

3PL Small Frame

Operator's & Parts Manual



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Introduction

Congratulations on your purchase of a Goldacres sprayer. For more than a quarter of a century Goldacres has supplied Australian farmers with quality, innovative and technologically advanced spraying solutions - equipment designed in Australia for Australian conditions.

Goldacres not only produce Australia's finest range of spraying equipment - we also keenly value the unique relationship we enjoy with owners of our equipment. We are pleased to welcome you as a Goldacres owner and look forward to making your spray applications as efficient as possible.

Please use this comprehensive resource to gain a full understanding of your equipment, and don't hesitate to contact your Goldacres Dealer or Goldacres for further information.

A handwritten signature in blue ink, appearing to read 'Roger Richards', with a large, stylized 'S' at the end.

Roger Richards
General Manager

Safety

General

The following pages outline important safety information. At Goldacres safety is a high priority. These safety and warning instructions **MUST** be followed to ensure the safe operation of your Goldacres equipment.

Explanation of key terms used in this operator's manual are:

DANGER - You will be killed or seriously hurt if you don't follow instructions

WARNING - You can be seriously hurt if you don't follow instructions

CAUTION - You can be hurt if you don't follow instructions

NOTE - Is used to notify people of installation, operation or maintenance information that is important but not hazard related.

The Operator

All operators of this equipment should be adequately trained in the safe operation of this equipment. It is important that all operator's have read and fully understand the operators manual prior to using this equipment.

All new operators should be trained in an area without bystanders or obstructions and become familiar with the sprayer prior to operation.

Safety Precautions

WARNINGS

- Never stand within the radius of boom wings.
- Keep clear of overhead obstructions.
- **CRUSH HAZARD** - Keep hands clear of moving parts when carrying out boom fold and unfold sequences.
- Any unauthorised modifications to this equipment may affect its function and create a serious safety risk.
- Never attempt to clean parts or nozzles, by blowing with mouth.
- Never attempt to siphon chemicals, or substances, by sucking.
- It is imperative that the vehicle

manufacturer's specifications be checked and all instructions for use when transporting, or towing, be adhered to at all times.

- Care should be taken when transferring liquid into the tank to ensure that the gross weight of the equipment does not exceed the carrying, braking and/or towing capacity of the vehicle to which the equipment is attached as specified by the vehicle manufacturer.

NOTE: 1 LITRE WATER = 1 KG.

- Water weighs 1kg per litre, however conversion factors must be used when spraying liquids that are heavier or lighter than water. Example: liquid urea has a density of 1.28 kg/L and will therefore be significantly heavier than water if the tank is filled completely.
- Suitable care should be taken when driving with the equipment attached to the vehicle. Consideration should be given to both the carrying capacity of the vehicle and the gradient of the terrain when determining the speed at which the vehicle can be driven safely.
- Ensure that the maximum speed of the vehicle, when loaded, is within the vehicle manufacturers limitations.
- Ensure equipment is securely fastened, or attached to the vehicle at all times.
- Regularly check the pump mounting bolts. The pump will always vibrate to some degree when operating, and this may work the bolts loose.

CAUTIONS

- Always ensure that there is adequate room for the boom to open.
- Always ensure that the boom is adequately supported when transporting.
- A supply of fresh water should be with the equipment at all times.
- Standard polyethylene tanks are not designed for use with diesel fuel or any flammable liquid.
- Do not use this machine in ambient temperatures exceeding 40 degrees Celsius.

Continued over page

- Ensure that all bolts are tightened and secured before operation.
- Where fitted, always ensure that the boom is securely supported when travelling.
- Area surrounding equipment may become slippery when wet.

NOTES

- Always read and understand the operator's manual prior to operation of this equipment.
- It is the responsibility of the operator to ensure that there are no decals missing from the equipment and that any damaged or missing decals are replaced prior to operation.
- Goldacres equipment ordered or operated, outside the guideline limitations may not be warranted by Goldacres for successful performance. Operators working outside these limitations do so at their own risk, unless specific advice has been sought from and provided by Goldacres in writing.
- Always read and follow the chemical manufacturer's guidelines for safe application as per the chemical label. Particular attention should be given to the recommended target application rate of the chemical being applied as per the chemical label.
- Inspect the equipment thoroughly for damage and wear before operation.
- Flush chemicals from equipment immediately after use.
- Certain chemicals may be unsuitable for use with Goldacres standard plumbing designs. Consult your Goldacres dealer if in doubt.
- Do not operate the equipment while under the influence of any drugs, alcohol or if excessively tired.
- Make sure that the equipment complies with all relevant road regulations when transporting.
- When draining fluids from the equipment use appropriate, leak proof containers. Do not use food or beverage containers

as someone may consume the contents by mistake.

- After reading the operator's manual if there is any thing that you do not understand please contact your Goldacres dealer.

Safe Chemical Use

The safe use of Ag chemicals with this equipment is the responsibility of the owner/operators. All operators should be trained in the safe use of Ag chemicals. Goldacres suggest that a relevant course is completed by owners/operators prior to operation of this equipment as a spray unit.

Personal Protective Equipment (PPE)

Always wear close fitting clothing and safety equipment designed for the job.

Chemicals can be harmful to humans, appropriate PPE should be used when handling chemicals.

Always refer to the chemical manufacturers label for guidelines on the appropriate PPE to use with the chemicals you are using.

Goldacres also suggest that you read and understand the following Australian standards:

- Australian Standard for Chemical protective clothing AS3765
- Australian Standard for Respiratory protection devices AS1715

Airborne particles

Always stand well clear of equipment during operation. Any spray drift is dangerous and may be hazardous to humans and animals.

Fluids under pressure

Do not disconnect any hoses, nozzles or filters while equipment is operating. Disconnecting these components while under pressure may result in uncontrolled fluid discharge which may be hazardous.

When the repair is complete ensure that all fittings and lines are secured before re-applying pressure.

Continued over page

Cuts, Stabs & Punctures

When Servicing machine, be mindful of sharp edges on parts such as trimmed cable ties, hose clamps, cut reinforced hose and the edges of plates and brackets as they could cause cut, stab or puncture injuries.

Safety Decals

Understanding safety decals and their purpose assists in the safe operation of your sprayer. Safety decals are there for your protection and it is the responsibility of the owner operator to replace damaged and/or missing safety decals.

Regularly review safety decals with operators. It is very important to ensure that all new machine components and replacement parts include current hazard identification decals.

Replacement safety decals can be ordered from all Goldacres dealers.

Part No	Description
GA8700166	3PL Work Ready Base Kit
GA8700167	3PL 450 Tank Decal
GA8700168	3PL 600 Tank Decal
GA8700169	3PL 800 Tank Decal
GA8700170	3PL 1000 Tank Decal



Warranty

How to make a warranty claim

In the event of a fault or breakdown with your product, that you believe to be a warranty issue, the following steps must be taken.

1. Ensure that you have read the Operator's Manual and gone through the troubleshooting procedure.
2. If you continue to experience problems then please contact your local authorised Goldacres dealer. They will advise the method of warranty service for your product.

Warranty Duration

Goldacres' standard warranty is 12 months from date of purchase.

Warranty Inclusions

- Chassis
- Steel Boom Components
- Tanks
- Electrical wire and connectors, (non-contaminated)
- Consoles and controllers
- Electrical motors and drivers
- Wheels, tyres and rims
- Pins and bushes*
- Pump housing
- Hydraulics
- Axle frame only
- Shockers and dampeners
- Wire cables
- Springs
- Drive chains*
- Wheel bearings*

*Failure caused by lack of lubrication not covered.

Warranty Exclusions

- Pump diaphragms
- Pump Seals
- Pump check valves
- Pump O-rings
- Filters and filter screens

- Filter O-rings
- Chemical Hoses
- Solenoid Diaphragms
- Hand Gun, lance or wand seals and O-rings
- Consumables, chemicals, fuels
- Items controlled by or fitted to Non Genuine parts or devices
- Contamination or corrosion of components
- Hose reel seal sand O-rings
- Pressurised sprayer seals and O-rings
- Belts, couplings
- Adjustment of components
- Brake pads and components
- Globes / Bulbs
- Fuses
- Oil / fluids / filters (Unless contaminated or lost due to a warrantable failure)
- Boom break away tips
- Boom break away hinges
- Boom protectors
- Nozzles
- Nozzle Bodies
- Nozzle Body Brackets
- Nozzle Diaphragms and seals
- Wiper Blades
- Skid plates
- Wear plates
- Damaged items
- Worn or wearing items

General Information & Specifications

The 3PL range is ideal for the small acreage and hard to get areas. They can be used to deliver water or chemical to your crops. Our range allows you to mix and spray chemical with multiple boom size and tank size options. PTO shaft driven diaphragm pumps are used to produce a high and consistent flow rate to the booms.

These products are made with durable industrial grade UV stabilised polyethylene tanks.

Know Your Sprayer

Getting to know your sprayer prior to operation is crucial in the safe and efficient operation of this equipment. Take the time to familiarise yourself with all the standard and optional components fitted to your sprayer, not only do you need to know where key components are located on your machine you need to become competent in the correct operation of these components prior to spraying operation.

It is also important to become familiar with common spraying methods and common spraying terms prior to using this sprayer for the first time

Chassis

The chassis is an all steel construction. The chassis is shot blasted, primed and then protected by the Goldacres paint process for excellent chemical resistance and durability.

Tank

All tanks are constructed from UV resistant polyethylene. Polyethylene tanks have a very high chemical resistance.

Due to the rotomoulding process, there can be a variance in the overall dimensions of the tank which in turn results in variations to the tank capacity. For this reason, calibration markings should be used as a guide only.

Paint Colours

Steel work: G13 Dark Green

Pump

The pump is critical to any sprayer performance. Correct operation and maintenance of the pump will ensure the sprayer is able to perform to its capabilities.

Always flush pump with clean water after every use. Prolonged chemical contact can severely damage valves, diaphragms and seals.

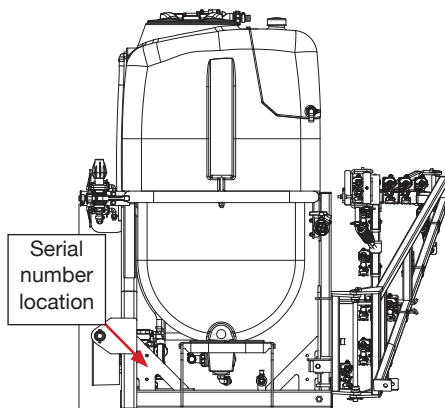
Do not leave water in pump if sprayer is to be left in a cold environment. The water may freeze and cause damage to pump. Empty pump of all water and cover the pump to ensure this situation does not arise. If this has not been done, and there is a possibility there may be frozen water in the pump, wait until any ice has thawed before using the pump.

Machine limitations

All Goldacres equipment is subject to operating limitations, it is the operator's responsibility to ensure that this equipment is being operated within these limitations and appropriately to the operating conditions at hand.

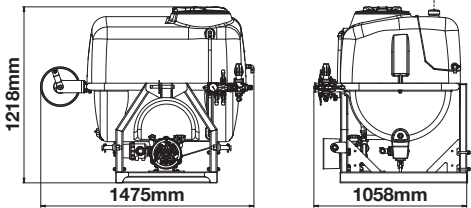
Identification

When ordering parts or requesting service information for your sprayer it is important to quote the serial number and the purchase date of your machine in order to receive accurate information.



Dimensions

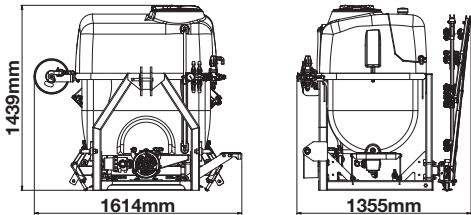
3PL 450L



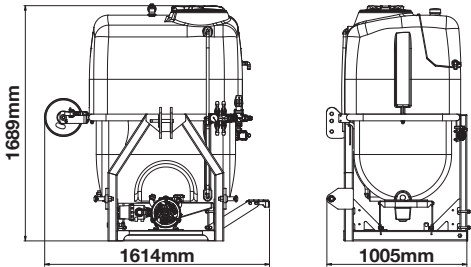
NOTE: Dimensions and weights are approximate only. They may be subject to change without notice.

Model	Weight
450 L	150 kg (Empty, no booms)
600 L	180 kg (Empty, no booms)
800 L	190 kg (Empty, no booms)
1000 L	240 kg (Empty, no booms)

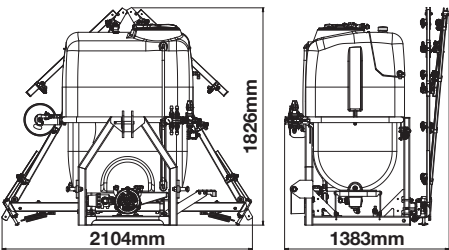
3PL 600L 6m Boom



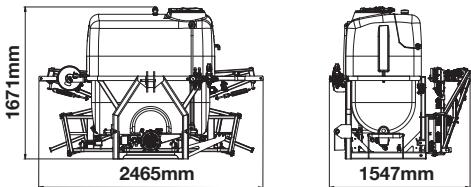
3PL 800L



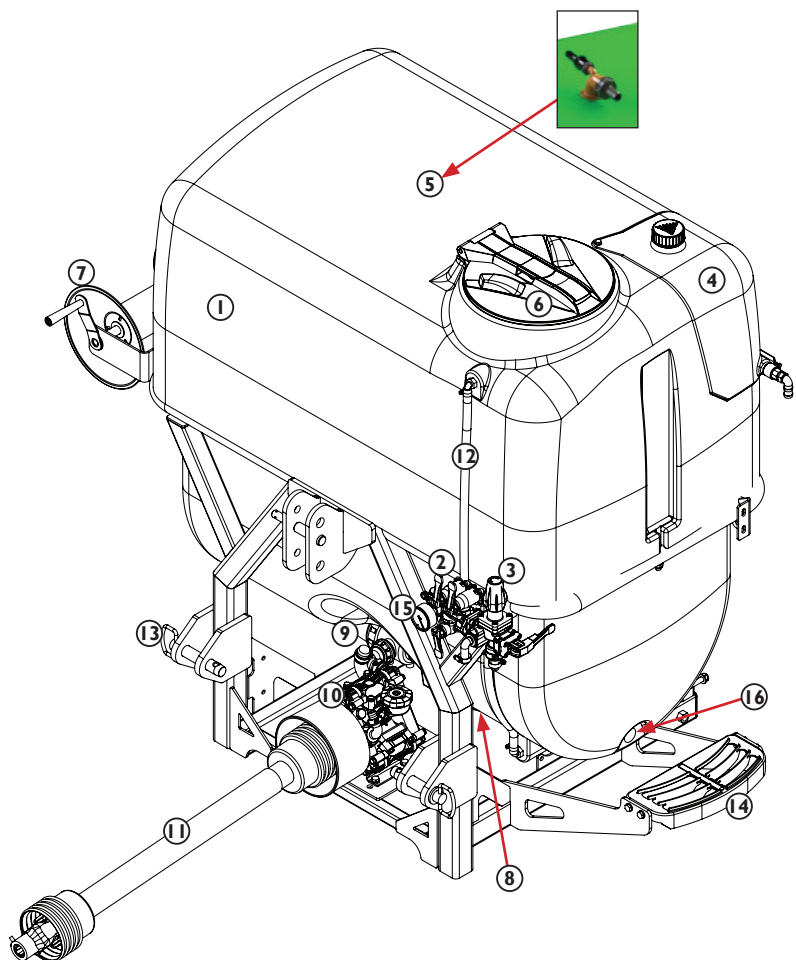
3PL 800L 8m Manual Dual Fold Boom



3PL 1000L



Key Features



Number	Description
1	Main Tank
2	Boom Section Levers
3	Pressure Adjustment
4	Fresh Water Hand Wash Tank
5	Venturi (if fitted)
6	Main Tank Lid
7	30m Hose Reel
8	Main Tank Drain

Number	Description
9	Suction Filter
10	Zeta 70 Pump
11	PTO Shaft
12	Wet Sight Tube
13	3PL Pins
14	Step (if fitted)
15	Manifold pressure gauge
16	Agitator (if fitted)

Operation

Common Spraying Methods

To ensure complete coverage in general field applications, Goldacres suggest that two spray swaths (depending on boom size fitted) are completed around the outside perimeter of the field. After completing the outside laps you will now have a wide headland on which to turn when completing the remaining sections moving up and down the length of the field. To avoid over application of chemical, switch off boom sections as you pass over the already completed headland section.

