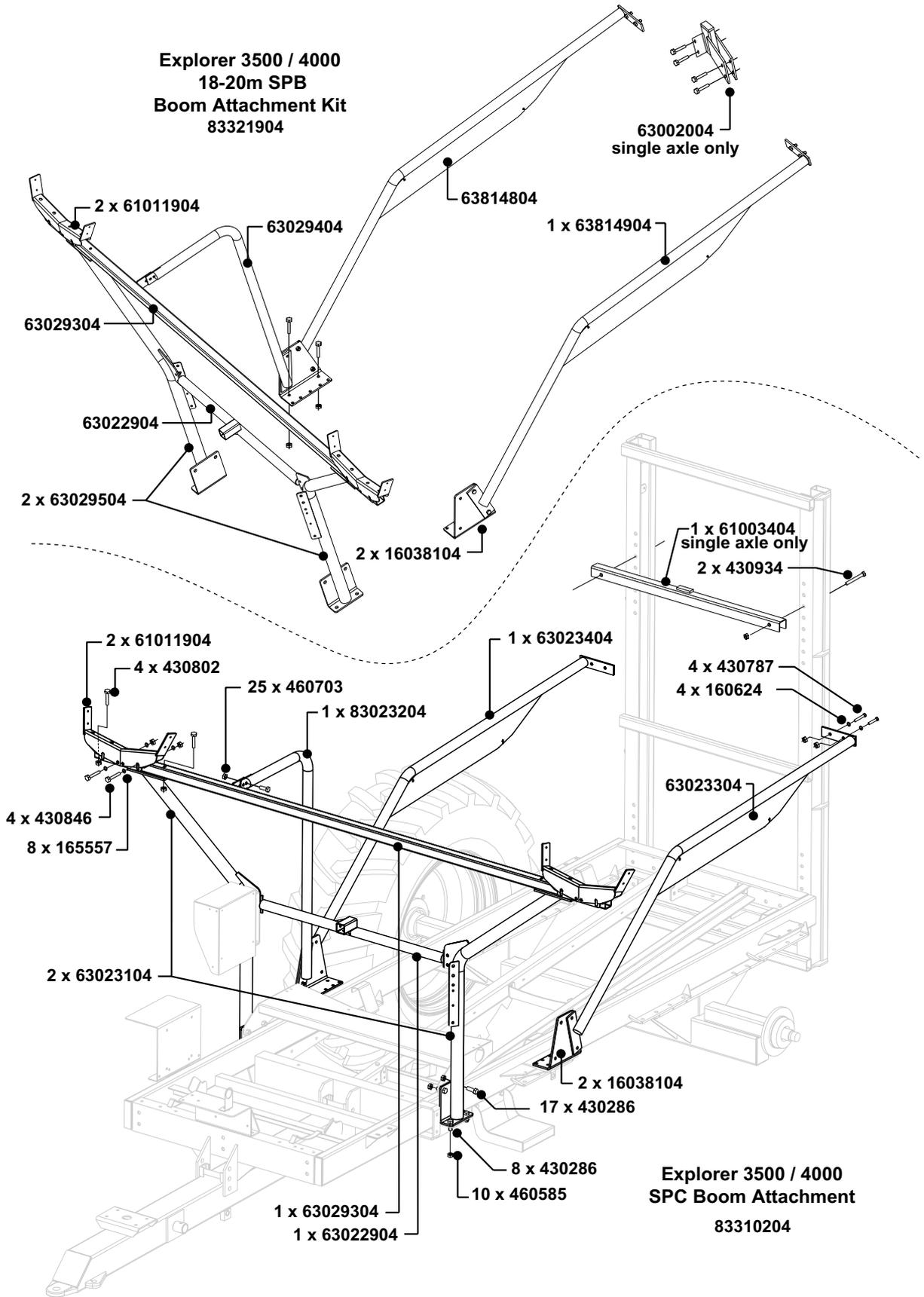
S93 (01)



