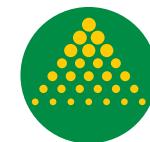




# Prairie Special Series 2

OPERATOR'S MANUAL MY23

GA8701871 REV 00  
JANUARY 2023  
FROM SERIAL NO 203627



**GOLDACRES**



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Under: Parts & Service > Owner-Operator Manuals:

<u>Model</u>	<u>Year</u>	<u>Revision</u>	<u>Part Number</u>
Prairie Special Series 2	2023	00	GA8701871

Under: Parts & Service > Parts Manuals:

<u>Model</u>	<u>Year</u>	<u>Revision</u>	<u>Part Number</u>
Prairie Special Series 2	2023	00	GA8701682





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## Welcome

Congratulations on your Selection of the Goldacres Prairie Special Series 2 Trailed Sprayer

Goldacres has been designing, building, supplying and servicing Australian farmers with high quality, innovative & technologically advanced spraying solutions for over 40 years.

Our advanced equipment is specifically designed & developed in Australia for Australian conditions.

Goldacres produce Australia's finest range of spraying equipment and we keenly value the unique relationships we develop and enjoy with the owners of our equipment.

We welcome you as a Goldacres Owner and look forward to assisting you to make your spraying applications as easy and efficient as possible.

This Operators Manual outlines all you need to know about the operation of your sprayer, along with operating guidance and the overall maintenance & care of your machine.

Our Customer Care booklet, called the Delivery & Warranty Registration Manual (supplied separately) explains in simple, easy to understand terms the Pre-Delivery, Post-Delivery, Warranty, Servicing and Maintenance of your Sprayer.

Please read, understand and use these comprehensive manuals to gain complete understanding of your sprayer for its reliable, safe, accurate & efficient operation.

Do not hesitate to contact your Goldacres Dealer or Goldacres for further information as explained in these manuals.

**Roger Richards**  
General Manager

## About this Manual

This manual provides instructions for some items requiring assembly on delivery, setting up instructions, calibration procedures, pre-operation requirements, operating instructions and maintenance requirements to achieve the best performance of this Prairie Special Series 2 Trailed Sprayer.

Some options explained in this manual may not be installed on your sprayer. Other options fitted may require another operator manual for instructions.

Please ensure this manual and other relevant manual are passed onto the new owner if the sprayer is sold.

## How to Use/Read this Manual

This manual includes a Contents page and 10 Chapters - with each Chapter beginning with a list of Headings & Subheadings.

Each page contains written instructions with pictures, illustrations, decal & symbol instructions, above & below providing visual support and information to each instruction.

Numerical values & settings shown in the manual are instructional examples only and may not be representative for your machine or local situation.

## Decal/Symbol Instructions

Danger, Warning, Caution & Note symbols & decals are used throughout this manual and on your Prairie Special Series 2 Trailed Sprayer instructing you of risks, procedures & operator safety.

It is important to familiarise yourself with these & understand their meaning to be able to quickly identify risks, procedures, operator safety & safety of others, as outlined below:

**⚠ DANGER**

- Conveys highest risk of injury or death to convey that action must be taken to protect personal health.
- Serious injury or death may occur if you don't follow instructions!

- **Danger Symbol** - used for areas where the highest personal risk of injury or death is present.

Always read the information on these decals and ensure you are taking the precautions necessary to prevent risk of injury or death.

You may be killed or seriously hurt if you don't follow instructions!

**⚠ WARNING**

- Conveys risk of injury highlighting the need for action to be taken to protect personal health.
- Serious injury may occur if you don't follow instructions!

- **Warning Symbol** - used in areas where there is potential for risk or injury highlighting the need for action to be taken to protect personal health.

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

**⚠ CAUTION**

- Conveys the potential for personal injury and/or damage to the machine itself.
- Injury and/or damage your machine, if you don't follow instructions!

- **Caution Symbol** - used where there is potential for personal injury and/or damage to the machine itself.

Injury and/or damage your machine may occur if you don't follow instructions

**NOTE**

- Conveys useful operating information and procedures.
- It is not hazard related.

- **Note Symbol** - is used to inform the operator of installation, operation or maintenance information & procedures that are important for the best ways of operating this sprayer.

The Note symbol is not hazard related.

## Operator Responsibilities

All operators of the Prairie Special Series 2 Trailed Sprayer should be adequately trained in the safe operation of this equipment.

It is important that all operators have read and fully understand the operator's manual prior to using this equipment.

All operators of the Prairie Special must **read all Operator Manuals** for this machine including but not limited to:

- This Prairie Special Series 2 Operators Manual
- Delivery & Warranty Registration Manual
- Prairie Special Series 2 Parts Manual (available online only).
- Raven Rate Control Module Operation Manual
- Other Manuals as required,

**and fully understand:**

- All risks & safety concerns
- Installation & assembly
- Pre-operation checks
- Calibration of the sprayer
- Operating the sprayer
- Sprayer lubrication & maintenance
- Use of protective clothing
- Risks of using chemicals & spraying.

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



The serial number plate is located on the left hand side of the front hitch.

## Identification & Parts Ordering

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

The serial number plate on your machine is located on the chassis at the front left hand side by the cabin access ladder.

When ordering parts from your Goldacres dealer, please quote:

- Machine serial number
- Part number required
- Part description
- Quantity required.

The Goldacres Parts Manual (available online) includes the relevant information you need when ordering parts from your dealer.

When returning parts to a Goldacres dealer for service or repair, all parts **MUST** be cleaned thoroughly before sending them.

Dealers will not expose their service technicians to the many potentially hazardous pesticides & substances that may have been used.

Use only Genuine Goldacres parts on Goldacres equipment.

### NOTE

To identify the exact options fitted to your particular sprayer, refer to the original quotation and/or build sheet. If needed, a copy of the build sheet may be obtained by contacting your dealer and quoting your machine serial number as described above.

### NOTE

Please ensure all parts are clearly labelled with the owner's details and a brief description of the fault. Dealers are not liable for the return of any goods to a Goldacres Dealer. Goods must be returned to point of sale.

### NOTE

If a tyre is replaced with a different brand or size, please contact the supplier for correct air pressures to suit the load carrying capacity of this machine.

### NOTE

Converting Kilopascals (Kpa) to Pounds per Square Inch (PSI):

PSI = Kpa x 0.145

Eg. 282 Kpa x 0.145 = 40.9 PSI

Tyre Size	Load Index	Model (L)	Recommended Pressure @ (kPa/PSI)
18.4 x 38		4000	260 / 38
		5000	290 / 42
		6500	315 / 46
480/80R46	166A8/159D	4000	140 / 20
		5000	140 / 20
		6500	240 / 35
		8500	310 / 45
480/80R50	HR45 X-Load/177 TL	10000	410 / 65
520/85R42	HR45 X-Load/169A8	4000	140 / 20
		5000	140 / 20
		6500	220 / 32
		8500	315 / 46
520/80R46	173A8/169D	8500	240 / 35
710/70R42		8500	240 / 35
		10000	315 / 46

## Wheels & Tyres

Tyre pressures need to be checked **regularly** - **check every 8 to 12 hours of operation.**

There are many factors concerning the appropriate tyre pressure for a particular tyre and load. The many factors include:

- Tyre size,
- Rim type,
- Tyre status (driven or free rolling),

- Load,
- Speed,
- Haul length and
- Load Index.

All factors need to be considered when determining the tyre pressure.

For information on wheel maintenance please refer to Chapter 8 "Lubrication & Maintenance".

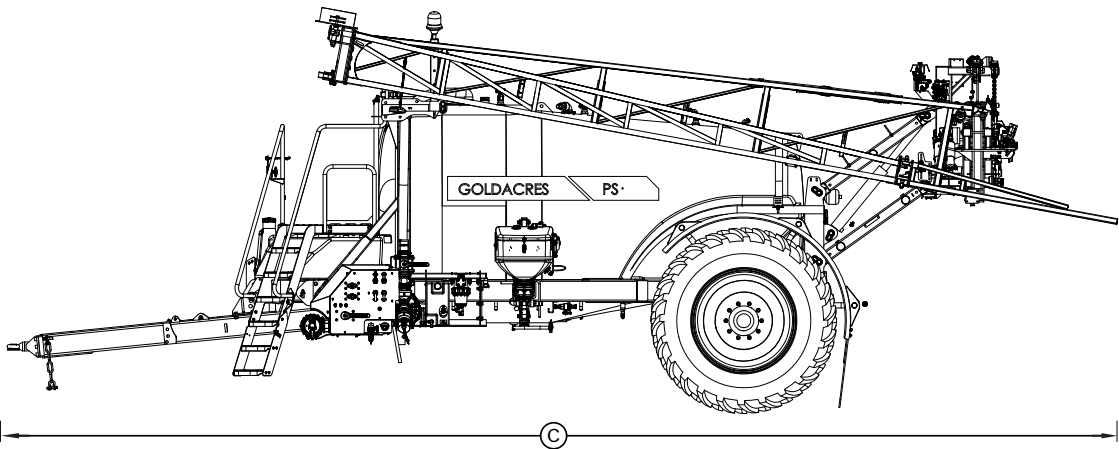
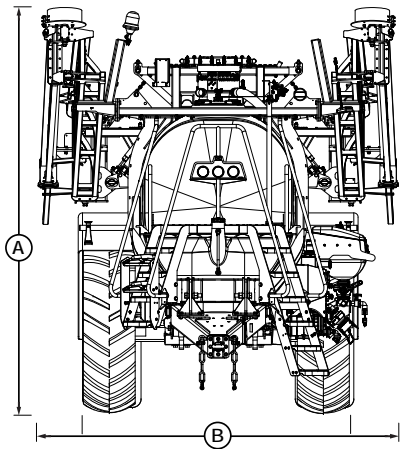
Sprayer Dimensions

The following Prairie Special Series 2 Trailed Sprayer dimensions are provided as a guide only.

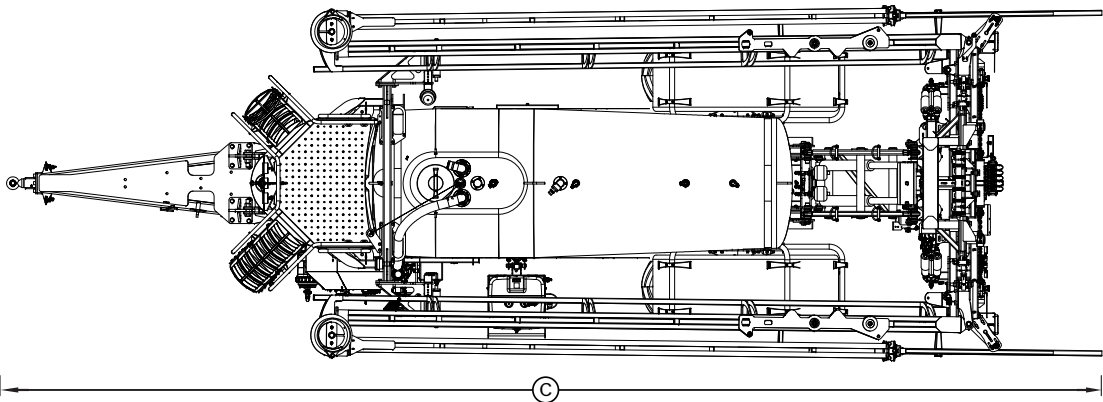
Variations in mass & dimensions may occur without notification.

Dimensions shown here do not include aerials and other attachments.

To ensure that the dimensions are accurate for your sprayer it is recommended that you measure your sprayer individually.



Prairie Special Series 2		Empty - Folded			Dimensions - Folded		
Model (L)	Boom (m)	Drawbar Load (kg)	Axle-Load (kg)	Total (kg)	A Height (mm)	B Width (mm)	C Length (mm)
10000	36						
	30						
8500	36						
	30						
6500	36						
	30	860	4880	5740	3800	3400	11050
	28						
	24						
5000	36						
	30	750	4850	5600	3920	3400	10360
	28						
4000	24						
	36	At time of publishing, table information was incomplete - Contact your Goldacres Dealer for up-to-date Weights & Dimensions.					
	30						
	28						
	24						



NOTE

Sprayer dimension are based on 480/85 R50 tyres fitted with airbags deflated.  
Be aware that dimensions given have no aerials fitted.

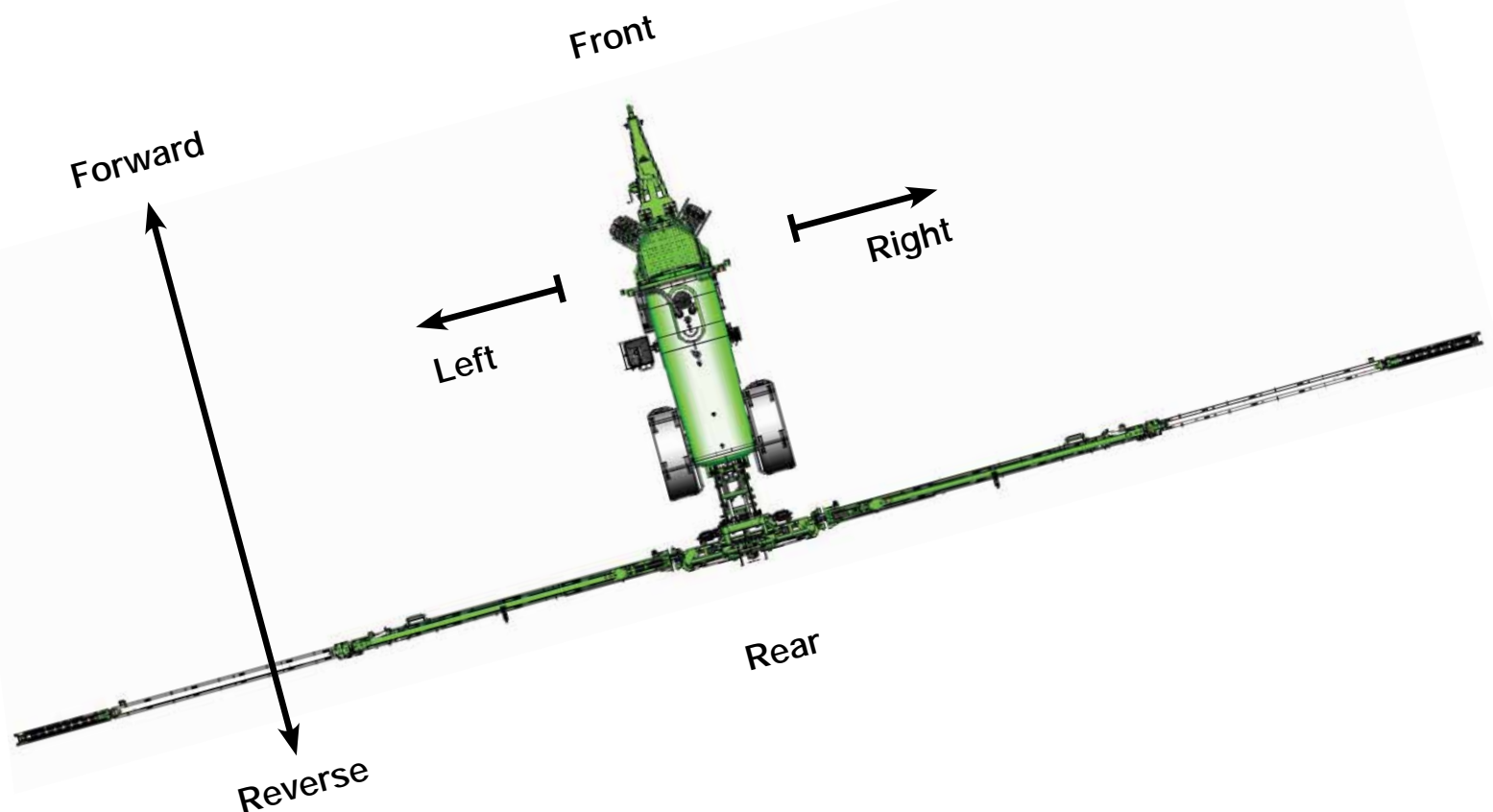
NOTE

The Prairie Special Series 2 sprayer is approximately 3.95m in height. Aerials on the tractor roof, may be higher. Check regulations in your state for maximum vehicle height restrictions. When driving on roads it may be necessary to remove aerials to meet the required height restrictions.

NOTE

Aerials on the roof may also need to be removed to meet clearance requirements for over head power lines, while on the road and also in some paddocks.





## Sprayer Orientation

Throughout this manual instructions are given with reference to the front, rear, left and right of the sprayer including moving forward and reversing.

To avoid any confusion or misunderstandings these are given using the orientation of the sprayer as illustrated (above).

## Paint Codes

For repairs or touching up damaged paintwork use Australian Standards AS2700 codes:

- Wheels: N23 Neutral Grey 2 pack
- Steel (Green): G13 Emerald Green 2 pack
- Steel (Black): N61 Black 2 pack.

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*Prairie Special Series 2.*

Critical safety information to keep you free from danger, injury or death is outlined in the following pages.

**Safety is a very high priority of Goldacres and must be for all operators. All safety and warning instructions MUST be followed to ensure the safe operation of your sprayer.**

## 1 Operator Safety

Always read and understand the operator manuals provided with your sprayer prior to its operation.

It is the responsibility of the operator to ensure there are no damaged or missing decals on the equipment and that any damaged or missing decals are replaced prior to operation.

### Training & Certification

Operational training for your sprayer will be given by your dealer or at the point of sale. If required, please ask for this training again.

Chemical certification through a local government body is recommended for all those working with chemicals.

### Not Okay to Operate!

**Do not operate** this sprayer if you are:

- Intoxicated (Never operate a sprayer while under the influence of any drugs or alcohol)
- Fatigued (Never operate a sprayer if you are excessively tired)
- Untrained (Never operate a sprayer if you are not qualified)
- Stressed or mentally unfit for work!

### First Aid

Before spraying make sure you are aware of first aid requirements relative to the chemicals being used.

Read the appropriate Chemical Safety Data Sheets (CSDS) and know the location of an appropriate First Aid Kit.

Make sure you have a first aid action plan in place whenever chemical handling/spraying.

It is recommended an appropriate First Aid Kit be kept with your sprayer.



*Front cover of Australian Standard for Chemical protective clothing AS3765 publication.*

### Personal Protective Equipment (PPE)

Chemicals can be extremely harmful to humans so the use of appropriate PPE when handling chemicals is essential.

Ensure the correct Personal Protective Equipment (PPE) is available & worn before using agricultural chemicals & operating the sprayer.

PPE must be appropriate to both chemicals and sprayer.

**Always refer to the chemical manufacturer's label for the guidelines on the appropriate PPE for the chemical(s) you are using.**

Always wear close fitting clothing and appropriate safety equipment for the job at hand.

Goldacres strongly recommends that you read and understand the following Australian standards:

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

Poisons Information Centres - Call 131 126 (AU)

### Minimum PPE

Minimum Personal Protective Equipment requires:

- Coveralls
- Elbow length rubber gloves
- Approved respirator &
- Face shield.

### Passengers

Do allow other to stand on or travel on the steps or platform of the sprayer when in motion or when the booms are being folded or unfolded.

### Avoid Excessive Noise Exposure

Exposure to loud noise over an extended period can cause permanent hearing impairment or loss.

Be pro-active in conservation of your hearing and wear appropriate hearing protection at all times.



*Do not operate or make alterations to the sprayer outside the guidelines or limitations given in all the manuals.*

## Machine Alterations

Any unauthorised modifications to this sprayer may affect its function and create a serious safety risk.

Any part of a Goldacres sprayer that is altered or operated outside the guidelines or limitations given may not be warranted by Goldacres for successful operation or performance.

Operators working outside standard specifications & limitations do so at their own risk, unless specific advice has been sought from, and approved by Goldacres in writing.

## 2 Chemical Safety

The safe use of Agricultural (Ag) chemicals with this equipment is the responsibility of the owner/operators. Owners & operators should be trained in the safe use of Ag-chemicals.

### Safe Chemical Usage

Agricultural chemicals can cause serious illness and even death if they are handled incorrectly or enter the body.

Risks of chemical entering the body include:

- Orally** - Drinking, splashing into mouth, eating/drinking with dirty hands
  - Never attempt to clean parts or nozzles by blowing with your mouth
  - Never attempt to siphon chemicals or substances by sucking.

**Inhalation** - Inhaling chemical vapours &/or spray droplets as Airborne Particles  
Always stand well clear of equipment during operation

Any spray drift is dangerous and may be hazardous to humans & other animals.

**Dermal Absorption** – Absorption of chemical through the skin. Risks are increased if your skin is broken.

Make sure your PPE is appropriate for the chemicals to be used.

Goldacres recommends a relevant spraying course is completed by owners and operators prior to operating the sprayer.

Always read & follow chemical manufacturer's guidelines for safe application as per the chemical labels & Material Safety Data Sheets.

Particular attention should be given to the recommended target application rate of the chemical being applied as per chemical guidelines.

### Keep Operator Areas Clean

Use disposable gloves or triple rinse multiple-use gloves.

Carefully remove all potentially contaminated PPE & clothing before entering the Cabin (if applicable) to ensure no chemical enters your working environment.

If chemical contacts your body, rinse with fresh water immediately & seek medical attention.



*Personal Protective Equipment (PPE) must be appropriate to both chemicals and sprayer.*

## Chemical Handling

You should have all relevant Chemical Labels, Material Safety Data Sheets (MSDS) and technical guides available to you.

These can be found on the manufacturer's website if you do not have hard copies.

Ensure you have familiarised yourself with all documentation - including chemical labels & Material Safety Data Sheets, before opening & mixing chemicals.

Always understand the complexities of the chemical you are using, the safety measures & have an appropriate safety plan in place.

### Safe Spraying Application

Safe application starts with being familiar with the safety requirements of the chemical being used.

Be sure to familiarise yourself with all the documentation supplied with your chemical drum or shuttle before you start mixing and spraying.



*Prairie Special Series 2.*

In addition to operator safety, it's important that the chemical being sprayed hits the target and drift is minimised.

The following conditions are generally unsuitable for spraying:

- Rain
- High winds above 15km/h
- Excessive humidity
- Cold air and low pressure systems that increase the risk of inversion

Delta T has become a widely used measure for acceptable spraying conditions with regards to temperature and humidity.

Observe all weather conditions, temperature, humidity, wind direction & speed before you start spraying & for the duration of the job.

Take all steps necessary to minimise spray drift and the risk of inversion.

If you have any doubt consult with a qualified advisor or agronomist.

### Spray Application Risk Assessment

Answer the following risk questions to assess risks & safety before spraying:

#### Weather Conditions?

#### Yes / No

Are winds or gusts likely to present risk of drift? .....	<input type="checkbox"/>	<input type="checkbox"/>
Are humidity and Delta T in the appropriate operating range? .....	<input type="checkbox"/>	<input type="checkbox"/>
Are weather conditions likely to change before the task is complete? .....	<input type="checkbox"/>	<input type="checkbox"/>
Have all pre-start checks been undertaken? .....	<input type="checkbox"/>	<input type="checkbox"/>
Is the sprayer in good working order? .....	<input type="checkbox"/>	<input type="checkbox"/>
Is the operator fit for work? .....	<input type="checkbox"/>	<input type="checkbox"/>
Has the operator been trained in the use of this machine & the chemicals? .....	<input type="checkbox"/>	<input type="checkbox"/>
Have all appropriate PPE items been made readily available? .....	<input type="checkbox"/>	<input type="checkbox"/>
Is the operator aware of the risks posed by the chemical(s) being used? .....	<input type="checkbox"/>	<input type="checkbox"/>

#### Physical risks and the work environment

Is there any danger posed by power lines? .....	<input type="checkbox"/>	<input type="checkbox"/>
Is there any uneven terrain to be considered? .....	<input type="checkbox"/>	<input type="checkbox"/>
Is there any likelihood of untrained bystanders or children in the area? .....	<input type="checkbox"/>	<input type="checkbox"/>
Is there a first aid station nearby? .....	<input type="checkbox"/>	<input type="checkbox"/>

### Disposal of Chemicals & Containers

Flush all chemicals from the sprayer immediately after use.

When draining fluids from the sprayer, use appropriate, leak proof containers.

Do not use food or beverage containers because someone may consume the contents by mistake.

Dispose of unused chemicals & empty chemical containers in the correct manner..

For information on correct disposal of unwanted farm chemicals, visit [ChemClear.org.au](http://ChemClear.org.au) or call 1800 008 182.

Label the product for disposal and store it securely away until it is able to be collected for disposal.

Disposal must be carried out by a licensed waste disposal company or chemical collection program.



## Personal Safety

Change out of protective clothing and shower as soon as possible after working with chemicals.

Wash hands and face thoroughly before eating, drinking or smoking.

Provide clean water at all filling sites and on the sprayer in case of emergency.

Wash & clean respirators regularly & replace respirator cartridges at recommended intervals.

## Goldacres Equipment

Our equipment uses several materials that may be harmful to the environment.

Potentially harmful waste used includes such items as oils and lubricants.

If disposed of incorrectly these can threaten the surrounding environment and ecology. Waste products can leech into surrounding water sources and contaminate the area.

Certain chemicals may be unsuitable for use with Goldacres standard plumbing designs. Consult your Goldacres dealer if required.

## 3 Maintenance Safety

Correct sprayer maintenance is an important part of eliminating the risk of incorrect spraying applications and ensuring overall safety.

Always maintain the sprayer to ensure it is in good working order for its next use.

Keep the sprayer clean - inside & out to minimise wear and allow easier recognition & identification of problems that might arise.

### Hydraulic Inspection, Adjustment & Repair

Periodic inspection & assessment of hydraulic systems and especially hoses is recommended and should include:

- 1 The age of hoses
- 2 Condition of hose fittings
- 3 Rub marks and potential wear points from hose contact
- 4 Unexplained hydraulic oil leaks
- 5 Excessive corrosion of fittings

If any faults are found, do not operate the machinery until the issues have been rectified.

Where practicable, all inspections and maintenance/servicing work should be conducted by a person competent in hydraulics systems and maintenance, including testing & commissioning.

Maintenance and routine checks should be conducted to ensure adequate hydraulic fluid levels and filter cleanliness are fully maintained.

Manufacturer's recommendations should be adhered to as excessive or inadequate fluid levels can cause system failure and present serious risks.

### Injury Risks

Encumbent with all sprayer maintenance is the risk of injury from:

#### Cuts, Stabs & Punctures:

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

### Crush Hazards:

- Never attempt maintenance on axles, wheels or components within the vicinity of the wheels with the engine running.
- Never attempt to do maintenance under any hydraulically raised boom or structure.

### Pinch Hazards:

- When operating moving components such as a boom, access ladder or other components. Keep fingers and hands away from potential pinch points.

### Burn Hazards:

- Hydraulic oil increases in temperature with pressure and use
- Components may be very hot to touch and could result in contact burns
- Oil leaks may spray hot oil and cause eye injury & burns





- Avoid contacting the hydraulic tank and all hydraulic lines when at operating temperature.
- Full coverage clothing minimises the risk of oil burns and is recommended with this type of equipment.

## Injection Injury

- Injection injuries occur when a jet of hydraulic fluid pierces the skin and enters the blood stream.
- This may occur if a hydraulic line is pierced or damaged. Be aware that injection injuries are extremely dangerous and have the potential to cause death.

## Hose Whip/Striking

- Hose whip or striking injuries may occur when an unrestrained hose releases oil pressure quickly causing whipping back & forth until the oil and energy is fully released.
- The most common point for failure in a hydraulic hose is at the fittings, where corrosion and stress related damage is most likely to occur.

## Fluids Under Pressure

Fluids escaping from high pressure lines can cause serious injury to skin. High pressure hydraulic oil can easily penetrate human skin.

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.

Pressure in the fluid lines must be released before any maintenance is undertaken.

Be mindful of the location of pressurised lines in the vicinity of the work area when using equipment such as grinders, oxy torches and welders.

Such equipment poses two major risks:

- Equipment may easily cut through lines
- Heat generated may cause line to rupture and/or burn.

Ensure all fittings and lines are fully/tightly secured before re-pressurizing after repairs.

## Pumps, Pressure Lines & Valves

It is important that the liquid flow systems of this sprayer are understood and well maintained because liquids under pressure create serious risks of injury.

Pressurised spraying and hydraulic systems operate at pressures up to 20 bar (284 psi) for spraying and (3000 psi) for hydraulics.

To avoid risks of injury, it is important to:

- Read and understand the operator's manual
- Never undo fittings, cut hoses or carry out maintenance when a pump is running or when a system is under pressure
- Do not exceed maximum pressures as stated in operators manual.

## Stored Energy Hazard

Even when a machine is not running, energy can be stored in components such as hydraulic accumulators, air tanks, tyres, air hoses and springs.

Hydraulically supported components such as the boom center are also a source of stored energy.

Before working on the machine, ensure that these parts are relieved of their energy in a safe manner.



Empty the spray tank, park on a flat area, ensure the boom is closed and chock wheels before lifting a sprayer.

## Lifting a Sprayer

Before raising a sprayer off the ground:

- Ensure that the boom is in its closed position.
- Park on a flat level, firm area.
- Empty the spray tank where possible.
- Chock all wheels that remain on the ground.
- Securely lift the sprayer using a rated jack and support the machine on work stands.
- Do not work under the machine when supported solely by a jack.
- Do not support the machine using materials that may crumble.

## Changing Wheels & Tyres

An experienced person with the correct equipment should mount the wheels on the sprayer.

When changing a wheel on the sprayer ensure the machine is on firm level ground and the opposite wheel is chocked.



## Tyre Maintenance

Maintain correct tyre pressure at all times. Inflation of tyres above or below the recommended pressure exerts additional pressure on the tyre, which may result in tyre damage.

Extreme caution is required during the inflation of tyres. Rapid inflation of a tyre may cause separation and/or explosion of the rim. Such an event can inflict serious or fatal injuries to the operator or close bystanders.

Always use a tyre inflation gauge.

Be pro-active and continually check the condition of your tyres during operations.

Do not weld, heat or modify a tyre rim.



Never get underneath a suspended machine or suspended part of a machine.

## Working Heights above Ground

Please contact your local government on the restrictions and safety requirements needed to operate at various heights above the ground.

Do not climb on machine to get access. There is a risk a falling if a person has climbed onto the machine.

Use ladder or work platform to get access to parts or areas of the machine above local government restrictions.

## Working On or Underneath the Sprayer

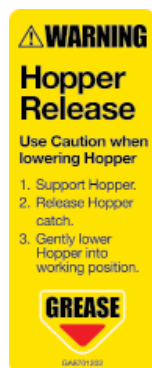
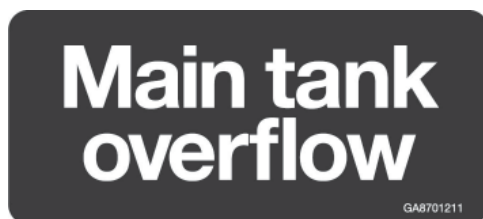
When working on or underneath a sprayer, always take measures to make sure that the sprayer cannot move.

Never get underneath a suspended machine or suspended part of a machine.

If you must work under the machine ensure the machine or machine part is solidly supported.

## CAUTION

Only rated and approved equipment should be used to lift and support the Prairie Special 2 sprayers. Failure to follow these instructions may result in injury.



### Slippery Surfaces

The surface of the sprayer platform has raised portions or grip tape to minimise the risk of slipping.

Keep platform surface clean of mud and other material to avoid risks of slipping.

### Main Spray Tank

**Danger** – The main spray tank is a confined space and you must not enter because the lack of oxygen and chemicals can cause asphyxiation and death..

Do not enter the tank for any purpose.

### Entanglement Hazard

Rotating drives can cause serious injury or even death when entanglement occurs.

Keep hands, feet, hair and clothing away from all moving parts to prevent injury.

Never operate a machine with covers, shrouds, or guards removed.

### Decals

Decals are an important part of making operators aware of risks and correct operations.

Understand the safety decals and their purpose to assist the safe operation of your machine.

It is the responsibility of the owner operator to replace damaged and/or missing decals.

All decals on the sprayer must be maintained in good order and replaced if damaged or missing.

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

Decals have a part number to assist in their identification & replacement.

Replacement decals can be ordered from your Goldacres' dealer.

Part numbers and descriptions of the decals on this machine can be found in the Part Manual on the Goldacres website.

### Safety Guards

All safety guards should be replaced if damaged to ensure that risks of injury are controlled as intended.

Some examples of safety guards includes fan blade guards, PTO guards and hydraulic hose covers.