NOTE: Variations in field sizes, shapes and terrain may require a change in the spraying method. Please use the most appropriate method that is safe and suitable for your application.

PTO Shaft Connection

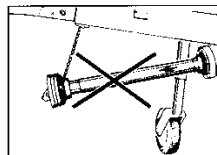
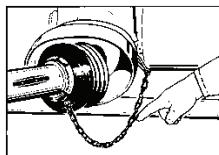
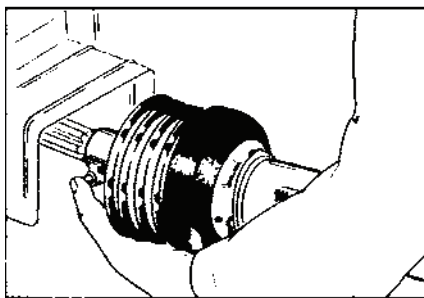
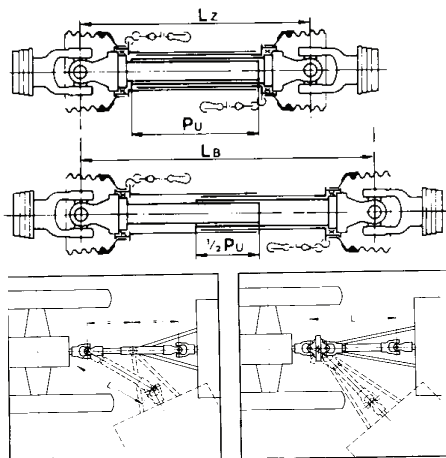
These 3PL sprayers have been designed for connection to Category 1 and 2 linkages.

1. Remove from pallet (if attached) and position on a solid, flat surface.
2. Lower the tractors linkage arms to a height appropriate for connection to the sprayer's lower linkage pins, and then connect the tractors top link to the top linkage pin of the sprayer.
3. Make sure that all securing pins are in place prior to raising 3PL.
4. Lift 3PL to intended spray height and then adjust linkage top link to level the sprayer.
5. Fit PTO shaft as per the following Instructions: When hitching a sprayer, especially for the first time, the following critical points concerning the PTO shaft must be considered: **MAXIMUM OPERATING LENGTH LB** Try to obtain the greatest possible overlap.

NOTE: In its working position, the PTO shaft must not be extended by more than half the profile overlap P_u available when fully compressed L_z .

Chains

Chains must be fitted so as to allow sufficient articulation of the shaft in all working positions. The PTO shaft must not be suspended from the chain.

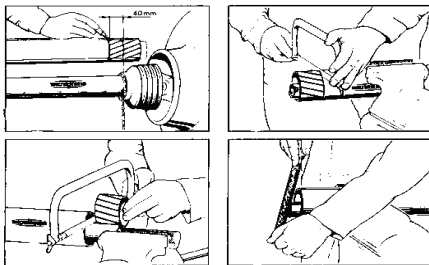


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PTO Shaft Length Adjustment

To adjust the length:

- 1 Hold the half-shafts next to each other in the shortest working position and mark them.
- 2 Shorten inner and outer guard tubes equally.
- 3 Shorten inner and outer sliding profiles by the same length as the guard tubes.
- 4 Round off all sharp edges and remove burrs.
- 5 Grease sliding profiles before reassembling.



CAUTION: When attaching shaft to sprayer and tractor, always ensure all guard covers are in place. Operate the PTO slowly when the PTO shaft is first attached to assess installation. Care should be taken when engaging the clutch so that sudden loading, which can result in pump damage and gear wear, is avoided. Ideally the pump should start from zero pressure. It is essential to maintain lubrication schedule while PTO shaft is in use.

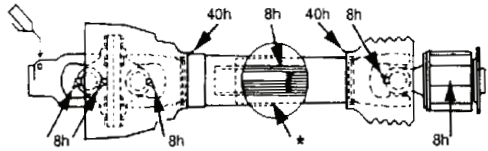
PTO Shaft Lubrication

Proper grease is essential for the sprayer to operate with maximum effectiveness and life-expectancy.

CAUTION:

Never lubricate the PTO shaft while it is running. It is important to keep the lubricant and lubricant applicator clean. Wipe all dirt from the fittings before use. Goldacres recommends that multi-purpose grease should be used for all lubrications.

The figures mentioned below refer to the frequency (in hours) of lubrication for the respective grease nipple locations.



- Pull shaft apart - apply grease to inside of outer Telescopic profile
6. Check pump oil level prior to engaging PTO.
 7. Fill the tank with a quantity of water sufficient to test spray unit for leaks.
 8. Unfold the boom as per the boom folding instructions in this manual
 9. Make sure the pressure relief valve is backed off prior to engaging PTO.
 10. Visually check that all fittings are in place and secure and taps are in working positions.
 11. Ensure that all taps are in the off position and bypass back to tank is open. All boom taps should be in the off position.

IMPORTANT: Do not run diaphragm pumps above 540 RPM.

12. To start the pump, engage the PTO at the lowest revs possible and then gradually increase revs until the pump reaches its operating speed.
13. Set the pressure relief valve to the desired spraying pressure. Once PTO has been engaged and is running at 540RPM.
14. Gradually turn on individual boom sections, until all sections are engaged.
15. Adjust pressure to suit desired spraying rate.
16. Run unit at operating speed until contents of tank are dispersed.
17. Take note of any water leaks, and tighten fittings to rectify the problem immediately.

Spray Control Manifold

Pressure Relief Valve

The pressure relief valve provides relief when the pressure exceeds a pre-determined value. Altering the adjusting stem will affect the setting at which the relief valve will come into operation. Turning the stem clockwise will increase the pressure relief setting. The pressure gauge gives indication of the delivery pressure to the boom or gunjet.

Bypass Valve

The controller features a bypass / dump valve. To pressurise the system to use the hose reel, boom etc., close the dump valve, the lever needs to be pulled out. To open the dump valve and allow all flow to return to tank under very low pressure, the dump valve needs to be pushed back against the tank.

Boom / Attachment Levers

The boom/attachment levers (number fitted dependent on options specified) open or close flow to the appropriate boom section/s or attachment/s as labeled. Pull the lever to the ON position in order to direct flow from the pump to the required function. Push the lever to the OFF position to stop flow going to the attachment that is now not required.



Number	Description
1	Pressure regulator
2	Bypass Lever
3	Hose reel on/off lever
4	Venturi on/off lever (when fitted)
5	Boom Right on/off Lever
6	Boom Left on/off Lever
7	Bypass
8	Pressure gauge

Specifications	L/min	GPM
Flow Rate	180	47.5
	Bar	PSI
Pressure - Max	20	290
No. of Outlets	2/3/4	
Suggested for Pump Models	RO 110, ZETA 70, ZETA 85, ZETA 100, ZETA 140, ZETA 170	

Electric Controls

Optional electric controllers allow for on/off switching of individual boom sections via boom valves, as well as a pressure adjustment toggle to increase or decrease the operating pressure of the boom.

Geoline console

NOTE: There is a redundant switch on the early control boxes that is not wired into any valve, and therefore does not perform a function at this stage.

The Geoline control panel has boom section switches (control box comes standard with 4 boom section switches, although commonly only 2 or 3 are used) and the pressure increase/decrease toggle switch.

During operation, a red LED light illuminates when the corresponding boom switch is turned on to indicate operation.

It is important that the console is mounted in the cabin in such a way that it cannot work loose and become a projectile in the event of sudden braking or an accident. A swivel bracket is supplied with the console to facilitate easy mounting.

The console has two separate cables coming from it, one being the power cable which is required to be connected straight to a 12V battery. The positive power wire is fitted with a 10A fuse. It is important that this fuse remain in the wiring loom when wiring into the tractor as a safety protection fuse for both tractor and console.

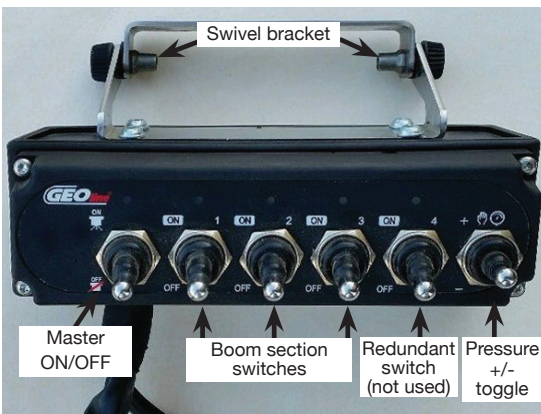
The second wiring loom coming from the console connects to the wiring harness mounted on the sprayer. It is important to route the sprayer harness into the tractor

through the appropriate rubber cabin grommets, and ensure the harness is located firmly. Bringing the harness through the back window of the tractor, then closing the window can cause damage to the wires within the harness over time. Also allowing the harness to rub alongside the drivers seat has been known to cause breakages in the wiring harness.

Control station

As well as the electric controls fitted to the sprayer for boom operation, a manual control station remains on the sprayer to allow for the operation of any other accessories fitted to the machine including the hose reel, venturi probe and agitator. The operation of the probe and hose reel are covered in other sections of the manual.

The control manifold also features 2 pressure gauges, one representing bypass pressure and the other boom spray line pressure.



Continued over page

Pressure Gauges

Testing has shown that there is a pressure loss between the pressure gauge on the manual regulator and the pressure at the spray nozzles, hence the second pressure gauge, which is plumbed into the motorised valves at the back of the sprayer.

When using the spray boom, please follow the gauge labelled 'spray pressure', and when using the hose reel, venturi probe etc, please follow the 'bypass pressure' gauge.



Above: Spray control station. All taps are closed, and the dump valve is open providing low pressure agitation when pump running.

Dump valve

A dump valve and manual pressure regulator are fitted to the control station. The dump valve enables all pump delivery to bypass back to the tank under low pressure. The dump valve should be opened to agitate the tank when not spraying. It is also a good practise when starting the sprayer to have the dump valve open. To open the dump valve, simply push the red handle back towards the tank. To close the dump valve, pull the red handle forwards bringing the handle out.

All sprayer functions including boom operation, hose reel or suction probe will not operate with the dump valve open to bypass (picture 3 showing the dump valve open).

Pressure regulator

The manual pressure relief valve provides pressure adjustment for the various sprayer

functions. To increase the pressure for hand gun operation, or operating the venturi probe for instance, turn the pressure regulator clockwise, which will wind more pressure on the spring inside the regulator.

Any adjustment to the pressure setting of the relief valve will correspond with a change in the pressure gauge reading fitted to the control station.

It is advisable to set the pressure regulator at around 7 bar pressure for boom spray operation, and use the electric pressure toggle switch on the control console to adjust the pressure back down to the desired spraying pressure.



Above: Manual pressure regulator with directional indicators.

Control station taps

Bypass tap

All flow to the sprayer's boom and electric pressure regulator is controlled by the bypass tap. When wanting to spray with the boom, ensure the dump valve is closed (pressurised) and the bypass tap is open. Picture 5 shows the bypass tap open.



Above: Showing bypass tap open for spraying.

Electric Boom Valves

The electric valves that control the boom section switching along with the electric bypass valve are located below the tank, between the tank and boom. The electric bypass valve will regulate the amount of bypass back to the spray tank.

The boom section valves are wired and plumbed in the same sequence as the control console, with section 1 being the left section.



Troubleshooting - Electric Boom

Valves

Display	Cause	Solution
The LED's illuminate on the console, but the valves do not open.	Connectors not connected or unplugged.	Connect the connectors in the correct way.
	Damaged cable	Replace
The LED's are off and the valves are not working.	Fuse burnt out.	Replace fuse and check for power / wiring issues.
	No power supply.	Replace fuse and check for power / wiring issues.
	Reversed power supply cable.	Check the power supply connection.
The switches are OFF but the valves are open.	Power supply on box reversed.	Check the power supply cable connection on box.

Calibrating your sprayer

Any sprayer should be calibrated regularly to ensure minimal error in the application rate. A nozzle selection chart indicates what application rates are to be expected but variations due to nozzle wear, ground speed error and pressure irregularities can result in large application rate errors.

Goldacres suggest the use of a current TeeJet nozzle selection catalogue for reference to nozzle sizes, outputs, spray patterns and general spraying information. For more technical information on the function of spray nozzles and factors affecting their performance you can also use the TeeJet "User's guide to spray nozzles".

The TeeJet nozzle selection catalogue and Users guide to spray nozzles are available from Goldacres dealers or as a free download from the TeeJet website. www.teejet.com

Application Rate

The application rate depends on the following:

Spray pressure - increasing pressure increases application rate and reducing pressure reduces application rate

Speed of travel - increasing speed reduces application rate and reducing speed increases application rate

Nozzle size - increasing the nozzle size increases the application rate.

Ground Speed

The ground speed read out on modern tractors should be sufficiently accurate for spraying but if in doubt check it for accuracy by the following method.

Measure and mark a distance of 100 metres. Fill the sprayer with water and engage the PTO to simulate normal spraying conditions. Approach the starting mark at the required spraying speed and accurately measure the time in seconds to reach the finishing mark. The ground speed can be calculated as follows.

Application rate (L/Ha) = $\frac{\text{Nozzle output (l/min)} \times 10,000}{\text{Spray width (m)} \times \text{speed (m/min)}}$

Nozzle Selection

Refer to the chemical manufacturer's information to determine the recommended

application rate in litres per hectare (l/ha) for your particular situation. Then determine the speed in kilometres per hour (km/hr) at which you intend to spray, taking into consideration the ground conditions of the area to be sprayed. Using the appropriate chart for your boom select the most suitable nozzle to use.