Drg 12
S93 Manifold

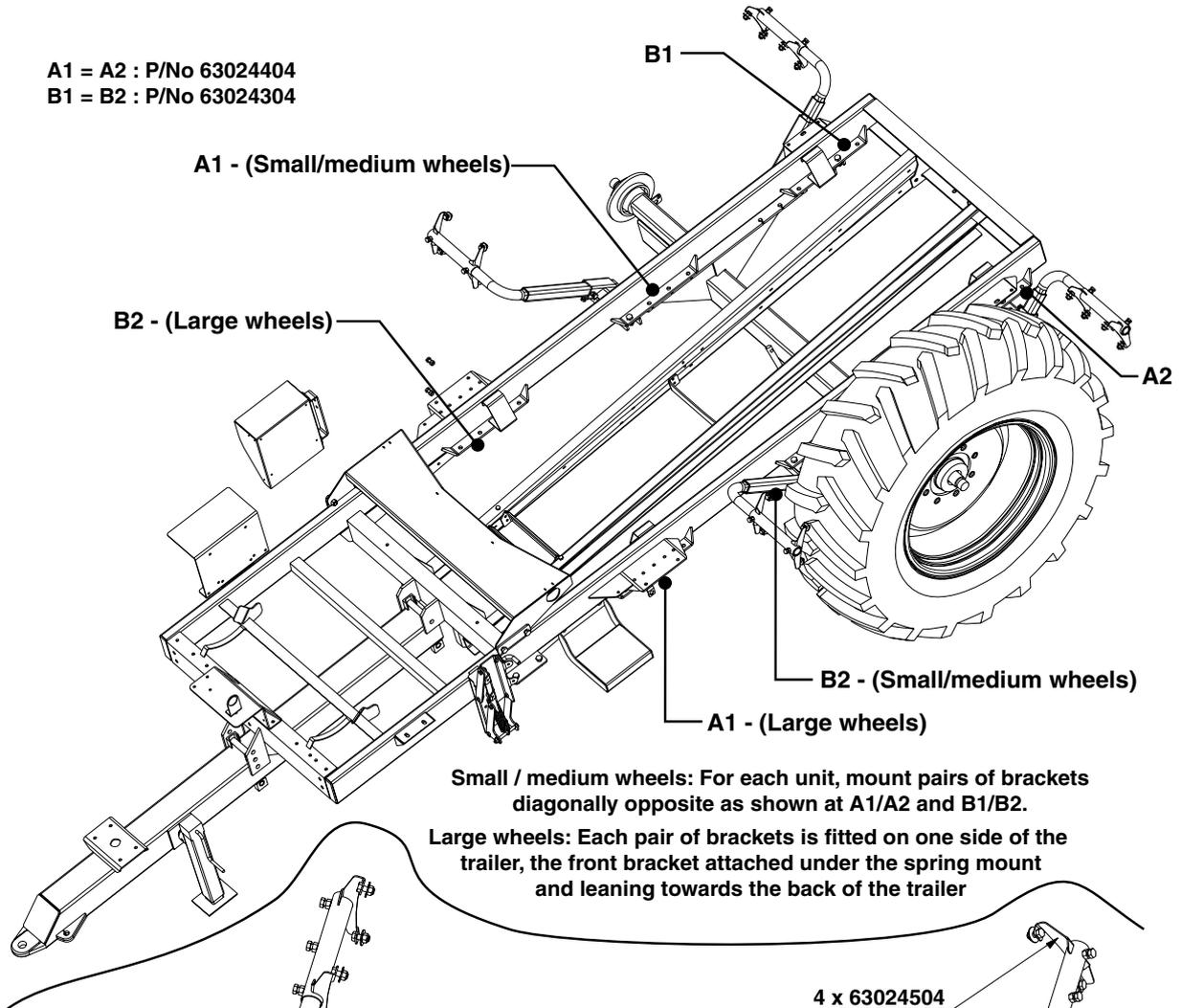


Drq 13
3500 / 4000 Chassis



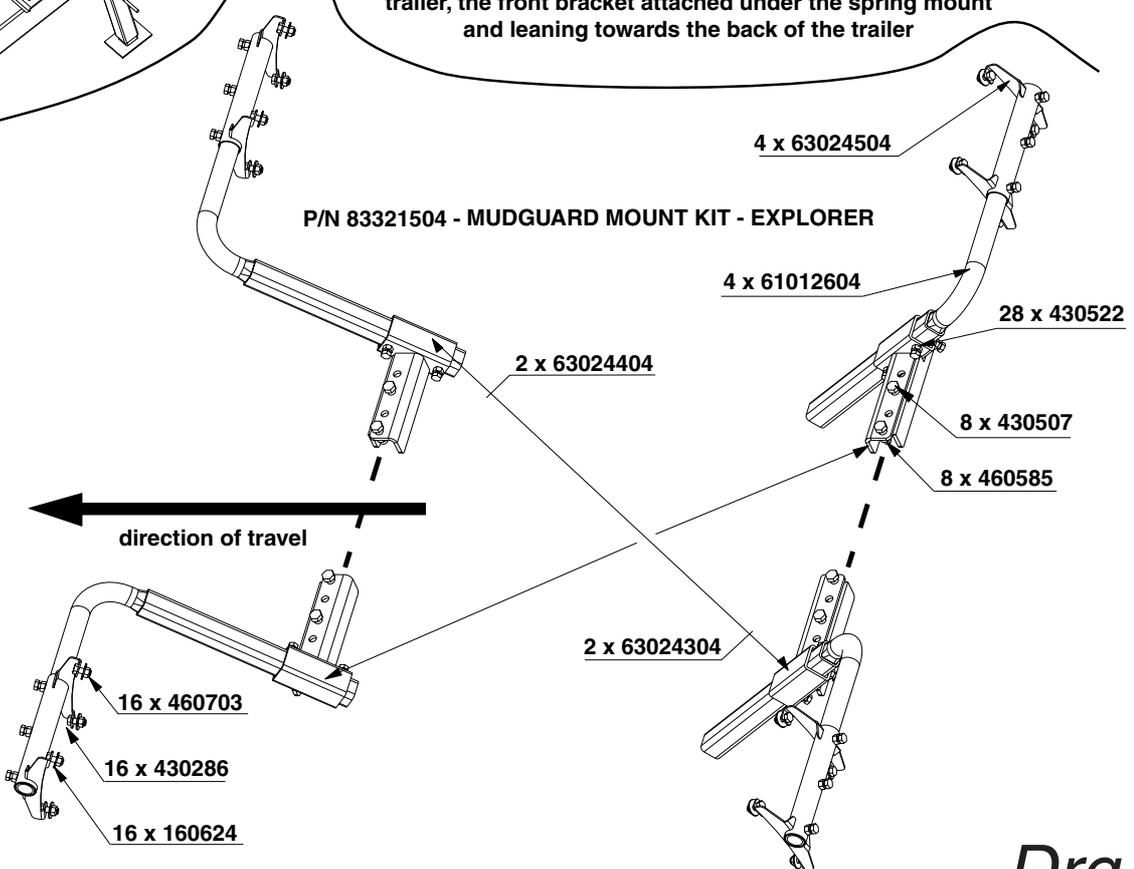
Drq 14
Boom Attachment and Transport

A1 = A2 : P/No 63024404
 B1 = B2 : P/No 63024304

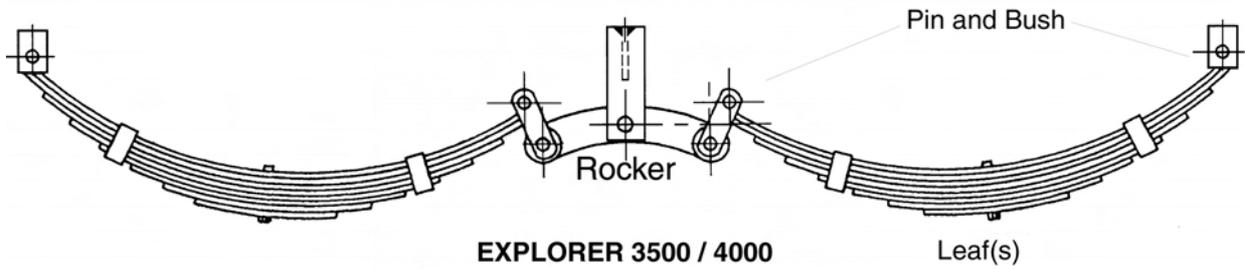