### Exhaust Fumes

Diesel engine exhaust fumes are harmful and can cause severe sickness or death.

If it is necessary to run a tractor engine in an enclosed area use an exhaust pipe extension.

If an exhaust pipe extension is unavailable ensure that all doors are fully open and the room is very well ventilated.

### Before Operating

Inspect all equipment thoroughly for damage and wear before operating.

Lubricate the sprayer as recommended before operating.

### Reversing

Be vigilant and aware of bystanders and other obstacles when attempting to reverse.

### Sprayer Lighting

Keep lighting and signs in good order and replace any damaged or faulty fixtures.





## 4 Transport Safety

Check the wheel nut tension on a regular basis, especially before and when travelling on roads.

The torque and inspection frequency is outlined in the maintenance section.

Brake performance should be checked regularly. The inspection frequency is outlined in the maintenance section.

Always ensure that the boom is securely supported when travelling on roads.

### Collision Risk & Warning Lights

Before driving the sprayer check with the relevant road management authorities for information regarding safe and legal transport on public roads in the state where the machine is being operated.

To assist in the prevention of collisions with other road users the sprayer is fitted with warning lights and signs in accordance with national road regulations.

### Public Roads

In your locality there may be special vehicle licencing conditions that govern the use and movement of your sprayer.

Check with relevant government authorities for the relevant road laws in your area (these can vary from area to area). It is the responsibility of the operator to know these laws.

Depending on the width of the machine, a pilot or escort vehicle may be required. Any wide vehicle must display an "Oversize" sign.

Most sprayers driven on public roads have requirements for flashing lights.

Make sure the sprayer complies with all relevant road regulations before travelling or transporting on public roads.

Always follow the laws requiring pilot vehicles, escorts and signage when traveling with oversized loads.

Even if a pilot vehicle is not legally required, if vision or manoeuvrability is limited, it is strongly recommended that an escort accompanies the equipment for road transport.

Always ensure a vehicle load does not exceed loads allowed for the towing vehicle (consult operators manual).

Where possible travel with your sprayer and tow when tanks are empty or near empty.

This sprayer can only be driven on public roads during daylight hours. However, there are some exceptions for night driving. Always check for your locality.

Always use safety chains when towing a trailed vehicle.



*Deflate the air-bag suspension system for more load stability when loading & transporting the sprayer.*

### Transporting the Sprayer

A disabled sprayer is best transported on a drop deck trailer.

Use chains to secure the machine via the tie down attachment points located under the sprayer.

### Loading & Unloading

Off loading a sprayer from a truck is an especially dangerous task. Similarly, loading a sprayer onto a truck.

This is not a one-person job and must be performed by people qualified for the task at hand and with equipment of sufficient capacity.

When loading onto a truck, always use the tie downs point provided.

Deflate the sprayer air-bag suspension system to provide more load stability.

Secure all components of the sprayer that might come loose or move during transport.



## 5 Operating Safety

### Ladders & Steps

Ladders present a number of risks to an operator. Therefore use them appropriately.

Not all ladders are configured the same. Familiarise yourself with the steps, handles, rails of your ladder.

Be mindful of wearing appropriate, enclosed foot wear with good grip when operating a sprayer and working with chemical.

Always keep 3 points of contact when using steps and ladders.

### Diaphragm Spray Pump

Care should be taken to never overfill a diaphragm pump with oil or operate at speeds exceeding 540 rpm.

### Centrifugal Spray Pump

Running the pump dry will cause failure.

Care should be not to operate at speeds exceeding 4200 rpm.

Do not exceed the maximum spraying pressure of 8 Bar.

### Electrical Safety

Only qualified persons should disassemble or service electric components of the sprayer.

If an electrical device or accessory is supplied with a three-pronged, earthed plug, ensure it is used correctly with a compatible earthed 240V power source.

Electrical looms should be checked on a regular basis for fraying and any signs of wear, damage or defects.

Do not use an electrical device in or near an area where it may fall or be pulled into water, other liquids or in the rain.

Do not touch an electrical device that has fallen into water.

In case of an electrical fire, shut off the power and use a suitable fire extinguisher.

Never use water to put out an electrical fire. Water used on an electrical fire may result in fatal shock.



## Hydraulic Safety

Hydraulic systems used on the Prairie Special include hydraulic cylinders, motors, manifolds, and accumulators.

Various hydraulic hoses, fittings and couplings used are all specific for purpose and rated to take the pressures used in the system.

Hydraulic system components are sometimes operated at very high pressures and temperatures.

For these reasons it's very important that the operator be familiar with the functions and limitations of the system.

Read and understand the operator's manual carefully before operating any of the sprayer's hydraulic systems.

## Connecting Hoses

Hydraulic hoses are colour coded to aid in correct identification.

Always double check hose connections, after maintenance work, especially the return line.

Failure to properly connect the return line will result in "dead heading" the system and can lead to a pressure failure.

Refer to the sprayer operator manuals for full details.

## Hydraulic functions

Hydraulically controlled moving parts should never be touched whilst in operation.

Hydraulically controlled components should be isolated and released of any hydraulic pressure before they are worked on or serviced.

This applies to all hydraulic cylinders.



### Boom Height Control System

If a boom height control system is fitted, keep clear of the boom as it could potentially move without notice.

### Bogged Sprayer

Goldacres strongly recommends that bogged sprayer's situations are addressed prudently by **using the assistance of a tow vehicle**.

Failure to heed this advice and doing otherwise can cause significant damage and **VOID WARRANTY**.



*Always ensure the fresh water tank is filled.*

### Operating Tips

- 1 A supply of fresh water should be maintained on the sprayer at all times.
- 2 Do not use this machine in ambient temperatures exceeding 40 degrees Celsius.
- 3 Ensure that all bolts are tightened and secured before operation.



*Take notice of warning signs for overhead power lines.*

## 6 In-Field Safety

Each paddock or field presents its own risks which must be assessed correctly to ensure safe spraying application.

### Sloping or Uneven Ground

Operating machinery on sloping or uneven ground creates risk of machine roll overs.

There is also a risk of towed vehicles sliding and/or pulling the towing vehicle sideways.

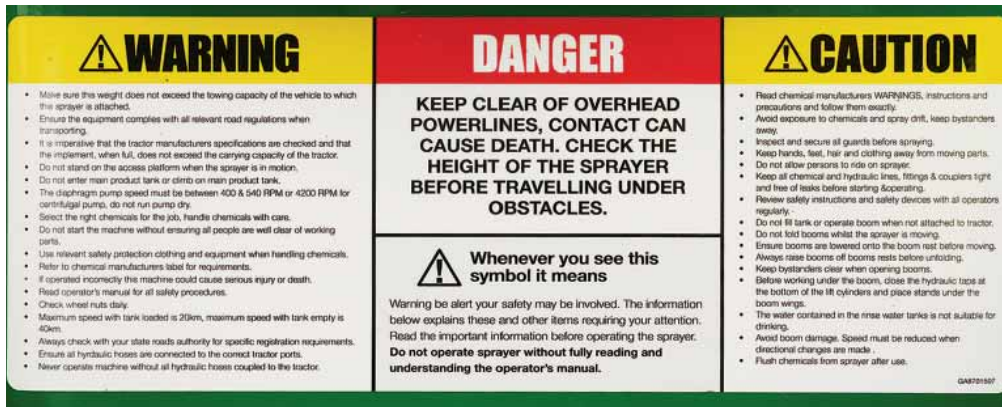
Always be aware of the ground conditions and grip levels of both personal footing and the sprayer.

When operating the sprayer:

- Slow down for slopes exceeding 10 degrees
- Do not operate on slopes exceeding 15 degrees
- Slow down when operating the sprayer on irregular or uneven country.

Pay special attention to ground surface conditions while operating as these will vary throughout the area and the duration of the work.





Be aware of unsafe & safe distances from power lines.

Be especially mindful when turning corners on sloping ground. Due to forces involved when turning corners it's very easy to exceed safe operating limits.

## Hazard identification

### Power Lines

Operating the sprayer too close to power lines can have serious consequences. The operator is responsible to maintain a safe distance from powerlines and its supporting structures.

Keep in mind a sprayer with a high potential to conduct electricity such as a wet spray boom does not need to touch a power line for it to arc down through the sprayer to reach the ground.

Minimum safe distance from power lines, for equipment or operators will vary from 1 to 6 metres depending on the transmission voltage (240 to 220,000 volts).

High humidity and dusty air will increase the danger of high voltage power lines.

Turn off automatic height control systems when under a power line to avoid the boom unexpectedly lifting up.

Changing weather conditions such as high temperatures will cause lines to sag & high winds will cause lines to move - changing the position of the power cables.

See your local authority for further information.

<https://www.safeworkaustralia.gov.au> has useful, comprehensive information as do most state safety offices.

Most Shires or Councils can assist with risk assessment and how to best manage the risk of power lines.

### Large booms

The end of large booms can be difficult to judge whilst spraying.

Be mindful hitting power poles, trees or other objects with boom tips because this can cause damage to the boom, the power pole as well as risking electrocution.

## Potential Risks

- 1 Proximity of the work to the overhead power lines and the height of the overhead power lines.
- 2 Environmental conditions, such as rain, wind, high humidity and uneven terrain may bring an increased risk.
- 3 Visibility of the overhead power lines and their supporting structures.
- 4 Location of overhead power lines and supporting structures such as poles & towers.
- 5 Frequency of work to be done near overhead power lines.
- 6 Proximity of operating plant and equipment to the overhead power lines.
- 7 Boom lift &/or tilt & radio antenna may be in danger of striking power lines.
- 8 Walking on the sprayer platform may put you in danger of electrocution when near power lines.



### Control measures

Once the risks and hazards of spraying near overhead power lines have been assessed, control measures should be taken to eliminate the risks.

- 1 Using a spotter to decrease the risk of striking the power lines accidentally.
- 2 Planning a different travel/spray route so the sprayer does not travel close to the power lines.
- 3 Use barriers or fences, if possible, so that no one can drive in the high risk areas identified.
- 4 Where practical have low lying power lines replaced with lines underground.
- 5 Do NOT walk on the machine platform when near power lines.
- 6 Do NOT use boom lift &/or tilt and radio antenna near dangerous power lines.

A combination of these control measures is recommended as best practice.

Keep clear of overhead obstructions, especially power lines, as contact can be fatal.

### Chemical & Water Densities

Care should be taken when transferring liquid into the sprayer tank to ensure the gross weight of the vehicle does not exceed the specified safe braking and carrying capacity of the vehicle.

**1 Litre water = 1 Kg.**

Water weighs 1kg per litre. However conversion factors must be used when spray liquids are heavier or lighter than water.

For example: Liquid nitrogen has a density of 1.28 kg/L. It will therefore significantly increase vehicle load if the tank were to be filled completely, ie, 6000 litres of water weighs 6000kg. 6000 litres of liquid nitrogen weighs 7680kg. 6000kg of liquid nitrogen is only 4687.5 litres.

**The total weight of a tank full of chemical, should not exceed that of a tank full tank of water only.**

Sprayer damage can result if the vehicle is over-weight.

For more information, refer to Chapter 6 'Operation', 'Filling the Sprayer' instructions.

### Operating & Travelling Speed

Check with Goldacres' specifications and follow the instructions for operating, transporting and/or towing.

Ensure that the maximum speed of the vehicle, when loaded is within recommended limits.

The sprayer is designed for a maximum speed of 50 km/h when empty. Maximum speed when fully loaded is 25km/hr. These speed must only be used with suitable terrain & conditions.

All components i.e. tyres, brakes, suspension, steering and chassis are designed and built this for maximum speed.

However, high speed turning places severe stress on the wheels and axles and should be avoided.

It is also essential to be aware of the stresses of turning impose on an open spray boom.

**Excessive turning speeds** transmit great stresses to the spray boom and **will cause boom damage.**

**Maximum speed** when cornering or turning at an angle greater than 45° or driving on a slope or uneven terrain is 5km/h.



Modification of the sprayer to increase maximum speed is **Strictly Prohibited.**

When fitted with narrow wheel track with high centre of gravity, the machine may become unstable when turning at excessive speed or when operating on excessively steep terrain.

Do not ride on the sprayer when moving.

Stand well clear of sprayer when operating.

Ensure equipment is securely fastened or attached to vehicle at all times

Never stand within the radius of the boom wings.



## Opening & Closing Booms

Be attentive to opening, closing & parking of hydraulically controlled booms at all times:

- Always check for clear and available space before operating booms
- Be especially vigilant of bystanders or power lines
- Regularly check for loose or damaged structures or components. These can be snagged or fail during operation
- Be sure a folded boom is properly positioned and locked into position before driving. A loose boom arm can be very dangerous.
- Be aware that in opening or closing a boom, it also changes the weight distribution of a sprayer
- Never allow the boom to be operated by untrained personnel.

## Transporting the Prairie Special

### 1 Loading onto a Truck

Before loading:

- Rinse & drain product tanks
- Fold the boom & close the boom lift cylinder taps
- Strap the booms ends in
- Remove beacons & antennae.

Load the Prairie Special Series 2 onto the truck, then:

- Release air pressure from the airbags by opening the dump valves & air drain valve
- Fasten the Prairie Special with chain to all tie-down points.

### 2 Unloading

Before unloading:

- Remove tie-down chains
- Check airbag dump valves & the air drain valve are closed
- Inflate the airbags.

Load the Prairie Special Series 2 off the truck, then:

- Remove the boom tie-straps
- Refit beacons & antennae
- Open the boom lift cylinder taps
- Check the product tank drain valves are closed.





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*Prairie Special Series 2 Hitch.*



*In-cab Sprayer Control Console*



*Optional In-cab Raven CR7 Controller.*



*Optional In-cab Raven SCS 4400 Controller.*

## Introduction

The Prairie Special Series 2 Trailed Sprayer is available in 4000, 5000, 6500, 8500 & 10000 litre models with Goldacre's boom sizes ranging from 24 to 36 metres in width and other boom & nozzle options.

The Prairie Special Series 2 Sprayer is fitted with a Raven PC1 ISO BUS system which operates with all leading spray controllers, steering & mapping providers using the ISO BUS protocol. For information on standard and optional controllers, refer to Chapter 4, 'Preparation for Use - Setting Up'.

Spray pump options include the 400L/min at 8 Bar centrifugal pump or 260L/min positive displacement oil backed diaphragm pump.

This 'Connect' chapter provides instructions to connect the tractor & sprayer, as well as the in-cabin control consoles, displays, auxiliary controls & harnesses.

Each tractor & sprayer will vary according to its size and the options fitted. Illustrations & pictures used in this manual are representative but may not be exactly the same as your machine.

## Tractor Requirements

This manual should be read in conjunction with the towing vehicle operators manual and specifications.

Safety of owners, operators and general public is of the highest importance to Goldacres.

The safe operation of a trailed sprayer is defined by the ability of the towing vehicle to safely control the sprayer.

It is the responsibility of the owner and/or operator to ensure the towing vehicle can safely control the sprayer.

The drawbar capacity of the towing vehicle must be known and safely matched with the gross drawbar mass of the sprayer. Refer to the towing vehicle specification for the towing capacity.

The gross mass of the liquid in the sprayer tank varies in relation to its specific gravity. The mass must be calculated by the operator to ensure gross vehicle mass is not exceeded.

If the sprayer tank is completely filled with specific chemicals, the gross mass may exceed the allowable capacity of the sprayer and towing vehicle.

Sprayer gross mass may also vary according to options fitted and any modifications or additions made to the sprayer. This must also be considered when calculating towing capacity.

## Hydraulic Capacity

The hydraulic system must be closed centre with load sensing.

Required hydraulic capacities for the Prairie Special Series 2 sprayer are:

- Main spray pump:
  - Diaphragm 40 l/min or
  - Centrifugal 50 l/min or
- Optional 3" fill pump 45 l/min.



Standard 9 pin ISO BUS connector.

With all hydraulic functions running at the same time, eg, whilst filling, maximum total hydraulic requirement might be 100 l/min, depending on model & options fitted.

If a boom height controller is fitted, extra oil capacity will be required depending on the performance settings.

If brakes are fitted a dedicated hydraulic brake port must be installed on the tractor.

Consult your tractor supplier to obtain an accurate hydraulic capacity.

## Electrical Requirements

The Prairie Special Series 2 sprayer requires 4 electrical tractor connection points:

- 1 The tractor must be configured for ISO BUS. The standard ISO BUS connector is 9 pin as shown above.

The Prairie Special Series 2 is not fitted standard with a sprayer console. To operate a console option, the tractor requires a compatible ISO BUS terminal.

If a tractor is not ISO BUS compliant, Goldacres offer the option of a cabin wiring kit to enable this functionality.

Goldacres also offers in-cabin options of a Raven CR7 controller or CRC 4400 controller.

The ISO BUS rate controller used on the sprayer has the ability to have up to 2 terminals connected (such as a Raven CR7 & steering controller).

This means the tractor can use one terminal for steering and mapping and the other for rate & height control (if required).

The total 12V maximum current draw is 23 amps.

- 2 A power connector.
- 3 A switch control connector.
- 4 Tail light adapter using the standard 7 pin round connector:
  - Tail lights
  - Brake lights
  - Indicators.



Manual Hitch Jack.

## Connecting Tractor & Sprayer

The 4000, 5000, 6500 models of the Prairie Special are fitted standard with a manual hitch jack and 8500 & 10000 models are fitted standard with a hydraulic hitch jack.

Follow the procedures outlined to connect the tractor and sprayer:

- 1 Fit In-Cab Controllers & Harnesses.
- 2 Connect the Drawbar & Hitch.
- 3 Connect Hydraulic Hoses.
- 4 Connect Electrical Harnesses.
- 5 Hitch Adjustment.
- 6 Fit PTO Shaft (Option)

Ensure the tractor being used matches the size and weight specifications of the Prairie Special Series 2 sprayer being used.

### **⚠ DANGER**

Ensure the tractor being used matches the size and weight specifications of the Prairie Special Series 2 Sprayer being used.

Failure to follow these instructions may result in severe injury or death.



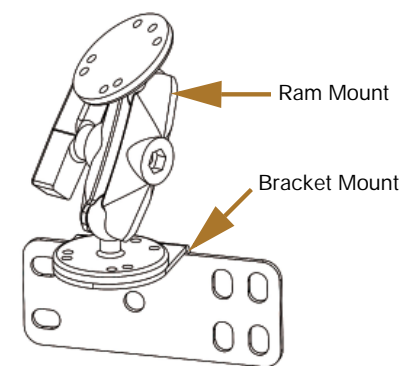
*Prairie Special Series 2 Trailed Sprayer*



*Optional In-cab Raven CR7 Controller.*



*In-cab Sprayer Control Console*



*In-cab Ram mount & Bracket mount.*

## 1 Fit In-Cab Controllers & Harnesses

The Prairie Special Series 2 Trailed Sprayer is fitted with a Sprayer Control Switch Pad and Raven PC1 ISO BUS system which operates with all leading spray controls, steering & mapping providers using the ISO BUS protocol.

Fit the In-Cab Controls (optional mountings available) and Harnesses as required.

For details refer to the information which follows in this chapter:

- Cabin Harnesses Options
- Tractor Connection Harnesses
- Air Compressor Connection
- Brake Options & Accessories

## In-Cab Controls

In-Cab Controls of the Raven PC1 ISO BUS system include:

- A Sprayer Control Console with 7 rocker switches to control boom tilt, height, fold, bi-fold, recirculation and Spray On/Off & Fenceline On/Off
- Optional In-cab Raven CR7 Controller
- Optional In-cab Raven SCS 4400 Controller
- Optional Master On/Off foot switch.

*Optional In-cab Raven SCS 4400 Console.*



*Optional Master On/Off Foot Switch.*



## Sprayer Control Console

Optional Sprayer Control Consoles include a RAM mount® for mounting flexibility in the tractor cabin.

Optional Sprayer Control Consoles are supplied with separate universal mounting for remote mounting within the tractor console.

The Spray switch can be bypassed using a optional foot switch or similar.

Mounting of in-cab consoles & displays in the tractor cabin is an important part of the setting up. It is important that units are mounted in the cabin in such a way as not to cause harm to the operator under any circumstances while being mounted in a user friendly way.

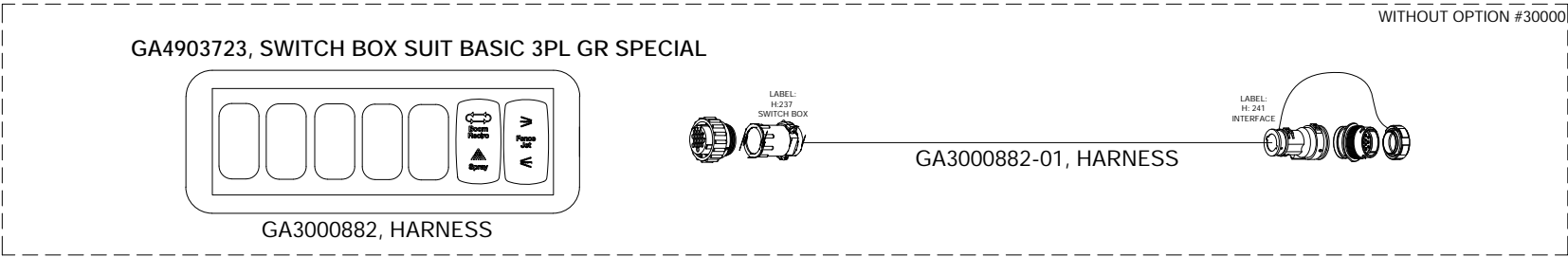
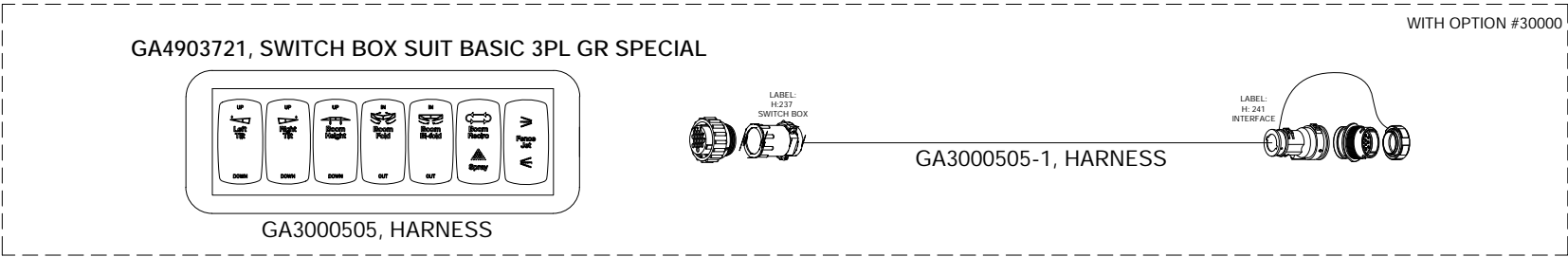
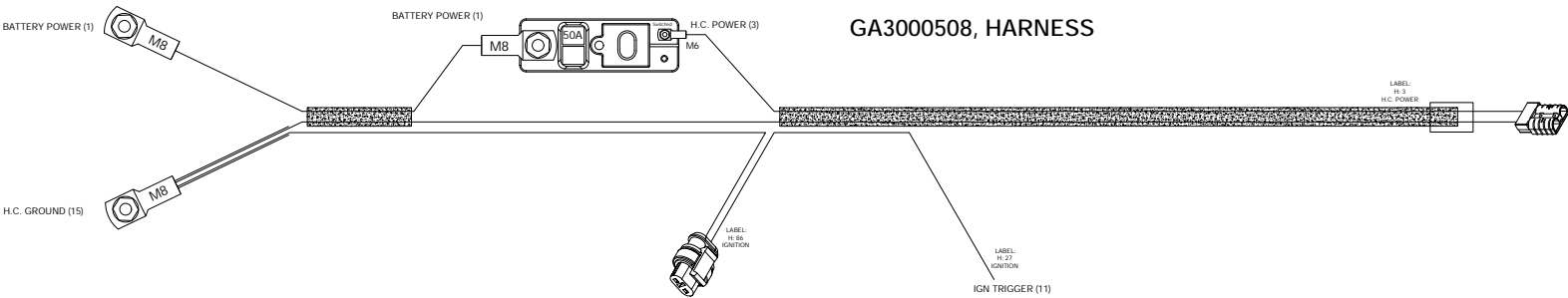
When the sprayer is disconnected from the tractor and console/displays remain fitted, ensure that all units remain firmly mounted and cannot become a projectile.

For specific information on mounting the consoles, please refer to the Raven installation and service manual supplied.

If there are mounting holes in the pillars of the tractor, a bracket (GA4522930) is supplied with the console mounting kit to allow the console to be mounted to the pillar.

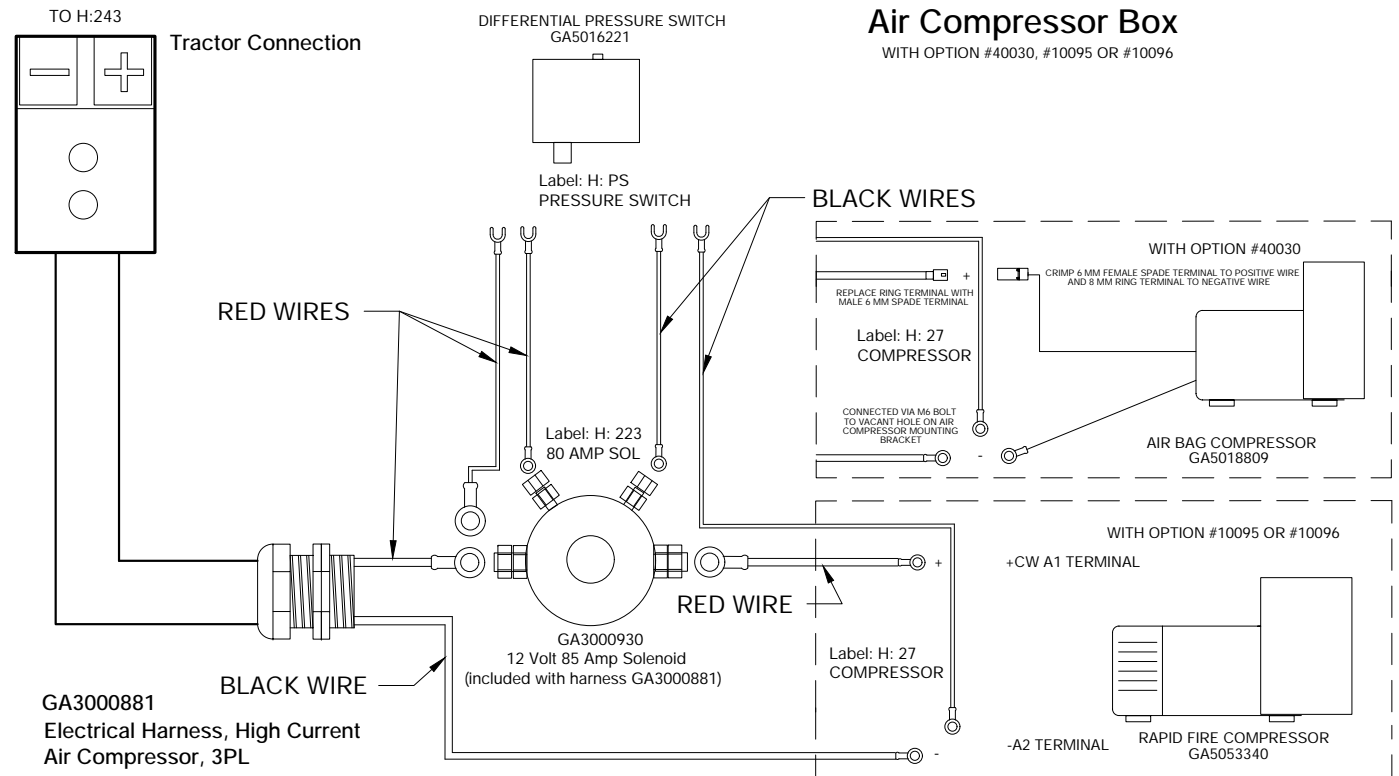
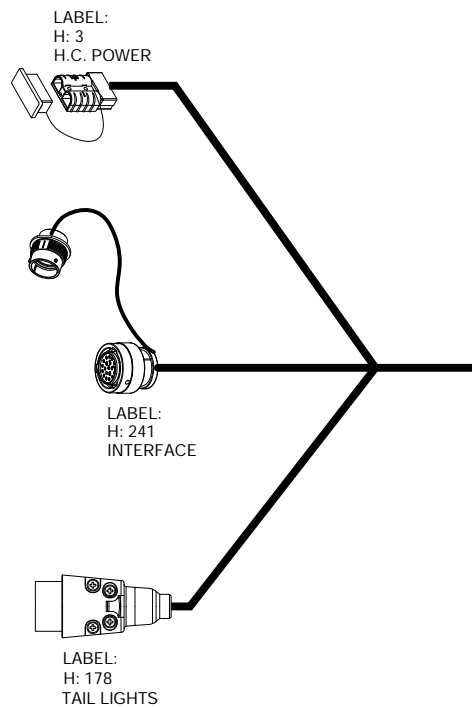
Cabin Electrical Harness Options

Controls - Cabin



## Tractor Connection Harnesses

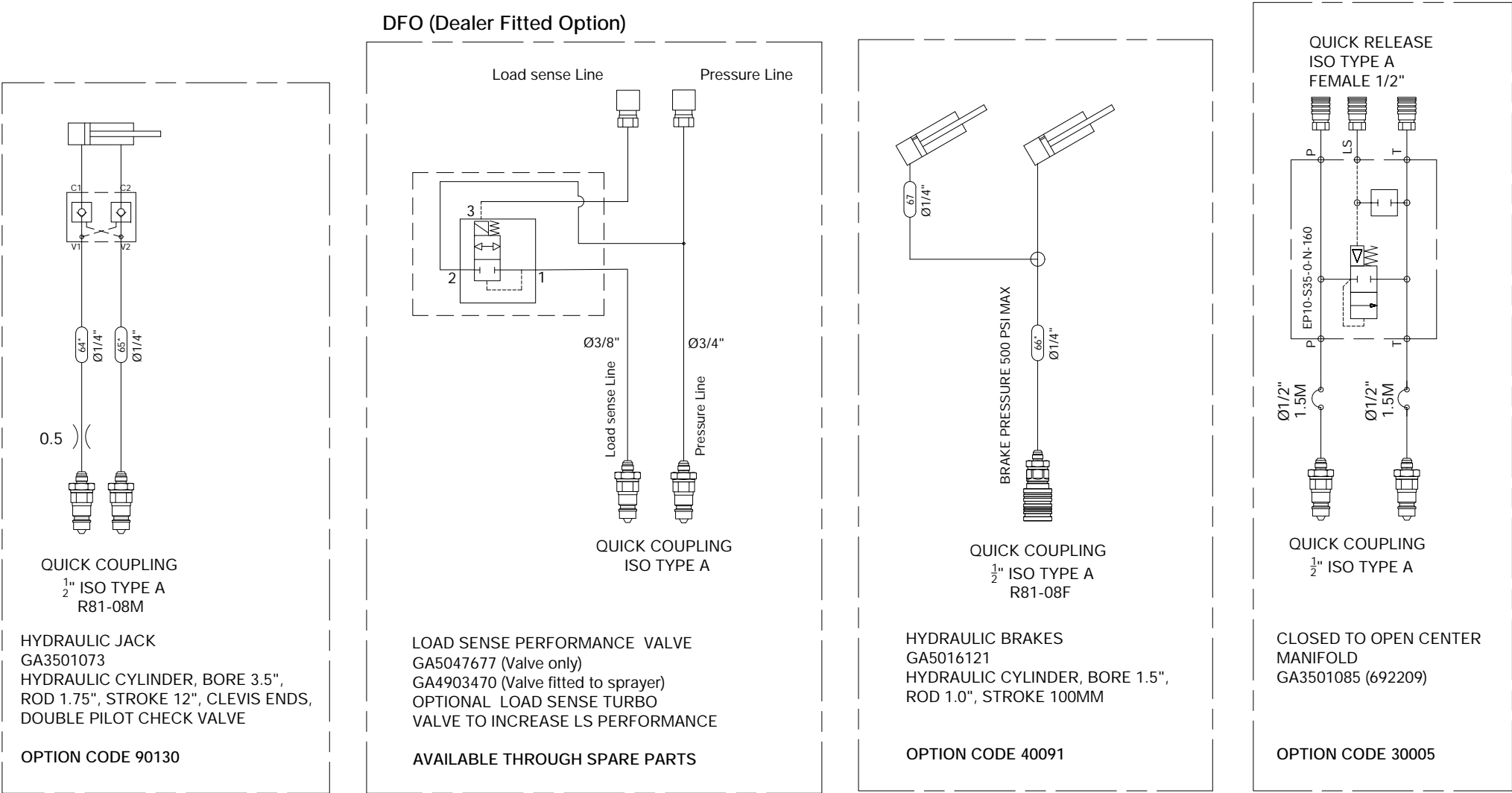
## Air Compressor Connection





Brake Options & Accessories

Brakes & Accessories - Tractor Remotes



## Sprayer, Tractor & Controls - **Connect**



*Hitch tongue & Manual Hitch Jack.*



*Reverse the tractor to align the tongue and drawbar holes, then fit the drawbar pin.*



*Ensure the drawbar pin is locked in position.*



*Unscrew & remove the hitch jack lock pin.*

### 2 Connect Drawbar & Hitch of 4000, 5000 & 6500 models

The 4000, 5000, 6500 models of the Prairie Special are fitted standard fitted with a Manual Hitch Jack. The hydraulic hitch jack is an option for these models.