Nozzle Calibration

As part of your daily sprayer calibration, Goldacres suggests that you carry out a jug test to ensure the spray nozzles you are using are delivering the correct amount of chemical, as stated in your nozzle supplier's rate chart.

The method of carrying out the jug test is as follows:

You will need:

- A calibrated measuring container that can measure the medium in litres, in 10 ml increments. e.g. 0.45 L.
- A timing device showing seconds.
- A pressure gauge mounted at the nozzle tip to verify the system pressure being delivered at the nozzle. Goldacres part number GA5077983 (Nozzle cap & washer) will mount a suitable gauge to the nozzle body bayonet fitting. (Not including gauge).

NOTE: There may be a noticeable difference between pressure shown on main spray pressure gauge on sprayer and the gauge installed on the boom. This is due to pressure loss through the circuit.

1. Check the plumbing system for kinked or obstructed hoses and repair or replace any hoses that restrict the normal flow of the liquid.
2. Start your sprayer
 - a. For sprayers not fitted with a spray application controller, set the boom operating pressure to the pressure at which you expect to spray.
 - b. For sprayers fitted with a spray application controller, initiate a 'self test' procedure and set the application rate and speed to the settings depicted in your "Rate Chart" at which you expect to spray.

3. Then place the jug under one of the nozzles, for 60 seconds (exactly) and then record the volume of liquid collected.
4. Repeat the test over a representative sample of the jets in each boom section
5. Compare the volume collected from each nozzle to the stated volume in your rate chart. It should be no more than plus or minus 10% of the volume stated in your Nozzle Supplier's rate chart
6. In the event that any of your nozzles do not deliver the required volume, a further investigation is required which may include, but not be limited to:
 - a. Cleaning the nozzles, using the method recommended by the nozzle supplier.
 - b. Replacing the nozzles.
 - c. TeeJet advise that nozzles that flow greater than +10% of their stated volume are 'worn out' and should be replaced.
 - d. Cleaning nozzle filters.
 - e. Replacing filters.
 - f. Replacing pump diaphragms.
 - g. Replacing the pump.
 - h. Ensuring that the application rate required does not exceed the maximum flow and pressure parameters of the sprayer.

Tasks prior to spraying

CAUTION: Before using this equipment with a chemical mix, read, and understand, the instructions on the chemical label. The first time setup procedure should be carried out as a water test only prior to any chemical being added to the tank and applied. Following the initial set up procedure being followed, there are several important checks to be carried out prior to starting spraying.

1. Inspect the sprayer to ensure there is no damage or wear which could lead to injury, further damage or reduce its performance.
2. Check all bolts and nuts to make sure they are tight and secure.
3. Carry out scheduled lubrication.
4. Fit PTO shaft and fit protective cover and chains.
5. Make sure the sprayer is securely hitched (i.e. PTO shaft is properly fitted and tractor linkage arms are securely attached to the sprayer);
6. Ensure that the two lower linkage arms are secure and do not sway
7. Fill the flush water tank (where fitted) and hand wash tank with an appropriate amount of clean water.
8. Clean all filters and nozzles.
9. Fill main tank with a quantity (approx 10% of total tank volume) of fresh water.
10. Test the pump with clean water. To start the pump, engage the PTO at the lowest revs possible and then gradually increase revs until the pump reaches its operating speed. Do not exceed 540 RPM.
11. Check nozzle patterns for irregularities. If there are irregularities, clean the nozzles and/or replace. If the problem persists they could be worn so remove and replace.
12. For optimal sprayer set-up, the operator needs to be aware of the correct nozzle, the correct speed at which to travel and the appropriate rate per hectare to apply the product. For this information, refer to the chemical label, the supplier of the product and the TeeJet catalogue.

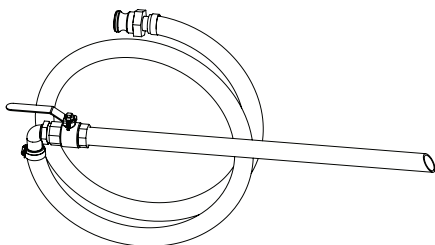
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13. Check all hoses and fittings for leaks or damage.
14. Follow the chemical label and ensure that you follow the specified mixing procedure for addition of chemicals to main tank.
15. When mixing procedure has been followed, fill main tank with appropriate quantity of water required for task at hand.

WARNING: When filling tanks with water, 1 litre of water will add 1kg of weight. Some chemicals weigh more than water, therefore it is the operators responsibility to ensure the loaded weight of the sprayer does not exceed the towing and / or carrying capacity of the vehicle.

16. You are now ready to start using the sprayer.

Chemical Probe



The optional chemical probe offers a simple method of transferring chemical into the sprayer tank. The chemical probe enables chemical transfer with minimal exposure to the operator. The probe is used in conjunction with the Venturi filler (located on the top of the tank) which creates the required suction on the pressure side of the pump.

The viscosity of the chemical being transferred will affect the rate of suction flow and hence the amount of time required to transfer the chemical. Water and air have low viscosities whereas molasses is an example of a highly viscous liquid. The higher the viscosity of the liquid, the longer it takes to transfer via the chemical probe. If the viscosity of a chemical is such that it takes too long to transfer, dilute the chemical with water, which will reduce the viscosity, and then transfer the solution.

The chemical should be transferred after about 20% to 50% of the required water quantity

has been added to the sprayer tank. This will ensure that agitation takes place when the remaining water is added.

The end of the probe is not flat so that the probe, when placed flat against the bottom of the container, will not restrict the flow of chemical.

Chemical Probe Operation

WARNING: It is critical that the chemical probe venturi continues to operate for a minimum of 30 seconds following use. This will ensure that no chemical is left in the line prior to the probe being disconnected.

NOTE: This item is intended for the induction of liquid chemicals only.

To operate the chemical probe:

1. Add 20 percent of the tank's volume of clean water to the main spray tank. Initially there needs to be a sufficient amount of water in the tank in order for the pump delivery to create the venturi effect via the venturi filler.
2. Open the Bypass on the controller.
3. To start the pump, engage the PTO at the lowest revs possible and then gradually increase revs until the pump reaches its operating speed. Do not exceed 540 RPM.
4. Ensure that the green handle on the controller for the Chem Probe is pulled up.
5. Connect probe via cam lever fitting.
6. Open the ball valve above the cam lever fitting
7. Close all other flip valves and move the Bypass valve to CLOSED.
8. The pump needs to generate at least 100 psi delivery pressure. Do not run the pump faster than 540 RPM. The higher the pump delivery pressure, the greater the venturi suction and the quicker the probe will transfer the chemical. The delivery pressure should not exceed 120 psi as determined by the pressure relief valve setting.
9. Place probe in chemical.
10. 'OPEN' the valve on the probe.
11. The chemical should be now transferring to the sprayer tank via the venturi filler.
12. When all of the chemical has been transferred, rinse the chemical container with water and transfer the rinsate to the sprayer tank via the probe. This

Continued over page

should ensure that the entire chemical is transferred and that the probe, venturi filler and connecting suction hose are cleaned. Induct clean water to rinse probe vacuum hose.

13. When finished, close the valve on the probe.
14. Close the Chem Probe flip lever.
15. OPEN the Bypass valve, this will keep the chemical agitated until sprayed.
- 16 Close the ball valve above the cam lever fitting, and disconnect the probe from the cam lever.

NOTE: Once chemical has been transferred into the main spray tank the sprayer should always be agitating until spraying begins.

Transporting Sprayer

Make sure the vehicle has sufficient lifting and braking capacity to carry the sprayer. All relevant transport regulations must be adhered to when transporting the sprayer. (ie: speed regulations, oversize signs, flashing light, etc.) It is the operator's responsibility to know the relevant regulations. Make sure the sprayer is securely hitched to the tractor 3PL.

- Ensure that the boom is securely supported when travelling and that the tail indicator lights on the sprayer are connected via the 7-pin trailer plug (if fitted on sprayer)

CAUTION: Take care when reversing the tractor with the sprayer attached. If driver visibility is restricted use another adult, with a clear view to the rear of the sprayer, to give reversing directions.

CAUTION: It is the operator's responsibility to know the tare weight and gross weight of the sprayer. Contact your Goldacres dealer to ascertain a more precise tare weight for your sprayer if unsure. If any alterations are made to the sprayer, it is the operator's responsibility to know the tare weight and the gross weight of the modified sprayer at all times.

End of Spraying Day Tasks

NOTE: Empty the spray tank by disposing of any residual spray in the appropriate manner. Refill the tank with approximately 10% of the tank volume of fresh water to flush the pump and boom. The following steps should be adhered to: Unfold the boom in an area convenient to dispose of residual chemical (an area where chemical can not run-off into above ground or sub surface water courses).

- Operate the diaphragm pump at idle revs
- Open the Boom Supply Ball Valves, and allow to rinse for a sufficient amount of time.
- Close the Boom Supply Ball Valves, and open the Hose Reel Ball Valve to rinse hand gun line (where fitted).
- Run sprayer until fresh water contents has been flushed through the system.
- When the tank has been emptied, shut off the pump drive by either disengaging the PTO, or closing the hydraulic supply.
- To clean and decontaminate the sprayer, follow the instructions provided on the chemical label for appropriate decontamination procedure.
- Clean all filters.
- Clean all nozzles.

CAUTION: If the sprayer is left attached to the tractor when parking the sprayer, make sure the tractor park brake is applied, the engine turned off and the sprayer lowered onto the ground. If the sprayer is to be disconnected from the tractor: Ensure the main tank and any other tanks fitted are empty.

- Lower the sprayer to release the weight off the linkage arms (the sprayer may need lowering onto a pallet or several large pieces of timber).
- Adjust the top linkage arm until it becomes loose, then remove from sprayer.
- Loosen the stabilising chains on the linkage arms, then detach arms from the sprayer.

- Disconnect all lines between the sprayer and the tractor (i.e. hydraulic lines, foam marker lines, etc.)
- Remove the PTO shaft from both the sprayer and the tractor.

NOTE: Store the sprayer in a suitable location to prevent freezing. If the sprayer is to be left where freezing may occur, cover the pump and flow meter with a material bag and empty pump and flow meter of all water (run the pump dry for 15-20 seconds). Make sure any ice has thawed before using sprayer.

End of Season Tasks

If the sprayer is to be stored for a long period of time without use, there are several tasks that need to be performed. Clean the sprayer thoroughly as described under

- With the sprayer attached to the tractor, carry out a thorough observation to determine if there is any damage to the sprayer.
- Park the sprayer in a position where it will not be affected by frosts, and preferably out of direct sunlight.
- Ensure all tanks are empty.
- Lower the sprayer to release the weight off the linkage arms (the sprayer may need lowering onto a pallet or several large pieces of timber).
- Adjust the top linkage arm until it becomes loose, then remove from sprayer.
- Loosen the stabilising chains on the linkage arms, then detach arms from the sprayer.
- Disconnect all lines between the sprayer and the tractor (i.e. hydraulic lines, foam marker lines, etc.).
- Remove the PTO shaft from both the sprayer and the tractor.
- Periodically check the sprayer to ensure frosts and/or vermin are not damaging the machine.

Folding Booms

The boom fitted as standard is part of the Goldacres range of manual 'folding booms' which are available in sizes from 3 metres to 8 metres. These booms are constructed from RHS for strength, the wings fold in for transport, and jet bodies are mounted on stainless steel brackets behind the boom for protection.

All booms, regardless of their design and operating width, present certain safety hazards in their operation. Please ensure that you have read all safety precautions as included in this manual and take particular note of those re-listed below.

WARNINGS

- Never stand within the radius of boom wings.
- Keep clear of overhead obstructions.
- CRUSH HAZARD - Keep hands clear of moving parts when carrying out boom fold and unfold sequences.

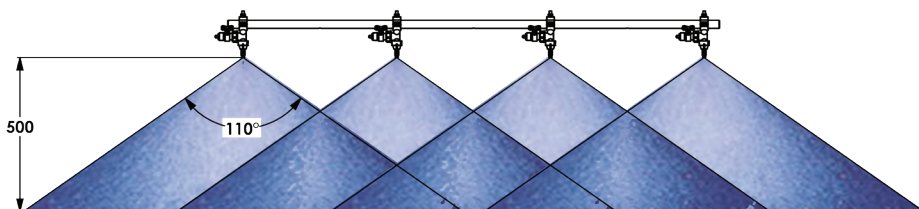
CAUTIONS

- Always ensure that there is adequate room for the boom to open.
- Always ensure that the boom is adequately supported when transporting.

Boom Height

The standard nozzle spacing on Goldacres booms is 500 mm. For this spacing, the optimum height the boom should be from the object to be sprayed (with a 110° fan angle nozzle) is 500 mm.

There will be adequate spray coverage if the nozzles are higher than this but this increases the potential for drift. The spray pattern is affected by many factors not limited to, but including, gravity, pressure, chemical composition and droplet size so the pattern does not extend to the full theoretical coverage. Refer to the TeeJet nozzle selection catalogue for further information on spray application and nozzle technology.



Diaphragm Pump

IMPORTANT: Never overfill pump with oil as damage to seals & oil bowl may result. Do not operate diaphragm pumps above 540 RPM.

NOTE: The pump will perform optimally operating between 400 and 540 RPM. At lower speeds excessive pulsation will occur, while pump and diaphragm damage can result at higher revs. Diaphragm pumps are a positive displacement pump that utilises a number of rubber diaphragms and non-return check valves to pump (displace) the fluid. Diaphragm pumps are fitted as standard equipment on all Goldacres sprayers and are very well suited to chemical spraying applications. To ensure that you get the most from your pump, using it correctly and carrying out periodic maintenance are essential in obtaining the best possible performance from your sprayer. Please follow the following guidelines for safe and efficient use:

1. When the pump is operating, the oil should be visible in the bowl.
2. Whilst the pump is running, frequently check the oil level and colour.

IMPORTANT: A change in either colour or level indicates probable damage to diaphragms or valves. **Stop the pump immediately.**

3. Inspect all hoses to make sure they are the correct size, fitted securely and that there is no restriction or leaking.
4. Do not start the pump with the pump delivery under pressure.
5. Make sure that the pump PTO shaft cover is fitted correctly to prevent accidental injury.
6. Make sure the strainer in the suction filter is clean and correctly installed.
7. Regularly lubricate the PTO shaft according to recommendations (see "PTO SHAFT") to prevent the shaft from binding.
8. Always flush pump with clean water at the end of each spraying day. Prolonged chemical contact can severely damage seals and diaphragms.
9. Regularly check the pump mounting bolts.
10. Change the pump oil after the first 50

hours of operation and then after every 300-350 hours. Be careful to use the correct oil (use SAE 30W40 motor oil) and do not overfill. Rotate pump manually (by hand) to remove air locks when filling with oil.

11. Do not leave water in pump if sprayer is to be left in a cold environment. The water may freeze and cause damage to pump if pumping is attempted while water is frozen. Empty pump of all water (run the pump dry for 15-20 seconds) and cover pump (i.e. with bag) to ensure this situation does not arise. If this has not been done and there is a possibility there may be frozen water in the pump and/or in the lines, wait until any ice has completely thawed before using pump.