Small / medium wheels: For each unit, mount pairs of brackets diagonally opposite as shown at A1/A2 and B1/B2.

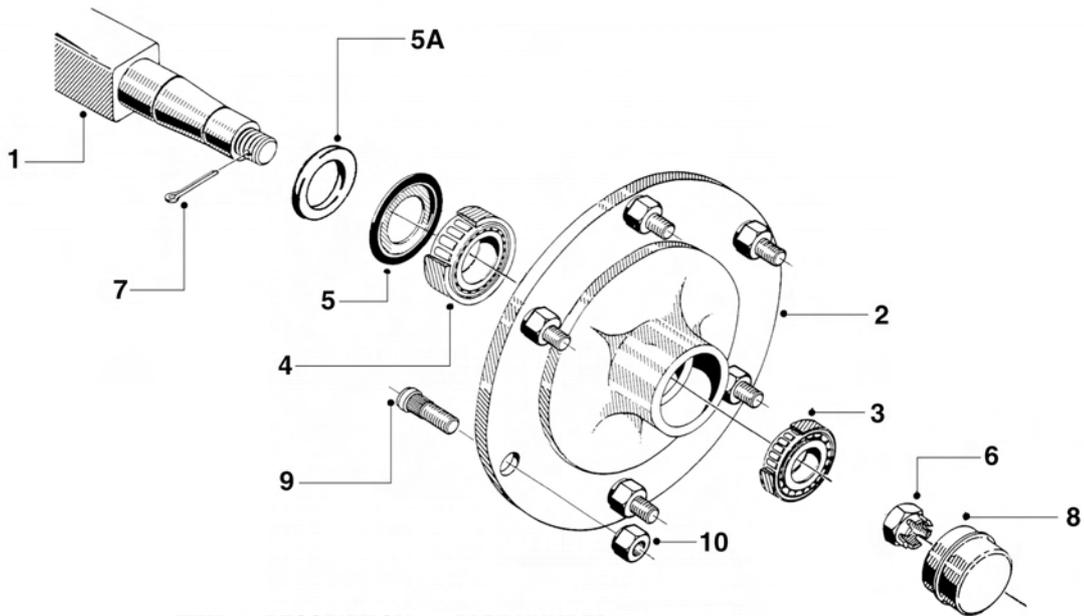
Large wheels: Each pair of brackets is fitted on one side of the trailer, the front bracket attached under the spring mount and leaning towards the back of the trailer