#### To Connect Drawbar & Hitch Using the Manual Hitch Jack:

- 1 Manually wind the Hitch Jack up or down to match the Sprayer's hitch tongue to the height of the tractor drawbar.

- 2 Reverse the tractor to align the holes of the tractor drawbar & sprayer hitch tongue.
- 3 Fit the drawbar pin into the drawbar.
- 4 Lower the Sprayer hitch tongue onto the tractor drawbar by rotating the hitch jack handle anti-clockwise until the Sprayer fully rests on the drawbar and the hitch jack base plate is raised off the ground.

- 5 Ensure the drawbar pin is locked in position.
- 6 If extended, raise the hitch jack base plate by removing the pin, lift up the base plate, align the holes, then replace the pin.

- 7 Unscrew & remove the hitch jack lock pin.
- 8 Rotate the hitch jack until the lock pin holes aligns to the transport position, then screw-in the hitch jack lock pin until it is fully tightened.

*Manually wind the Hitch Jack up or down to match the hitch tongue to the height of the tractor drawbar.*



*Rotate the hitch jack handle anti-clockwise to lower the hitch tongue onto the tractor drawbar.*



*Raise the base plate by removing the pin, lift up the base plate, align the holes, then replace the pin.*



*Rotate the hitch jack to the transport position, then replace the lock pin & screw-in until it is fully tightened.*





The hitch jack in transport position.

- 9 Unsew the D-shackles of the sprayer's safety chains to release them from the sprayer hitch.
- 10 Connect the safety chains to the tractor, then fully tighten the D-Shackle bolts.



Reverse the tractor close enough to connect the hydraulic hitch jack hoses (shown by arrow above) to the tractor.

## 2 Connect Drawbar & Hitch of 8500 & 10000 models

The 8500 & 10000 models of the Prairie Special are fitted standard with a hydraulic hitch jack.

### To Connect Drawbar & Hitch Using the Hydraulic Hitch Jack:

- 1 Reverse the tractor close enough to connect the hydraulic hitch jack hoses to the tractor.

Unswcrew the safety chains D-shackles & connect them to the tractor, then fully tighten the D-Shackle bolts.



Locate the hydraulic hitch jack hoses to the tractor - labelled 'JACK UP' & 'JACK DOWN'.

- 2 Locate and connect the hydraulic hitch jack hoses - labelled 'JACK UP' & 'JACK DOWN'.
- 3 Hydraulically raise or lower the hitch jack to match the Sprayer's hitch tongue to the height of the tractor drawbar.
- 4 Reverse the tractor to align the holes of the tractor drawbar & sprayer hitch tongue.



Reverse the tractor to align the tongue and drawbar holes, then fit the drawbar pin.

- 5 Fit the drawbar pin into the drawbar.
- 6 Hydraulically lower the Sprayer hitch tongue onto the tractor drawbar until the Sprayer fully rests on the drawbar.
- 7 Ensure the drawbar pin is locked in position
- 8 Fully raise the hitch jack until it rests neatly under the sprayer hitch.

Connect the hydraulic hitch jack hoses to the tractor - labelled 'JACK UP' & 'JACK DOWN'.



Ensure the drawbar pin is locked in position.





## Sprayer, Tractor & Controls - **Connect**



Fully raise the hitch jack & its base until it rests neatly under the sprayer hitch.



Connect the Tank, Pressure, Case Drain & Load Sensing hydraulic hoses to the tractor.



Each hydraulic hose is tagged for easy recognition - Tank & Pressure hose tags shown below.

- 9 Unscrew the D-shackles of the sprayer's safety chains to release them from the sprayer hitch.
- 10 Connect the safety chains to the tractor & fully tighten the D-Shackle bolts.

### 3 Connect Hydraulic Hoses

Tractor hydraulics are used to control the boom level, folding & unfolding functions, hydraulic hitch jack (option) and the hydraulic motors which drive diaphragm pumps, centrifugal pumps and air compressor.

After completing the drawbar and hitch connection, it is necessary to connect the hydraulic hoses correctly.

Each hydraulic hose is tagged:

- Tank
- Pressure
- Case Drain
- Load Sensing
- Brake (option)

### To Connect the Hydraulic Hoses:

- 1 If the Brake option is fitted, connect the Brake hose to the dedicated tractor brake port.
- 2 Connect the Tank hose to the tractor.
- 3 Connect the Pressure hose to the tractor.
- 4 Connect the Case Drain and Load Sensing hoses to the tractor.

Connect the safety chains to the tractor & fully tighten the D-Shackle bolts.



Each hydraulic hose is tagged for easy recognition - Case Drain & Load Sensing hose tags shown below.





Connect the Tail Light harness.



Connect the Control harness.



Connect the Power harness.

## 4 Connect Electrical Harnesses

Connect the electrical harnesses of the sprayer to the connectors at the rear of the tractor:

- Tail Light Harness connector
- ISO BUS Harness connector

- Control Harness connector
- Sprayer Console Harness connector

- Power Harness connector
- Master Switch connector

For more information relating to In-cab controls, harnesses & connectors, refer to:

- 'Cabin Harness Electrical Layout' in this chapter
- Chapter 6, 'Operation'.

## 5 Hitch Adjustment

The angle of the Prairie Special hitch is adjustable for variations in tyre size and hitch height of towing vehicles to keep the sprayer chassis level.

It may be necessary to adjust the hitch angle to keep the sprayer chassis level if using:

- Different tyre size and/or
- Tow ball hitch.



Connect ISO BUS harness.



Connect Sprayer Console harness.



Connect the Master Switch connector.





Adjustable hitch of the Prairie Special.



With the chassis and hitch firmly supported, loosen & remove the hitch angle adjustment bolts.

### To Make Hitch Angle Adjustment:

- 1 Park the sprayer on a flat level surface with both wheels firmly chocked.
- 2 Unfold the boom & lower it to working position.
- 3 Use appropriate jacks & supports under the front & rear sprayer chassis to level the chassis and firmly support the chassis while the hitch angle is being changed.
- 4 Adjust the hitch jack to support the hitch.
- 5 Loosen & remove the two hitch angle adjustment bolts. It maybe necessary to adjust the hitch jack to take any weight off the bolts to easily remove them.
- 6 Using the hitch jack, raise or lower the hitch tongue to the required level to match the towing vehicle hitch point.
- 7 Refit the hitch angle adjustment bolts to the closest aligned holes and fully tighten.
- 8 With the hitch jack supporting the front of the sprayer, remove the jacks & supports from under the sprayer chassis
- 9 Connect the towing vehicle, including safety chains, then fold-up the hitch jack.
- 10 Ensure the towing vehicle park brake is On, then remove the wheel chocks from the sprayer wheels.

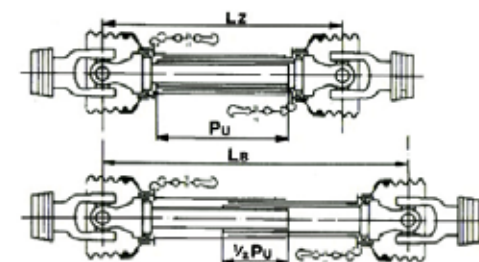


### 6 Fit the PTO Shaft (Optional)

A wide angle PTO shaft can be fitted as an option to the Prairie Special sprayers.

If the PTO option is used, then setting up the PTO shaft, especially for the first time, requires attention to two critical points of PTO operation:

- Maximum PTO Operating Length
- Maximum PTO Joint Operation.



Important sliding shaft overlap information for fitting Wide Angle PTO shafts.

### Maximum PTO Operating Length

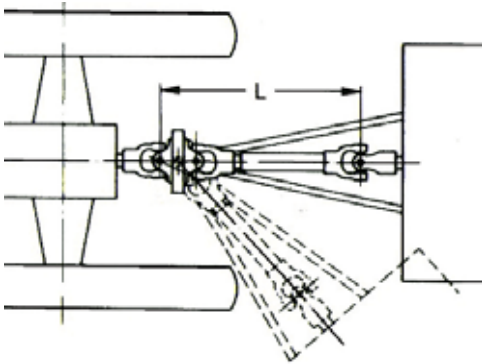
Maximum PTO Operating Length must be correct be correctly set so that PTO sliding shaft overlap is least 50% of PTO sliding shaft length in working position.

In the illustration (above):

- 'Lz' represents the **minimum** PTO operating length (joint centre to joint centre) when turning.
- '½Pu' represents the **minimum** PTO sliding shaft contact length when turning.
- 'Lb' shows the **maximum** PTO operating length (joint centre to joint centre) when travelling forward.
- 'Pu' shows the **maximum** PTO compression when travelling forward.

When tractor & sprayer are turning right or left, PTO sliding shafts slide inwards (compress) and the sliding shaft length 'Pu' **must not** exceed half its sliding length (½Pu).

If shafts compress more than '½Pu', binding will occur causing damage to the PTO.



Important joint operating information for Wide Angle PTO shafts.

## Maximum PTO Joint Operation

When travelling forwards, the point at which the sprayer drawbar joins to the tractor should be as close as possible to halfway between the PTO universal joints to ensure equal joint angles and maximise turns with minimal angling of the universal joints.

Wide Angle PTO Shaft guideline for operating angles are:

- Continuous operation - 25 degrees
- Short duration - 80 degrees
- Stationary - 80 degrees

## To Adjust PTO Shaft Length

- 1 Turn the tractor & sprayer to maximum turn, left or right.
- 2 Slide the PTO inner & outer shafts apart and fit each end spline to tractor and pump.
- 3 Align the inner and outer shafts next to each other in the shortest working position (see step 1) and mark them.
- 4 If necessary, shorten the inner and outer guard tubes equally.
- 5 Shorten inner and outer sliding profiles by the same length as the guard tubes.
- 6 Round off all sharp edges and remove burrs.
- 7 Grease sliding profiles before reassembling.

## To Fit a PTO Shaft

- 1 Ensure the tractor engine is Off.
- 2 Press in the locking pin and simultaneously push PTO shaft onto pump or tractor PTO splined shaft until the pin engages.
- 3 Pull PTO shaft back to make sure pin has engaged and the shaft cannot come off.
- 4 Attach the PTO safety chains allowing sufficient articulation of the shaft & safety chain in all working positions.

## To Remove a PTO Shaft

- 1 Ensure the tractor engine is Off.
- 2 Detach the PTO safety chains.
- 2 Press in the locking pin and simultaneously pull the PTO shaft from the tractor's PTO splined shaft. If required, do the same to remove PTO shaft from the pump.
- 3 Place the PTO shaft in a safe position.

### NOTE

Measuring & cutting a PTO shaft to the correct length requires knowledge and experience of the procedures required.  
If you have never carried out these procedures before, ensure your Dealer performs this important process.

### CAUTION

Be sure to allow enough 'travel' in the inner & outer PTO shafts to ensure they do not 'butt together' when turning or travelling through a ditch to cause damage to the pump & PTO shaft.

### CAUTION

The PTO shaft must not be suspended from the safety chain, other wise damage may occur to the chain and shaft.



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## Preparation for Use – Setting Up



Optional In-Cabin Raven CR7 Controller.



Optional In-Cabin Raven SCS 4400 Controller.

### Prairie Special Controls

The Prairie Special Series 2 Sprayer is fitted with a Raven ISO BUS system which operates with all leading spray controls, steering & mapping providers using the ISO BUS protocol.

### In-Cab Controls

Standard In-Cab Controls of the Prairie Special Series 2 include:

- Sprayer Control Console with 7 rocker switches used to operate boom and spray functions.
- A Master On/Off Switch for spraying.

Options include:

- Raven Controller CR7 (with On/Off foot switch).
- Raven SCS 4400 Controller.
- On/Off foot switch.

Optional Master On/Off Foot Switch.



### Sprayer Control Console

The Sprayer Control Console comprises 7 rocker switches for operating boom and spray functions.

#### 1 Left Tilt Up or Down

Press & hold the top of the switch to raise the left boom tilt. Release the switch when the boom reaches the tilt required.

Press & hold the bottom of the switch to lower the left boom tilt. Release the switch when the boom reaches the level required.

#### 2 Right Tilt Up or Down

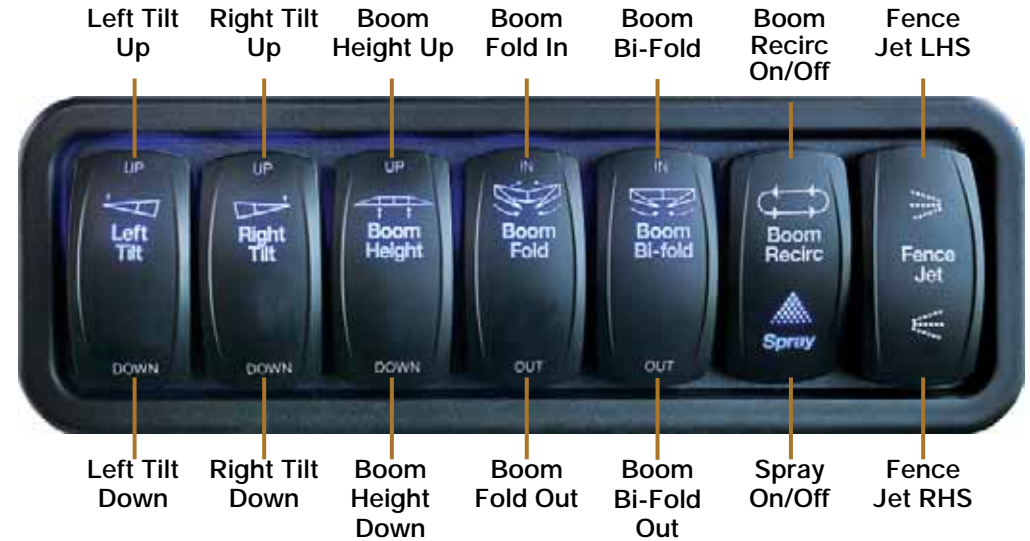
Press & hold the top of the switch to raise the right boom tilt. Release the switch when the boom reaches the tilt required.

Press & hold the bottom of the switch to lower the right boom tilt. Release the switch when the boom reaches the level required.

#### 3 Boom Height Up or Down

Press & hold the top of the switch to raise the boom. Release the switch when the boom reaches the position required.

Press & hold the bottom of the switch to lower the boom. Release the switch when the boom reaches the position required.



Seven rocker switch functions of the standard Sprayer Control Console.

#### 4 Boom Fold In or Out

Press & hold the top of the switch to fold-in the boom. Release the switch when the boom is fully folded or to stop the process.

Press & hold the bottom of the switch to fold-out the boom. Release the switch when the boom is fully open or to stop the process.

#### 5 Boom Bi-Fold In or Out

Press & hold the top of the switch to fold-in the outer wings of the boom. Release the switch when the outer wings are fully folded or to stop the process.

Press & hold the bottom of the switch to fold-out the outer wings of the boom. Release the switch when the outer wings are fully open or to stop the process.

#### 6 Boom Recirculation On or Off & Spray On or Off

Press the top of the switch to start boom recirculation. Boom Recirc illuminates blue.

Press the bottom of the switch to start spraying. Spray illuminates blue.

#### 7 Fence Jet LHS On or Off & Fence Jet RHS On or Off

Press the top of the switch to start the LHS Fence Jet spraying - illuminates blue. Press the switch again to stop LHS Jet.

Press the bottom of the switch to start the RHS Fence Jet spraying - illuminates blue.

Press the switch again to stop RHS Jet.

Boom must be spraying for the Fence Jets to spray.





Optional Raven CR7 In-Cabin Controller.

## Pre-Set the Raven PC1 ISO BUS & Controller

The Raven PC1 ISO BUS is factory pre-set and tested for spraying using an optional CR7 Raven Controller. The CR7 Universal Terminal (UT) interface allows use of most 3rd party Universal Terminals.

However, all settings and operation must be checked and tested for each situation and accuracy prior to spray applications.

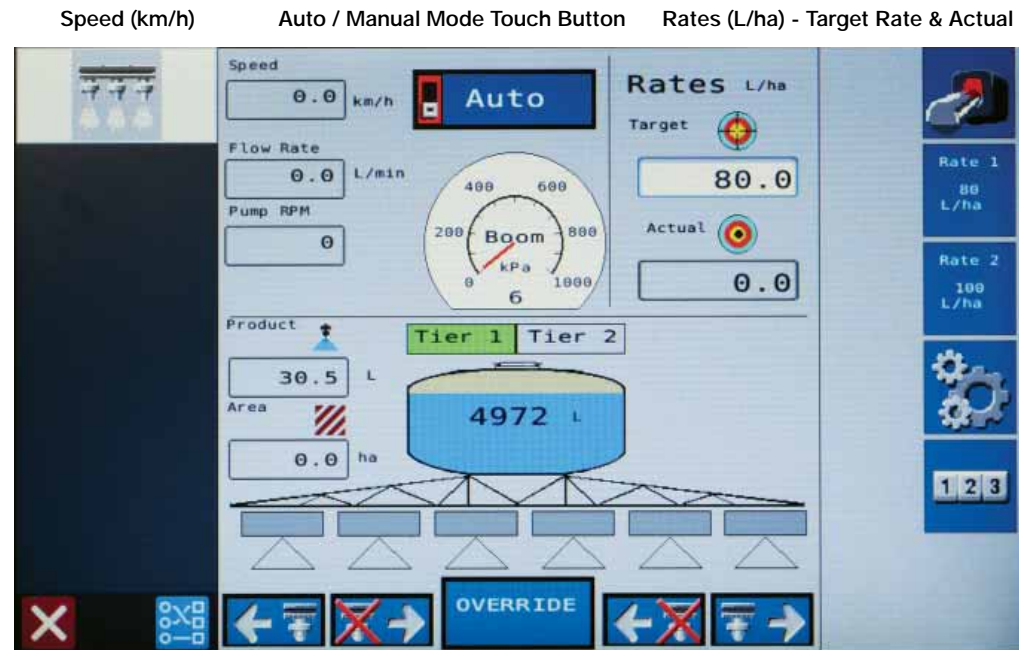
The operator is responsible for correctly pre-setting & operating the sprayer at all times.

The following instructions are applicable to all Universal Terminals (UT) which can be used with the Prairie Special sprayer.

### NOTE

The easiest way to determine the Width of a Section is to count the nozzles.  
Start at section 1 which is on the left end of the boom by counting the number of nozzles in the section.  
For example, section 1 has 4 nozzles. Four nozzles at 500mm spacing gives a section width of 2.0m.  
Repeat the procedure for each section.  
This procedure is applicable to both Broadacre & Rowcrop plumbed booms.

- ISOBUS Product Control Symbol
- Flow Rate (l/min)
- Pump RPM
- Boom Pressure (kPa)
- Volume Applied (L)
- Area Applied (ha)
- Boom Section On/Off Touch Buttons - Active (Blue) / Inactive (Grey)



- Master Switch Touch Button
- Rate 1 Touch Button
- Rate 2 Touch Button
- Boom Tier Status - Active (Green) / Inactive (Grey)
- Settings Touch Button
- Data Access Touch Button
- Tank Volume & Liquid Volume Available (L)

The 'Home' screen of the Raven PC1 ISO BUS Universal Terminal (optional CR7 Controller shown) can be used to monitor, calibrate & control product application without other consoles or displays in the sprayer cab.

The 'Settings' touch button on the 'Home' screen of an optional Raven CR7 Controller or UT screen is used to enter required calibration values for:

- Boom Settings - Number of Boom Sections & Section Widths
- Product Settings - Meter Calibration, Valve Type & Calibration and Rate Calibration
- Alarm Settings

### NOTE

For further information refer to the 'Raven ISOBUS Product Control Installation and Operation Manual' supplied with the Prairie Special sprayer.

## To Pre-Set the Raven PC1 ISO BUS & Controller:

- 1 Start the tractor engine.
- 2 Start the Universal Terminal fitted.

If properly connected & powered, the Raven ISO BUS is automatically detected by the Universal Terminal.

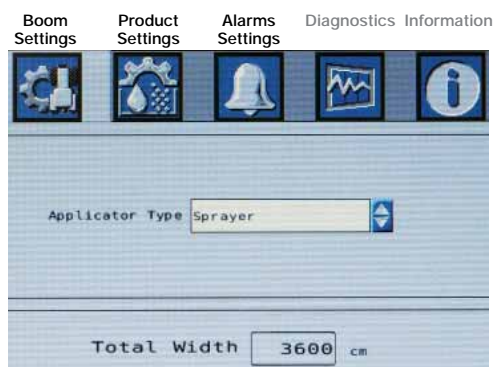


- 3 Press the 'Settings' touch button on the Universal Terminal 'Home' screen, and a Settings screen is displayed.

Press the 'Setting' touch button on the 'Home' screen to display the 'Boom Settings' screen.



# Preparation for Use – Setting Up



Three touch buttons (at the top of the 'Boom Settings' screen) are used to enter 'Boom', 'Product' & 'Alarm'

Touch buttons at the top of the opening 'Settings' screen include:

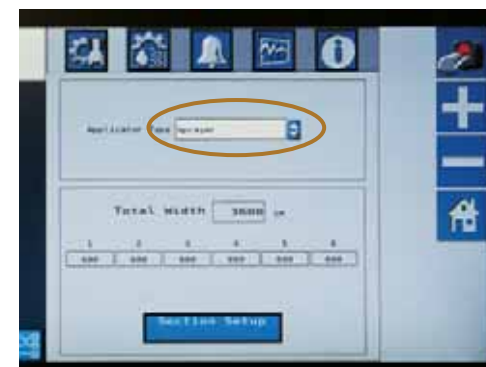
- Boom Settings (Opening screen)
- Product Settings
- Alarm Settings
- Diagnostics
- Information

Photo Right: Two nozzles plumbed either side of the centre of the boom - referred to as Broadacre plumbing.

Section Number (L to R)	Nozzle Spacing (m)	No Nozzles in Section	Section Width (m)
1	0.5	12	6.0
2	0.5	12	6.0
3	0.5	12	6.0
4	0.5	12	6.0
5	0.5	12	6.0
6	0.5	12	6.0
Total No of nozzles:		72	
Spray Application Width:		36.0m	



Section Number (L to R)	Nozzle Spacing (m)	No Nozzles in Section	Section Width (m)
1	0.5	12	6.0
2	0.5	12	6.0
3	0.5	12	6.0
4	0.5	13	6.5
5	0.5	12	6.0
6	0.5	12	4.5
Total No of nozzles:		73	
Spray Application Width:		36.5m	



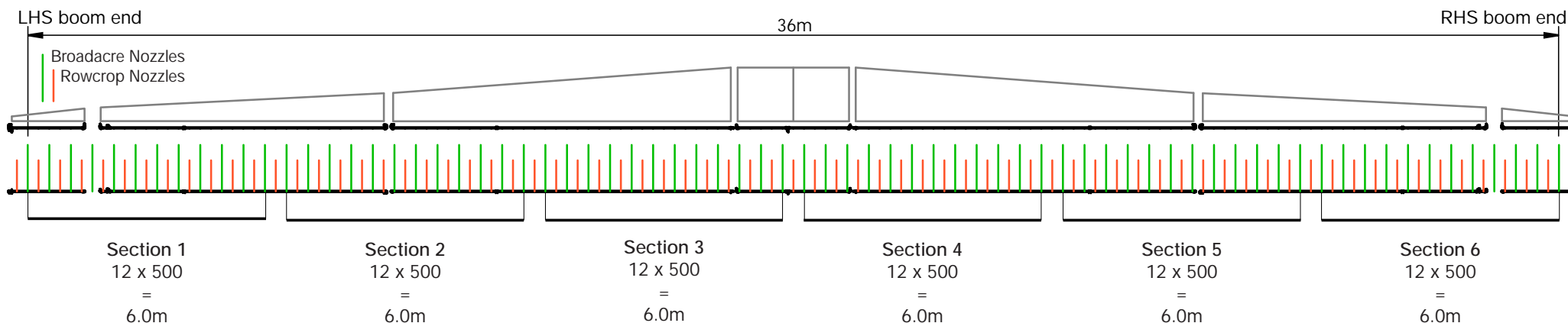
Press the 'Applicator Type' touch button.

- 4 Press the 'Applicator Type' touch button of the Boom Settings screen and an 'Enter Value' menu appears.

Photo Left: A single nozzle plumbed to the centre of the boom - referred to as Centreline or Rowcrop.

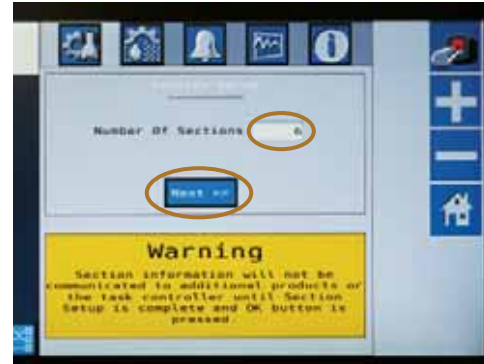
Boom Illustration Below: A 36m Boom illustration showing details of both Broadacre & Centreline (Rowcrop) plumbing for 6 boom sections with 500mm nozzle spacing.

Boom Sections are numbered 1 to 6 starting from the LHS boom end. Green vertical lines illustrate the Broadacre plumbing nozzle location option. Red vertical lines illustrate Centreline (Rowcrop) plumbing nozzle locations.





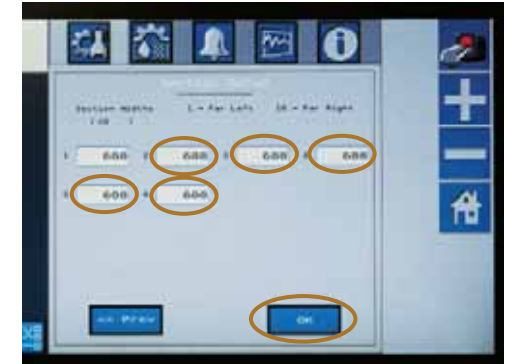
Press the 'Sprayer' touch button to select it.



Enter the number of boom sections, then press the 'Next' touch button to enter boom section widths.



Press the 'Section 1' touch button to enter the width of Section 1.



Repeat step 12 to enter the width of each section 2 - 6, then press the 'OK' touch button.

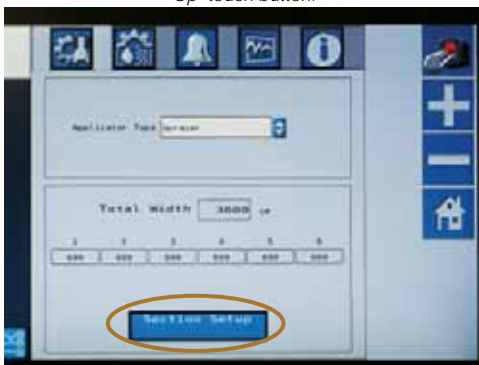
- 5 Press the 'Sprayer' touch button in the Enter Value menu and 'Sprayer' will be displayed in Applicator Type window. The total width value displays the sum of the currently entered section widths. Use the 'Section Setup' touch button to edit boom section widths and total width.
- 6 Press the 'Section Setup' touch button and the 'Section Setup' screen appears.

- 7 Press the 'Number of Sections' touch button and a numerical keypad appears.
- 8 Press the appropriate touch button to enter the number of boom sections, eg, '6', then press the 'Tick' touch button. The screen returns to the 'Section Setup' screen with the value, eg, '6' showing in the 'Number of Sections' window.
- 9 Press the 'Next' touch button to enter the boom section widths.

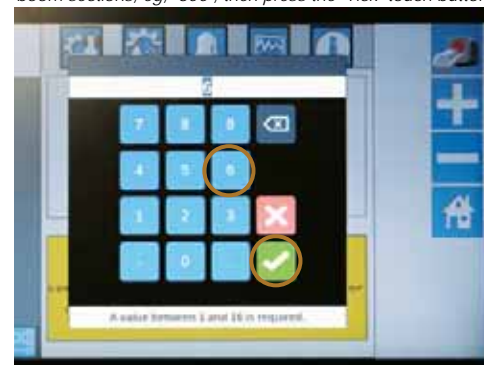
- 10 Press the 'Section 1' touch button and a numerical keypad appears. Section 1 is the outer end section of left hand side boom (refer to previous page illustration for details).
- 11 Press the appropriate touch buttons to enter the 'Section 1' width in cm eg, '600', then press the 'Tick' touch button. The screen returns to the 'Section Widths' screen with the value eg, '600' showing in the 'Section 1' window.

- 12 Repeat the previous step 11 for each of the remaining sections, eg, 2 - 6. The last section (eg, 6) is the outer section of the right hand side of the boom.
- 13 After all section widths have been entered, press the 'OK' touch button. The screen returns to the 'Settings' screen with 'Total Width' & each 'Section Width' displayed.
- 14 Press the 'Product Settings' touch button and a Product Control screen is displayed.

Ensure 'Sprayer' is selected, then press the 'Section Set-Up' touch button.



Press the appropriate touch button to enter the number of boom sections, eg, '600', then press the 'Tick' touch button.

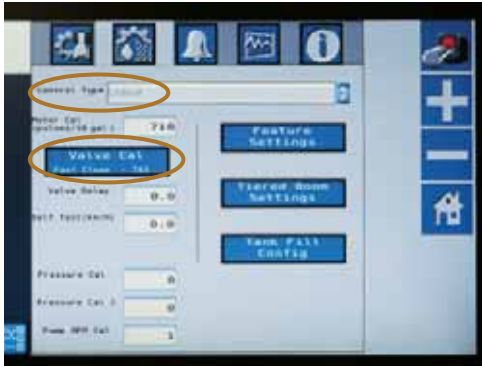


Total Width & Section Widths are displayed. Press the 'Product Settings' touch button.

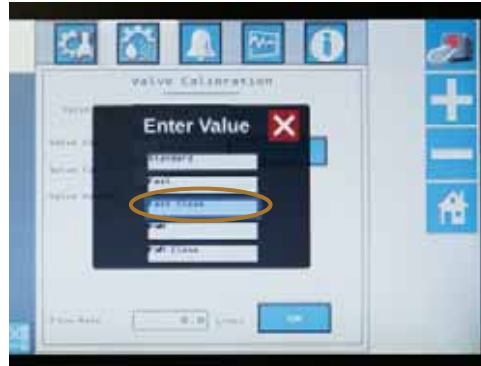




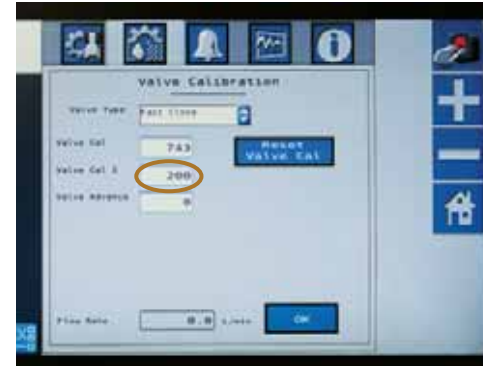
## Preparation for Use – Setting Up



Check 'Liquid' is displayed in 'Control Type' of the Product Calibration' screen. Press the 'Valve Cal' touch button.



Press the 'Fast Close' touch button to select it.



Press the 'Valve Cal 2' touch button.



Press the appropriate touch buttons to set the 'Valve Cal 2' value, eg, '200', then press the 'Tick' touch button.