NOTE: Ensure that the pump can be turned over by hand before starting.

Pump Diaphragms

The pump diaphragms are wearing components that need to be replaced during the life of the pump. Life expectancy depends upon the operation and maintenance and its suitability for the task.

- Pump diaphragms should be replaced prior to diaphragm failure.
- For large operations, where the sprayer is used extensively, the pump should be reconditioned once a season, including replacing diaphragms, seals and valve springs.
- It is recommended to keep a spare pump repair kit (including diaphragms, seals, valve o-rings and springs) on hand in case of a breakdown. The main causes of premature diaphragm failure are:
- Blocked or incorrectly fitted suction filter restricting flow to the pump.
- Incorrect air damper chamber pressure.
- Running pump at speeds greater than 540 RPM.
- Exceeding the pressure limit of the pump.
- Failure to wash chemicals from pump after use.
- Incompatibility of the diaphragm material and the chemicals used.

- Insufficient lubrication of PTO shaft or binding of PTO shaft which can cause a side thrust to the internal components of the pump and overheat the pump and diaphragms. A change of oil colour indicates a pump problem. The oil should be regularly monitored when spraying so that any problem is detected as soon as possible. If the oil goes milky in colour, it is likely the diaphragm has been damaged and the spray mixture has come into contact with the oil. If the oil goes black (or dark grey), it is likely the pump has overheated, possibly due to the PTO shaft binding through insufficient lubrication.

To replace a side diaphragm:

When side diaphragms require replacement it is normal practice to replace the air damper diaphragm as well.

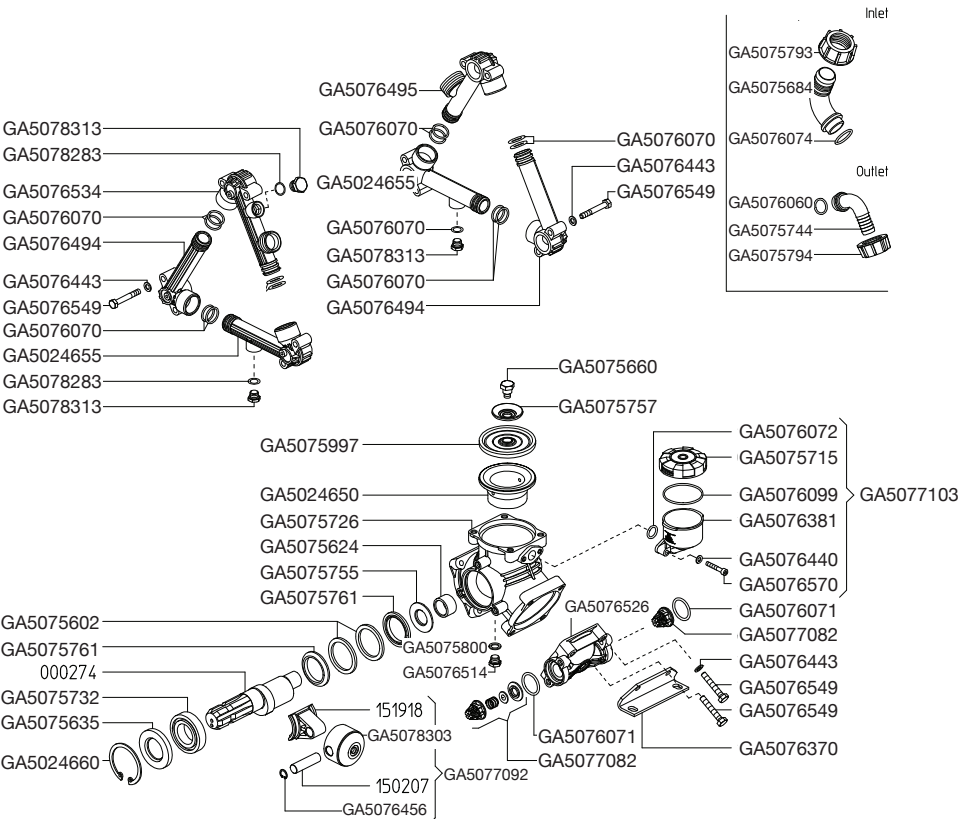
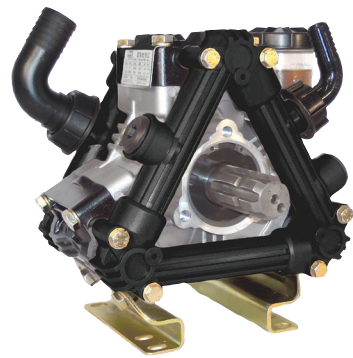
1. Flush pump with clean water to remove chemical residue, then flush with appropriate decontaminating agent (refer to chemical label for decontamination instructions).
2. Run pump dry for 15-20 seconds to remove water.
3. Remove all air from air damper chamber by pushing in air valve.
4. Remove pump from sprayer.
5. Remove pump manifolds and pump heads.
6. Drain oil from pump.

NOTE: Carefully note the position and orientation of all heads, manifolds and valves when disassembling pump. Failure to reassemble correctly will result in severe pump damage.

7. Remove diaphragms.
8. Remove cylinder sleeves.
9. Flush inside of pump with diesel.
10. Visually inspect inner workings of pump.
11. Reassemble with new diaphragms (must be correct diaphragms) once satisfied with condition of pump.
12. Refill with oil. Rotate pump manually (by hand) to remove air locks. Do not overfill.

Diaphragm Pump - Zeta 70

Specifications	
Max Pump Capacity	70.5 L/min
Max Pump Speed	540 RPM
Max Pressure Capacity	20 BAR (290 PSI)
Max Power Requirement	3.0 HP
Oil Type	SAE 30W40

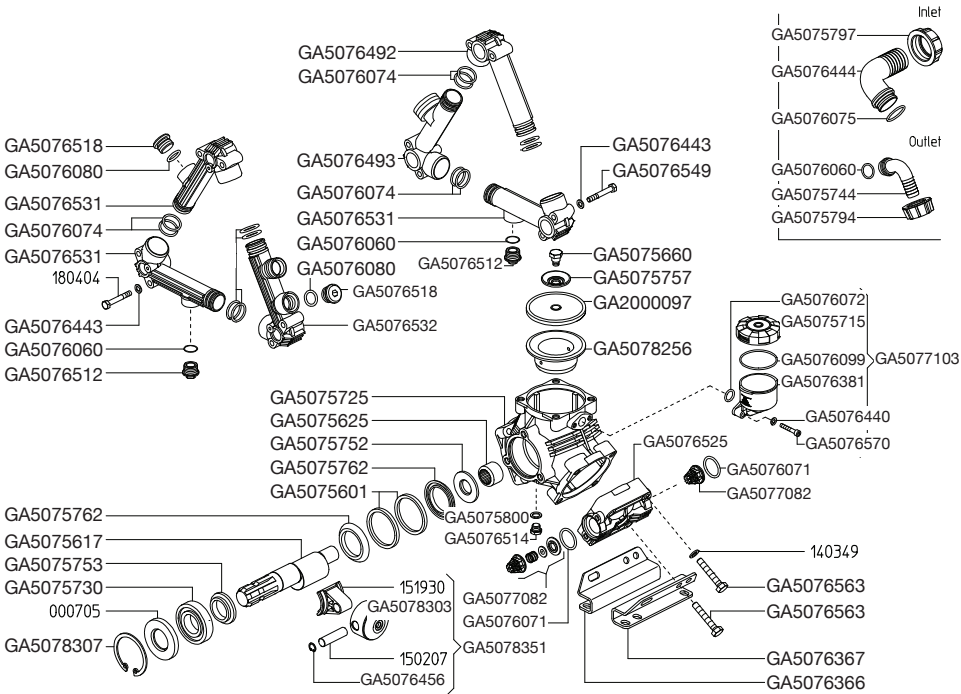
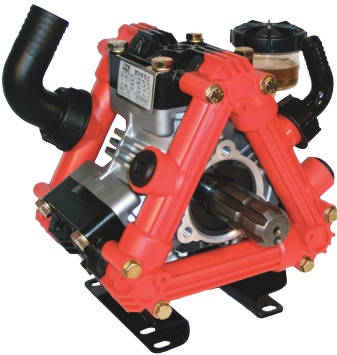


Service kits	
Part No	Description
GA5077794	Udor Zeta 70 Complete Kit
GA5077795	Udor Zeta 70 Diaphragm kit

Diaphragm Pump - Zeta 85

Specifications

Max Pump Capacity	85 L/min
Max Pump Speed	540 RPM
Max Pressure Capacity	20 BAR (290 PSI)
Max Power Requirement	3.0 HP
Oil Type	SAE 30W40



Service kits

Part No	Description
GA5077796	Udor Zeta 85 Complete Kit
GA5077797	Udor Zeta 85 Diaphragm kit

Diaphragm Pump - Troubleshooting

The troubleshooting information is provided as a reference when your sprayer is not functioning correctly.

To ensure that you receive the best possible service, it is recommended that you exhaust

all applicable troubleshooting solutions shown prior to calling your dealer, or Goldacres, for service advice.

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Pressure and flow rate are too low	Pump	Check suction line for air leaks.
		Suction filter may be blocked.
		Adjust pump speed: 400 - 540 RPM
		Check oil for colour change. If the oil appears milky, one or more diaphragms will be damaged and needs replacement.
		Check valves in pump.
		Turn the pressure station ball valve to off, if the pressure increases on the pump gauge there is a problem with the control valve.
		Measure the flow per minute coming out of one nozzle and check the nozzle chart for the corresponding flow.
		Check the regulator valve is rotating the full 90 degrees when the boom valves are switched off.
		Check tank sump and suction line blockages.
Pressure and flow rate are too high	Excessive bypass on pressure manifold	Verify console calibration settings.
	Supply to pump is restricted	Close the bypass ball valve. If the pressure increases on the pump gauge there is a problem with the control valve.
	Bypass line is restricted or blocked.	Check for restriction in bypass line. Check pump speed is not too fast. Check if Bypass valve is turned on.

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PROBLEM	COMMON CAUSES	COMMON SOLUTION
The flow rate is correct but my pressure is too low or high.	Nozzles	Check nozzle chart for correct nozzle size.
The pressure on gauge is higher than the nozzle flow indicates	Blocked filters of nozzles	Check and clean all pressure and nozzle filters
	Flow loss due to resistance in lines, valves and filters.	Re-calibrate console to allow for pressure loss
Pressure fluctuation	Air leak on suction side of pump	Check suction pump for air leaks.
	Incorrect pump speed	Adjust pump speed: 400 - 540 RPM
	Faulty pump valves	Replace pump valves
Pump pressure pulsating	Air accumulator pressure is incorrect (if fitted)	Reset the pressure in air accumulator
	Air accumulator diaphragm has a leak (if fitted)	Replace air accumulator diaphragm
	Incorrect pump speed	Adjust pump speed: 400 - 540 RPM
	Air leak on suction side of pump	Check pump suction for air leaks
Pump oil is becoming milky	Cracked diaphragm	Replace all diaphragms
Pump oil is becoming black or dark grey	Pump is overheating	Check pump speed and oil level
Pump is noisy	Low oil level	Refill or replace oil
	Damaged pump valves	Replace pump valves
	Insufficient PTO shaft lubrication	Lubricate PTO shaft & replace all bearings if necessary
	Pump suction line has air leak or is restricted	Clean suction filter and check for leaks in suction lines
Pump housing or mounting cracked.	Extremely cold weather can cause liquid in the pump to freeze	Check for ice in the pump and let defrost if required
PTO shaft has become bent or vibrating excessively	PTO shaft is too short	Replace PTO shaft

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PROBLEM	COMMON CAUSES	COMMON SOLUTION
Damaged PTO shaft universal joint	PTO shaft is inadequately lubricated	Lubricate PTO shaft and universal joints
	PTO shaft is too long	Shorten PTO shaft
Pump housing or mountings cracked	PTO shaft not sliding freely or incorrect length	Check PTO shaft length and lubricate. Repair mountings
	Extreme cold weather can cause liquid in the pump to freeze and expand	Replace damaged housing and drain fluid from pump when storing in very cold conditions

Filling

When filling the sprayer it is necessary to use an external water source and wear the appropriate PPE.

The following steps should be followed when filling the tank:

1. Turn the pump off.
2. Remove the tank lid.
3. Add chemical as required. When filling with water, after adding the chemical, some agitation will take place.
4. Use external water source to fill main tank (Do not exceed the tank capacity).
5. Replace the tank lid and ensure that it is secure prior to switching on pump. You are now ready to use the sprayer.

Calibration

All sprayers need to be calibrated and kept in good condition. This will ensure that the correct rate of chemical is applied to the target.

Follow these steps to calibrate the sprayer:

1. Measure the spray width of the nozzle on a dry surface (in metres).
2. Spray a test area at the intended pressure and speed. Record distance (in metres) covered in one minute (minute).
3. Measure the nozzle output in litres over one minute in a measuring jug (l/min).

The spray volume can be calculated by the following formula:

$$\text{Application rate (L/Ha)} = \frac{\text{Nozzle output (l/min)} \times 10,000}{\text{Spray width (m)} \times \text{speed (m/min)}}$$

Spray Application

NOTE: It is the responsibility of the operator to ensure that the chemical mix is sufficiently agitated and that the conditions are right to start spraying. Operators must wear the appropriate PPE.

1. Switch pump on.
2. Allow pump to build pressure.
3. Engage the trigger on the spray lance to start spraying.

4. Adjust the nozzle pattern as required by rotating the nozzle in the appropriate direction as required.
5. Use a consistent speed or swath pattern to ensure even coverage of the target, or adjust the method of application according to your target.

Agitation

Agitation should take place when filling or through another method as deemed suitable by the operator.

Flushing

The following information is provided as a general guide for flushing your sprayer after a spray application

For more specific information regarding flushing, and decontamination, specific to the products that you are applying, it is recommended that you consult the chemical label or your chemical supplier.

1. Turn pump off
2. Drain main tank by removing drain plug
3. Add a quantity of fresh water to main tank and allow to drain through plug.
4. Replace plug and add a quantity of fresh water, and decontaminating agents if required, to main tank.
5. Turn on pump, and spray fresh water through the lance. This will ensure that fresh water has circulated through the pump and lance.
6. Drain remaining contents of fresh water and replace tank drain plug. The sprayer is now ready for storage.

Storage

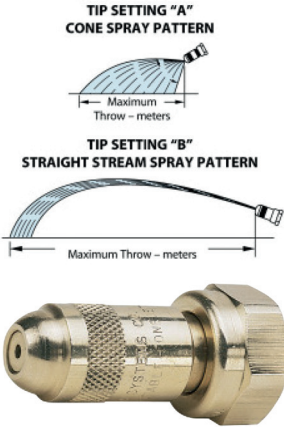
If the sprayer is to be stored for a long period of time without use, there are several tasks that need to be performed.