Drg 15
Explorer Mudguards and Mudguard Mount Kit



Part No	Description
H1006B 5916725	
5916710-20	Pin / Bush Kit
5916710-21	Pin / Bush / Rocker Kit

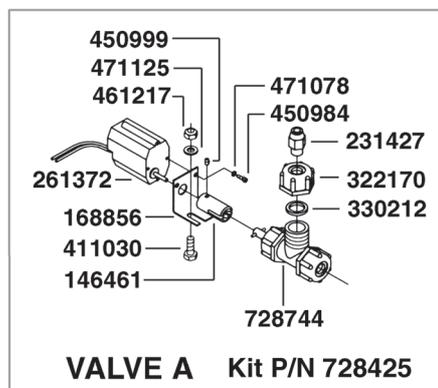
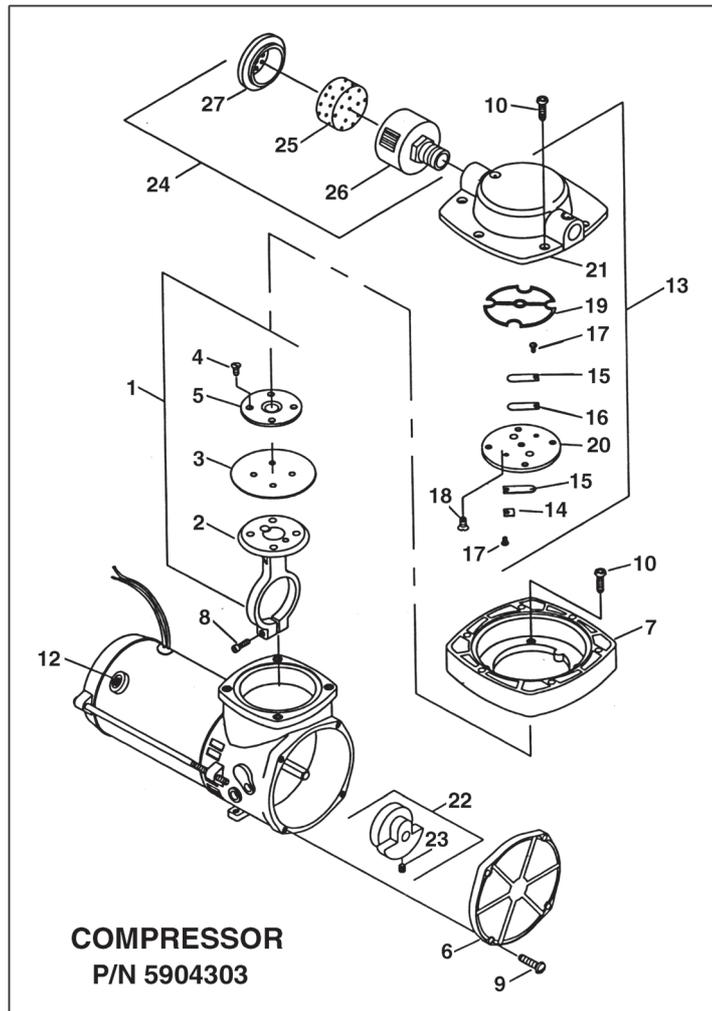


ITEM	DESCRIPTION	PART NUMBER	
		60 mm	80 mm
1	Stub	5916371-2	5916380-2
2	Hub	5916371-7	5916380-7
3	Outer Bearing	5916371-5	5916380-5
4	Inner Bearing	5916371-9	5916380-9
5	Seal	5916371-4	5916380-4
5A	Seal Ring	5916371-13	5916380-13
6	Axle Nut	5916371-11	5916380-11
7	Split Pin	5916371-3	5916380-3
8	Grease Cap	5916371-12	5916380-12
9	Wheel Stud	5916371-6	5916380-6
10	Wheel Nut	5916371-8	5916380-8

TANDEM WHEELS
3500 / 4000: 60 mm

Drg 16

Hubs and Suspension



Drq 17
Cyclone Compressor and Valve A