- 15 Check 'Liquid' is displayed in the 'Control Type' window.
- 16 Press the 'Valve Cal' touch button and a 'Valve Calibration' screen is displayed.
- 17 Press the 'Valve Type' touch button and the 'Enter Value' list is displayed.

- 18 Press the 'Fast Close' touch button and Fast Close is displayed in the 'Valve Type' window.
- 19 'Valve Cal' sets the responsiveness of the control valve which is required for product control.

The recommended value is automatically entered when the valve type is selected. Press the 'Reset Valve Cal' touch button to check & reset the Valve Cal value.

Alternatively, press the 'Valve Cal' touch button to display a numerical keypad, then manually enter the value, eg, 743, which is on the valve identification label.

Press the 'Reset Valve Cal' touch button or manually enter the value using 'Valve Cal'.

- 20 Press the 'Valve Cal 2' touch button and a numerical keypad appears.

The 'Valve Cal 2' value is used to fine tune valve response and reduce application rate oscillation when a Controller is programmed in PWM mode.

With 'Fast Close Valve' selected, the 'Valve Cal 2' value is used for refined rate control for lower application rates.

Enter a non-zero value for the time, in milliseconds, in which the valve will be fully opened before switching into more refined control.

Press the appropriate numerical touch buttons, then the 'Tick' touch button to enter the value manually.

For example, a value of 200 will give the valve a 200 millisecond 'burst' at fully open fast valve from its closed position before resuming its product rate control.

A zero value will disable this feature.

- 18 Press the appropriate touch buttons to enter the 'Valve Cal 2' eg, '200', then press the 'Tick' touch button.

The screen returns to the 'Section Widths' screen with the value eg, '200' showing in the 'Valve Cal 2' window.

- 19 Press the 'OK' touch button to save values & the screen returns to Product Settings'.

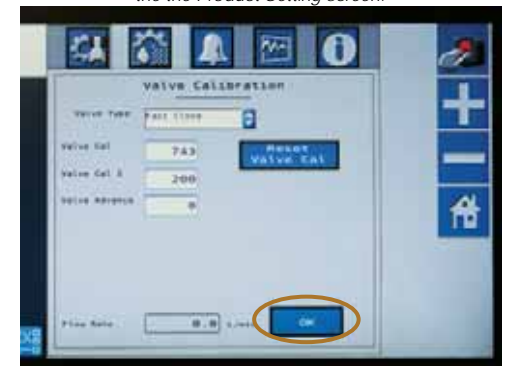
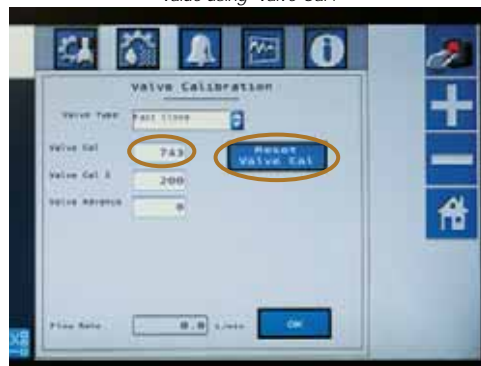
Press the 'OK' touch button to save the entered and return the the Product Setting screen.

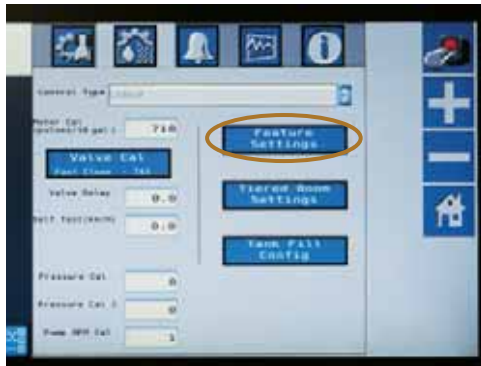
### NOTE

#### Valve Response Rate

The Response Rate has a range of 1 to 100 and the setting determines how aggressively the target rate is controlled to. Increasing this value will cause the system to respond more quickly. Decreasing it will cause a slower response. If the flow is slow to reach the target value, consider increasing it.

Press the 'Valve Type' touch button.

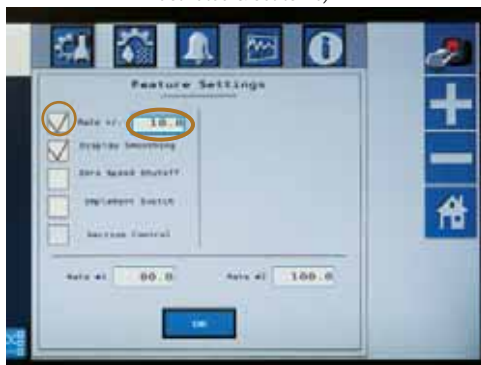




Press the 'Feature Settings' touch button and a 'Feature Settings' screen appears.

- 20 Press the 'Feature Settings' touch button and a 'Feature Settings' screen appears.
- 21 Press the 'Rate +/-' window to activate the Rate Bump feature (ticked).
- 22 Press the 'Rate +/-' window touch button to enter a Rate Bump value and a numerical keypad appears.
- 23 Press the appropriate touch buttons to enter a Rate Bump value in kg, eg, '10', then press the 'Tick' touch button.  
The screen returns to the 'Feature Settings' screen with the value eg, '10' displayed in the 'Rate +/-' window.

Feature Settings screen with 'Rate +/-' (Rate Bump activated & set to 10).



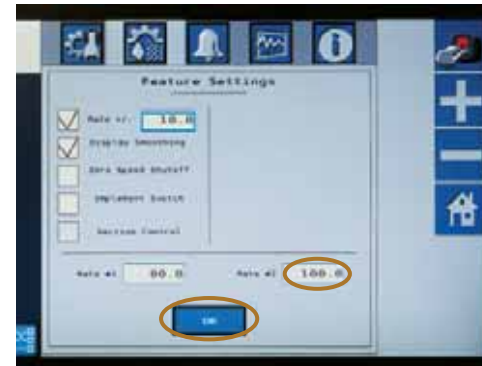
Press 'Display Smoothing' touch button to activate Display Smoothing. Press the 'Rate 1' touch button

- 24 Press the 'Display Smoothing' window to activate the Display Smoothing feature (ticked).  
Other features available are:
  - 'Zero Speed Shutoff'
  - 'Implement Switch'
  - 'Section Control'
- 25 Press the 'Rate #1' window touch button to enter an application rate and a numerical keypad appears.
- 26 Press the appropriate touch buttons to set the application rate in litres/ha, eg, '80', then press the 'Tick' touch button.  
The 'Featured Settings' screen returns with the entered value eg, '80' showing in the 'Rate #1' window.

## NOTE

### Rate Bump

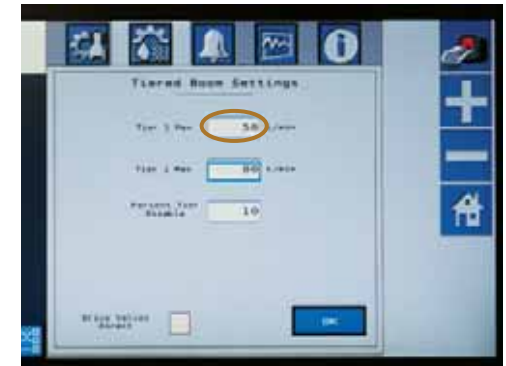
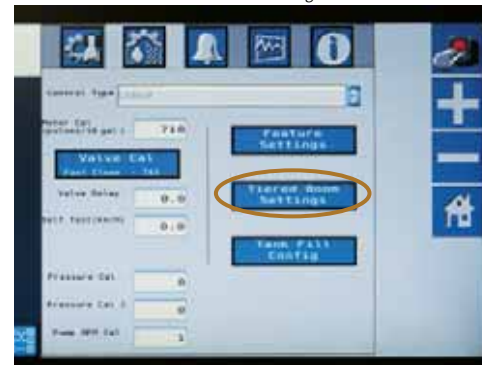
When spraying in Manual Mode, the operator can adjust the Spray Application Rate (using touch buttons on the Controller) by the amount (l/ha) pre-set in the Spray Bump setting.



Feature Settings screen with 'Rate # 1' & 'Rate # 2' values displayed. Press the 'OK' touch button.

- 27 Press the 'Rate # 2' window touch button to enter an application rate and a numerical keypad appears.
- 28 Press the appropriate touch buttons to set the application rate in litres/ha, eg, '100', then press the 'Tick' touch button.
- 29 The 'Featured Settings' screen returns with the entered value eg, '100' showing in the 'Rate # 2' window.  
Press the 'OK' touch button to save settings & the 'Product Setting' screen returns.

Press the 'Tiered Boom Settings' touch button.

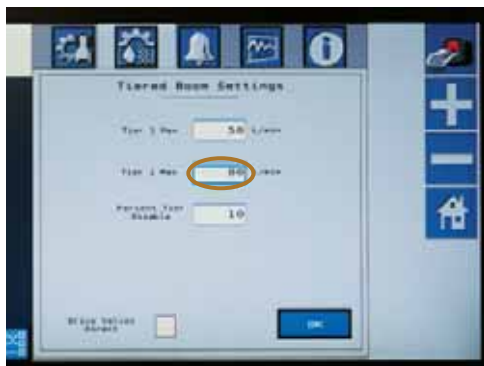


Press the 'Tier 1 Max' touch button on the 'Tiered Boom Settings' screen.

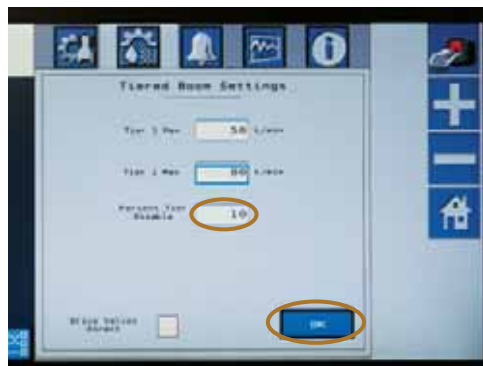
- 30 Press the 'Tiered Boom Settings' touch button and a Tiered Boom Settings screen appears.  
**This setting requires the operator to calculate the maximum flow rates of nozzles fitted to Tier 1 & Tier 2 boom sections.**  
**Refer to Chapter 6 'Calibration' for information required to determine Maximum Tier Flow Rates.**
- 31 Press the 'Tier 1 Max' touch button to enter the desired maximum rate applied through the first tier boom sections. A numerical keypad appears.
- 32 Press the appropriate touch buttons to set the 'Tier 1 Max' value in litres/min, eg, '50', then press the 'Tick' touch button.  
The 'Tiered Boom Settings' screen returns with the value eg, '50' showing in the 'Tier 1 Max' window.



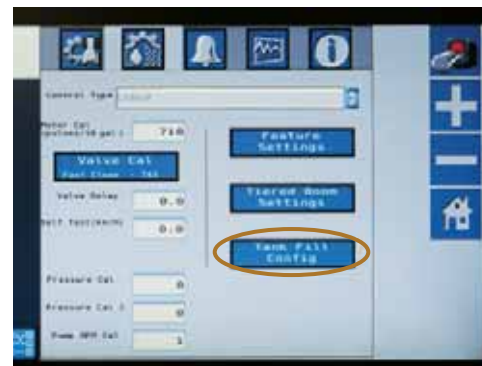
## Preparation for Use – Setting Up



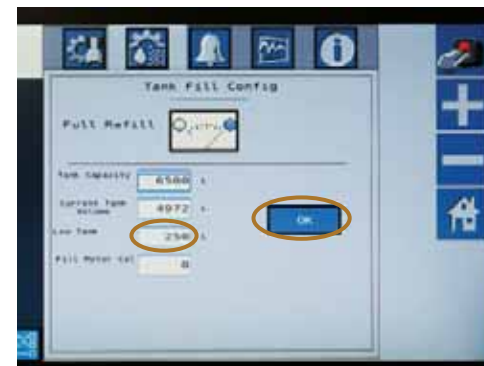
The Tiered Boom Settings screen. Press the 'Tier 2 Max' window touch button.



Press the 'Percent Tier Disable' touch button.



Press the 'Tank Fill Config' touch button.



Press the 'Low Tank' touch button to enter the 'Low Tank' alarm value, eg, 250 litres. Press the 'OK' to save values'.

31 Press the 'Tier 2 Max' window touch button to enter the desired maximum rate applied through the second tier boom sections. A numerical keypad appears.

32 Press the appropriate touch buttons to set the maximum Tier 1 value in litres/min, eg, '80', then press the 'Tick' touch button. The 'Tiered Boom Settings' screen returns with the value eg, '80' showing in the 'Tier 2 Max' window.

Press the appropriate touch buttons to set the 'Rate #1' in l/min, eg, '80', then press the 'Tick' touch button.



33 Press the 'Percent Tier Disable' touch button to enter the 'Percent Tier Disable' value which is used to determine the percentage of the maximum tier rate at which tiers are disabled as required volume per minute decreases. Using a Percent Tier Disable value allows the control valves to adjust target rate more quickly as required rate decreases. A numerical keypad appears.

34 Press the appropriate touch buttons to set the 'Percent Tier Disable' value, eg, '10' (%), then press the 'Tick' touch button. The 'Tiered Boom Settings' screen returns with the value eg, '10' (%) showing in the 'Percent Tier Disable' window.

Max Flow Rates & Tier Disable values will vary with nozzle type selected.

### NOTE

#### Percent Tier Disable

The 'Percent Tier Disable' value is used to minimise unnecessary tier switching when spraying close to the switch point of a tier. Increasing the value, reduces the sensitivity when switching tiers.

The '10% Percent Tier Disable' value means a spraying Tier will not change down until the spray rate is 10% below the target rate.

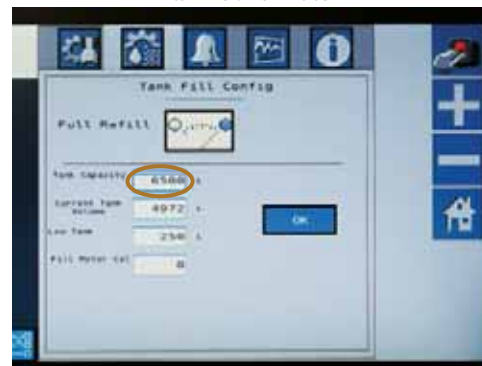
35 Press the 'OK' touch button to save values & the 'Product Settings' screen returns.

36 Press the 'Tank Fill Config' touch button and the 'Tank Fill Config' screen appears.

37 Press the 'Tank Capacity' touch button and a numerical keypad appears.

38 Press the appropriate touch buttons to set the 'Tank Capacity' value in litres, eg, '6500', then press the 'Tick' touch button. The 'Tank Fill Config' screen returns with the value eg, '6500' showing in the 'Tank Capacity' window.

Press the 'Tank Capacity' touch button to enter the total tank volume in litres.



39 Press the 'Low Tank' touch button to enter a low tank warning value. A numerical keypad appears.

40 Press the appropriate touch buttons to set the 'Low Tank' value in litres, eg, '250', then press the 'Tick' touch button. The 'Tank Fill Config' screen returns with the value eg, '250' showing in the 'Low Tank' window.

41 Press the 'OK' touch button to save values & the Product Settings' screen returns.

Press the appropriate touch buttons to set the 'Low Tank' value in litres, eg, '250', then press the 'Tick' touch button.





Press the 'Alarms' touch button to access the Alarms Setup screen.

42 Press the 'Alarms' touch button and the Alarms Setup screen appears.

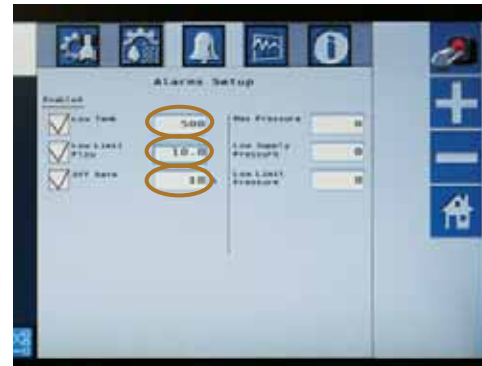
43 Three alarms can be activated and set:

- Low Tank
- Low Limit Flow
- Off Rate

Press the desired alarm touch buttons to enable or disable alarms.

A 'Tick' appears when an 'Alarm' is enabled (the checkbox is blank if disabled).

Press desired alarm touch buttons to enable or disable alarms.



A 'Tick' appears when an 'Alarm' is enabled. Press each alarm touch button to set each alarm value.

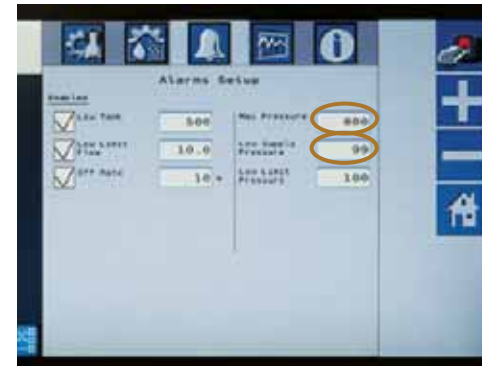
44 To set desired alarm values, press the desired alarm touch button and a numerical keypad appears.

Press the touch buttons to enter an alarm value in litres, eg, Low Tank '500', then press the 'Tick' touch button.

The 'Alarms Setup' screen returns with '500' displayed in "Low Tank" display.

Repeat the procedure for the 'Low Limit Flow' alarm and Off Rate alarm.

The Off Rate alarm responds when the Actual Application Rate differs from Target Application Rate differs by more than the percentage set, eg, 10%.



Press touch buttons 'Max Pressure', 'Low Supply Pressure' and enter then desired values.

45 Press the 'Max Pressure' touch button and a numerical keypad appears.

46 Press the touch buttons to enter a 'Max Pressure' value in kPa, eg, '800', then press the 'Tick' touch button.

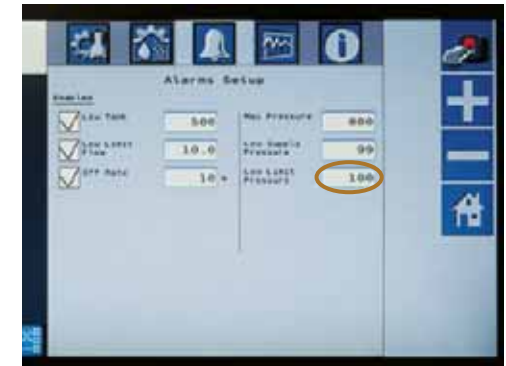
The 'Alarms Setup' screen returns with '800' displayed in 'Max Pressure' display.

47 Press the 'Low Supply Pressure' touch button and a numerical keypad appears.

This alarm responds when pressure has fallen below an acceptable threshold and control will be stopped/shutdown if pressure does not increase.

48 Press touch buttons to enter a 'Low Supply Pressure' value in kPa, eg, '99', then press the 'Tick' touch button.

The 'Alarms Setup' screen returns with '99' displayed in 'Low Supply Pressure' display.



Press the 'Low Limit Pressure' touch button to enter the Low Limit Pressure. Press the 'Home' screen touch button.

49 Press the 'Low Limit Pressure' touch button and a numerical keypad appears.

This alarm responds when pressure drops below the desired 'Low Limit pressure'.

50 Press touch buttons to enter a 'Low Limit Pressure' value in kPa, eg, '100', then press the 'Tick' touch button.

The 'Alarms Setup' screen returns with '100' displayed in 'Low Limit Pressure' display.

51 This completes settings for:

- Boom
- Product &
- Alarms.

Press the Home touch button to return to the Home screen.

## NOTE

For further information refer to the 'Raven ISOBUS Product Control Installation and Operation Manual' supplied with the Prairie Special sprayer.

## Preparation for Use – Setting Up



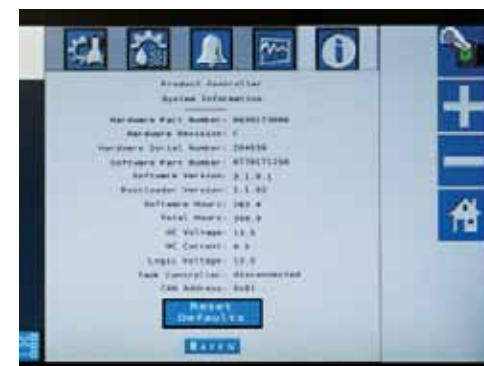
Press the 'Setting' touch button on the 'Home' screen to display the 'Settings' screen.



Press the desired 'Zero' touch buttons on the 'Totals Data' screen to reset values to zero.



Press the 'Diagnostics' touch button to access the 'Diagnostic' screen.



Product Controller System Information screen.

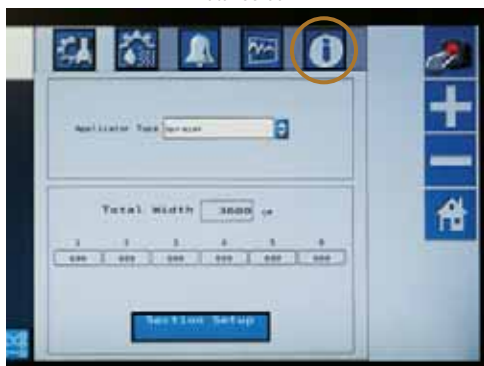
### Data Recording:

The Controller & PC1 ISO BUS system records data relating to application area and liquid volume applied.

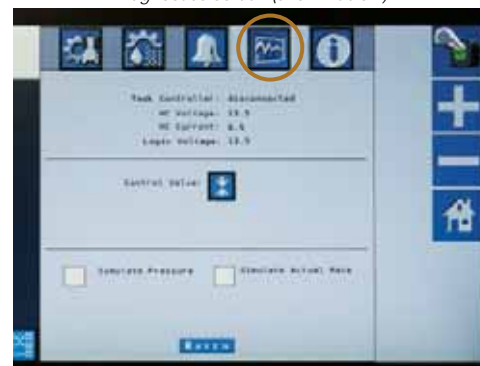
The following data records can be reset or re-calibrated by the operator at any time:

- Field Area
- Field Volume
- Total Area
- Total Volume.

Press the 'Information' touch button to display the 'totals Data' screen.



The Totals Data screen with totals reset to zero.



Press the 'Diagnostics' push button to access the 'Diagnostics' screen (shown below).

### Diagnostics:

The Controller & PC1 ISO BUS system can be used for troubleshooting if problems arise.

#### To Access Diagnostics:

- 1 Start the tractor engine and Universal Terminal fitted.
- 2 Press the 'Settings' touch button on the Universal Terminal 'Home' screen, and a Settings screen is displayed.
- 3 Press the 'Diagnostic' touch button and a 'Diagnostic' screen appears.

The following Information may also be used for troubleshooting:

**Distance:** The distance reading displays distance traveled since the last time the distance register was cleared. This information may be helpful for troubleshooting product control.

**Volume per Minute:** Current volume of product applied per minute rate is displayed in this area. This value may be helpful for troubleshooting product control.

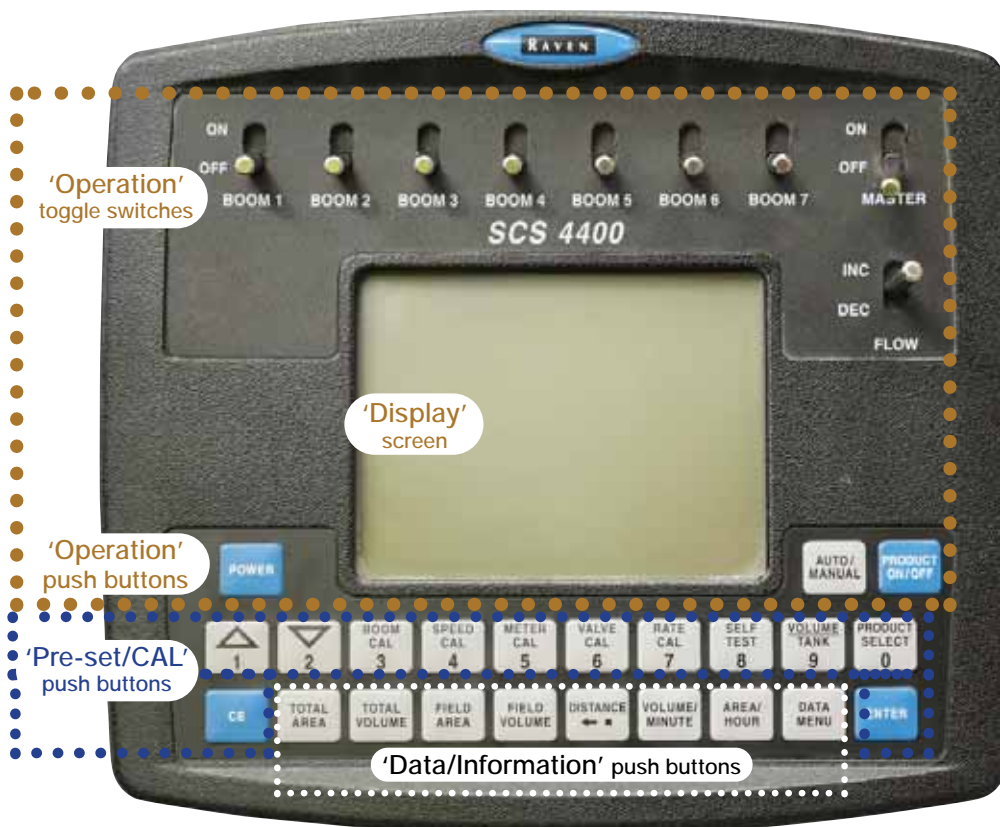
**Area per Hour:** Current area covered per hour is displayed in this area. This may be helpful for troubleshooting product control.

**Self Speed Test:** Enter a value similar to normal application speeds to allow the unit to control product application functions while the sprayer remains stationary. The test speed is useful for checking & troubleshooting product control.

### NOTE

For further information for using Diagnostics, refer to the 'Raven ISOBUS Product Control Installation and Operation Manual' supplied with the Prairie Special sprayer.





Optional Raven SCS 4400 Controller toggle switch & touch button function layout.

## Pre-Set the Raven SCS 4400 Controller Option

If fitted, the Raven SCS 4400 Controller (Spray Rate Controller) is pre-set and tested for spraying applications prior to delivery.

However, it is recommended that all settings and values for spraying applications are checked and tested for desired applications land accuracy prior to commencing spraying operations.

It is the operator's responsibility to correctly operate all controller and sprayer functions at all times.

### NOTE

It is recommended to record all 'Pre-Set' values (entered & saved) on 'Pre-Set SCS 4400 Record Sheets' for future reference.

Record sheets are provided near the end of this chapter. Copy & use the 'Pre-Set SCS 4400 Record Sheets' near the end of this chapter for your records.



Press the 'POWER' touch button to start the Controller.

## To Pre-Set the SCS 4400:

- 1 Start the engine.
- 2 Press the 'POWER' touch button and the 'ADJUST LCD CONTRAST' screen appears.
- 3 Press & Hold Arrow the '1 Up' (lighten) &/or '2 Down' (darken) touch buttons to adjust screen clarity for existing light conditions, Press the 'ENTER' touch button to save the screen contrast setting and move to the next screen 'LANGUAGE'.

Adjust screen contrast, then press 'Enter' touch button to save the setting.



Scroll to 'ENGLISH LANGUAGE', then press 'Enter' touch button to save the setting.

- 4 Repeatedly press the 'CE' touch button to scroll through the language menu until 'ENGLISH LANGUAGE' is displayed. Press the 'ENTER' touch button to save the language setting and move to the next screen 'UNITS OF MEASURE'.
- 5 Repeatedly press the 'CE' touch button to scroll through the Units of Measure menu until 'SI METRIC HECTARES' is displayed. Press the 'ENTER' touch button to save the units of measure selection and move to the next screen 'PRODUCT TYPE'.

Scroll to 'SI METRIC HECTARES', then press 'Enter' touch button to save the setting.



## Preparation for Use – Setting Up



SELECT 'LIQUID CONTROL', then press 'Enter' touch button to save the setting.



Scroll to 'FAST CLOSE VALVE', then press 'Enter' touch button to save the setting.

- 6 Press the 'CE' touch button to select the Product Type, namely 'LIQUID CONTROL'. Press the 'ENTER' touch button to save the Product Type selection and move to the next screen 'VALVE TYPE'.
- 7 Labelling on the side of the Flow Control Valve on the sprayer will provide the information required for Flow Valve Type and its calibration

Located on top of the boom centre section, labelling of the Flow Control Valve provides the information required for valve type & calibration.



Calibration first requires the 'ENTER' touch button to be pressed to display an 'E' symbol in the lower right hand side of the calibration screen.

### To Enter the Calibration Value:

- i) Press the 'ENTER' button to display the 'E' enter symbol.



Ready for calibration, press the appropriate touch buttons, eg, '1' '8' & '5', then press 'ENTER' to save the calibration.

- ii) Press the appropriate buttons to enter the calibration number eg, '185'.
- iii) Press the 'ENTER' button to save the flow control valve calibration value and move to the next screen 'RATE CAL'.
- 9 The Controller's 'RATE CAL' is the desired application rate in litres/hectare. Before entering an application rate, refer to the nozzle application charts provided at the end of Chapter 5 'Calibration' or Nozzle Manufacturer's catalogue or online information - to ensure the application rate is within the speed & pressure range of the nozzles fitted to the boom.

### NOTE

When entering Calibration values during any calibration process, the 'ENTER' button must first be pressed to display the 'E' symbol in the lower right hand side of the calibration screen.

'E' indicates the Controller is ready to accept a calibration value. After entering a value, the 'ENTER' button must be pressed again to save the Calibration value prior to moving onto the next screen (next step).



Press the 'ENTER' touch button to display the 'E' symbol in the lower right hand side of the calibration screen.

### To enter the Application Rate:

- i) Press the 'ENTER' button to display the 'E' enter symbol.
- ii) Press the appropriate buttons to enter the desired application rate eg, '50'.
- iii) Press the 'ENTER' button to save the application rate value and display the screen to enter 'SPEED SENSOR TYPE'.

Ready for calibration, press the appropriate touch buttons, eg, '5' & '0' to enter the desired application rate, then press 'ENTER' to save the desired application rate.







If using a wheel sensor, select 'SPEED SENSOR WHEEL SPEED-SP1', then press 'Enter' to save the setting.

- 10 Two types of Speed Sensor can be used with the Prairie Special, either Wheel Sensor or Raven GPS.

To Set the Speed Sensor Type:

- Press the 'CE' touch button to select either 'SPEED SENSOR WHEEL SPEED SP-1' or 'SPEED SENSOR RADAR SP-2'
- Press the 'ENTER' button to save the Speed Sensor Type and display the screen to enter SPEED CAL' value.

If using a Raven GPS, select 'SPEED SENSOR RADAR-SP2', then press 'Enter' to save the setting.



Press the 'POWER', 'DISTANCE' then 'ENTER' touch buttons to display 'E' in the lower RHS side of the screen.

- 11 Before entering a 'SPEED CAL' value, the speed calibration type & value must first be ascertained.

Wheel Sensor 'SPEED CAL' Value is the distance travelled with one wheel revolution. It can be measured by:

## a) Measuring One Wheel Revolution

To Measure One Wheel Revolution:

- Mark the sensor wheel & travel for one wheel revolution.
- Measure distance travelled for the 'SPEED CAL' value.

## b) Wheel Revolutions to Travel 100m

To Measure One Wheel Revolution:

- Measure 100 metres on level ground.
- Travel 100 metres counting the number of wheel revolutions.
- Divide 100m by number of wheel revolutions to obtain the 'SPEED CAL' value.



Ready for calibration, press the appropriate touch buttons, eg, '0' then press 'ENTER' to save the '0' value.

## c) Measure 100m with Raven SCS 4400

To Measure with Raven SCS 4400:

- Measure 100 metres on level ground.
- Press the Raven Controller SCS 4400 POWER touch button 'On' & ensure all other switches are 'Off'
- Press the 'DISTANCE' button.
- Press the 'ENTER' button to display the 'E' enter symbol.
- Press the appropriate buttons to enter the value '0', then press the 'ENTER' button to set the '0' value.
- Drive the sprayer on marked 100m being careful not to accelerate or decelerate suddenly, then stop.
- Write down the distance the screen displays for the 100 metres. Distance should read 100. If it is between 99 - 101, it will be correct.
- Repeat the procedure to confirm the 'SPEED CAL' value is correct.
- Divide 100m by number of wheel revolutions to obtain the 'SPEED CAL' value.