1. Clean the sprayer thoroughly as described under “flushing”
2. Store the sprayer out of direct sunlight and where it will not be affected by frosts
3. Ensure that the main tank is empty
4. Protect hoses and electrical connections

Spray Gun - Nozzle

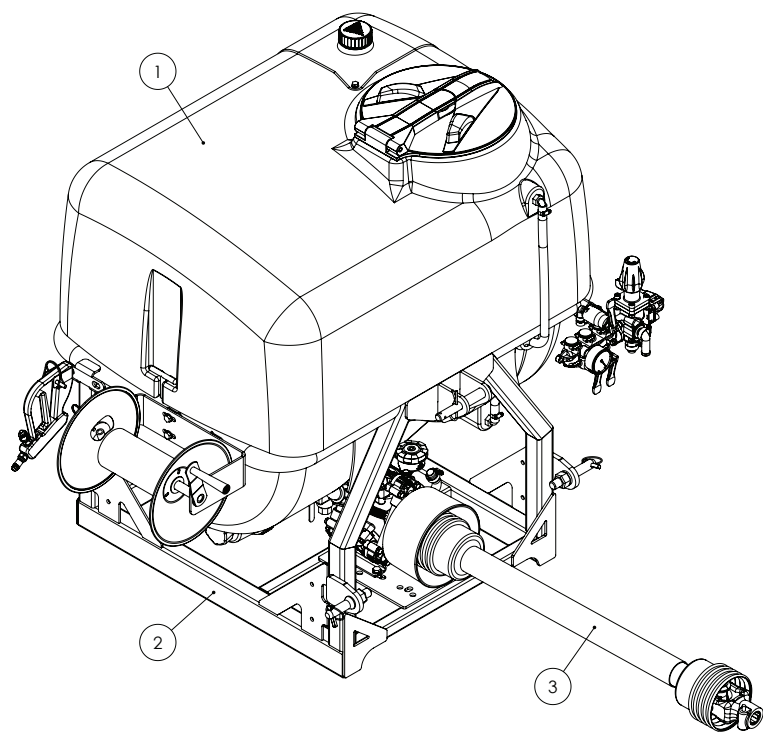
The adjustable brass ConeJet nozzle rotates through a half turn to provide spray selection from wide angle, finely atomized cone spray to a straight stream spray.

NOTE: Tip settings “A” and “B” represent two extreme points of rotation in tip adjustment.



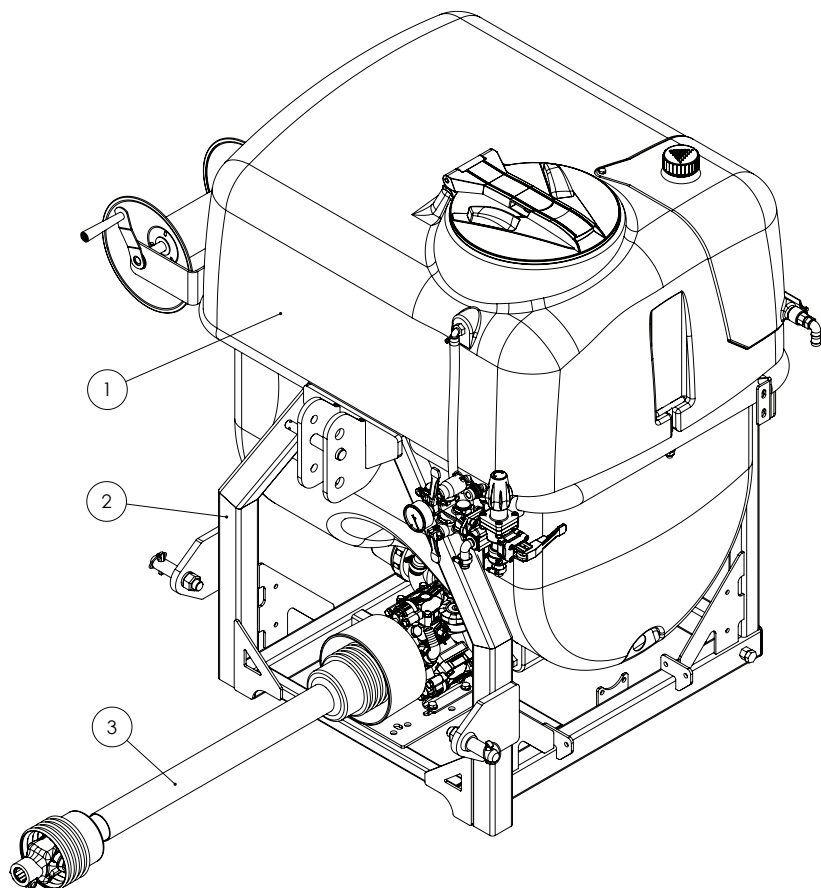
Adjustable ConeJet Tip No.	Performance	Liquid Pressure (bar)							
		1.5		2		3		4	
		A	B	A	B	A	B	A	B
GA8100370 - Standard	Capacity—l/min	0.79	2.61	0.98	3.18	1.14	3.67	1.40	4.54
	Spray angle °	71	-	75	-	77	-	78	-
	Max throw m	1.2	11.6	1.2	12.8	1.2	13.3	1.2	13.0
GA8100377	Capacity—l/min	0.98	3.14	1.21	3.79	1.40	4.54	1.70	5.30
	Spray angle °	71	-	75	-	78	-	79	-
	Max throw m	1.2	11.7	1.40	13.0	1.5	13.6	1.5	13.2
GA8100371	Capacity—l/min	1.17	3.71	1.40	4.54	1.63	5.30	2.01	6.43
	Spray angle °	72	-	76	-	78	-	79	-
	Max throw m	1.4	11.6	1.5	13.1	1.5	13.7	1.7	13.3

3PL - 450L



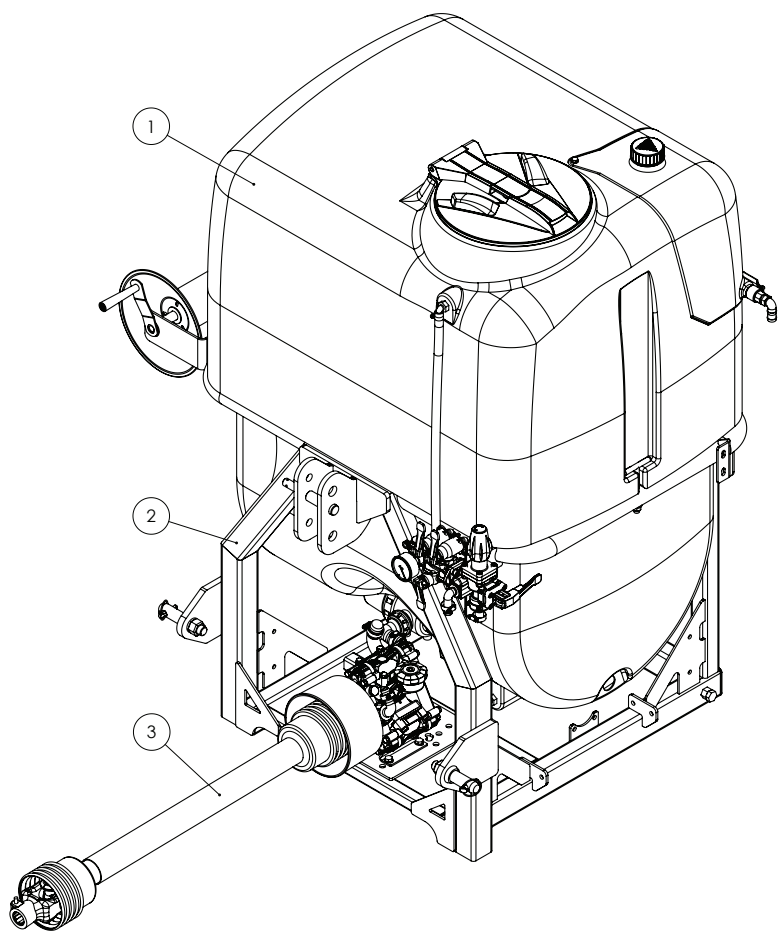
Pos.	Part No.	Description	Qty.
1	GA4906600	Tank Assembly, 450L, 3PL	1
2	GA4908070	3 Point Linkage Sprayer Frame 450L	1
3	GA4900714	PTO shaft, Series 2, 860 mm, with quick release free rotating cover	1

3PL - 600L



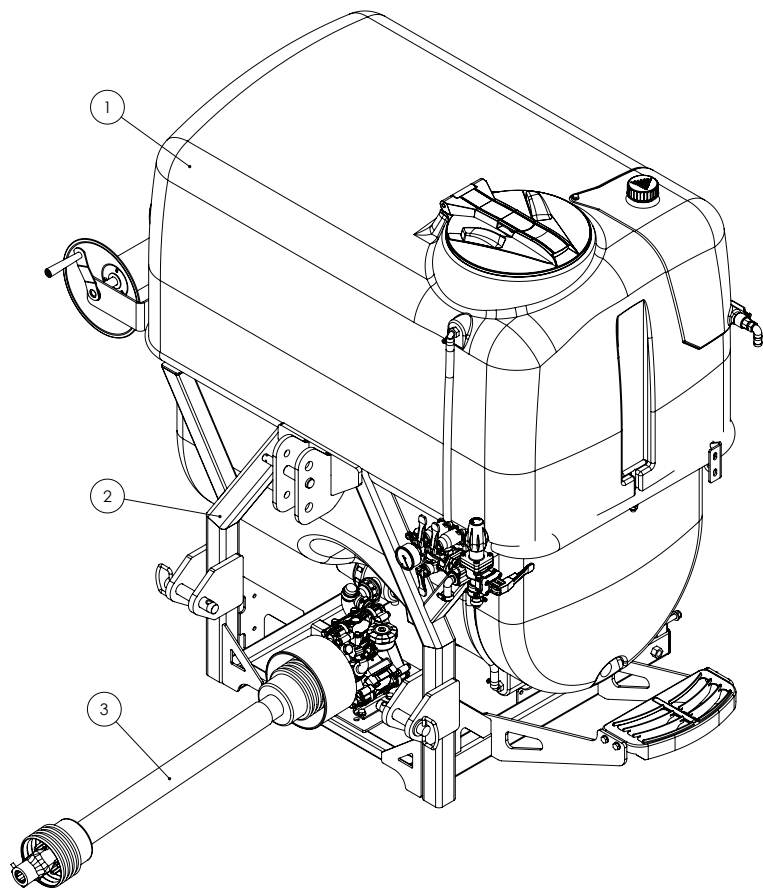
Pos.	Part No.	Description	Qty.
1	GA4906605	Tank Assembly, 600L, 3PL	1
2	GA4908075	3 Point Linkage Sprayer Frame 600L	1
3	GA4900714	PTO shaft, Series 2, 860 mm, with quick release free rotating cover	1

3PL - 800L



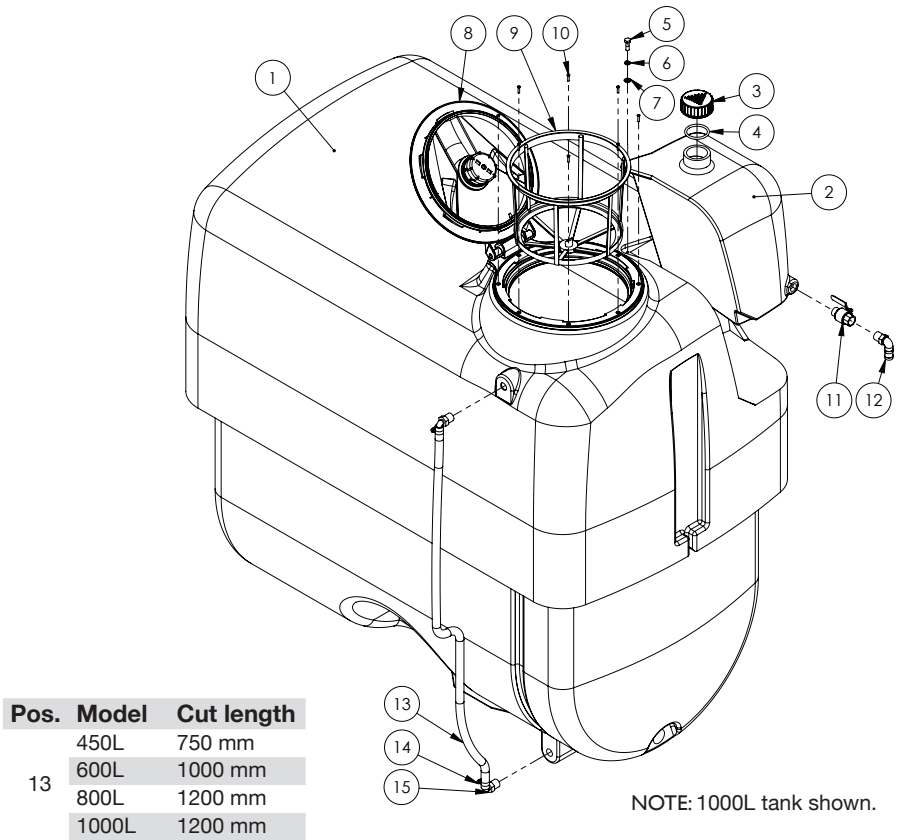
Pos.	Part No.	Description	Qty.
1	GA4906610	Tank Assembly, 800L, 3PL	1
2	GA4908080	3 Point Linkage Sprayer Frame 800L	1
3	GA4900714	PTO shaft, Series 2, 860 mm, with quick release free rotating cover	1

3PL - 1000L



Pos.	Part No.	Description	Qty.
1	GA4906615	Tank Assembly, 1000L, 3PL	1
2	GA4908085	3 Point Linkage Sprayer Frame 1000L	1
3	GA4900714	PTO shaft, Series 2, 860 mm, with quick release free rotating cover	1

Tank Assembly - 450-1000L



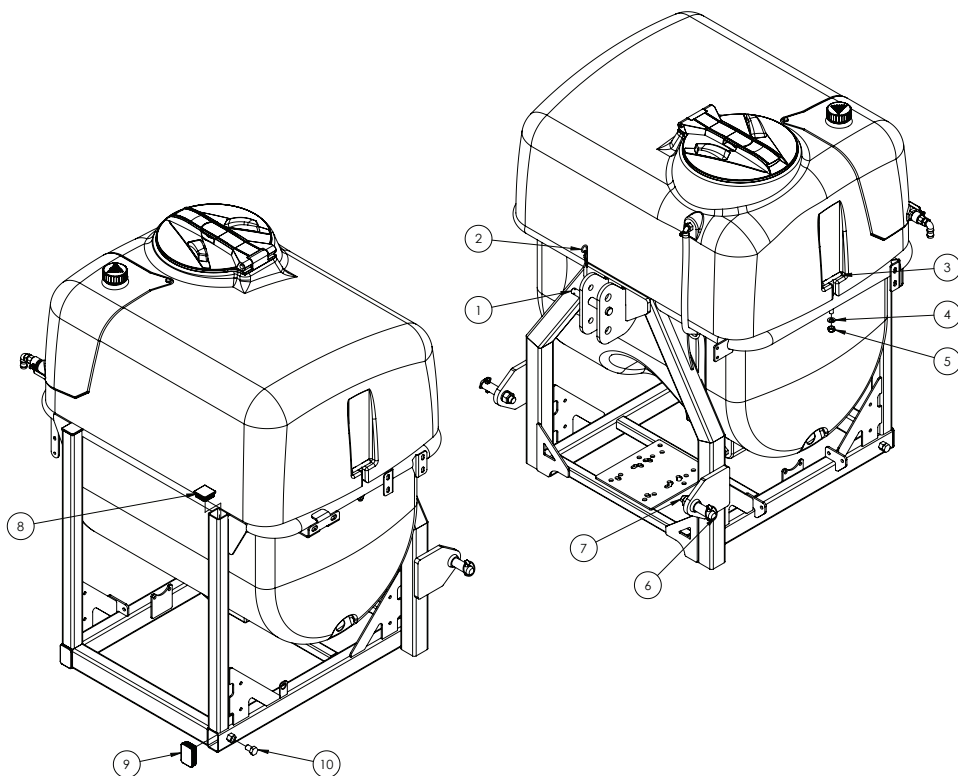
Pos.	Part No.	Description	Qty.
1	GA5071255	Tank, 450L with lid & 23L hand wash tank, Bare	1
	GA5071260	Tank, 600L with lid & 23L hand wash tank, Bare	1
	GA5071265	Tank, 800L with lid & 23L hand wash tank, Bare	1
	GA5071270	Tank, 1000L with lid & 23L hand wash tank, Bare	1
2	GA5071275	Tank, Handwash, Green, Slip in, Bare	1
3	GA5075400	Cap, Tank, Plastic, Lid, M65.5 x 8 mm Thread, Black, Goldacres Logo, O Ring Not Included	1
4	GA5009187	O ring, 60 OD, 50 ID x 5mm, suits exacta tank cap	1
5	GA5004711	Bolt M8 x 25 GR8.8 ZP	1
6	GA5004919	Washer 8mm Spring SS	1
7	GA5003643	Washer 8mm Flat SS HD	1

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Tank Assembly - 450-1000L

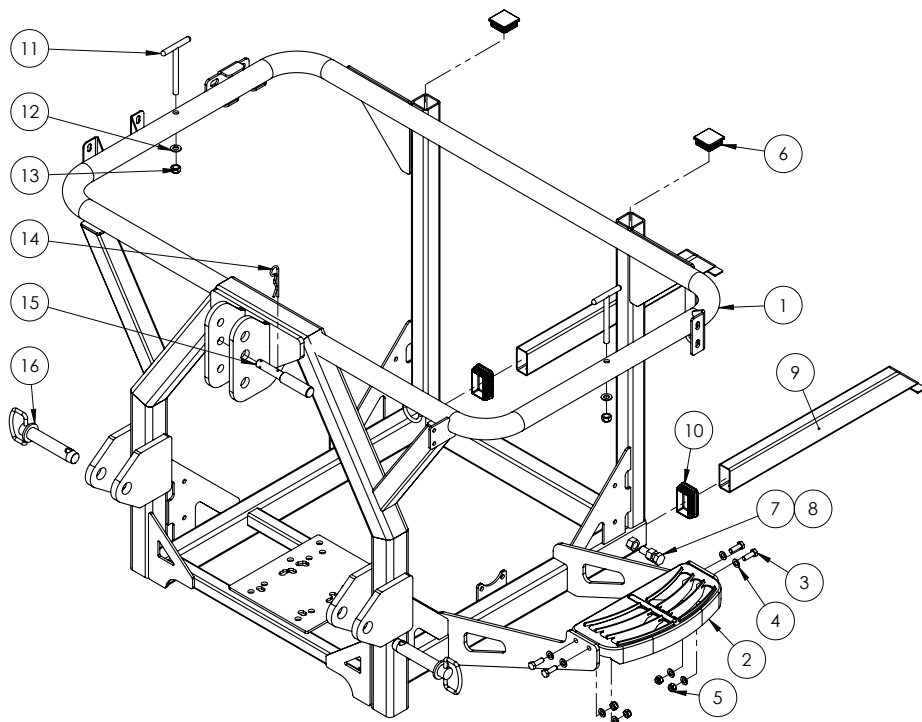
Pos.	Part No.	Description	Qty.
8	GA5078498	Lid, Hinged, Black plastic, 355mm	1
9	GA5076714	Filter, Basket type, Diameter 305 x 245mm deep, Suit main spray tank	1
10	GA5069815	Screw Countersunk Phillips M4 x 20 ZP	8
11	GA5020295	Valve, Ball, 12mm, 1/2" male, female, Lever handle, Brass	1
12	GA5077704	Hose barb, Elbow, 90 degree, 1/2" male thread x 3/4" hose	1
13	HOS12WSIGHT	Hose, 12mm, Clear, Wire reinforced	1
14	GA5000469	Hose clamp, 1/2", SS	2
15	GA5077708	Hose barb, Elbow, 90 degree, 1/2" male thread x 1/2" hose	2

Frame Spare Parts - 450-800L



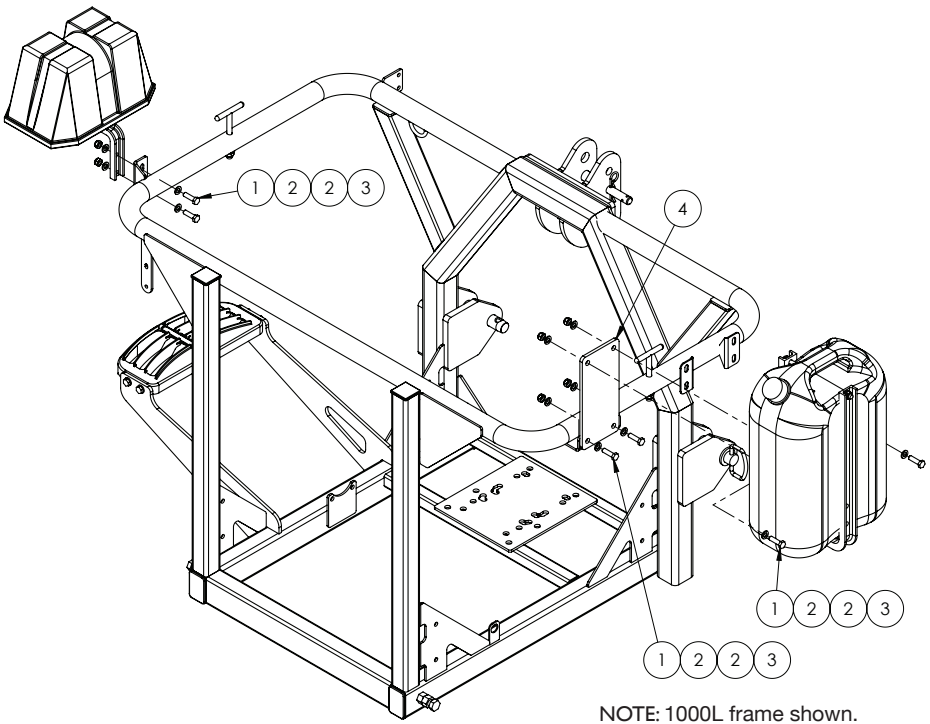
Pos.	Part No.	Description	Qty.
1	GA5016789	Top Link Pin, Dual Cat.	1
2	GA5007197	Clip R type 4 mm ZP S12	1
3	GA5071830	T Bolt, M12 130mm Long 90mm Wide	2
4	GA5000577	Washer 12mm Flat SS HD	2
5	GA5012461	Nut M12 Nyloc ZP	2
6	GA5010905	Linch pin, 7/16" OD x 45 mm long	2
7	GA5010511	Implement Pin, Cat 2	2
8	GA5003783	End cap, Plastic, Black, Insert, RHS. 50 x 50, 0.8 - 2.5 mm wall	2
9	GA5071885	End cap, Plastic, Black, Insert, RHS. 75 x 50, 2.5 - 4.5 mm wall	2
10	GA5000903	Bolt M16 x 25 GR8.8 ZP	2

Frame Spare Parts - 1000L



Pos.	Part No.	Description	Qty.
1	GA4660220	3 Point Linkage Sprayer Frame 1000L	1
2	GA5072535	Pressed step tread bolt in 370 mm wide Painted	1
3	GA5065455	Bolt M10 x 30 GR8.8 ZP	4
4	GA5000117	Washer 10mm Flat SS HD	8
5	GA5000141	Nut M10 Nyloc ZP	4
6	GA5003783	End cap, Plastic, Black, Insert, RHS. 50 x 50, 0.8 - 2.5mm wall	2
7	GA5000931	Bolt M16 x 50 GR8.8 ZP	2
8	GA5012385	Nut M16 ZP	2
9	GA4661800	3PL, Support Leg	2
10	GA5071885	End cap, Plastic, Black, Insert, RHS. 75 x 50, 2.5 - 4.5mm wall	2
11	GA5071830	T Bolt, M12 130mm Long 90mm Wide	2
12	GA5000577	Washer 12mm Flat SS HD	2
13	GA5012461	Nut M12 Nyloc ZP	2
14	GA5007197	Clip R type 4 mm ZP S12	1
15	GA5016789	Top Link Pin, Dual Cat.	1
16	GA5072730	Lynch Pin, Cat 2, 28.5mm Dia, 140 mm Long	2

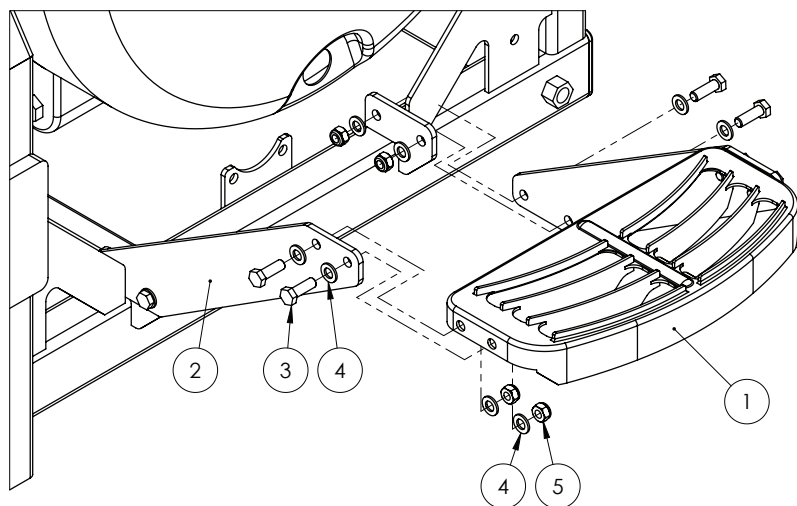
Foam Marker - 450-1000L



NOTE: 1000L frame shown.

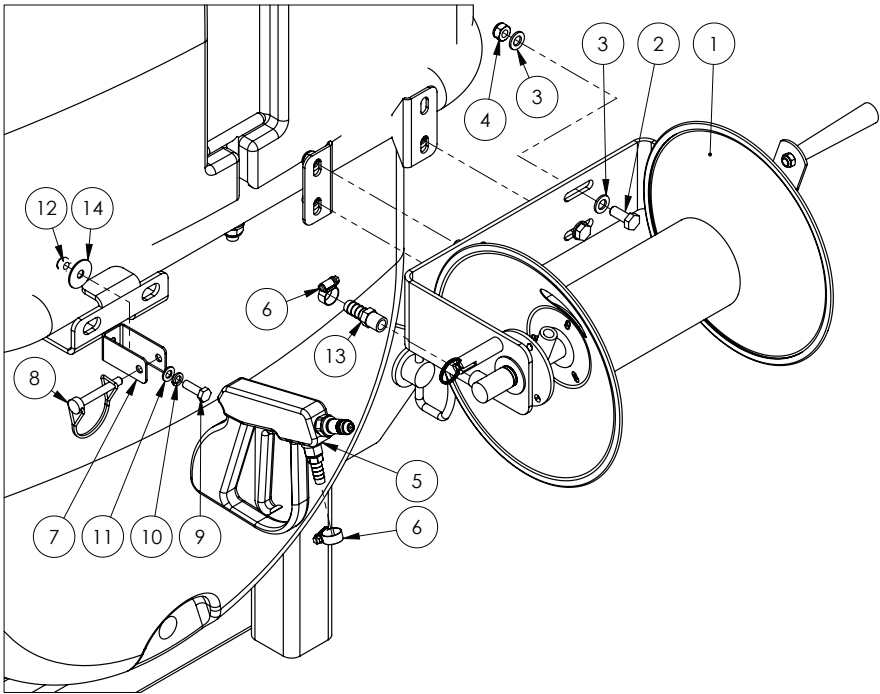
Pos.	Part No.	Description	Qty.
-	GA5053065	Ezi Mate Foam Marker Complete Kit, 24L, 12V, horizontal droppers, double sided	-
-	GA5078420	Foam Marker Generator, Vertical, Complete end (old style)	-
-	GA5023110	Foam Marker Generator, Horizontal, Complete end	-
-	GA5024915	Dual hose, 33m, air / liquid	-
-	GA5078421	Needle Valve for TFL Kit	-
-	GA5078422	Foam marker tank lid needle valve & pickup tube	-
-	GA5023111	Solenoid, suit Ezi mate Foam Marker	-
-	GA5023113	Cap Assembly for Ezimate foam marker	-
1	GA5006111	Bolt M10 x 35 ZP GR8.8	6
2	GA5000117	Washer 10mm Flat SS HD	12
3	GA5000141	Nut M10 Nyloc ZP	6
4	GA4401530	Plate, Foam marker tank mount	1

Step - 600-800L



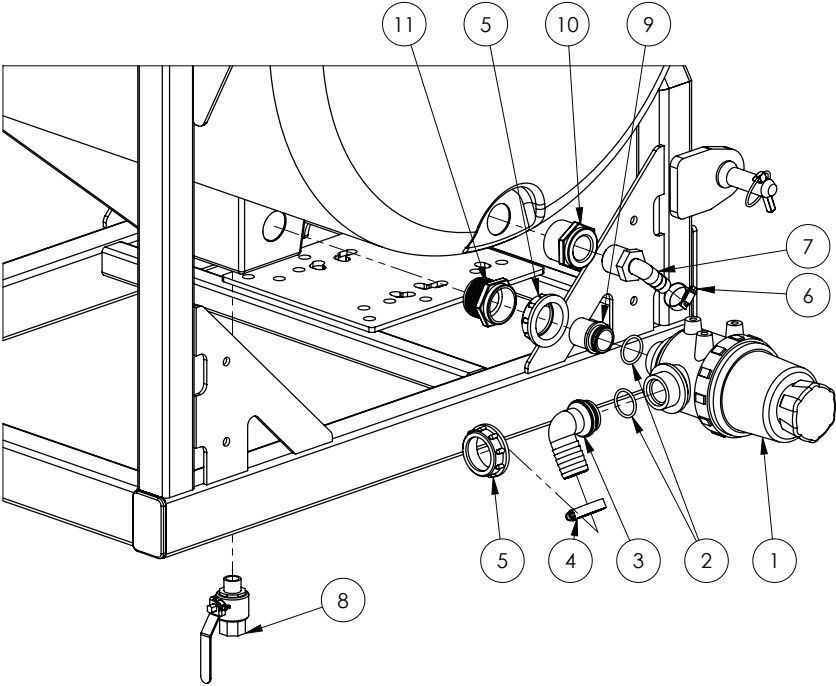
Pos.	Part No.	Description	Qty.
1	GA5070535	Step Tread Pressed bolt in 370mm wide painted	1
2	GA4508495	Plate, Step Bracket	2
3	GA5065455	Bolt M10 x 30 GR8.8 ZP	8
4	GA5000117	Washer 10mm Flat SS HD	16
5	GA5000141	Nut M10 Nyloc ZP	8