Press the 'ENTER' touch button to display the 'E' symbol in the lower right hand side of the calibration screen.

## To Enter Wheel Sensor 'SPEED CAL' Value:

- Press the 'ENTER' button to display the 'E' enter symbol.
- Press the appropriate buttons to enter the calibration number eg, '320'.
- Press the 'ENTER' button to save the 'SPEED CAL' value and move to the next screen 'BOOM CAL 1'.

Ready for calibration, press the appropriate touch buttons, eg, '3', '2' & '0' then press 'ENTER' to save the value.



## Preparation for Use – Setting Up



If using a wheel sensor, select 'SPEED SENSOR WHEEL SPEED-SP1', then press 'Enter' to save the setting.

If the Raven SCS 4400 is connected to Raven GPS, use a 'Speed Cal' value of '785' which is standard 'Speed Cal' value for all Raven GPS units.

### To Enter Raven GPS 'SPEED CAL' Value:

- Press the 'ENTER' button to display the 'E' enter symbol.
- Press the appropriate buttons to enter the calibration number eg, '320'.



Press the appropriate touch buttons, eg, '7', '8' & '5' then press 'ENTER' to save the value.

- Press the 'ENTER' button to save the 'SPEED CAL' value and move to the next screen 'BOOM CAL 1'.
- 9 The Raven SCS 4400 Controller utilises up to a maximum of 7 boom sections. Each Boom Section Width must be entered to enable the Controller to calculate Flow Rate & Area of Application as sections are switched On & Off.

Section Details of a 36m Boom with Centreline Plumbing			
Section Number (L to R)	Nozzle Spacing (m)	No Nozzles in Section	Section Width (m)
1	0.5	14	7
2	0.5	14	7
3	0.5	17	8.5
4	0.5	14	7
5	0.5	14	7
Total No of nozzles:		73	
Spray Application Width:		36.5m	

Section Details of a 36m Boom with Broadacre Plumbing			
Section Number (L to R)	Nozzle Spacing (m)	No Nozzles in Section	Section Width (m)
1	0.5	14	7
2	0.5	14	7
3	0.5	16	8
4	0.5	14	7
5	0.5	14	7
Total No of nozzles:		72	
Spray Application Width:		36.0m	

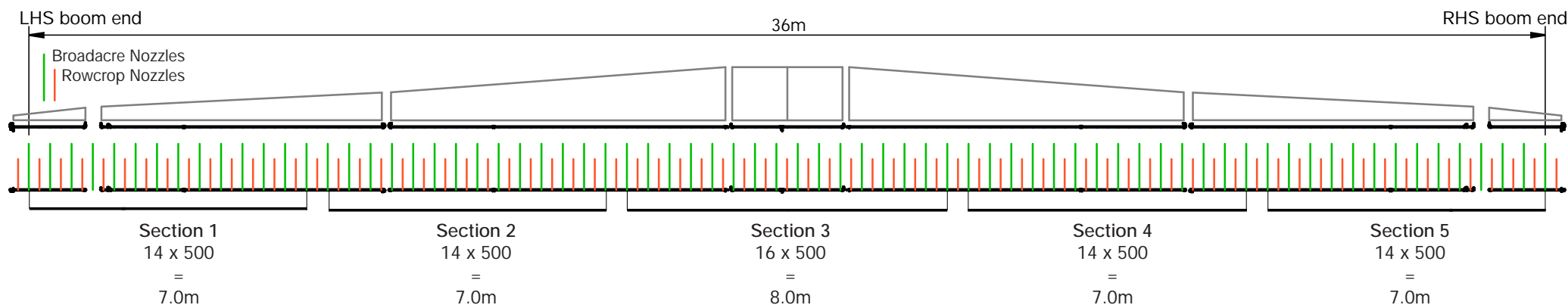
As boom sections switch On & Off, Flow Rate & Area of Application increase or decrease according to boom width & Flow Rate (total minimum to the boom) required for the Area of Application.

### To Measure the 'Width' of Each Boom Section:

- Count the number of nozzles in each boom section, then

A 36m Boom illustration showing details of both Broadacre & Centreline (Rowcrop) plumbing for 5 boom sections with 500mm nozzle spacing.

Boom Sections are numbered 1 to 5 starting from the LHS boom end. Green vertical lines illustrate the Broadacre plumbing nozzle location option. Red vertical lines illustrate Centreline (Rowcrop) plumbing nozzle locations.





*BOOM CAL 1: Press the 'ENTER' touch button to display the 'E' in the lower RHS of the calibration screen.*

- ii) Multiply number of nozzles by nozzle spacing, eg, Boom Section 1 has 14 nozzles @ 50 cm spacing  
= 14 x 50 cm = 700 cm
- iii) Repeat for all Boom Sections.  
Section Width must be entered in centimetres.

## To Enter Boom Section Width ('BOOM CAL') for a Boom Section:

- i) Ensure the appropriate Boom Section is displayed on the screen - start with 'Boom Section 1'.

*Ready for calibration, press the appropriate touch buttons, eg, '7', '0' & '0', then press 'ENTER' to save the 'WIDTH' value.*



*Press the 'UP' touch button to display the 'BOOM CAL 2' for Section 2 calibration.*

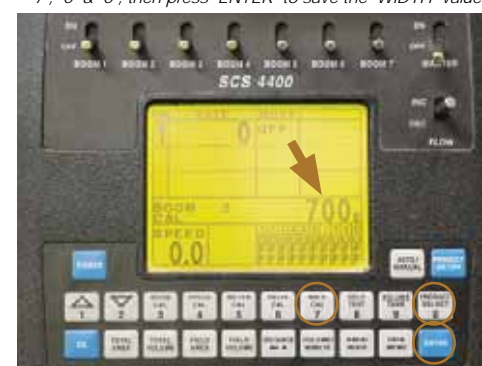
- ii) Press the 'ENTER' button to display the 'E' symbol.
- iii) Press the appropriate buttons to enter the value '700', then press the 'ENTER' button to save the width value for Boom Section 1.
- vi) At this point the Controller does not proceed automatically to Boom 2 .  
To proceed to Boom 2, press the 'UP' touch button to display 'BOOM CAL 2'.



*BOOM CAL 2: Press the 'ENTER' touch button to display the 'E' symbol in the lower RHS of the calibration screen.*

- vii) Press the 'ENTER' button to display the 'E' symbol in the lower right hand side of the screen.
- viii) Press the appropriate buttons to enter the value '700', then press the 'ENTER' button to save the width value for Boom Section 2.
- ix) Repeat steps i) to viii) for the remaining boom sections.
- x) If a boom section is not being utilised, ensure '0' is entered in these sections. otherwise the Controller will not function correctly.

*Ready for calibration, press the appropriate touch buttons, eg, '7', '0' & '0', then press 'ENTER' to save the 'WIDTH' value.*



*Press the 'DATA MENU' touch button x 4 times to display & review a summary screen of the pre-set values.*

This completes the pre-setting of calibration values in the SCS 4400.

It is recommended to review (check) values entered & saved at completion of Pre-Setting on the Controller screen.

## To Review Pre-Values:

Press the 'DATA MENU' touch key x 4 times to display & review a summary screen of the saved/preset values.

If a value requires alteration, proceed to the appropriate touch buttons and make desired change(s).



## Preparation for Use – Setting Up



Press the 'DATA MENU' touch button to display a Data Sub Menu with the word 'SERIAL' highlighted.



Press the 'DOWN' touch button to move the screen cursor adjacent to 'RATE DELTA' & press 'Enter' to display 'E'.



Press & hold the 'SELF TEST' touch button to cycle through and view values entered (eg, Product Type shown).



Press THE 'DATA MENU' touch button, then 'DOWN' touch button to move the screen cursor adjacent to 'LOW LIMIT'.

### Pre-Set Other SCS 4400 Functions

Pre-set other Controller functions before starting spray application:

- 1 Rate Bump Delta
- 2 Low Flow Limit
- 3 Low Tank
- 4 Pump RPM (hydraulically driven)
- 5 Audible Alarm
- 6 Display Smoothing.

#### 1 Pre-Set Rate Bump Delta

'RATE BUMP DELTA' is an increment at which 'RATE CAL' (application rate) is 'Increased or Decreased' using the 'INC/DEC' 'FLOW' toggle switch in AUTO mode applications.

Press the 'DATA MENU' touch button again to highlight 'PRODUCT'.



Press the appropriate buttons to enter a 'RATE BUMP DELTA' value, then press the 'ENTER' touch button to save the value (eg, 10 [litres per ha]).



#### To Preset Rate Bump Delta:

- i) Press the 'DATA MENU' touch button to display the data sub menu at the bottom of the screen. The word 'SERIAL' will be highlighted.
- ii) Press 'DATA MENU' touch button again to highlight 'PRODUCT'.
- iii) Press the 'DOWN' touch button to move the screen cursor adjacent to 'RATE DELTA', then press the 'ENTER' button to display 'E' (enter symbol).

- iv) Press the appropriate buttons to enter a 'RATE BUMP DELTA' value, then press the 'ENTER' touch button to save the value (eg, 10 [litres per ha]).
- v) Press the 'Volume' or 'Area' button to exit the data sub menu and return to the operating screen.

### 2 Pre-Set Low Flow Limit

'LOW FLOW LIMIT' prevents boom line pressure falling too low which might result in fan angle collapse, nozzle check valve closure or low speed shut off.

When set, the Controller effectively defaults to an 'over-application' mode when minimum speed of an application rate is not maintained.

Calculate the 'Minimum Flow Rate' required for the nozzle type/size fitted to the sprayer. Refer to the nozzle chart to determine the 'flow rate' of the nozzle used at the minimum recommended operating pressure. Multiply this 'flow rate' by the total number of nozzles fitted to the boom to calculate the 'LOW FLOW LIMIT' value (litres/ha).

#### To Enter Low Flow Limit:

- i) Press the 'DATA MENU' touch button to highlight Data sub menu 'SERIAL'.
- ii) Press the 'DATA MENU' button again to highlight 'PRODUCT'.
- iii) Press the 'DOWN' touch button to move the screen cursor adjacent to 'LOW LIMIT', then press the 'ENTER' button to display 'E' (enter symbol).

#### NOTE

'Low Flow Limit' should not be used with chemicals with poor crop selectivity which might cause damage to a crop if 'over-applied'.

Check with your chemical supplier for more details on chemical/crop selectivity before using this setting.

#### NOTE

The Minimum Flow Rate value is automatically proportioned as boom sections are turned On and Off. Hence a minimum pressure will be maintained regardless of boom section status.



Press appropriate buttons to enter a 'LOW FLOW LIMIT', then press 'ENTER' to save the value (eg, 30 [litres per ha]).

- iv) Press the appropriate buttons to enter the calculated 'LOW FLOW LIMIT' value, then press the 'ENTER' button to save the value (eg, 30 [litres per ha]). Press the 'Volume' or 'Area' touch button to exit the data sub menu & return to the operating screen.



Press the 'DOWN' touch button to move the screen cursor adjacent to 'LOW TANK' & press 'Enter' to display 'E'.

### 3 Pre-Set Low Tank Level

When the level in the Product tank falls below an assigned minimum level, 'LOW TANK' enacts a low level alarm.

The alarm stops when a value, equal to or greater than 'LOW TANK' value, is entered into 'VOLUME/TANK' or booms are turned OFF.

Entering '0' for 'LOW TANK' disables the function.



Press appropriate buttons to enter a 'LOW TANK' value, then press 'ENTER' to save the value (eg, 500 [litres]).

### To Enter Low Flow Limit:

- i) Press the 'DATA MENU' touch button to highlight Data sub menu 'SERIAL'.
- ii) Press the 'DATA MENU' button again to highlight 'PRODUCT'.
- iii) Press the 'DOWN' touch button to move the screen cursor adjacent to 'LOW TANK', then press the 'ENTER' button to display 'E' (enter symbol).
- iv) Press the appropriate buttons to enter the 'LOW TANK' value, then press the 'ENTER' touch button to save the value (eg, 500 [litres]).

Press the 'Volume' or 'Area' touch button to exit the data sub menu & return to the operating screen.



Press the 'DOWN' touch button to move the screen cursor adjacent to 'PUMP CAL' & press 'Enter' to display 'E'.

### 4 Pre-Set Pump RPM

'PUMP CAL' provides for 'Pump RPM' to be displayed on screen for the Hydraulic Driven Pump options. The pump must have an RPM Sensor for this function.

### To Display 'Pump RPM' on Screen:

- i) Press the 'DATA MENU' touch button to display the data sub menu at the bottom of the screen. The word 'SERIAL' will be highlighted.
- ii) Press 'DATA MENU' touch button again to highlight 'PRODUCT'.
- iii) Press the 'DOWN' touch button to move the cursor adjacent to 'PUMP CAL'.



## Preparation for Use – Setting Up



Press appropriate buttons to enter a 'LOW TANK' value, then press 'ENTER' to save the value (eg, 500 [litres]).

- iv) Press the 'ENTER' button to display the 'E' (enter symbol).
- v) Press the appropriate buttons to enter 'Pump RPM' (Pulses per Revolution), then press the 'ENTER' touch button to set the value (normally 1).  
RPM will display in the top right hand corner of the screen when operating.
- vi) Press the 'Volume' or 'Area' button to exit the data sub menu and return to the operating screen.



Press the 'DOWN' touch button to move the screen cursor adjacent to "PUMP CAL" & press 'Enter' to display 'E'.

### 5 Pre-Set Audible Alarm

This setting turns audible alarms On or Off.

#### To Activate/Deactivate 'Audible Alarm':

- i) Press the 'DATA MENU' touch button to display the data sub menu at the bottom of the screen. The word 'SERIAL' will be highlighted.
- ii) Press 'DATA MENU' touch button again to highlight 'PRODUCT'.
- iii) Press 'DATA MENU' touch button again to highlight 'CONSOLE'.
- iv) Press the 'DOWN' touch button to move the cursor adjacent to 'AUDIBLE ALM'.
- v) Press the 'CE' touch button to select either alarm 'ON OR OFF', then press 'ENTER' to save the setting.
- vi) Press the 'Volume' or 'Area' button to exit the data sub menu and return to the operating screen.



Press the 'DOWN' touch button to move the screen cursor adjacent to "DISP SMOOTH" & press 'Enter' to display 'E'.

### 6 Pre-Set Display Smoothing

The 'DISPLAY SMOOTHING' setting allows screen application rate smoothing to be set 'ON or OFF'.

With display smoothing 'ON', 'RATE' displays target rate with actual rate being within 10% of target rate.

Actual rate is displayed if the unit does not reach deadband within 10 seconds.

With display smoothing 'OFF', 'RATE' displays actual rate at all times.

#### To Activate/Deactivate 'Display Smoothing':

- i) Press the 'DATA MENU' touch button to display the data sub menu at the bottom of the screen. The word 'SERIAL' will be highlighted.
- ii) Press 'DATA MENU' touch button again to highlight 'PRODUCT'.
- iii) Press 'DATA MENU' touch button again to highlight 'CONSOLE'.



Press the 'DOWN' touch button to move the screen cursor adjacent to "PUMP CAL" & press 'Enter' to display 'E'.

- iv) Press the 'DOWN' touch button to move the cursor adjacent to 'DISP SMOOTH'.
- v) Press the 'CE' touch button to select either 'ON' or 'OFF', then press 'ENTER' to save the setting.
- vi) Press the 'Volume' or 'Area' button to exit the data sub menu and return to the operating screen.



Press the 'DATA MENU' touch button to display the Data Sub Menus - 1st displayed & highlighted is 'SERIAL'.

## Other Data Menu Settings

Other Data Menu settings of the SCS 4400 Controller which may be useful include:

### Sub Menu SERIAL

- FIELD REFERENCE  
Allows user to enter up to a four-digit number to represent a field. Field reference is included in field begin and field end pages and the data logger time/date string.
- DATA DIRECTION  
Select between Save Data To Flashcard or Pass Data Through Com Port.

## NOTE

Follow the instructions shown of previous pages to access the Data Menus listed on this page.



Press the 'DATA MENU' touch button to display the Data Sub Menus - 2nd displayed & highlighted is 'PRODUCT'.

### Sub Menu PRODUCT

- OFF RATE %  
Off Rate Alarm is enacted when actual application rate (volume/area) is off from the target rate by the specified percentage for more than 5 seconds.
- AGITATOR  
Enables or disables chemical agitator.

## NOTE

Refer to the separate Raven SCS 4400 Installation and Operation Manual provided for further information and instruction if required.



Press the 'DATA MENU' touch button to display the Data Sub Menus - 3rd displayed & highlighted is 'CONSOLE'.

### Sub Menu CONSOLE

- CONTRAST  
Adjust LCD Display contrast
- TIME  
Set the current time of day.
- MONTH  
Set the current month.
- DAY  
Set the current date.
- YEAR  
Set the current year (two digits).
- DAYS WAIT  
Set the number of days after Controller is powered off before Controller goes into very low power consumption mode and time settings are lost.

- PGM UPDATE  
Press to initialize Controller update procedure via serial port. Requires programming software, PC with null modem cable, and replacement firmware.
- PGM REV LEVEL  
Displays Controller software program number and revision level.
- ZERO SPEED SHUTOFF  
Enable or disable Low Speed Shutoff feature. If enabled, product control will be shut off if speed drops below 0.7 MPH [km/H] in automatic mode.  
The Master switch must be cycled OFF and then ON to restart the system.  
If a constant speed greater than 0.7 MPH [km/H] is not attained within 10 seconds, the low speed shutoff will be enacted again.

## Preparation for Use – Setting Up

**Pre-Set SCS 4400 Record Sheet** - Photocopy this page to record 'Pre-Set' values for future reference or contacting service technician.

Controller Pre-Sets		
UNITS OF MEASURE	SI (HECTARES)	US (ACRES)
LANGUAGE	ENGLISH LANGUAGE	
PRODUCT TYPE	LIQUID CONTROL	
VALVE TYPE	FAST CLOSE VALVE	
METER CAL	(eg, 185)	
RATE CAL	(eg, 50)	
SPEED TYPE	SPEED SENSOR WHEEL SP-1	SPEED SENSOR RADAR SP-2
SPEED CAL	(eg, 320)	
BOOM CAL (Section Widths)	1 (eg, 700)	
	2 (eg, 700)	
	3 (eg, 700)	
	4 (eg, 800)	
	5 (eg, 700)	
	6	
	7	
	8	
	9	
	10	

Other Pre-Set Functions	
1 Rate Bump Delta	
2 Low Flow Limit	
3 Low Tank	
4 Pump RPM	
5 Audible Alarm	
6 Display Smoothing	

Controller Pre-Sets		
UNITS OF MEASURE	SI (HECTARES)	US (ACRES)
LANGUAGE	ENGLISH LANGUAGE	
PRODUCT TYPE	LIQUID CONTROL	
VALVE TYPE	FAST CLOSE VALVE	
METER CAL		
RATE CAL		
SPEED TYPE	SPEED SENSOR WHEEL SP-1	SPEED SENSOR RADAR SP-2
SPEED CAL		
BOOM CAL (Section Widths)	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	

Other Pre-Set Functions	
1 Rate Bump Delta	
2 Low Flow Limit	
3 Low Tank	
4 Pump RPM	
5 Audible Alarm	
6 Display Smoothing	





*Goldacres' TriTech booms feature a unique three directional suspension system.*

## Check Boom Settings

The Prairie Special Series 2 can be fitted with 24, 28, 30 & 36 metre boom widths.

Each boom features hydraulic lift, fold and individual wing tilt controlled from the cabin, as well as pitch, roll and yaw suspension for superior boom ride & efficient, targeted spray application.

Wing tips are fitted with spring loaded breakaway ends to prevent damage when striking objects.

Prior to delivery each boom is pre-set and tested for spraying application.

However, it is recommended that the boom settings checked and tested for the accuracy prior to spraying application.

It is the operator's responsibility to correctly operate all sprayer functions at all times.

## Boom Centre Section

The TriTech boom centre section comprises two components - a Paralift rear and a boom centre section held together by delta links. The delta links allow the boom to provide roll and yaw suspension.

Roll suspension is when the boom pitches up and down at the tips. Yaw suspension is when the boom moves fore and aft at the tips.

If the boom did not feature yaw suspension there would be excessive stresses exerted on the boom and centre section when cornering or corrections of line are made.

The yaw suspension allows the chassis of the machine to move left and right without any movement being transferred to the boom.

The Paralift rear can move with the machine while the boom centre section can remain static or level as it rotates around the delta links connecting it to the Paralift rear.

Goldacres unique TriTech boom suspension system provides three directional suspension:

- **Pitch Suspension**

Vertical boom movement & forces encountered over rough ground conditions are dampened using hydraulic cylinders connected to a nitrogen filled accumulator.

- **Roll Suspension**

Constant boom height over sloping and uneven ground is maintained with the use of shock absorbers

- **Yaw Suspension**

Any erratic whipping movement (fore & aft) of the boom is minimised using hydraulic cylinders connected to nitrogen filled accumulators. Whipping of a boom can create undue stress on the boom frame and uneven spray application.

Refer to Chapter 7 'Boom Settings' for further information & any necessary boom adjustments.



*Front Cover of the Raven AutoBoom XRT Calibration & Operation Manual.*

### Pre-Set the AutoBoom XRT (Option)

If fitted the AutoBoom XRT controller is pre-set and tested for spraying applications prior to delivery.

However, it is recommended that all settings and operation be checked and tested for accuracy prior to spraying applications.

It is the operator's responsibility to correctly operate all controller and sprayer functions at all times.

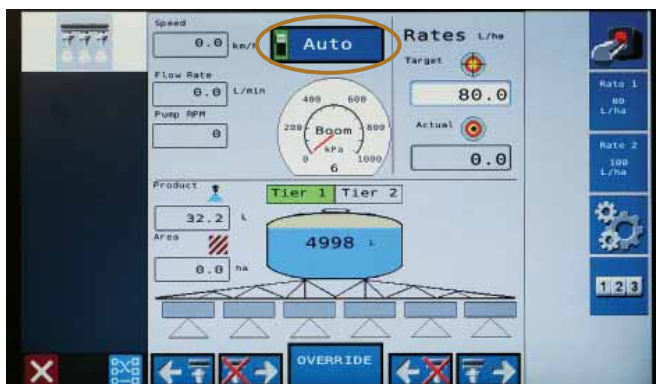
For instructions on the configuring & operating the AutoBoom XRT controller, refer to the Raven XRT Operation Manual supplied.



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## 5 Set & Check Application Rates – Calibration



Optional Raven Controller CR7 home screen showing 'Automatic' mode.



Optional Raven Controller CR7 home screen showing 'Manual' mode.



Application rates & droplet size for a situation can be sourced from chemical & nozzle manufacturers and the local agronomist.

### Sprayer Calibration

Sprayer Calibration is the process of determining the amount of spray solution to be applied to a given area and ensuring the target or application rate is being applied according to its product label.

The application rate of a sprayer operating manually remains constant as long as ground speed, spray pressure, number of nozzles and nozzle orifices remain unchanged. If there is any change in these factors, the application rate will change.

An automatic spray controller, however, maintains a constant application rate while allowing for some variation in ground speed and boom width.

To achieve a constant application rate, the spraying system must be correctly maintained and calibrated

### Calibration Procedure

Five steps are required to complete calibration:

- 1 Application Rate Required - Calculating & clearly understanding the volume of liquid (chemical & water) required for the specific application over a given area.
- 2 Nozzle Output Required - Calculating the output required for the application.
- 3 Nozzle Selection - Selecting and fitting the appropriate nozzles.
- 4 Controller Set-Up - Checking controller set-up values and entering values for the nozzles & spray rates required.
- 5 Test Actual Sprayer Output - Test the actual output to ensure the accuracy of the nozzle application rate before spraying.

### 1 Application Rate Required

The application rate is entirely dependant on the chemical manufacturer's application specifications and conditions of the target at the time of application.

Refer to the manufacturer's information and/or consult with the local agronomist for the best application rates and droplet size for your situation.

#### NOTE

Nozzle spray patterns & outputs must be checked regularly to ensure correct & uniform application rates because nozzles wear with use.

#### NOTE

Uneven volumes from individual nozzles will result in variations in the application rate across the width of the boom. Spray efficiency will be reduced. Crop damage may result.

If you have any further questions, Goldacres recommends that you contact your nozzle supplier or your Goldacres dealer for additional information.

#### NOTE

All nozzles have a pressure and flow rate range to achieve the best results. Ensure you have selected the nozzle which best suit the application to avoid any problems.



Calculate the required nozzle output.



Selected & fit the appropriate nozzles for the application.

## 2 Calculate Required Nozzle Output

Once an application rate is chosen, the required nozzle output can be calculated using the following factors:

- Application rate required (eg, 80 l/ha)
- Speed of travel (eg, 12km/hr)
- Swath width (eg, 36m) and
- Number of nozzles on the boom (eg, 72).

Nozzle output can be calculated using the following formulae:

- **Nozzle Flow Rate (l/min)** = Speed (km/hr) x Swath Width (m) x Application Rate (l/ha) ÷ 600 ÷ Number of nozzles

eg,  $[(12 \times 36 \times 80) \div 600] \div 72 = 0.8 \text{ l/min}$  for each nozzle.

An alternative formula is:

- **Nozzle Flow Rate (l/min)** = Speed (km) x Nozzle Spacing (cm) x Application Rate (l/ha) ÷ 60,000  
eg,  $(12 \times 50 \times 80) \div 60,000 = 0.8 \text{ l/min}$ .

### NOTE

Nozzles manufacturers' downloadable Apps may be useful in helping to calculate required nozzle rates, as well as displaying suitable nozzles for various applications.

## 3 Nozzle Selection

Use a manufacturer's Nozzle Chart (refer to Nozzle Charts further on in this chapter) and/or a manufacturer's App to find & select the most appropriate nozzles for the application according to:

- Application rate (eg, 80 l/ha)
- Speed of travel (eg, 12km/hr)
- Pressure setting (eg, 300kPa [3 bar])
- Boom configuration & nozzle control system fitted to the Prairie Special - single line, 3TS option, 3TS Pro option or Hawkeye option.

### NOTE

Nozzles must be selected & fitted for the appropriate application. Nozzle orifices are subject to wear and must be checked regularly. Use the Jug Test to check accuracy of application whenever nozzles are changed or wear.

	DROPS SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	I/ha							
				5	6	7	8	10	12	16	
AIXR110015 (100)	1.0	XC	—	0.34	81.6	68.0	58.3	51.0	40.8	34.0	25.5
	2.0	C	—	0.48	115	96.0	82.3	72.0	57.6	48.0	36.0
	3.0	C	—	0.59	142	118	101	88.5	70.8	59.0	44.3
	4.0	M	—	0.68	163	136	117	102	81.6	68.0	51.0
	5.0	M	—	0.76	182	152	130	114	91.2	76.0	57.0
	6.0	M	—	0.83	199	166	142	125	99.6	83.0	62.3
AIXR11002 (50)	1.0	XC	—	0.46	110	92.0	78.9	69.0	55.2	46.0	34.5
	2.0	VC	—	0.65	156	130	111	97.5	78.0	65.0	48.8
	3.0	C	—	0.79	190	158	135	119	94.8	79.0	59.3
	4.0	M	—	0.91	218	182	156	137	109	91.0	68.3
	5.0	M	—	1.02	245	204	175	153	122	102	76.5
	6.0	M	—	1.12	269	224	192	168	134	112	84.0
AIXR110025 (50)	1.0	XC	**	0.57	137	114	97.7	85.5	68.4	57.0	42.8
	2.0	VC	**	0.81	194	162	139	122	97.2	81.0	60.8
	3.0	VC	**	0.99	238	198	170	149	119	99.0	74.3
	4.0	C	**	1.14	274	228	195	171	137	114	85.5
	5.0	C	**	1.28	307	256	219	192	154	128	96.0
	6.0	M	—	1.40	336	280	240	210	168	140	105

The Teejet AIXR11002 nozzle @ 3 Bar gives 0.79l/min and an output of 0.91l/min @ 4 Bar.

## Single Line Boom

Find one nozzle which is nearest to the application requirements.

Check the speed variation available maintaining the same application rate & droplet size.

It is recommended to select a nozzle on mid-range pressure as this allows the spray controller to adjust pressure up or down with some but limited speed variation.

Using the appropriate nozzle chart, look down the nozzle capacity column (l/min) and select a nozzle to suit the output (eg 0.8 l/min), droplet size and travel speed.

### Example: Nozzle Selection for a Single line Boom

Using the AIXR Teejet Application Chart (see page 104):

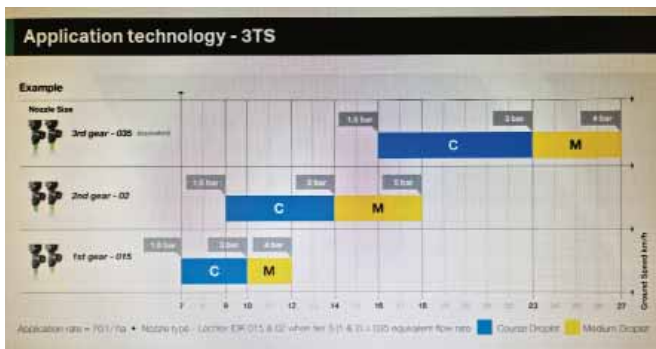
Look down the nozzle capacity column (l/min) and select a nozzle to suit an output of 0.8 l/min (shown above).

The AIXR11002 nozzle @ 3 Bar gives 0.79l/min and an output of 0.91l/min @ 4 Bar.

This nozzle should allow the controller to apply 80 litres per ha with a speed range of approximately 12 to 15kmh and with pressure range of 3 to 5 Bar.

Fit the selected nozzle to the boom.

## 5 Set & Check Application Rates – Calibration



*An illustration of the speed range & output (70l/ha) available of two nozzles fitted with the 3TS Option.*

### 3TS Option

Find two nozzles which are nearest to the application requirements..

Check the speed variation available maintaining the same application rate & droplet size.

It is recommended to select two nozzles which allow the spray controller to adjust pressure & switch nozzles On & Off with required speed variations while maintaining consistent droplet size and application rate.

Using the appropriate nozzle chart, look down the nozzle capacity column (l/min) and select a nozzle to suit the output (eg 0.8 l/min), droplet size and travel speed.





Refer to the commonly used Teejet and Lechler broadacre nozzle charts at the end of this chapter. For more information, go to:

[www.teejet.com](http://www.teejet.com)

[www.lechler.com](http://www.lechler.com)

## NOTE

Download the free copy of 'A user's guide to spray nozzles' from the TeeJet website. Also Lechler nozzle selection catalogue and Users guides to spray nozzles are available from your Goldacres dealer, or as a free download from the TeeJet web site: [www.teejet.com](http://www.teejet.com) or Lechler web site: [www.lechler.de](http://www.lechler.de)

 		DROP SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN							
					5 km/h	6 km/h	7 km/h	8 km/h	10 km/h	12 km/h	16 km/h
<b>AIXR10015</b> (100)	1.0	XC	—	0.34	81.6	68.0	58.3	51.0	40.8	34.0	25.5
	2.0	C	—	0.48	115	96.0	82.3	72.0	57.6	48.0	36.0
	3.0	C	—	0.59	142	118	101	88.5	70.8	59.0	44.3
	4.0	M	—	0.68	163	136	117	102	81.6	68.0	51.0
	5.0	M	—	0.76	182	152	130	114	91.2	76.0	57.0
	6.0	M	—	0.83	199	166	142	125	99.6	83.0	62.3
<b>AIXR11002</b> (50)	1.0	XC	—	0.46	110	97.0	78.9	69.0	55.2	46.0	34.5
	2.0	VC	—	0.65	156	130	111	97.5	78.0	65.0	48.8
	3.0	C	—	0.79	190	158	135	119	94.8	79.0	59.3
	4.0	M	—	0.91	218	182	156	137	109	91.0	68.5
	5.0	M	—	1.02	245	204	175	153	122	102	76.3
	6.0	M	—	1.12	269	224	192	168	134	112	84.0
<b>AIXR10025</b> (50)	1.0	XC	**	0.57	137	114	97.7	85.5	68.4	57.0	42.8
	2.0	VC	**	0.81	194	162	139	122	97.2	81.0	60.8
	3.0	VC	**	0.99	238	198	170	149	119	99.0	74.3
	4.0	C	**	1.14	274	228	195	171	137	114	85.5
	5.0	C	**	1.28	307	256	219	192	154	128	96.0
	6.0	M	—	1.40	336	280	240	210	168	140	105

The 1st AXIR110015 nozzle @ 2 Bar gives 0.48l/min & an output of 0.68l/min @ 4 Bar & 2nd AXIR11002 nozzle @ 3 Bar gives 0.79l/min & an output of 1.02l/min

### Example: Nozzle Selection for the 3TS Option

### Using the AIXR Teejet Application Chart:

Look down the nozzle capacity column (l/min) and select two nozzles to suit an output of 0.8 l/min (shown above).

The AXIR110015 nozzle @ 2 Bar gives 0.48l/min which is 82.3 l/ha at 7 kmh and an output of 0.68l/min @ 4 Bar which is 81.6 l/ha at 10 kmh.

The AXIR11002 nozzle @ 2 Bar gives 0.65l/min which is 78.0 l/ha at 10 kmh and an output of 1.02l/min @ 5 Bar which is 76.5 l/ha at 16 kmh.

These nozzles should allow the controller to apply 80 litres per ha with a speed range of 7 to 16 kmh and a pressure range of 2 to 5 Bar switching between the 1st & 2nd Tiers.

By adding these two outputs together to use the 3rd Tier @ 3-4 Bar to give 1.38 -1.59 l/min would provide 80 l/ha application rate at increased speeds of 20 to 22kmh.

Fit the selected nozzles to the boom.

## NOTE

When selecting nozzle outputs, higher pressures & wider spray angles generally give finer droplet sizes than lower pressures & narrower spray angles.



*Press the 'Settings' touch button to enter application rates.*

## 4 Controller Set-Up

New application rate values must be entered into the Automatic Controller (CR7 or SCS 4400 Consoller option) according to the boom's nozzle configuration.

The Prairie Special may be fitted with one of two nozzle control option technologies:

- a) Single line boom
- b) 3TS option

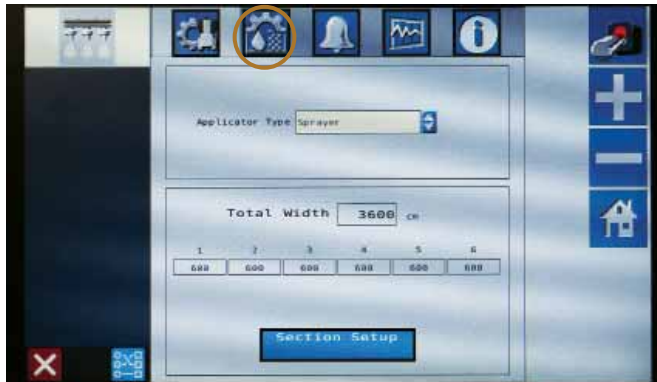
a) Enter Values for the Single Line Boom

After nozzle selection, a single line boom configuration requires the application rates to be entered into the controller according to the nozzle selected. (Refer to Chapter 4 for instructions on entering values for the SCS 4400 Controller option).

To Enter New Values (Optional CR7/Universal Terminal):

- 1 Start the tractor engine.
- 2 Start the Universal Terminal fitted.
- 3 Press the 'Settings' touch button on the Universal Terminal 'Home' screen, and a Settings screen is displayed.





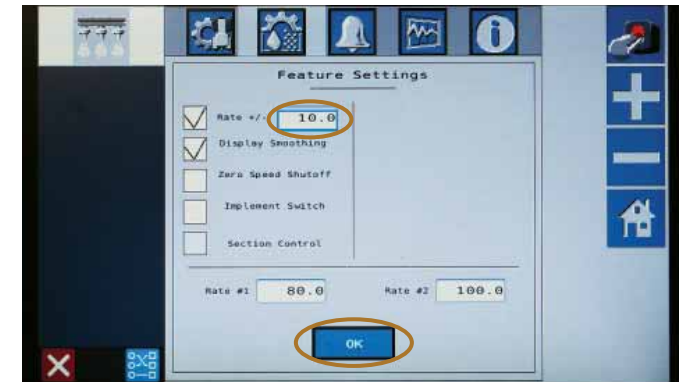
Press the 'Product Settings' touch button.

- 4 Press the 'Product Settings' touch button and the 'Product Settings' icon touch button is displayed.
- 5 Press the 'Product Settings touch button and a Product Control screen is displayed.
- 6 Press the 'Featured Settings' touch button and a Featured Settings screen appears.



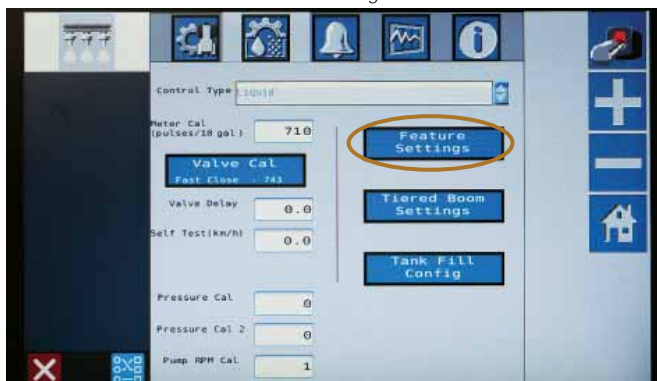
Press the 'Rate 1' touch button to set Rate 1, then press the 'Rate 2' touch button to set Rate 2.

- 7 Press the 'Rate 1' touch button and a numerical keypad is displayed.
  - 8 Press the appropriate touch buttons to enter the spray application rate required for Rate 1 (eg, 80 l/ha), then press the 'Tick' touch button.
- The screen returns to the Feature Settings' screen with '80.0' in the Rate 1 display.
- 9 Press the 'Rate 2' touch button and a numerical keypad is displayed.

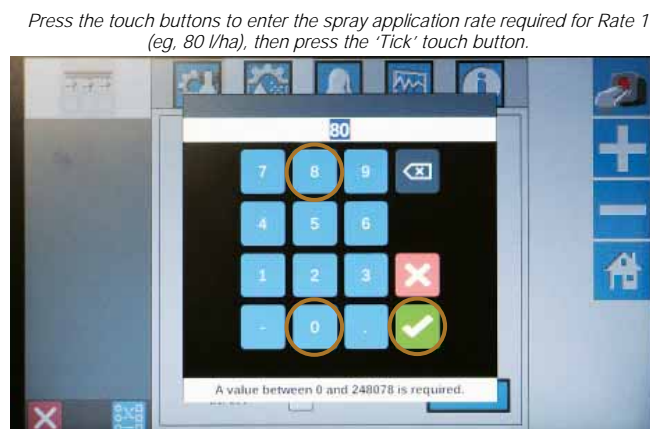


Press the 'Rate +/-' touch button to change the Bump Rate if required. Press the 'OK' touch button to save the settings.

- 10 Press the appropriate touch buttons to enter the spray application rate required for Rate 2 (eg, 100 l/ha), then press the 'Tick' touch button.
- The screen returns to the Feature Settings' screen with '100.0' in the Rate 2 display.
- 11 Press the 'Rate +/-' touch button to change the Rate Bump setting if required.
  - 12 Press the 'OK' touch button to save values & the Product Settings screen return.
  - 13 Press the home touch button to return to the home screen.
- This completes the controller entries for the Single Line boom calibration.



Press the 'Featured Settings' touch button.

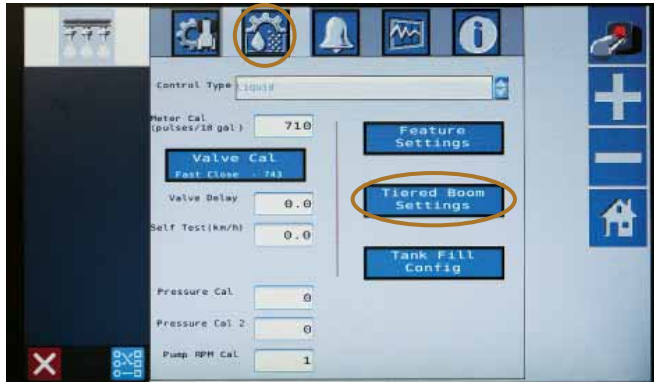


Press the touch buttons to enter the spray application rate required for Rate 1 (eg, 80 l/ha), then press the 'Tick' touch button.

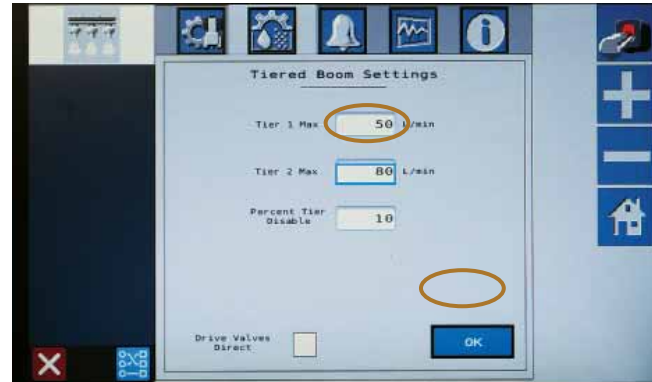


Press the 'Home' touch button to return to the Home screen.

## 5 Set & Check Application Rates – Calibration



Press the 'Tiered Boom Settings' touch button.



Press the 'Tier 1 Max' touch button to enter the desired Tier 1 Max Flow Rate.



Press the 'Tier 2 Max' touch button to enter the desired Tier 2 Max Flow Rate.

### b) Enter Values for the 3TS Option

After nozzle selection, the 3TS configuration requires new values to be entered into the controller according to the nozzles selected, namely.

- Spray application rates
- Maximum flow rate (for each tier/nozzle fitted [2 tiers]).

#### To Enter New Application Rates:

Follow the steps 1 - 12 previously given under 'Enter Values for the Single Line Boom'.

#### To Enter Maximum Flow Rates:

- 1 Press the 'Tiered Boom Settings' touch button and the 'Tiered Boom Settings' screen appears.

- 2 Press the 'Tiered Boom Setup' touch button and the 'Tiered Boom Set-up' screen appears.
- 3 Press the 'Tier 1 Max' touch button to enter the desired maximum rate applied through the first tier boom sections. A numerical keypad appears.
- 4 Calculate Max Flow Rate of the 1st Tier nozzles fitted to the boom, eg, AXIR110015 nozzle @ 5 Bar 0.761 l/min. Multiply  $0.76 \times 72$  (number of nozzles) = 54.7 l/min.
- 5 Press the touch buttons to enter the 'Tier 1 Max' value in litres/min, eg, '54.7', then press the 'Tick' touch button. The 'Tiered Boom Settings' screen returns with the value eg, '54.7' showing in the 'Tier 1 Max' window.

Press the touch buttons to enter the Max Flow Rate required for Tier 1 (eg, 54.7 l/min), then press the 'Tick' touch button.



- 6 Press the 'Tier 2 Max Flow Rate' touch button and a numerical keypad appears.
- 7 Calculate Max Flow Rate of the 2nd Tier nozzles fitted to the boom, eg, AXIR11002 nozzle @ 5 Bar 1.02 l/min. Multiply  $1.02 \times 72$  (number of nozzles) = 73.5 l/min.
- 8 Press the touch buttons to enter to enter the Max Flow Rate for Tier 2, eg, 73.5, then press the 'Tick' touch button. The screen returns to the Tiered Boom Setup screen with '73.5' in the Tier 2 Max Flow Rate value.
- 9 Press the 'Percent Tier Disable' touch button to change the value if required.
- 10 Press the 'OK' touch button. The screen returns to the 'Settings' screen. This completes the 3TS calibration.

Press the 'OK' touch button to save settings & return to the Home screen.





Unfold the boom in a suitable area & set the height of the boom to allow easy access to nozzles.

## 5 Test Actual Sprayer Output

It is essential to Test the Actual Output of the Prairie Special to ensure the accuracy of the application rate before spraying. This part of calibration uses the 'Jug Test' to check spray nozzles deliver the correct amount of liquid, according to the nozzle manufacturer's rate chart.

### Jug Test

Items required for the 'Jug Test' are:

- Calibrated 2 litre measuring jug which measures in no less than 10 ml increments
- Timing device that counts in seconds
- Device or pen & paper for recording nozzle outputs
- Pressure gauge mounted on a nozzle tip to verify pressure being delivered at the nozzle.

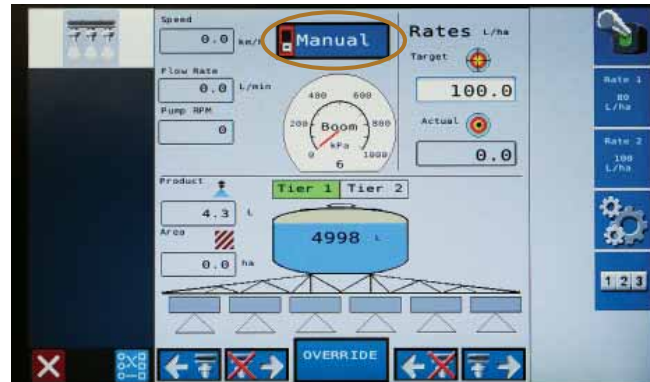
Goldacres part number GA5077983 (suitable gauge mount) is available for attaching a gauge to nozzle body bayonet fittings (gauge not included).

### NOTE

#### Percent Tier Disable

The 'Percent Tier Disable' value is used to minimise unnecessary tier switching when spraying close to the switch point of a tier. Increasing the value, reduces the sensitivity when switching tiers.

The '10% Percent Tier Disable' value means a spraying Tier will not change down until the spray rate is 10% below the target rate.

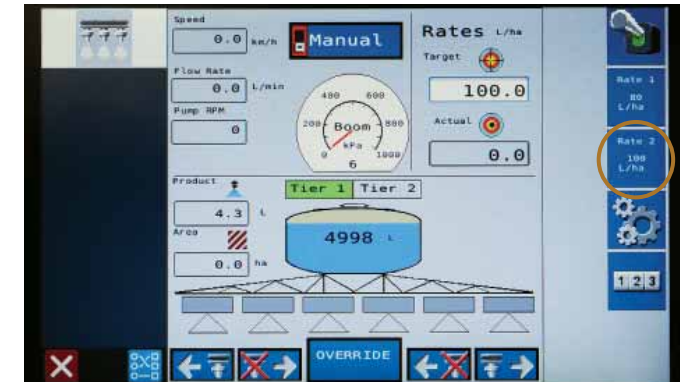


Press the 'Automatic/Manual' touch button on the Home screen to change the Universal Terminal from Automatic to Manual mode.

## To Do the Jug Test using 3rd Party or CR7 Controller Option

- 1 With sufficient clean water in the Product tank, start the tractor, Universal Terminal & Prairie Special hydraulics. Unfold the boom in a suitable area & set the height of the boom to allow easy access to nozzles.
- 2 Press the 'Automatic/Manual' touch button on the Universal Terminal Home screen to 'Manual' mode.
- 3 Start the 'Product Pump', then press the 'Boom Recirc' switch to prepare the boom & nozzles for spraying.

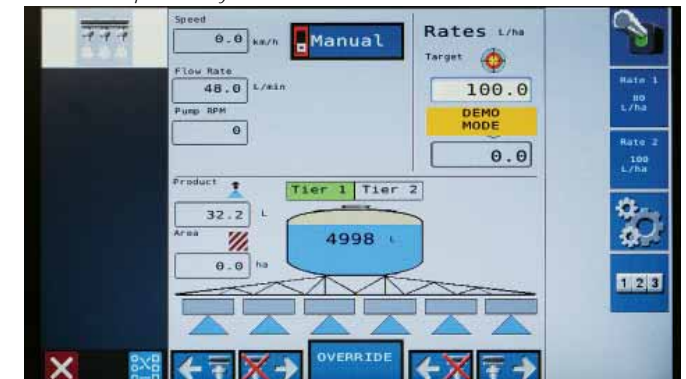
Start the 'Product Pump', then press the 'Boom Recirc' switch 'On', then switch to 'Spray' to start the nozzles spraying.



Press the 'A' touch button to set the application rate, eg, 100 l/ha.

- 4 Press the 'Rate 2' Rate touch buttons to set the application rate, eg, 100 l/ha, then adjust the spray pressure '(kPa)' to mid-range operating pressure of the chosen nozzle output, eg, AXIR110015 nozzle @ 3 Bar (300kPa).
- 5 Manually adjust the pressure until 300 kPa is achieved. Check the pressure gauge is showing 300 kPa. Adjust if needed.
- 6 Check the Tier display on the screen (near boom illustration) to ensure all Tiers are spraying for the Jug test:
  - Single line boom - all nozzles operating for the Jug test
  - 3TS option - all nozzles operating for the Jug test

Check the Home screen to ensure all Tiers are spraying. If not, manually increase pressure by increments of 100 kPa until all Tiers show.





## 5 Set & Check Application Rates – Calibration



Place the measuring jug under one nozzle to collect nozzle output for exactly 1 minute, then remove it.

Manually adjust pressure upwards to 400 or 500 kPa until all tiers are spraying (relative to the boom used).

Pressure increments of 100 kPa must be used to be able to check the nozzle chart pressures & outputs.

- 7 Before measuring the nozzle outputs, check for both air & liquid plumbing leaks, kinked or obstructed hoses and uniform nozzle spray patterns.

If necessary, stop the machine & repair or replace any leaks or hoses which disrupt or reduce the normal air or liquid flows and fix non-uniform nozzle spray patterns.

*If necessary, stop the machine & repair or replace any leaks or hoses that might restrict the normal flow of the liquid and correct any non-uniform spray patterns.*



Before measuring nozzle outputs, check for both air & liquid plumbing leaks, kinked or obstructed hoses and good nozzle spray patterns.

- 8 Place the measuring jug under one nozzle to collect the nozzle volume output for exactly 1 minute, then remove it.
- 9 Measure and record the nozzle output, nozzle size (Tier) and section location.
- 10 Repeat steps 8 & 9 for each nozzle in each of the 6 boom sections being used.
- 11 Compare the volume collected from each nozzle to the stated volume in the nozzle manufacturer's rate chart at the operating pressure used.

Any variation must be less than 10% (plus or minus).

Discard and replace all nozzles that deviate more than 10% from the specified output, for example:

- AXIR110015 chart @ 5 Bar (500kPa) = 0.76 l/min plus 10% is 0.84 l/min, less 10% 0.68 l/min
- AXIR11002 chart @ 5 Bar (500kPa) = 1.02 l/min plus 10% is 1.12 l/min, less 10% 0.92 l/min.

TeeJet advise nozzles with a flow greater than +10% of their stated volume are 'worn out' and should be replaced.

### CAUTION

Do not proceed with nozzle testing with mixed chemicals, pesticides or an uncleaned liquid system. Ensure the liquid system is completely decontaminated and use only clean water for testing.

Contamination or use of any chemicals or pesticides when testing is extremely hazardous to human health.



Illustration of the RapidFlow and RapidFire nozzle technologies.

- 12 Test and check any replacement nozzles by collecting and measuring the output of each replacement.
  - 13 Record each replacement and its output.
  - 14 For each nozzle type tested, add the measured outputs together, then divide the total by the number of test nozzles to obtain the average nozzle output per minute.
- eg, Using the 3TS two tier system:

- AXIR110015 Nozzle - Total spray output 15.4 litres ÷ 20 nozzles tested = 0.77 l/min per nozzle.
- AXIR11002 Nozzle - Total spray output 22 litres ÷ 20 nozzles tested = 1.1 l/min per nozzle.

### NOTE

Do not use a worn nozzle to set the pressure setting and nozzle rates. If the boom is not fitted with new nozzles, fit one new nozzle and use it to set the flow rate and pressure setting. This sets the standard flow rate, pressure setting and spray pattern with which to test the performance of other nozzles.





Move the 'BOOM sections' (1-5) & 'Master Switch' toggle switches to On.



Press the 'SELF TEST' touch button, then enter & save normal operating speed, eg, 20km/hr.



Press the 'SELF TEST' touch button, then enter & save normal operating speed, eg, 20km/hr.

## To Do the Jug Test using the SCS 4400 Controller Option

- 1 With sufficient clean water in the Product tank, start the tractor, Controller & Prairie Special and unfold the boom in a suitable area & set the height of the boom to allow easy access to nozzles.
- 2 Ensure 'BOOM SECTION' widths, 'SPEED CAL', 'METER CAL', 'VALVE CAL', and 'RATE CAL' are correctly entered.
- 3 Move required 'BOOM ON/OFF' toggle switches to ON, and 'MASTER ON/OFF' toggle switch to ON.

- 4 Press the 'SELF TEST' touch button, then enter & save normal sprayer operating speed, eg, 20 km/hr.
- 5 Press the 'AUTO/MANUAL' touch buttons to select 'MANUAL' mode.
- 6 Start the 'Product Pump', then press the 'Boom Recirculation' switch to On and press the 'Spray' switch to start nozzles spraying.
- 7 Run pump at normal operating RPM:
  - If a centrifugal pump is used, proceed to Step 8.
  - If a positive displacement pump is used set the pressure relief valve (PRV) to 65 PSI [450 kPa].

- 8 Ensure each boom section operates correctly with no nozzles blocked by switching each 'BOOM section' toggle switch Off & On.
- 9 Use the 'FLOW' toggle switch to 'INC' then 'DEC' spray application rate to check the flow control valve is functioning correctly.
- 10 Before measuring the nozzle outputs, check for both air & liquid plumbing leaks, kinked or obstructed hoses and uniform nozzle spray patterns.

Start the 'Product Pump', then press the 'Boom Recirc' switch 'On', then switch to 'Spray' to start the nozzles spraying.



Use the 'FLOW' toggle switch to 'INC' then 'DEC' spray application rate to check the flow control valve is operating correctly.



## NOTE

While doing the 'Jug Test' visually check the nozzle spray patterns and spray angles for accuracy and, if necessary, replace any faulty nozzles.

## 5 Set & Check Application Rates – Calibration



*If necessary, stop the machine & repair or replace any leaks or hoses that might restrict the normal flow of the liquid and correct any non-uniform spray patterns.*

If necessary, stop the machine & repair or replace any leaks or hoses which disrupt or reduce the normal air or liquid flows and fix non-uniform nozzle spray patterns.

- 11 Place the measuring jug under one nozzle to collect the nozzle volume output for exactly 1 minute, then remove it.
- 9 Measure and record the nozzle output, nozzle size (Tier) and section location.
- 10 Repeat steps 8 & 9 for each nozzle in each of the 10 boom sections being used.

*Place the measuring jug under one nozzle to collect nozzle output for exactly 1 minute, then remove it.*



*Before measuring nozzle outputs, check for both air & liquid plumbing leaks, kinked or obstructed hoses and good nozzle spray patterns.*

- 11 Compare the volume collected from each nozzle to the stated volume in the nozzle manufacturer's rate chart at the operating pressure used.  
Any variation must be less than 10% (plus or minus).  
Discard and replace all nozzles that deviate more than 10% from the specified output, for example:
  - AXIR110015 chart @ 5 Bar (500kPa) = 0.76 l/min plus 10% is 0.84 l/min, less 10% 0.68 l/min
  - AXIR11002 chart @ 5 Bar (500kPa) = 1.02 l/min plus 10% is 1.12 l/min, less 10% 0.92 l/min.
 TeeJet advise nozzles with a flow greater than +10% of their stated volume are 'worn out' and should be replaced.
- 12 Test and check any replacement nozzles by collecting and measuring the output of each replacement.

- 13 Record each replacement and its output.

- 14 For each nozzle type tested, add the measured outputs together, then divide the total by the number of test nozzles to obtain the average nozzle output per minute.

eg, Using the 3TS two tier system:

- AXIR110015 Nozzle - Total spray output 15.4 litres ÷ 20 nozzles tested = 0.77 l/min per nozzle.
- AXIR11002 Nozzle - Total spray output 22 litres ÷ 20 nozzles tested = 1.1 l/min per nozzle.

### NOTE

Do not use a worn nozzle to set the pressure setting and nozzle rates. If the boom is not fitted with new nozzles, fit one new nozzle and use it to set the flow rate and pressure setting. This sets the standard flow rate, pressure setting and spray pattern with which to test the performance of other nozzles.

### NOTE

While doing the 'Jug Test' visually check the nozzle spray patterns and spray angles for accuracy and, if necessary, replace any faulty nozzles.



Check Boom Width & Boom Section Width values saved in the optional SCS 4400 Controller.



The Flow Meter, located on top of the boom centre section, should regularly inspected & cleaned.



The Boom Flow Regulating Valve should regularly checked & calibrated.

## Other Calibration Items

Other items critical to accurate calibration & application include:

- 1 Boom Width
- 2 Flow Meter
- 3 Regulator Valve.

### 1 Boom Width

The Boom Width values are entered into the RCM controller during the initial set-up of the machine. Check controller settings have not been changed.

Refer to Chapter 4 'Setting Up', 'Pre-Set the Raven Control Module (RCM)' for instructions.

### 2 Flow Meter

The Flow Meter (used by the controller to monitor flow rates) is critical to the accuracy of application rates.

The Flow Meter should be regularly inspected and cleaned of debris.

The ISO Bus UT has a built-in feature to conduct a flow meter calibration test.

For information on the test procedure, refer to the Raven Rate Control Module Operation Manual (RCM) supplied with the Prairie Special.

See Chapter 8 'Lubrication & Maintenance', for 'Flow Meter' service information.

### 3 Regulator Valve

The Boom Flow Regulating Valve or Flow Control Valve (used to adjust & control pressure & flow rates) is critical to the accuracy of spraying rates and should be checked & calibrated on a regular basis.

#### Regulator Valve Performance Adjustments

The Regulator Valve can be adjusted to alter its performance. The **factory set 'Valve Cal'** is [30] [3] [3]. Each value adjusts the performance of the valve:

**[30] is the 'Valve Speed Onto Rate'** (time it takes to reach set rate). The range is 0 – 100.

The valve speed can be adjusted to increase or decrease the time taken to achieve the set rate after switching the Boom Master On.

#### NOTE

In the event of any nozzles not delivering the required volume, investigate further, including but not be limited to:

- Cleaning the nozzles using a method recommended by the nozzle supplier
- Cleaning nozzle filters
- Replacing the nozzles.

#### NOTE

The flow meter & regulator valve used by the controller are critical components of the spraying system and must be checked & calibrated on a regular basis to ensure accurate application.

#### NOTE

Each flow meter has a unique calibration number printed on a tag attached to the flow meter.

## 5 Set & Check Application Rates – Calibration

[3] is the 'Ramping Onto Rate' (allowable overshoot of set rate). The range is 1 – 10.

The valve speed can be adjusted to increase or decrease the allowable overshoot.

[3] is the 'Percentage Off Rate until Valve Reacts' (Off Rate percentage before valve makes correction).

The range is 1 – 10%. The valve can be adjusted to increase or decrease Off-Rate percentage.

### Record All Data For Future Reference

Record the set-up and calibration data on a work sheet similar to the one shown at the end of this chapter ('Calibration/ Application Work Sheet') for future reference and information.




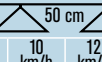
Photocopy the blank work sheets f at the end of this chapter for operational use as required.

### NOTE

Nozzle spray patterns & outputs - must be checked regularly to ensure correct & uniform application rates (nozzles wear with use).



## AIXR Teejet Application Chart

AIXR Teejet Application Chart					DROPLET SIZE CATEGORIES										CAP PART NUMBER
					XF EXTREMELY FINE	VF VERY FINE	F FINE	M MEDIUM	C COARSE	VC VERY COARSE	XC EXTREMELY COARSE	UC ULTRA COARSE			
 		DROP SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	I/ha 										
	bar				5 km/h	6 km/h	7 km/h	8 km/h	10 km/h	12 km/h	16 km/h	18 km/h	20 km/h		
AIXR110015 (100)	1.0	XC	—	0.34	81.6	68.0	58.3	51.0	40.8	34.0	25.5	22.7	20.4	11441A-CELR	
	2.0	C	—	0.48	115	96.0	82.3	72.0	57.6	48.0	36.0	32.0	28.8		
	3.0	C	—	0.59	142	118	101	88.5	70.8	59.0	44.3	39.3	35.4		
	4.0	M	—	0.68	163	136	117	102	81.6	68.0	51.0	45.3	40.8		
	5.0	M	—	0.76	182	152	130	114	91.2	76.0	57.0	50.7	45.6		
	6.0	M	—	0.83	199	166	142	125	99.6	83.0	62.3	55.3	49.8		
AIXR11002 (50)	1.0	XC	—	0.46	110	92.0	78.9	69.0	55.2	46.0	34.5	30.7	27.6	11441A-CELR	
	2.0	VC	—	0.65	156	130	111	97.5	78.0	65.0	48.8	43.3	39.0		
	3.0	C	—	0.79	190	158	135	119	94.8	79.0	59.3	52.7	47.4		
	4.0	M	—	0.91	218	182	156	137	109	91.0	68.3	60.7	54.6		
	5.0	M	—	1.02	245	204	175	153	122	102	76.5	68.0	61.2		
	6.0	M	—	1.12	269	224	192	168	134	112	84.0	74.7	67.2		
AIXR110025 (50)	1.0	XC	**	0.57	137	114	97.7	85.5	68.4	57.0	42.8	38.0	34.2	11441A-CELR	
	2.0	VC	**	0.81	194	162	139	122	97.2	81.0	60.8	54.0	48.6		
	3.0	VC	**	0.99	238	198	170	149	119	99.0	74.3	66.0	59.4		
	4.0	C	**	1.14	274	228	195	171	137	114	85.5	76.0	68.4		
	5.0	C	**	1.28	307	256	219	192	154	128	96.0	85.3	76.8		
	6.0	M	—	1.40	336	280	240	210	168	140	105	93.3	84.0		
AIXR11003 (50)	1.0	XC	**	0.68	163	136	117	102	81.6	68.0	51.0	45.3	40.8	11441A-CELR	
	2.0	VC	**	0.96	230	192	165	144	115	96.0	72.0	64.0	57.6		
	3.0	VC	**	1.18	283	236	202	177	142	118	88.5	78.7	70.8		
	4.0	C	**	1.36	326	272	233	204	163	136	102	90.7	81.6		
	5.0	C	**	1.52	365	304	261	228	182	152	114	101	91.2		
	6.0	M	—	1.67	401	334	286	251	200	167	125	111	100		
AIXR11004 (50)	1.0	UC	***	0.91	218	182	156	137	109	91.0	68.3	60.7	54.6	11443A-CELR	
	2.0	XC	**	1.29	310	258	221	194	155	129	96.8	86.0	77.4		
	3.0	VC	**	1.58	379	316	271	237	190	158	119	105	94.8		
	4.0	VC	**	1.82	437	364	312	273	218	182	137	121	109		
	5.0	C	**	2.04	490	408	350	306	245	204	153	136	122		
	6.0	C	—	2.23	535	446	382	335	268	223	167	149	134		
AIXR11005 (50)	1.0	UC	***	1.14	274	228	195	171	137	114	85.5	76.0	68.4	11443A-CELR	
	2.0	XC	***	1.61	386	322	276	242	193	161	121	107	96.6		
	3.0	VC	**	1.97	473	394	338	296	236	197	148	131	118		
	4.0	VC	**	2.27	545	454	389	341	272	227	170	151	136		
	5.0	C	**	2.54	610	508	435	381	305	254	191	169	152		
	6.0	C	—	2.79	670	558	478	419	335	279	209	186	167		
AIXR11006 (50)	1.0	UC	***	1.37	329	274	235	206	164	137	103	91.3	82.2	11443A-CELR	
	2.0	XC	***	1.94	466	388	333	291	233	194	146	129	116		
	3.0	VC	**	2.37	569	474	406	356	284	237	178	158	142		
	4.0	VC	**	2.74	658	548	470	411	329	274	206	183	164		
	5.0	C	**	3.06	734	612	525	459	367	306	230	204	184		
	6.0	C	—	3.35	804	670	574	503	402	335	251	223	201		
AIXR11008 (50)	1.0	UC	—	1.82	437	364	312	273	218	182	137	121	109	11443A-CELR	
	2.0	XC	—	2.58	619	516	442	387	310	258	194	172	155		
	3.0	VC	—	3.16	758	632	542	474	379	316	237	211	190		
	4.0	VC	—	3.65	876	730	626	548	438	365	274	243	219		
	5.0	VC	—	4.08	979	816	699	612	490	408	306	272	245		
	6.0	C	—	4.47	1073	894	766	671	536	447	335	298	268		
AIXR11010	1.0	UC	—	2.28	547	456	391	342	274	228	171	152	137	11443A-CELR	
	2.0	UC	—	3.23	775	646	554	485	388	323	242	215	194		
	3.0	XC	—	3.95	948	790	677	593	474	395	296	263	237		
	4.0	VC	—	4.56	1094	912	782	684	547	456	342	304	274		
	5.0	VC	—	5.10	1224	1020	874	765	612	510	383	340	306		
	6.0	VC	—	5.59	1342	1118	958	839	671	559	419	373	335		

## AIXR TEEJET® AIR INDUCTION XR FLAT SPRAY TIPS

# MOST VERSATILE AIR INDUCTION TIP

The AIXR TeeJet Flat Spray Tip offers excellent drift resistance without compromising spray coverage. AIXR spray tips are suitable for a wide variety of systemic herbicides and applications where drift control is critical.