Hose Reel - 450-1000L



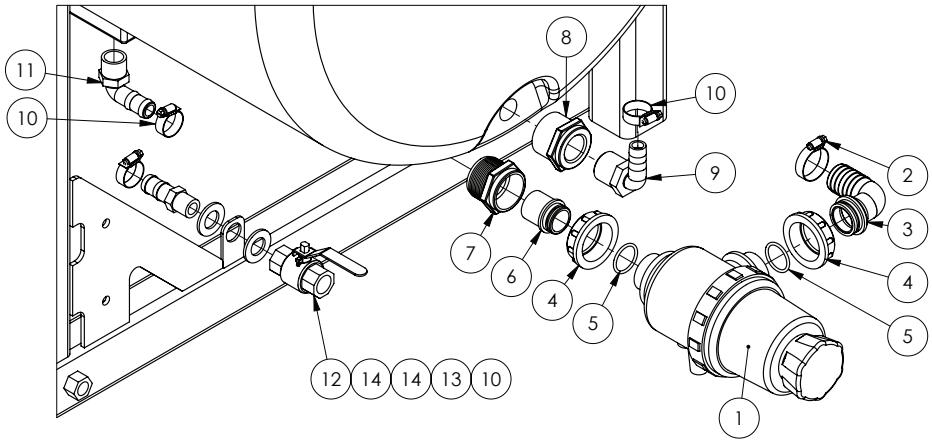
Pos.	Part No.	Description	Qty.
1	GA5066080	Hose reel, 30m 3/8" hose, manual rewind	1
2	GA5006161	Bolt M10 x 25 GR8.8 ZP	4
3	GA5000117	Washer 10mm Flat SS HD	8
4	GA5000141	Nut M10 Nyloc ZP	4
	GA4900546	Gunjet, AA30, adjustable nozzle, 1/2" Hose Barb	1
5	GA5020875	Hose barb, 1/4" male thread x 1/2" barb, Brass	-
	GA8100370	Spray tip, Adjustable ConeJet, Brass, 18	-
6	GA5000469	Hose clamp, 1/2", SS	2
7	GA4534635	Bracket Nozzle suit small booms	1
8	GA5013003	Pipe pinch pin, 8 OD x 60 mm long	1
9	GA5004713	Bolt M8 x 25 SS A2-70	1
10	GA5004919	Washer 8mm Spring SS	1
11	GA5003643	Washer 8mm Flat SS HD	1
12	GA5004917	Nut M8 Nyloc ZP	1
13	GA5021070	Hose barb, Straight, 3/8" BSP male x 1/2" hose, Brass	1
14	GA5003645	Washer 5/16" ID x 1 1/4" OD Flat SS	1

Suction Filter - 450L



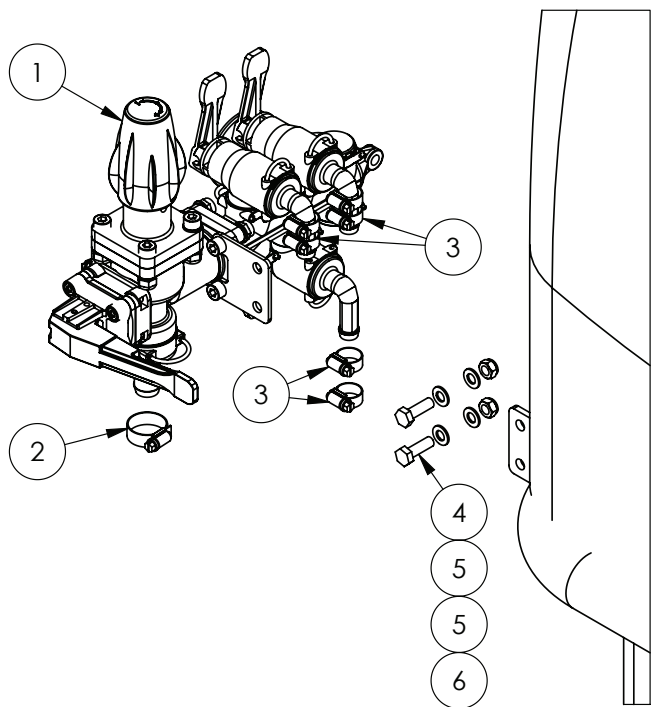
Pos.	Part No.	Description	Qty.
1	GA5076758	Suction filter, 1 1/2", with shut off valve, 50 mesh	1
2	GA5077679	O ring, 30 x 3 mm	2
3	GA5076259	Hose barb, Elbow, 90 degree, 1 1/2" fly nut end x 32 mm hose, Arag	1
4	GA5002783	Hose Clamp, 1 1/4", SS (30-45/13W)	1
5	GA5076604	Fly nut, 1 1/2", Arag	2
6	GA5000999	Hose Clamp, 3/4", SS (16-27/12W)	1
7	GA5077719	Hose barb, Elbow, 90 degree, 1" male thread x 3/4" hose	1
8	GA5018317	Valve, Ball, 20mm, 3/4" male, female, Lever handle, Brass	1
9	GA5076712	Coupling 1 1/4" Male for fly nut 1 1/2"	1
10	GA5078018	Reducing bush, 1 1/2" male thread x 1" female thread	1
11	GA5078019	Reducing bush, 1 1/2" male thread x 1 1/4" female thread	1

Suction Filter - 600-1000L



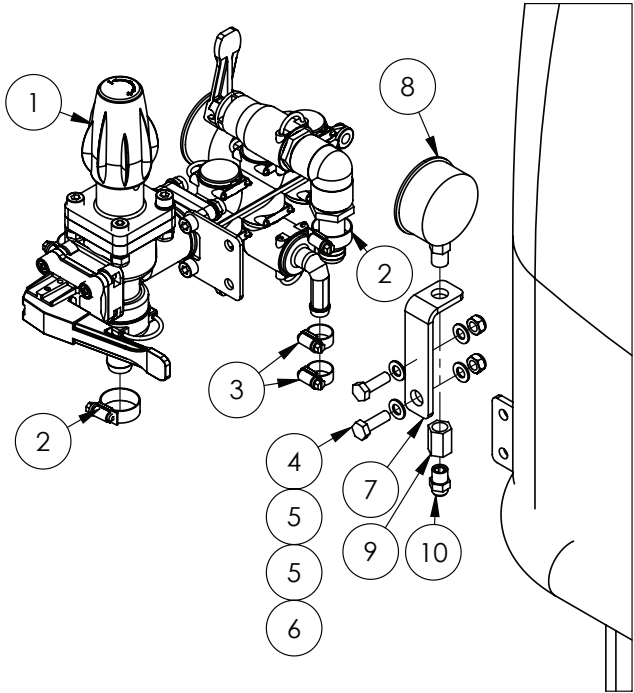
Pos.	Part No.	Description	Qty.
1	GA5076758	Suction filter, 1 1/2", with shut off valve, 50 mesh	1
2	GA5002783	Hose Clamp, 1 1/4" , SS (30-45/13W)	1
3	GA5076259	Hose barb, Elbow, 90 degree, 1 1/2 fly nut end x 32 mm hose	1
4	GA5076604	Fly nut, 1 1/2"	2
5	GA5077679	O ring, 30 x 3 mm, G10061	2
6	GA5076712	Coupling 1 1/4" Male for fly nut 1 1/2"	1
7	GA5078019	Bush, Reducing, Poly, 1 1/2" Male Thread x 1 1/4" Female Thread	1
8	GA5078018	Bush, Reducing, Poly, 1 1/2" Male Thread x 1" Female Thread	1
9	GA5077719	Hose barb, Elbow, 90 degree, 1" male thread x 3/4" hose	1
10	GA5000999	Hose Clamp, 3/4" , SS (16-27/12W)	3
11	GA5077717	Hose barb, Elbow, 90 degree, 3/4" male thread x 3/4" hose	1
12	GA5018309	Valve, Ball, 12mm, 1/2" female, Lever handle, Brass	1
13	GA5077707	Hose barb, 1/2" male thread x 3/4" hose	1
14	GA5001741	Washer 20mm Flat SS HD	2

Spray Manifold - 450-1000L - Non-Boom Valve



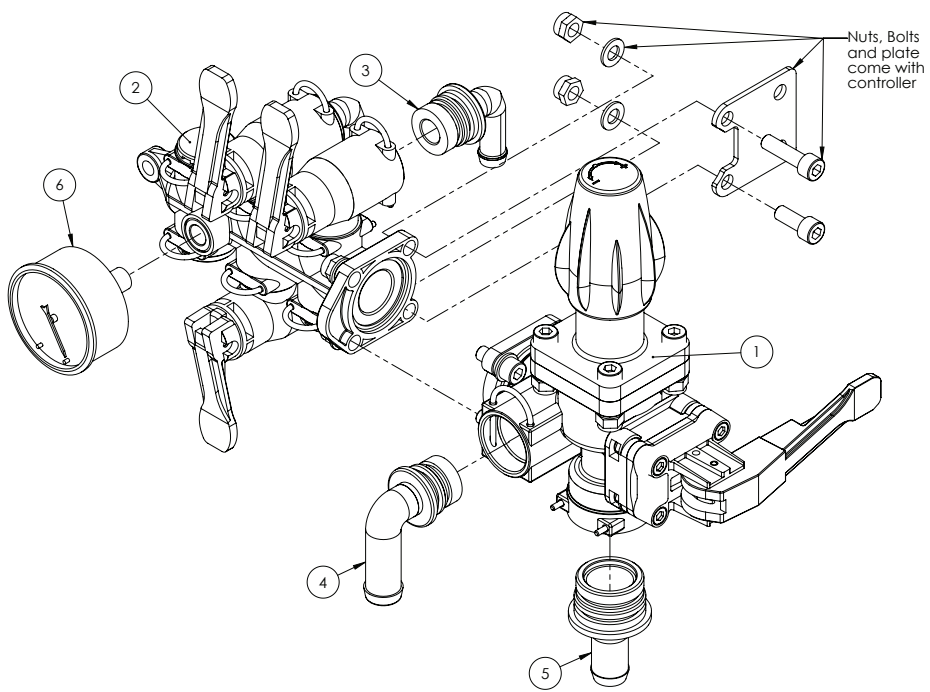
Pos.	Part No.	Description	Qty.
1	GA2000051	Pressure control valve, manual, constant, 4 way, Geoline	1
2	GA5000999	3/4" SS hose clamp	2
3	GA5000469	Hose clamp, 1/2", SS	6
4	GA5004711	Bolt M8 x 25 GR8.8 ZP	2
5	GA5003643	Washer 8mm Flat SS HD	4
6	GA5004917	Nut M8 Nyloc ZP	2

Spray Manifold - 800-1000L - Boom Valve



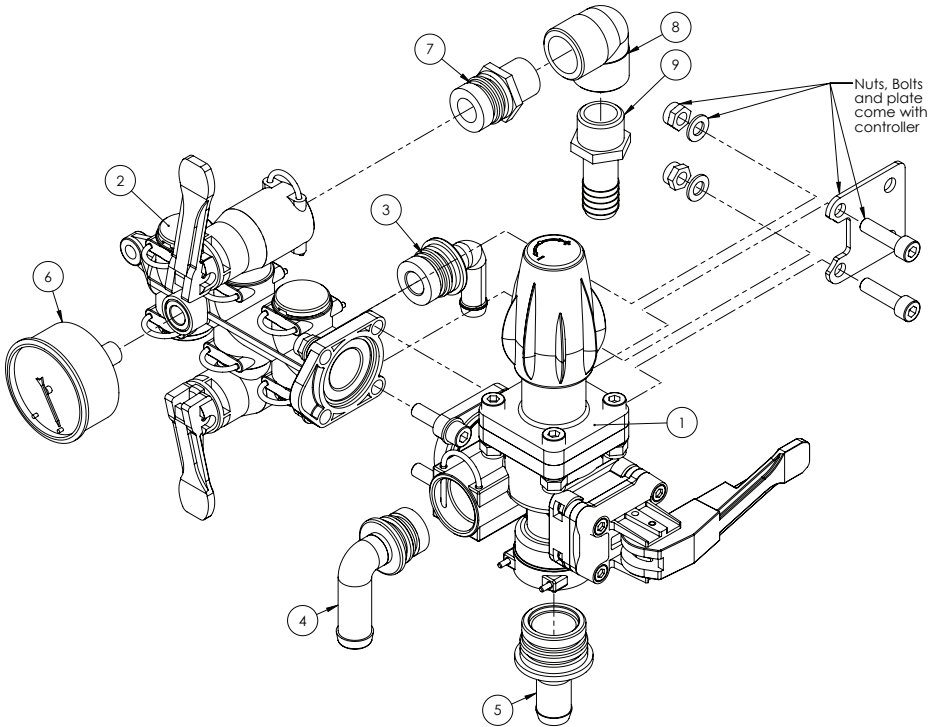
Pos.	Part No.	Description	Qty.
1	GA2000051	Pressure control valve, manual, constant, 4 way, Geoline	1
2	GA5000999	3/4" SS hose clamp	2
3	GA5000469	Hose clamp, 1/2", SS	6
4	GA5004711	Bolt M8 x 25 GR8.8 ZP	2
5	GA5003643	Washer 8mm Flat SS HD	4
6	GA5004917	Nut M8 Nyloc ZP	2
7	GA4534550	Bracket 100mm Director Encircling Manifold	1
8	GA4948470	Gauge, Pressure, Small face, 160psi	1
9	GA5066940	Socket, 1/4 female thread, Hex, Brass	1
10	GA5045140	Pneumatic fitting, Nipple, 1/4 BSPT male x 6mm push in type, Brass	1