### Features & Benefits

- The unique UHMWPE material provides significantly longer wear life and better acid resistance, making the AIXR ideal for highly acidic applications, such as applying defoliation products
- Air-induction design enhances coverage of larger droplets through air inclusion
- A perfect balance of drift control and coverage – precisely sized, large, air-filled drops stay on target and cover the entire plant



VP

MATERIALS:  
VISIFLO ACETAL



SPRAY ANGLE:  
110°

## NOTE

The nozzle charts shown in this manual are for instruction purposes only. Always jug test the accuracy of your nozzles. Also check with the nozzle manufacturer to ensure you are using the correct charts as updates may occur at any time.



USE WITH:  
HERBICIDES  
SYSTEMIC FUNGICIDES  
SYSTEMIC INSECTICIDES



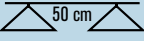


PRESSURE:  
1.5-6 BAR

# 5 Set & Check Application Rates – Calibration

TTJ60 Teejet Application Chart



	 bar	DROP SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	<div>l/ha </div>									CAP PART NUMBER
					5 km/h	6 km/h	7 km/h	8 km/h	10 km/h	12 km/h	16 km/h	18 km/h	20 km/h	
TTJ60- 11002 (100)	1.5	C	—	0.56	134	112	96.0	84.0	67.2	56.0	42.0	37.3	33.6	11441A *-CELR
	2.0	C	—	0.65	156	130	111	97.5	78.0	65.0	48.8	43.3	39.0	
	3.0	M	—	0.79	190	158	135	119	94.8	79.0	59.3	52.7	47.4	
	4.0	M	—	0.91	218	182	156	137	109	91.0	68.3	60.7	54.6	
	5.0	M	—	1.02	245	204	175	153	122	102	76.5	68.0	61.2	
6.0	M	—	1.12	269	224	192	168	134	112	84.0	74.7	67.2		
TTJ60-110025 (100)	1.5	VC	**	0.70	168	140	120	105	84.0	70.0	52.5	46.7	42.0	
	2.0	C	**	0.81	194	162	139	122	97.2	81.0	60.8	54.0	48.6	
	3.0	C	--	0.99	238	198	170	149	119	99.0	74.3	66.0	59.4	
	4.0	M	--	1.14	274	228	195	171	137	114	85.5	76.0	68.4	
	5.0	M	--	1.28	307	256	219	192	154	128	96.0	85.3	76.8	
6.0	M	--	1.40	336	280	240	210	168	140	105	93.3	84.0		
TTJ60-11003 (100)	1.5	VC	**	0.83	199	166	142	125	99.6	83.0	62.3	55.3	49.8	
	2.0	C	**	0.96	230	192	165	144	115	96.0	72.0	64.0	57.6	
	3.0	C	--	1.18	283	236	202	177	142	118	88.5	78.7	70.8	
	4.0	M	--	1.36	326	272	233	204	163	136	102	90.7	81.6	
	5.0	M	--	1.52	365	304	261	228	182	152	114	101	91.2	
6.0	M	--	1.67	401	334	286	251	200	167	125	111	100		
TTJ60-11004 (50)	1.5	VC	**	1.12	269	224	192	168	134	112	84.0	74.7	67.2	
	2.0	C	**	1.29	310	258	221	194	155	129	96.8	86.0	77.4	
	3.0	C	--	1.58	379	316	271	237	190	158	119	105	94.8	
	4.0	M	--	1.82	437	364	312	273	218	182	137	121	109	
	5.0	M	--	2.04	490	408	350	306	245	204	153	136	122	
6.0	M	--	2.23	535	446	382	335	268	223	167	149	134		
TTJ60-11005 (50)	1.5	VC	**	1.39	334	278	238	209	167	139	104	92.7	83.4	
	2.0	C	**	1.61	386	322	276	242	193	161	121	107	96.6	
	3.0	C	**	1.97	473	394	338	296	236	197	148	131	118	
	4.0	M	--	2.27	545	454	389	341	272	227	170	151	136	
	5.0	M	--	2.54	610	508	435	381	305	254	191	169	152	
6.0	M	--	2.79	670	558	478	419	335	279	209	186	167		
TTJ60-11006 (50)	1.5	VC	—	1.68	403	336	288	252	202	168	126	112	101	
	2.0	VC	—	1.94	466	388	333	291	233	194	146	129	116	
	3.0	C	—	2.37	569	474	406	356	284	237	178	158	142	
	4.0	C	—	2.74	658	548	470	411	329	274	206	183	164	
	5.0	M	—	3.06	734	612	525	459	367	306	230	204	184	
6.0	M	—	3.35	804	670	574	503	402	335	251	223	201		
TTJ60-11008 (50)	1.5	VC	—	2.23	535	446	382	335	268	223	167	149	134	
	2.0	VC	—	2.58	619	516	442	387	310	258	194	172	155	
	3.0	C	—	3.16	758	632	542	474	379	316	237	211	190	
	4.0	C	—	3.65	876	730	626	548	438	365	274	243	219	
	5.0	C	—	4.08	979	816	699	612	490	408	306	272	245	
6.0	M	—	4.47	1073	894	766	671	536	447	335	298	268		
TTJ60-11010 (50)	1.5	XC	—	2.79	670	558	478	419	335	279	209	186	167	
	2.0	VC	—	3.23	775	646	554	485	388	323	242	215	194	
	3.0	VC	—	3.95	948	790	677	593	474	395	296	263	237	
	4.0	C	—	4.56	1094	912	782	684	547	456	342	304	274	
	5.0	C	—	5.10	1224	1020	874	765	612	510	383	340	306	
6.0	C	—	5.59	1342	1118	958	839	671	559	419	373	335		

## TTJ60 TURBO TWINJET® FLAT SPRAY TIPS

# IDEAL COVERAGE & TURBO-CHARGED DROPLETS

The TTJ60 produces a symmetrical twin spray pattern which provides superior coverage of small, hard-to-reach vertical targets. Due to the unique Turbo construction of the spray tip, it produces optimally-sized droplets for high coverage, with anti-drift characteristics resulting in a high quality spray application.

## Features & Benefits

- Twin fan provides uniform coverage and penetration to the canopy
- Consistent droplet size spectrum and less driftable droplets for better coverage
- Medium to very coarse drift-resistant Turbo droplets



USE WITH:  
**CONTACT HERBICIDES**  
**CONTACT FUNGICIDES**  
**CONTACT INSECTICIDES**



PRESSURE:  
**1.5-6 BAR**



SPRAY PATTERN:  
**TWIN FAN**



MATERIALS:  
**VISIFLO ACETAL**

## NOTE

The nozzle charts shown in this manual are for instruction purposes only. Always jug test the accuracy of your nozzles. Also check with the nozzle manufacturer to ensure you are using the correct charts as updates may occur at any time.

## ID3 Lechler Application Chart

	ISO 25358	I/min	I/ha									
			5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h	
ID-120-01 (80 M)	VC	3.0	0.39	94	78	67	59	47	39	29	26	
	VC	4.0	0.45	108	90	77	68	54	45	39	34	
	VC	5.0	0.51	122	102	87	77	61	51	44	38	
	VC	6.0	0.55	132	110	94	83	66	55	47	41	
	C	7.0	0.60	144	120	103	90	72	60	51	45	
ID-120-015 (60 M)	VC	3.0	0.59	142	118	101	89	71	59	51	44	
	VC	4.0	0.68	163	136	117	102	82	68	58	51	
	VC	5.0	0.76	182	152	130	114	91	76	65	57	
	C	6.0	0.83	199	166	142	125	100	83	71	62	
	C	7.0	0.90	216	180	154	135	108	90	77	68	
ID-120-02 (60 M)	VC	3.0	0.80	192	160	137	120	96	80	69	60	
	VC	4.0	0.92	221	184	158	138	110	92	79	69	
	VC	5.0	1.03	247	206	177	155	124	103	88	77	
	C	6.0	1.13	271	226	194	170	136	113	97	85	
	C	7.0	1.22	293	244	209	183	146	122	105	92	
ID-120-025 (60 M)	VC	3.0	0.81	194	162	139	122	97	81	69	61	
	VC	4.0	0.99	238	198	170	149	119	99	85	74	
	VC	5.0	1.15	276	230	197	173	138	115	99	86	
	VC	6.0	1.28	307	256	219	192	154	128	110	96	
	VC	7.0	1.40	336	280	240	210	168	140	120	105	
ID-120-03 (60 M)	VC	3.0	0.97	233	194	166	146	116	97	83	73	
	VC	4.0	1.19	286	238	204	179	143	119	102	89	
	VC	5.0	1.37	329	274	235	206	164	137	117	103	
	VC	6.0	1.53	367	306	262	230	184	153	131	115	
	VC	7.0	1.68	403	336	288	252	202	168	144	126	
ID-120-04 (60 M)	VC	3.0	1.29	310	258	221	194	155	129	111	97	
	VC	4.0	1.58	379	316	271	237	190	158	135	119	
	VC	5.0	1.82	437	364	312	273	218	182	156	137	
	VC	6.0	2.04	490	408	350	306	245	204	175	153	
	VC	7.0	2.23	535	446	382	335	268	223	191	167	
ID-120-05 (25 M)	VC	3.0	1.61	386	322	276	242	193	161	138	121	
	VC	4.0	1.97	473	394	338	296	236	197	169	148	
	VC	5.0	2.28	547	456	391	342	274	228	195	171	
	VC	6.0	2.55	612	510	437	383	306	255	219	191	
	VC	7.0	2.79	670	558	478	419	335	279	239	209	
ID-120-06 (25 M)	VC	3.0	1.93	463	386	331	290	232	193	165	145	
	VC	4.0	2.36	566	472	405	354	283	236	202	177	
	VC	5.0	2.73	655	546	468	410	328	273	234	205	
	VC	6.0	3.05	732	610	523	458	366	305	261	229	
	VC	7.0	3.34	802	668	573	501	401	334	286	251	
ID-120-08 (25 M)	VC	3.0	2.58	619	516	442	387	310	258	221	194	
	VC	4.0	3.16	758	632	542	474	379	316	271	237	
	VC	5.0	3.65	876	730	626	548	438	365	313	274	
	VC	6.0	4.08	979	816	699	612	490	408	350	306	
	VC	7.0	4.47	1073	894	766	671	536	447	383	335	
ID-120-10 (25 M)	VC	3.0	3.22	773	644	552	483	386	322	276	242	
	VC	4.0	3.94	946	788	675	591	473	394	338	296	
	VC	5.0	4.55	1092	910	780	683	546	455	390	341	
	VC	6.0	5.09	1222	1018	873	764	611	509	436	382	
	VC	7.0	5.57	1337	1114	955	836	668	557	477	418	

ISO 25358  
Droplet size classification

New measuring system!  
Further information see page 13.

VF	Very fine
F	Fine
M	Medium
C	Coarse
VC	Very coarse
XC	Extremely coarse
UC	Ultra coarse

Classifications are subject to change.

- Spray pressure at the nozzle tip (gauged with a diaphragm valve)
- The stated liter-per-hectare rates apply to water
- Prior to each spraying season, verify the table data by gauging the flow rates
- Make sure that all nozzles have the same settings

Online nozzle calculator



Apple



Android

Air-Injector  
flat spray nozzles ID3

ID3

Drift reduction:  
90/75/50 %

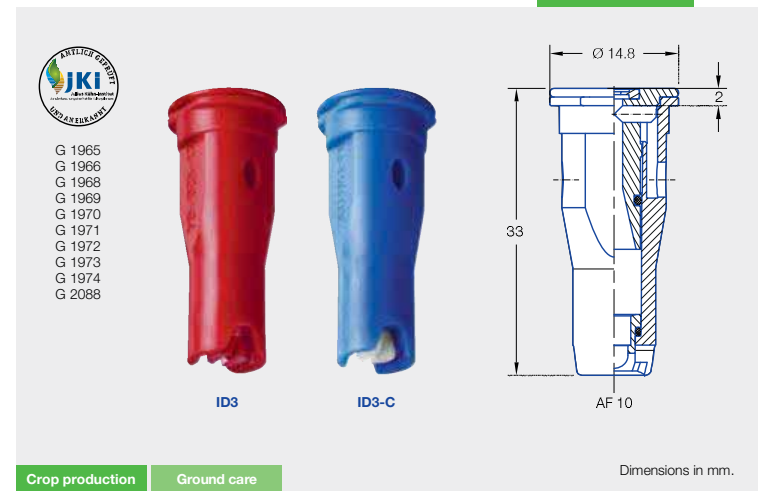


Current  
list under  
www.lechler-agri.com/  
drift-reduction

Extremely low-drift, air-injector flat spray nozzle for professional use.

### Advantages

- Up to 90% drift reduction depending on nozzle size, pressure and country
- Long injector design ensures high drift stability over a wide pressure range
- Timely application even under adverse weather conditions
- Increased workrate due to flexible use over a wide pressure range
  - Adaptation by changing the driving speed and l/ha rate without nozzle changes
- Very good deposition structure and crop penetration



ISO Nozzle size  
01 – 10

Spray angle  
120°

Material  
POM, ceramic

Pressure range  
– ID-01 to -015:  
3 – 4 – 8 bar  
– ID-02 to -10:  
2 – 4 – 8 bar  
– UAN: 2 – 4 bar

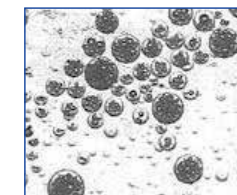
Recommended filters  
80 M 01  
60 M 02 – 04  
25 M 05 – 10

Droplet size  
Ultra coarse – medium

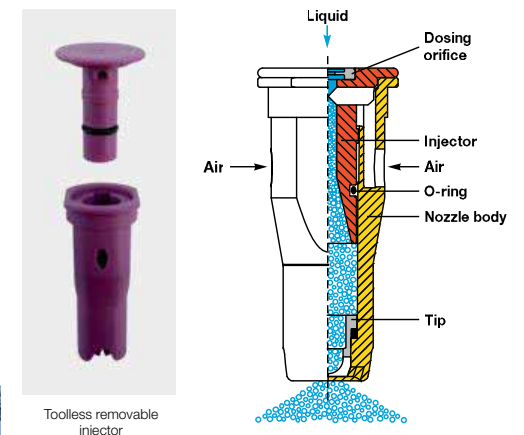
Width across flats  
10 mm

### Application areas

- Plant protection products and growth regulators
- Liquid fertilizer
- Border application can be combined with border nozzle IS 80
- Golf course



Aeration effect






Toolless removable injector

## NOTE

The nozzle charts shown in this manual are for instruction purposes only. Always jug test the accuracy of your nozzles. Also check with the nozzle manufacturer to ensure you are using the correct charts as updates may occur at any time.

# 5 Set & Check Application Rates – Calibration

## IDK/IDKN Lechler Application

	ISO 25358			I/min	I/ha 									
	IDKN	IDK			5.0 km/h	6.0 km/h	7.0 km/h	8.0 km/h	10.0 km/h	12.0 km/h	14.0 km/h	16.0 km/h	18.0 km/h	
<b>IDK 120-01 90-01 (80 M)</b>		VC	1.0	0.23	55	46	39	35	28	23	20	17	15	
		VC	1.5	0.28	67	56	48	42	34	28	24	21	19	
		VC	2.0	0.32	77	66	55	48	38	32	27	24	21	
		VC	2.5	0.36	86	72	62	54	43	36	31	27	24	
		VC	3.0	0.39	94	78	67	59	47	39	33	29	26	
		C	4.0	0.45	108	90	77	68	54	45	39	34	30	
		M	5.0	0.51	122	102	87	77	61	51	44	38	34	
	M	6.0	0.55	132	110	94	83	66	55	47	41	37		
<b>IDK 120-015 90-015 (60 M)</b>		VC	1.0	0.34	82	68	58	51	41	34	29	26	23	
		VC	1.5	0.42	101	84	72	63	50	42	36	32	28	
		VC	2.0	0.48	115	96	82	72	58	48	41	36	32	
		VC	2.5	0.54	130	108	93	81	65	54	46	41	36	
		C	3.0	0.59	142	118	101	89	71	59	51	44	39	
		C	4.0	0.68	163	136	117	102	82	68	58	51	45	
		M	5.0	0.76	182	152	130	114	91	76	65	57	51	
	M	6.0	0.83	199	166	142	125	100	83	71	62	55		
<b>IDK 120-02 90-02 (60 M)</b>		VC	1.0	0.46	110	92	79	69	55	46	39	35	31	
		VC	1.5	0.56	134	112	96	84	67	56	48	42	37	
		VC	2.0	0.65	156	130	111	98	78	65	56	49	43	
		VC	2.5	0.73	175	146	125	110	88	73	63	55	49	
		VC	3.0	0.80	192	160	137	120	96	80	69	60	53	
		C	4.0	0.92	221	184	158	138	110	92	79	69	61	
		C	5.0	1.03	247	206	177	155	124	103	88	77	69	
	M	6.0	1.13	271	226	194	170	136	113	97	85	75		
<b>IDK 120-025 90-025</b>		XC	1.0	0.57	137	114	98	86	68	57	49	43	38	
		VC	1.5	0.70	168	140	120	105	84	70	60	53	47	
		VC	2.0	0.81	194	162	139	122	97	81	69	61	54	
		VC	2.5	0.91	218	182	156	137	109	91	78	68	61	
		C	3.0	0.99	238	198	170	149	119	99	85	74	66	
		C	4.0	1.15	276	230	197	173	138	115	99	86	77	
		M	5.0	1.28	307	256	219	192	154	128	110	96	85	
	M	6.0	1.40	336	280	240	210	168	140	120	105	93		
<b>IDK 120-03 90-03 IDKN 120-03 (60 M)</b>	UC	XC	1.0	0.69	166	138	118	104	83	69	59	52	46	
	XC	VC	1.5	0.84	202	168	144	126	101	84	72	63	56	
	VC	VC	2.0	0.97	233	194	166	146	116	97	83	73	65	
	VC	VC	2.5	1.08	259	216	185	162	130	108	93	81	72	
	VC	VC	3.0	1.19	286	238	204	179	143	119	102	89	79	
	VC	C	4.0	1.37	329	274	235	206	164	137	117	103	91	
	C	C	5.0	1.53	367	306	262	230	184	153	131	115	102	
	C	M	6.0	1.68	403	336	288	252	202	168	144	126	112	
<b>IDK 120-04 (60 M)</b>	UC	UC	1.0	0.91	218	182	156	137	109	91	78	68	61	
	XC	XC	1.5	1.12	269	224	192	168	134	112	96	84	75	
	XC	XC	2.0	1.29	310	258	221	194	155	129	111	97	86	
	VC	VC	2.5	1.44	346	288	247	216	173	144	123	108	96	
	VC	VC	3.0	1.58	379	316	271	237	190	158	135	119	105	
	VC	C	4.0	1.82	437	364	312	273	218	182	156	137	121	
	C	C	5.0	2.04	490	408	350	306	245	204	175	153	136	
	C	C	6.0	2.23	535	446	382	335	268	223	191	167	149	
<b>IDK 120-05 (25 M)</b>		XC	1.0	1.14	274	228	195	171	137	114	98	86	76	
		XC	1.5	1.39	334	278	238	209	167	139	119	104	93	
		VC	2.0	1.61	386	322	276	242	193	161	138	121	107	
		VC	2.5	1.80	432	360	309	270	216	180	154	135	120	
		VC	3.0	1.97	473	394	338	296	236	197	169	148	131	
		VC	4.0	2.28	547	456	391	342	274	228	195	171	152	
		C	5.0	2.55	612	510	437	383	306	255	219	191	170	
	C	6.0	2.79	670	558	478	419	335	279	239	209	186		
<b>IDK 120-06 (25 M)</b>		XC	1.0	1.36	326	272	233	204	163	136	117	102	91	
		VC	1.5	1.67	401	334	286	251	200	167	143	125	111	
		VC	2.0	1.93	463	386	331	290	232	193	165	145	129	
		VC	2.5	2.15	516	430	369	323	258	215	184	161	143	
		VC	3.0	2.36	566	472	405	354	283	236	202	177	157	
		C	4.0	2.73	655	546	468	410	328	273	234	205	182	
		C	5.0	3.05	732	610	523	458	366	305	261	229	203	
	C	6.0	3.34	802	668	573	501	401	334	286	251	223		

ISO 25358  
Droplet size classification

New measuring system!  
Further information see page 13.

VF Very fine  
F Fine  
M Medium  
C Coarse  
VC Very coarse  
XC Extremely coarse  
UC Ultra coarse

Classifications are subject to change.

- Spray pressure at the nozzle tip (gauged with a diaphragm valve)
- The stated liter-per-hectare rates apply to water
- Prior to each spraying season, verify the table data by gauging the flow rates
- Make sure that all nozzles have the same settings

Online nozzle calculator



Best Protection of IDK/IDKN/IDKS/IDKT nozzles through long side walls of MultiCap (see page 108).

Available assembled with IDK-, IDKT- and IDKN nozzle

## Air-injector flat spray compact nozzles IDK/IDKN

Drift reduction:  
90/75/50 %  
Current list under  
[www.lechler-agri.com/drift-reduction](http://www.lechler-agri.com/drift-reduction)

ISO 1661  
ISO 1662  
ISO 1663  
ISO 1683  
ISO 1718  
ISO 1799  
ISO 1800  
ISO 1801  
ISO 1802  
ISO 1936

Ø 14.8  
22  
8 mm AF

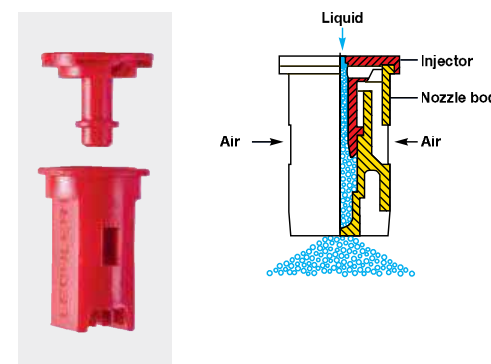
\* IDKN-characteristic: body with white stripe

Dimensions in mm.

Crop production Ground care

### Application areas

- Plant protection products and growth regulators
- Liquid fertilizer
- Spray frame
- Border application can be combined with border nozzle IDKS 80
- Golf course
- Knapsack sprayer
- Greenhouse



Toolless removable injector

## NOTE

The nozzle charts shown in this manual are for instruction purposes only. Always jug test the accuracy of your nozzles. Also check with the nozzle manufacturer to ensure you are using the correct charts as updates may occur at any time.







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## Prairie Special Series 2

OPERATOR'S MANUAL MY23

*Prairie Special Series 2 Trailed Sprayer Operator's Manual.*



*Check the suction filter is clean.*



*Check tyre inflation and wheel nuts.*

## Pre-Operation Check

### Before Starting the Prairie Special:

- Read the Prairie Special Series 2 Trailed Sprayer Operator's Manual thoroughly, before attempting to use this machine
  - Read & follow instructions on chemical manufacturers labels
  - Refer to instructions provided in other operator manuals supplied
  - Always wear appropriate protective clothing.
  - Before operating the machine, check all fluid levels (oil & water).
  - Check all maintenance procedures have been followed
  - Complete scheduled lubrication
- Inspect the machine to ensure there is no damage or wear which could lead to injury, further damage or reduced performance
  - Check all plumbing lines & fittings to ensure they are tight, not damaged or leaking
  - Check to ensure frost and/or vermin have not damaged the machine
  - Check the suction filter is clean
  - Check the pressure filter is clean
  - Check nozzles are spraying correctly
  - Check all hydraulic connections
  - Check boom controls functions
  - Check all spraying control functions (refer to the instructions in this manual)
- Check tyres are correctly inflated
  - Check all lights are working correctly
  - Check all bolts & nuts are tight & secure
  - Ensure there is a sufficient clean water in the hand wash tank for personal hygiene and chemical safety
  - Organise communication with someone to come to your aid, if required.

A more comprehensive checklist of routine checks is provided in chapter 8, 'Lubrication & Maintenance'.

### NOTE

A high quality multi-purpose grease is essential for the machine to operate with maximum effectiveness and life-expectancy.  
It is important to keep the lubricant and lubricant applicator clean. Wipe all dirt from the fittings before use.

### NOTE

Be sure to adequately clean and flush all chemical handling equipment.  
All spray equipment should be cleaned at the start and end of each spray season including all filters and nozzles.

### NOTE

Test the pump with clean water. Switch on the pump at the lowest revolutions possible & gradually increase revolutions until the pump reaches its operating speed.  
Do not exceed 4200 rpm on centrifugal pump or 540 rpm on diaphragm pump.





Ensure the Prairie Special Series 2 meets your state vehicle height & width restrictions before driving on roads.

## Machine Transit Safety

The largest Prairie Special Series 2 Trailed Sprayer height is approximately 4.55m high when folded & tractor roof aerials may be higher.

Check the regulations in your state for maximum vehicle height & width restrictions. Bigger booms may require an escort in some areas.

When driving the machine on roads it may be necessary to remove aerials to meet the required height restrictions.

Aerials on the roof may also need to be removed to meet clearance requirements for over head power lines - on the road & in some paddocks.

## Overhead Power Lines

Check areas to be sprayed for any overhead power lines.

If there are power lines in the area, contact the relevant energy provider for information on safe use of machinery near live power lines.



Lighting around the Prairie Special at night needs to be sufficient for all labels and warnings on the machine to be clearly visible to an operator.

## Night Spraying

When conducting spraying operations at night:

- Lighting around the machine needs to be sufficient for all labels and warnings on the machine to be clearly visible to the operator.
- Lighting of the area to be sprayed needs to be sufficient for obstacles in the path of the machine to be clearly visible to the operator.

### DANGER

Check the area to be sprayed for over head power lines. Any contact of the machine & power lines can result in serious injury or death. If power lines are in the spray area, exercise extreme caution when tilting, raising/lowering & folding booms & especially when using automatic fold.

### NOTE

Some options like large tyres may put a machine over-width. Check the road regulations for your State.

### DANGER

Do NOT walk on the machine platform when near power lines.

### CAUTION

If spraying is to be done at night, ensure that adequate lighting is available around the machine and the area to be sprayed.

## Ready to Spray – Operation



Standard In-Cab Sprayer Control Console (shown left) with Optional Raven Controller CR7 (shown right).



Optional Raven SCS 4400 Controller.



L to R: RapidFire air pressure gauge, Hydraulic pressure gauge (pump) & Spray pressure gauge - located at the front of the Prairie Special for spraying information.

### Start-Up

The Prairie Special is fitted standard with:

- In-Cab Sprayer 3rd party Control Console or optional CR7 Consoller or optional SCS 4400 Consoller
- Console On/Off switch.

Another optional item may include:

- Master On/Off Foot Switch.

Instructions follow for operating with the Raven ISO BUS system with 3rd party Universal Terminals, optional Raven Controller CR7 and optional SRS 4400 Controller.

It is the responsibility of the operator to familiarise themselves with and understand the information in this manual to ensure competent and safe operation.

Follow instructions for starting, driving, stopping and shutting-down the Prairie Special.

Optional Master On/Off Foot Switch



### Starting & Stopping the Prairie Special

Follow the instructions below to start & stop the Prairie Special.

#### To Start-Up the Prairie Special:

- 1 Conduct the 'Pre-operation Check' of the Prairie Special.
- 2 Check the tractor park brake is On.
- 3 Start the tractor engine.
- 4 Run the Prairie Special Air Compressor for at least 30 seconds to allow the compressor to build the required system air pressure before moving or operating.
- 5 After starting the tractor engine allow hydraulic oil to warm up before operating hydraulic functions.
- 6 Switch the Cabin Universal Terminal/Controller On.
- 7 Disengage the tractor park brake before moving.

#### Before Starting in Cold Conditions

If the Prairie Special is in a cold environment, always check components to make sure that they have not been damaged and that there is no ice in the system before starting spraying.

If the water has frozen in the pump and/or in the lines, wait until it has completely thawed before use.

#### To Shut-Down the Prairie Special:

- 1 Bring the Prairie Special to a complete stop.
- 2 Engage the tractor park brake.
- 3 Turn Off all sprayer functions.
- 4 Switch Off the Console.
- 5 Stop the tractor engine.
- 6 Wait 30 seconds to allow any fitted Controller enough time to save the data before shutting off its power source.

### NOTE

The operator must wear the operator safety belt at all times when seated in the tractor or when the machine is in motion.



Switches on the Sprayer Switch Console are used to operate boom folding and unfolding functions.

## Boom Folding/Unfolding

The Sprayer Switch Console is used for Boom Folding and Unfolding functions.

As well as usual folding and unfolding of the boom, a Bifold function allows the outside boom sections to be folded reducing spray width for purposes such as finishing along fencelines and other applications.

The 'Boom Unfolding' process is manually operated using the the rocker switches on the Sprayer Switch Console.

Always ensure the Prairie Special is stationary, on level ground with the tractor park brake engaged, before attempting to fold or unfold the boom.



Use the 'Boom Height UP' switch to lift the boom from its rests, then the 'Boom Fold OUT' to unfold the boom, then the 'Boom Height DOWN' to lower the boom.

## Unfolding the Boom

Unfolding the Boom is manually done using two switches on the Sprayer Control Console.

### To Unfold the Boom:

- Press & hold the 'Boom Height UP' switch to fully raise the boom then release the switch.
- Press & hold the 'Boom Fold OUT' switch to fully unfold the boom until it is aligned with the boom centre section, then release the switch.
- Press & hold the 'Boom Height DOWN' switch to lower the boom to the desired operating height.



Press the 'Boom Height UP' switch to lift the boom to full height, then the 'Boom Fold IN' to fold in the inner and outer boom sections.

## Folding the Boom

Folding the Boom is manually done using two switches on the Sprayer Control Console.

### To Fold the Boom:

- Press & hold the 'Boom Height UP' switch on the Sprayer Control Console to raise the boom to its full height then release the switch.
- Press & hold the 'Boom Fold IN' switch to fold the inner & outer boom sections to their folded position, then release the switch.
- Press the 'Boom Height DOWN' switch momentarily to lower the boom into its boom rests.

### CAUTION

The booms must not be folded or unfolded, while the sprayer is moving.  
While a boom moves from fully open to fully closed (and vice versa), greater stresses are placed on many components.  
If the sprayer moves while folding or unfolding the boom, any bumps or uneven travel may result in severe damage to the boom.

### CAUTION

Do not release the Boom Fold & Bi-fold switches until the boom inner and outer wing sections are fully folded In or Out otherwise boom stress may occur.

### NOTE

To ensure Boom Fold cylinders extend or compress equally on both sides:

- Continue holding the 'Boom Fold OUT' switch for a few extra seconds after the boom is fully unfolded.
- Conversely, hold down the 'Boom Fold IN' switch for a few extra seconds after the boom is fully folded.

## Ready to Spray – Operation



Raise the boom above any obstructions, then press & hold the 'Boom Bi-fold IN' switch to fold the boom outer sections.



Raise the boom above any obstructions, then press & hold the 'Boom Bi-fold OUT' switch to unfold the boom outer sections.



Raise the boom above any obstructions, then press & hold the 'Boom Bi-fold OUT' switch to unfold the boom outer sections.

### Boom Bifold (Optional)

Folding & unfolding the Boom Bifold is manually done using two switches on the Sprayer Control Console.

#### Folding Boom Bi-fold

Ensure the Prairie Special is stationary, on level ground with the tractor park brake engaged, before attempting to fold or unfold the boom.

##### To Fold the Boom Bifold:

- Press & hold the 'Boom Height UP' switch on the Sprayer Control Console to raise the boom above any obstructions then release the switch.
- Press & hold the 'Boom Bifold IN' switch to fully fold-in the outer boom, then release the switch.

Do not release the switch until the boom outer wing sections are fully folded-in or boom stress may occur.

### CAUTION

Do not release the Boom Fold & Bi-fold switches until the boom inner and outer wing sections are fully folded In or Out otherwise boom stress may occur.