Spray Manifold Assembly - Non-Boom Valve



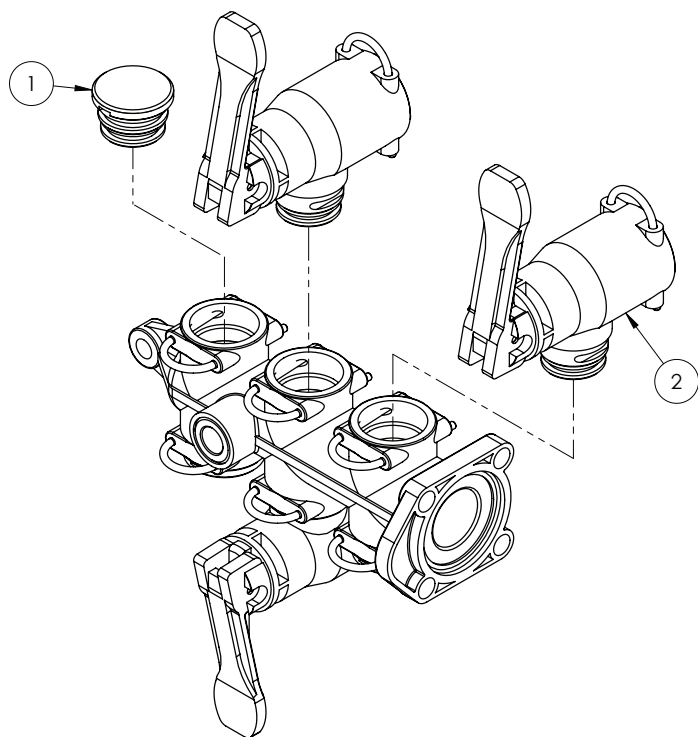
Pos.	Part No.	Description	Qty.
1	GA2000085	Main Manual Control Valve, Adjustable presure Relief, Geoline	1
2	GA2000086	Plumbing Manifold, 4-6 Sections, Geoline	1
3	GA2000056	Plumbing fitting, Hose barb 13mm, elbow, With oring, outlet, Geoline	3
4	GA2000060	Plumbing fitting, Hose barb 25mm, elbow, With oring, Inlet, Geoline	1
5	GA2000054	Plumbing fitting, Hose barb 19mm, With oring, Bypass, Geoline	1
6	GA2000075	Pressure Gauge, Rear Mount, 25 Bar, 1/4", coloured scale, Geoline	1

Spray Manifold Assembly - Boom Valve



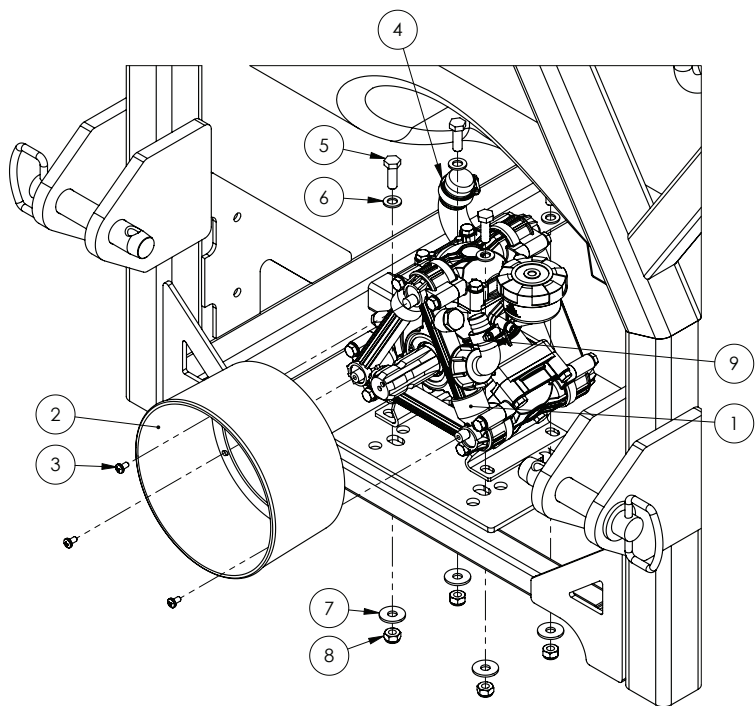
Pos.	Part No.	Description	Qty.
1	GA2000085	Main Manual Control Valve, Adjustable presure Relief, Geoline	1
2	GA2000086	Plumbing Manifold, 4-6 Sections, Geoline	1
3	GA2000056	Plumbing fitting, Hose barb 13mm, elbow, With oring, outlet, Geoline	1
4	GA2000060	Plumbing fitting, Hose barb 25mm, elbow, With oring, Inlet, Geoline	1
5	GA2000054	Plumbing fitting, Hose barb 19mm, With oring, Bypass, Geoline	1
6	GA2000075	Pressure Gauge, Rear Mount, 25 Bar, 1/4", coloured scale, Geoline	1
7	GA2000096	Plumbing Fitting, 3/4 male thread to PTG valve Outlet, Brass, Geoline	1
8	GA5024215	Elbow, Brass, 3/4" Female x 3/4" Female BSPT	1
9	GA5071495	Hose barb brass, straight, 3/4" male thread x 3/4" hose barb	1

Plumbing Manifold Assembly



Pos.	Part No.	Description	Qty.
1	GA2000058	Plumbing fitting, plug, Geoline	-
2	GA2000087	Modular section valve, Geoline, Suits Geoline manifold GA2000086 and GA2000051	-

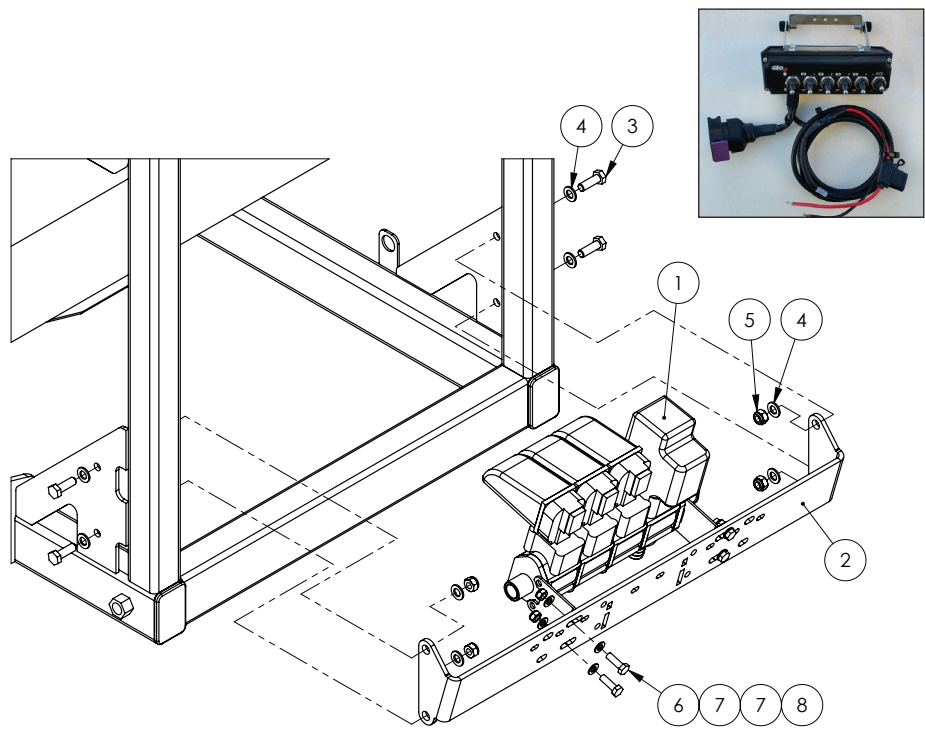
Pump - 450-800L



NOTE: 1000L frame shown.

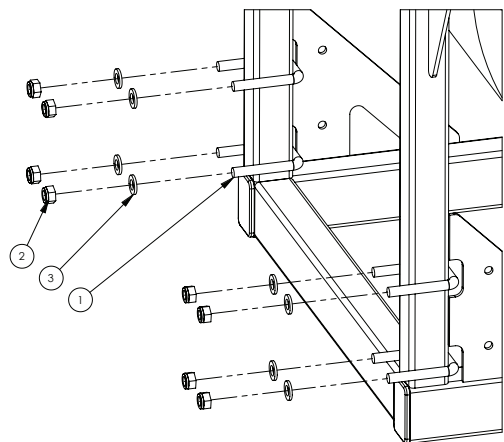
Pos.	Part No.	Description	Qty.
1	GA5078218	Pump , Diaphragm type, Zeta 70 PTO shaft drive, shaft not included	1
2	GA5076400	Cover, PTO shaft, Black	1
3	GA5014827	Screw Pan head 12g x 1/2" ZP	3
4	GA5002783	Hose Clamp, 1 1/4" , SS (30-45/13W)	1
5	GA5065455	Bolt M10 x 30 GR8.8 ZP	4
6	GA5000117	Washer 10mm Flat SS HD	4
7	GA5002627	Washer 3/8" ID x 1 1/8" OD High Tensile	4
8	GA5000141	Nut M10 Nyloc ZP	4
9	GA5000999	Hose Clamp, 3/4" , SS (16-27/12W)	1

Boom Valves - 800-1000L



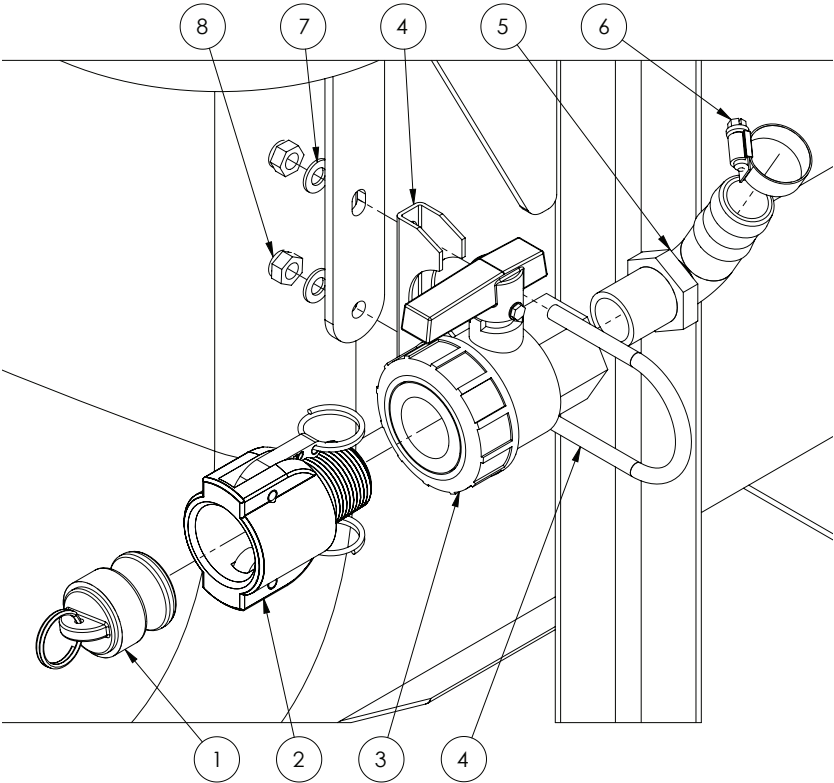
Pos.	Part No.	Description	Qty.
-	GA3000065	Switch box, control 4 boom valves, 4V+P+G RD, Geoline	-
-	GA3000064	Electrical harness, 5m extension, boom valves, Geoline	-
1	GA2000052	Pressure control valve, electric, 3 way, 3/4" inlet and return, 1/2" outlets	1
	GA5045140	Pneumatic fitting, Nipple, 1/4 BSPT male x 6mm push in type, Brass	1
2	GA4403145	Support Bar, for Electric Valves	1
3	GA5065455	Bolt M10 x 30 GR8.8 ZP	4
4	GA5000117	Washer 10mm Flat SS HD	8
5	GA5000141	Nut M10 Nyloc ZP	4
6	GA5004711	Bolt M8 x 25 GR8.8 ZP	4
7	GA5003643	Washer 8mm Flat SS HD	8
8	GA5004917	Nut M8 Nyloc ZP	4

Boom Mounting Fasteners



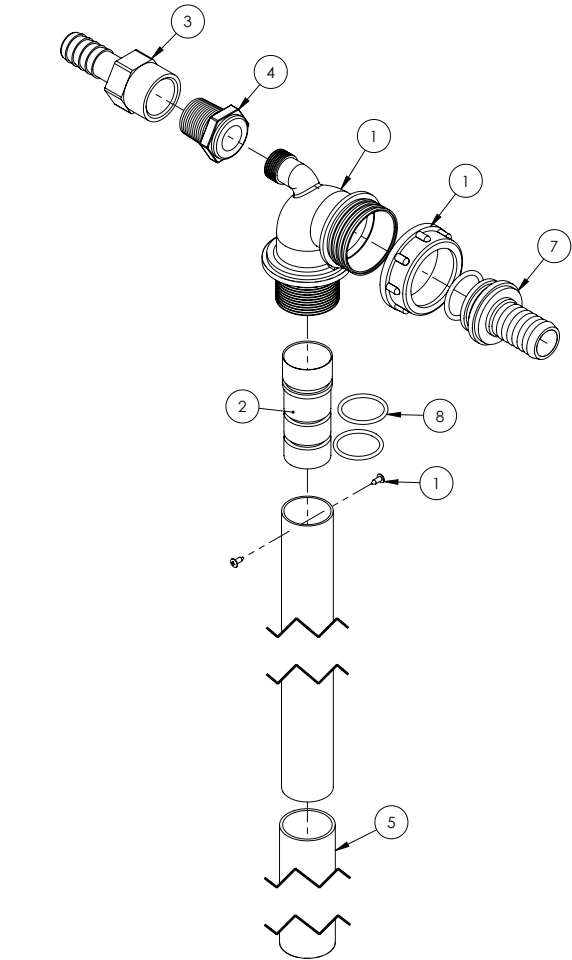
Pos.	Part No.	Description	Qty.
1	GA5011251	U-Bolt M12 x 52 x 80 mm Square Top	4
2	GA5012461	Nut M12 Nyloc ZP	8
3	GA5000577	Washer 12mm Flat SS HD	8

Chemical Probe Assembly



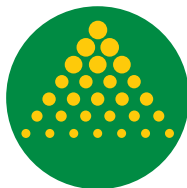
Pos.	Part No.	Description	Qty.
1	GA5076005	Cam lever, Male plug, Suits 1" & 1 1/4" couplings	1
2	GA5076007	Cam lever, 1" female coupler, 1" male thread	1
3	GA5078164	Valve, Ball, 1" female thread inlet / outlet, Full port, Lever handle	1
4	GA5006705	Clamp, 2"	1
5	GA5077716	Hose Barb, Elbow, 90 degree, 3/4" male thread x 1" hose	1
6	GA5000999	Hose Clamp, 3/4", SS (16-27/12W)	1
7	GA5003643	Washer 8mm Flat SS HD	2
8	GA5052590	Nut M8 Nyloc SS	2

Venturi Filler Assembly



Pos.	Part No.	Description	Qty.
-	GA4903086	Venturi filler, Pre assembled, to mount in top of tank	1
-	GA5007235	Hose clamp, Cobra type, 1 1/2"	1
1	GA5077035	Venturi, Top of tank, 32mm OD outlet	1
2	MACH0022	Jet for Arag venturi	1
3	GA5077743	Hose barb female 3/4"	1
4	GA5078010	Poly Pipe Reducer Bush 3/4" x 1/2"	1
5	GA5050205	Hose Lay flat Blue, 32mm - Cut 405mm long	1
6	GA5077679	O-ring 30 x 3mm	1
7	GA5076036	Hose barb, Straight, 1 1/2" fly nut end x 1" hose barb	1
8	GA5049125	O-ring, 23.4 x 3.53mm, BS213	2

NOTE: Not all parts supplied with kit GA5077035 are used in this assembly.



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