### Unfolding Boom Bi-fold

Ensure the Prairie Special is stationary, on level ground with the tractor park brake engaged, before attempting to fold or unfold the boom.

##### To Unfold the Boom Bifold:

- Press & hold the 'Boom Height UP' switch on the Sprayer Control Console to raise the boom above any obstructions then release the switch.
- Press & hold the 'Boom Bifold OUT' switch to fully fold-out the outer boom, then release the switch.

Do not release the switch until the boom outer wing sections are fully folded-out or boom stress may occur.

### CAUTION

The booms must be folded continuously without stopping and starting during the sequence. Stopping & starting boom folding may result in damage to the boom.

### Fenceline Nozzles

The 'Fence Jet Left/Right' switch is used to individually switch On & Off the Left & Right Fenceline Nozzles as required.

The Pump, Spray Switch on the Sprayer Control Console and the Boom Master Switch must be On before engaging Fenceline nozzles.

##### To Switch On/Off the Left Fenceline Nozzle:

- Press the 'Fence Jet' switch 'Left Spray Emblem' to start spraying from the left Fenceline nozzle.  
When the Fenceline nozzle is spraying, the 'Fence' & 'Left Spray Emblem' on the switch illuminates Blue.
- Press the 'Fence Jet' switch 'Left Spray Emblem' again to Stop the left Fenceline nozzle spraying.

##### To Switch On/Off the Right Fenceline Nozzle:

- Press the 'Fence Jet' switch 'Right Spray Emblem' to start spraying from the right Fenceline nozzle.  
When the Fenceline nozzle is spraying, the 'Jet' & 'Right Spray Emblem' on the switch illuminates Blue.
- Press the 'Fence Jet' switch 'Right Spray Emblem' again to Stop the right Fenceline nozzle spraying.





Boom section On/Off Toggle Switches & Boom Master On/Off Toggle Switch on the optional SCS 4400 Controller.



Optional In-cab Raven CR7 Controller.



Check items closely during the first 8 hours of operation as instructed in Chapter 8 'Lubrication & Maintenance'.

## Boom Master On/Off

Standard fitted Boom Master On/Off switches of 3rd party Universal Terminals, optional Raven CR7 & optional SCS 4400 Controllers are used for switching boom spraying On and Off. An optional Foot Switch is also available.

### To Switch On/Off Boom Spraying:

- Ensure all required boom section switches are On.
- Switch the Boom Master Switch On to Start the boom spraying.
- Switch the Boom Master Switch Off to Stop the boom spraying.

### NOTE

The pump must be running for nozzles to spray. Refer to instructions on engaging & disengaging the product pump and boom On/Off switches.

### NOTE

An optional Boom Master foot switch (if fitted) can also be used to switch boom spraying On & Off.

## Console Operating Instructions

If using a 3rd party fitted Controller, follow the manufacturer's operating instructions.

If using the optional Raven CR7 or optional SCS 4400 Controllers refer to Chapter 4 'Setting Up – Preparation for Use' and Chapter 5 'Calibration – Set & Check Application Rates' for the appropriate Controller operating instructions.

Optional Master On/Off Foot Switch



### NOTE

Check nozzle patterns for irregularities. If there are irregularities, clean the nozzles and refit. If the problem persists they could be worn so remove and replace.



The Fast Fill Station - see opposite page for details.



The 3" Clean Fill inlet camlock cap fitted.



Use good quality suction hose and fittings.

## Filling the Sprayer

All filling & cleaning procedures are conducted at the Fast Fill Station located on the left hand side of the Prairie Special.

The Prairie Special sprayers are fitted (depending on sprayer configuration) with:

- Product tank (4000, 5000, 6500, 8500 or 10000 litre)
- Rinse tank (500 or 800 litre)
- Hand Wash tank (20 litre)

When filling, the Prairie Special must be safely parked in an appropriate area with the tractor engine running.

## Water Source

A clean external water source is required to fill the Prairie Special tanks ready for spraying.

### Filling the Main Product Tank

The main tank is filled through the 3" Clean Fill Inlet of the Fast Fill Station. Refer to the Fast Fill Station details shown on the next page.

## Clean Fill

The Clean Fill Inlet must be used only with clean fresh water sources as the pump connects to all rinsing circuits.

Rinsing circuits must not be contaminated with dirty, contaminated or unclean liquid.

The Clean Fill Inlet uses either the:

- Onboard Fill Pump option (hydraulically driven) of the Prairie Special, or
- External fill pump, which is required if the Onboard Fill Pump option is not fitted.

## Suction & Delivery Lines

Use good quality suction hose and fittings that will not collapse or leak air under suction.

If pumping water from structures other than storage tanks, the use of an appropriate sized floating filter equipped with a check valve.

The suction line diameter should match the suction port diameter of 3" to maximise pump performance.

Filling functions require the Prairie Special to be safely parked in an appropriate area with the tractor engine running.

### NOTE

Always use clean, fresh water, free of suspended organic matter or clay.  
Some chemicals are deactivated when they contact these materials

### NOTE

All filling, adding chemicals and rinsing functions require the tractor engine to be running and the Park Brake applied.

### CAUTION

It is very important to understand that water weighs 1.0 kg per litre and conversion factors must be used when spraying liquids that are heavier than water.

The **total weight of the liquid being sprayed must not exceed the equivalent weight of a full tank of water**. Exceeding this weight can lead to machine damage.

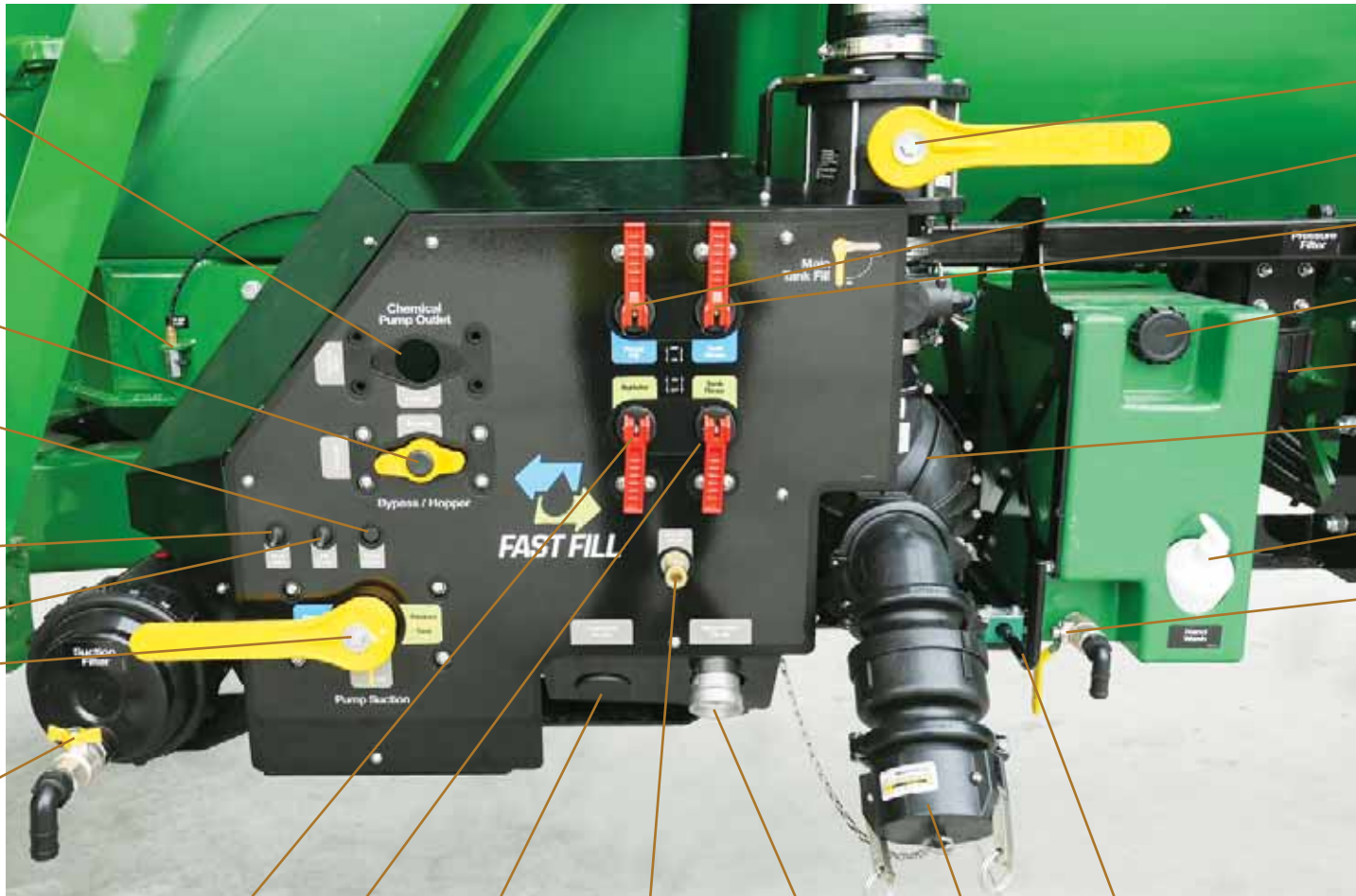
For example, liquid Nitrogen has a density of 1.28 kg per litre. The Prairie Special tank size might be 6000 litres BUT the equivalent water weight of liquid Nitrogen is calculated by dividing 6000 by 1.28 kg = 4690 litres.

This means the total volume of liquid Nitrogen allowed in a 6000 litre tank is 4690 litres. It is very important not exceed weight limits.

This rule applies for all tanks sizes.

If unsure about the density/weight of chemicals being applied, contact your local agronomist or chemical supplier for more information.

- Chemical Pump Outlet Selector (Optional)  
- Fill to Main Tank or Hopper
- Gauge Drain Valve  
- On/Off
- Bypass/Hopper Valve  
• Hopper  
• Bypass (Spray mode)
- Chemical Pump On/Off (Optional)  
- Draws from Chemical Probe & pumps to Main Tank or Hopper
- Work Light Switch - On/Off
- Fill Pump Switch - On/Off
- Pump Suction Valve  
• Product Tank  
• Rinse Tank  
• Off
- Suction Filter Drain Valve  
- On/Off



- Main Tank Fill Valve  
- On/OFF
- Rinse Tank Fill Valve  
- On/OFF
- Tank Rinse Valve  
- On/OFF (Clean Water)
- Hand Wash Tank Fill Cap  
(Fresh Water Only)
- Pressure Filter
- Onboard 3" Fill Pump  
(Optional)
- Hand Wash Soap Dispenser
- Hand Wash Valve - On/Off  
(Fresh water only)

## Fast Fill Station

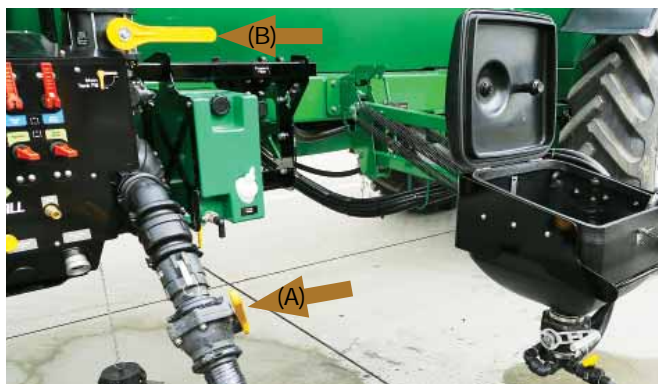
The Fast Fill Station (shown above) comprises the valves and hose connectors used for all filling & cleaning functions.

- Agitator Valve  
- On/Off (Product liquid)
- Tank Rinse Valve  
- On/Off (Product liquid)
- Chemical Probe Inlet & Valve (Optional)  
- For Chemical Probe 1" hose & other liquid chemical sources
- Aux Air Outlet  
- General use air line (Prairie Special air tank pressurised)
- Micromatic Rinse Coupling  
- For rinsing Micromatic chemical supply systems
- Clean Fill Inlet  
- Connect 3" external hose here
- Main Tank Drain Valve Lever  
- Pull Out to open drain valve / Push In - to close valve

If the Onboard Fill Pump Option (shown fitted above) is not fitted, then the Clean Fill Inlet remains as standard and the operator must use an external pump for all filling and cleaning functions.

*Fast Fill Station showing hose connectors, switches & valves.*





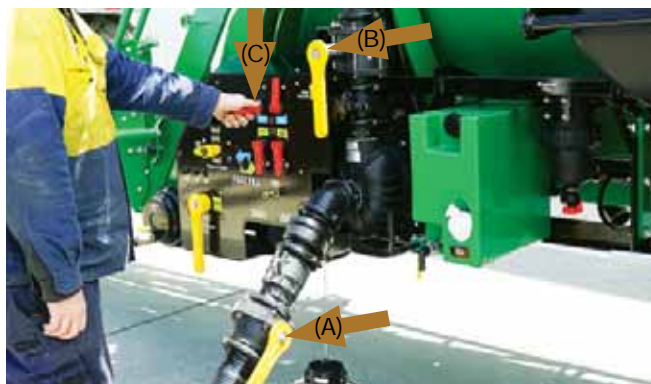
Connect a 3" fill hose to the 'Clean Fill' inlet, then open the ball valve on the suction hose (A) & fully open the 'Main Tank Fill Valve' (B).

#### To Fill the Product Tank - Fill Pump Option fitted

- 1 Connect a 3" suction hose (not supplied) to the 3" camlock coupling of the 'Clean Fill Inlet'. Connect the other end of the suction hose connected to a clean water source.
- 2 Fully open the ball valve on the suction hose.
- 3 Fully open the 'Main Tank Fill Valve' (above the Fill Pump).
- 4 Check the 'Fill Pump Switch' is Off.
- 5 With the tractor engine running at low idle.
- 6 Push the 'Fill Pump Switch' On to start Fill Pump.  
Fill speed can be reduced by rotating the 'Main Tank Fill Valve' 50% closed, if more time or more flow is required to fill the Rinse Tank, operate the Chemical Hopper or other auxiliary functions.  
The filling process can be stopped at any time by pushing 'Fill Pump Switch' Off.
- 7 When filling is complete, push the 'Fill Pump Switch' Off, then close the 'Main Tank Fill Valve' & suction hose valve).

#### NOTE

It is recommended to calculate the correct quantity of liquid required, and when filling, allow sufficient quantity for adding and mixing chemicals.  
If necessary top up the tank to to required quantity after adding chemicals is completed.



Open the ball valve on the suction hose (A), fully open the 'Main Tank Fill Valve' (B) and open the 'Rinse Tank Fill Valve' (C).

#### To Fill the Rinse Tank - Fill Pump Option fitted

- 1 Connect a 3" suction hose (not supplied) to the 3" camlock coupling of the 'Clean Fill Inlet'. Connect the other end of the suction hose connected to a clean water source.
- 2 Fully open the ball valve on the suction hose.
- 3 Fully open the 'Main Tank Fill Valve' (above the Fill Pump).
- 4 Check the 'Fill Pump Switch' is Off.
- 5 Open the Rinse Tank Fill Valve.
- 5 With the tractor engine running at low idle.
- 6 Push the 'Fill Pump Switch' On to start fill pump.  
Fill speed of the Rinse Tank can be increased by rotating the 'Main Tank Fill Valve' 50-75% closed.  
The filling process can be stopped at any time by pushing 'Fill Pump Switch' Off.
- 7 When filling is complete, push the 'Fill Pump Switch' Off, then close the Rinse Tank Fill Valve', 'Main Tank Fill Valve' & suction hose valve).

#### CAUTION

It is important NOT to close the suction hose valve while the Fill Pump is running. Running the Fill Pump with a closed suction inlet may damage the pump.



Partially close the 'Main Tank Fill Valve' to increase flow for other filling & cleaning functions.

#### To Fill the Product Tank - Fill Pump Option not fitted

- 1 Connect a 3" suction hose (not supplied) to the 3" camlock coupling of the 'Clean Fill Inlet'. Connect the other end of the suction hose connected to a clean water source.
- 2 Fully open the ball valve on the suction hose.
- 3 Fully open the 'Main Tank Fill Valve'
- 4 Operate the external fill pump to start filling the Main Tank.  
Fill speed can be reduced by rotating the 'Main Tank Fill Valve' 50% closed, if more time or more flow is required to fill the Rinse Tank, operate the Chemical Hopper or other auxiliary functions.  
The filling process can be stopped at any time by stopping the external fill pump.
- 5 When filling is complete, stop the external fill pump, then close the 'Main Tank Inlet Valve' & suction hose valve.
- 6 Disconnect the suction hose from the 'Clean Fill Inlet' camlock coupling when filling & cleaning is completed.

#### NOTE

If filling the Rinse Tank at the same time as the Main Tank, the 'Main Tank Fill Valve' can be partially close so that individual tank filling rates are reduced when filling both tanks at the same time.





Connect a 3" suction hose to the 'Clean Fill Inlet'.

## To Fill the Rinse Tank - Fill Pump Option not fitted

- 1 Connect a 3" suction hose (not supplied) to the 3" camlock coupling of the 'Clean Fill Inlet'. Connect the other end of the suction hose connected to a clean water source.
- 2 Fully open the ball valve on the suction hose.
- 3 Fully open the 'Main Tank Fill Valve'.
- 4 Open the Rinse Tank Fill Valve.
- 5 Operate the external fill pump to start the filling the Main Tank and Rinse Tank.  
Fill speed of the Rinse Tank can be increase by rotating the 'Main Tank Fill Valve' 50-75% closed.  
The filling process can be stopped at any time by stopping the external fill pump.
- 6 When filling is complete, stop the external fill pump, then close the 'Main Tank Inlet Valve', Rinse Fill valve & Suction hose valve.
- 7 Disconnect the suction hose from the 'Clean Fill Inlet' camlock coupling when filling & cleaning is completed.

### NOTE

Before disconnecting the suction hose from the Clean Fill Inlet, it should be noted the Drum Rinse & Hopper Rinse nozzles both require the use of suction hose for the supply clean water when rinsing.  
If hopper rinsing will be required, keep the suction hose connected to the clean water source until completion of the rinsing functions.



Remove the Hand Wash Tank fill cap to fill the tank with clean water only. Replace the cap when the tank is filled.

## To Fill the Hand Wash Tank

- 1 Connect a fresh water hose to a fresh water source.
- 2 Open the lid on top of the fresh water tank located next to the 'Clean Fill Inlet'.  
An alternative method of filling the tank is to connect a hose to the on the 'Hand Wash Valve' outlet.
- 3 Open the 'Hand Wash Valve' outlet & turn On fresh water hose to fill the tank with fresh water.
- 4 Turn Off the fresh water hose valve when full.
- 5 Remove the hose and close the fresh water tank lid, or alternatively, close the 'Hand Wash Valve' and remove the hose.

### CAUTION

Always ensure the hand wash tank is filled with clean water at all times.  
Never fill the hand wash tank with dirty or contaminated water. Always use fresh clean water to fill the tank.  
In case of emergency, this water must be used to clean chemical off an operator.



Connect a 3" suction hose to the 'Clean Fill Inlet' and provide at least 500 litres of clean water in the product tank before adding chemicals.

## Adding Chemicals to the Product Tank

Chemicals are added to the Product Tank using the:

- Chemical Induction Hopper (granular & liquid)
- Chemical Probe (liquid only).

Before adding chemical to the Product tank, at least 500 litres of clean water must be in the Product Tank.

At least 500 litres is required for the Product Pump to operate:

- The venturi effect required to transfer fluid from the Chemical Induction Hopper to the Product Tank and
- The agitator to keep added chemicals mixed.

All functions for adding chemicals to the Product tank require the Prairie Special to be safely parked in an appropriate area with the tractor engine running.

### CAUTION

Always ensure the sprayer is properly calibrated & tested before beginning to spray (refer to chapter 5, "Calibration - Checking your Application Rates").  
Failure to properly calibrate and test chemical mixtures & nozzles may result in undesirable and damaging outcomes.



Chemical Hopper in raised/transport position.



Remove safety pin & lifting arm locking pin. Support hopper weight, pull the latch lever to unlock, then lower the hopper.



Release the latch & open the Hopper lid.



Operate pump speed to generate at least 80 psi (with hopper valves open).

## Chemical Induction Hopper

The Chemical Induction Hopper provides mixing, measuring and induction functions for adding required chemicals to the Product Tank.

The Bottom Drain Valve of the Chemical Induction Hopper can be used as an entry point for Chemical Induction directly to the Product Tank.

### To Lower the Chemical Induction Hopper

- 1 Remove the safety pin, then the locking pin from the hopper lifting arms.
- 2 Support the weight of the hopper, then pull the latch lever beside the hopper to unlock the latch holding the hopper in position.
- 3 Pull down the hopper slowly to its work position.
- 4 Check the hoses connecting to the hopper are not restricted or kinked.

### To Add & Mix Chemicals in the Chemical Induction Hopper

- 1 Release the hopper lid latch & open the lid.
- 2 Turn the 'Bypass/Hopper Valve' to 'Hopper'.

#### NOTE

Wear the necessary protective clothing and use the required safety equipment to avoid exposure to chemicals.

- 3 Start the Product Pump (Hydraulic or PTO drive) to pump liquid from the Product tank. The pump should operate at a speed to generate at least 80 psi (with hopper valves open). Check system pressure on the pump gauge & adjust as necessary.
- 4 Open the Mixing Jet valve on the right hand side of the hopper to start mixing.

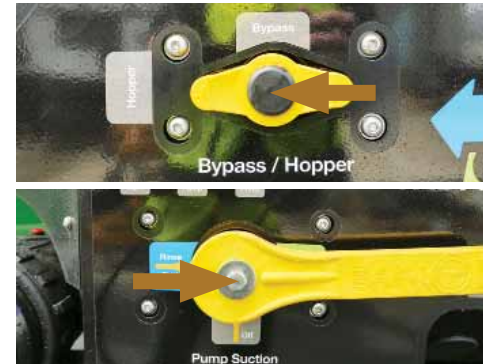
To lower the Chemical Induction Hopper, remove the hopper safety pin & locking pin.



Support the hopper weight while unlocking the latch lever, then lower the hopper to its working position.



Rotate the 'Bypass/Hopper Valve' to Hopper and the 'Pump Suction Valve' to Product Tank position.



Open the Mixing Jet valve on the RHS of the Hopper.







Add the chemical granules or powder to the flowing liquid.

- 6 Add the required chemical granules or powder into the flowing liquid.  
If required leave the mixing jet On to assist induction.
- 7 Open the foot operated 3" ball valve at the base of the Hopper to transfer product into the Main Tank.

## NOTE

When transferring contents of the hopper to the Product Tank, avoid letting the hopper run empty or suck air because it may cause foaming in the Product Tank.

Lift-up to Open the foot operated ball valve at the bottom of the hopper.



On completion of mixing, Close the Mixing Jet valve.

- 8 Close the Mixing Jet valve on the right hand side of the hopper.
- 9 Close the foot operated 3" ball valve at the base of the hopper.
- 8 Rinse all chemicals from the Hopper (refer to instructions in this Chapter 'Hopper Rinse Functions').

Push-Down to Close the foot operated ball valve at the base of the hopper.



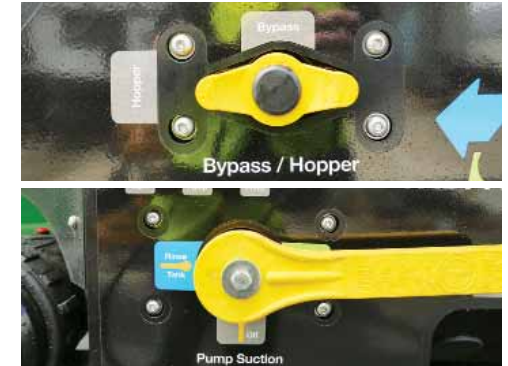
Lift-up to Open the foot operated ball valve at the bottom of the hopper.

## Adding Liquid Chemicals to the Product Tank via the Chemical Hopper Bottom Drain Valve

The Bottom Drain Valve of the Chemical Induction Hopper can be used to add liquid chemicals directly to the Product Tank using a:

- Micromatic Coupling or
- Chemical Probe.

Push-Down to Close the foot operated ball valve at the base of the hopper.



Rotate the 'Bypass/Hopper Valve' to Hopper and the 'Pump Suction Valve' to Product Tank position.

## To Add Liquid Chemical the Product Tank Using the Micromatic Coupling

- 1 Close the Bottom Drain Valve, remove the camlock coupling & fit a micromatic hose.
- 2 Turn the 'Bypass/Hopper Valve' to 'Hopper'.
- 3 Start the Product Pump (Hydraulic or PTO drive) to pump liquid from the Product tank.  
The pump should operate at a speed to generate at least 80 psi (with hopper valves open). Check system pressure on the pump gauge & adjust is necessary.

Operate pump speed to generate at least 80 psi (with hopper valves open).



## Ready to Spray – Operation



Open the Bottom Drain Valve to transfer chemical to the main tank.



Disconnect the micromatic hose from the chemical source, then rinse the hose.



Lift-up to Open the foot operated ball valve at the bottom of the hopper.



Rotate the 'Bypass/Hopper Valve' to Hopper and the 'Pump Suction Valve' to Product Tank position.

- 4 Open the Bottom Drain Valve at the base of the Hopper to transfer product into the Main Tank.
- 5 Close the Bottom Drain Valve valve on completion of chemical transfer.

- 6 Disconnect the micromatic hose from the chemical source and rinse with clean water by opening & closing the Bottom Drain Valve of the Chemical Induction Hopper as required.
- 7 Fit the Enviro coupling onto the micromatic rinse socket if required.
- 8 Disconnect the micromatic hose from the Bottom Drain Valve camlock coupling and refit the camlock coupling cap.

### To Add Liquid Chemical to the Product Tank Using the Chemical Probe

- 1 Close the Bottom Drain Valve & remove the camlock coupling.
- 2 Connect a chemical probe hose to the Bottom Ball Valve camlock coupling.
- 3 Turn the 'Bypass/Hopper Valve' to 'Hopper'.

- 4 Start the Product Pump (Hydraulic or PTO drive) to pump liquid from the Product tank. The pump should operate at a speed to generate at least 80 psi (with hopper valves open). Check system pressure on the pump gauge & adjust is necessary.

Close the Bottom Drain Valve, disconnect the micromatic hose & refit the camlock coupling cap.



Push-Down to Close the foot operated ball valve at the base of the hopper.



Operate pump speed to generate at least 80 psi (with hopper valves open).



### NOTE

When transferring contents of the hopper to the Product Tank, avoid letting the hopper run empty or suck air because it may cause foaming in the Product Tank.





Open the Bottom Drain Valve for transferring chemical to the product tank.

- 5 Open the Bottom Drain Valve for transferring chemical to the product tank.
- 6 Place the Chemical Probe into the chemical, then Open the Probe Valve to transfer the chemical to the Product tank. Chemical will begin transferring to the Product tank.
- 7 After the required amount of chemical has been transferred to the Product tank, pull the Probe out of the drum to allow the pump to suck air & purge all chemical mixture out.

Open the Bottom Drain Valve for transferring chemical to the product tank.



On completion of rinsing, close the Probe valve.

- 8 Rinse the Chemical Probe and hose by placing the Probe into a container of clean water with the Probe valve Open to suck clean water through the Probe and hose. On completion of rinsing, Close the Probe Valve.
- 9 Disconnect the Chemical Probe hose from the 1" Chemical Probe Inlet & replace the camlock cap.

Close the Bottom Drain Valve, disconnect the Chemical Probe hose & refit the camlock coupling cap.



Rotate the 'Chemical Pump Outlet' valve to 'Product Tank'.

## Adding Liquid Chemical Using the Chemical Pump (Optional)

If fitted, the Chemical Pump option allows liquid chemical to be added directly to the Product Tank or the Chemical Hopper using a:

- Micromatic Coupling or
- Chemical Probe.

## To Add Liquid Chemical Directly to the Product Tank Using the Micromatic Fitting

- 1 Connect a Micromatic hose to the 1" Chemical Probe Inlet.
- 2 Open the Chemical Probe inlet valve.

Open the Chemical Probe inlet valve.



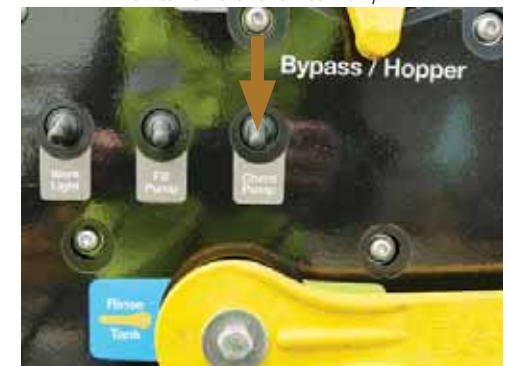
Connect the Micromatic hose to the chemical source.

- 3 Connect the other end of hose to a chemical source using the Micromatic coupling.
- 4 Rotate the Chemical Pump Output Selector to 'Product Tank' position.
- 5 Switch On the 'Chemical Pump'. Chemical will begin transferring to the Product Tank.

## CAUTION

Do not let the 'Chemical Pump' run with a closed suction inlet as it may damage the pump.

Switch On the 'Chemical Pump'.





Switch Off the 'Chemical Pump'.



Connect the Micromatic hose coupling to the 'Micromatic Rinse' outlet on the Prairie Special.



Connect the Micromatic hose & Open Chemical Probe inlet valve.



Rotate the 'Chemical Pump Outlet' valve to 'Product Tank'.

- 6 After the required amount of chemical has been transferred to the hopper, the Enviro coupler can be partially disconnected to allow air to suck into and clear fluids in the pump and hoses.
- 7 Switch Off the 'Chemical Pump'.

#### To rinse the Micromatic Hose & Fittings:

- 1 Disconnect the Micromatic hose end from the chemical source and connect it to the Micromatic Rinse Coupling on the Prairie Special.
- 2 Switch On the 'Chemical Pump'. Rinse will transfer to the Product Tank.
- 3 After rinsing, disconnect the micromatic coupling from the rinse socket and allow air to suck.
- 5 Switch Off the 'Chemical Pump'.
- 6 Rotate the Probe Inlet valve to Off position and disconnect the hose from the 1" Probe Inlet & refit the camlock cap.

#### To Add Liquid Chemical to the Hopper Using the Micromatic Coupling

- 1 Connect a Micromatic hose to the 1" Chemical Probe Inlet.
- 2 Open the Chemical Probe inlet valve
- 3 Connect the other end of hose to a chemical source using the Micromatic coupling.
- 4 Rotate the Chemical Pump Output Valve to 'Hopper' position.

- 5 Switch On the 'Chemical Pump'. Chemical will begin transferring to the Chemical Induction Hopper.
- 6 After the required amount of chemical has been transferred to the hopper, the Enviro coupler can be partially disconnected to allow air to suck into and clear fluids in the pump and hoses.
- 7 Switch Off the 'Chemical Pump'.
- 8 Close the Chemical Probe Inlet valve.
- 9 Transfer chemical from the Hopper to the Product Tank - as outlined in this chapter.

#### CAUTION

Do not let the 'Chemical Pump' run with a closed suction inlet as it may damage the pump.

#### NOTE

After adding chemical to the Product Tank, ensure both Pump Product and Agitator push buttons are On to keep the chemical evenly mixed in the tank ready for spraying.



Connect the Micromatic hose to the chemical source.



Switch On the 'Chemical Pump'.





Connect the Micromatic hose coupling to the 'Micromatic Rinse' outlet on the Prairie Special.

## To rinse the Micromatic Hose & Fittings:

- 1 Disconnect the Micromatic hose end from the chemical source, then connect it to the Micromatic Rinse Coupling on the Prairie Special & Open the Rinse Coupling Valve (located above the coupling).
- 2 Rotate the Chemical Pump Output Valve to 'Hopper' position or Product Tank as required.
- 3 Switch On the 'Chemical Pump'.  
Rinse will transfer to the Chemical Induction Hopper or Product Tank according to choice.

- 4 Disconnect the micromatic coupling from the rinse socket and allow air to suck.
- 5 Switch Off the 'Chemical Pump'.
- 6 Rotate the Probe Inlet valve to Off position and disconnect the hose from the 1" Probe Inlet & refit the camlock cap.
- 7 Refer to instructions 'To Add & Mix Chemical in the Chemical Induction Hopper' & 'To Transfer Chemical from the Hopper to the Product Tank' to complete the hopper procedures.

## NOTE

If a tank has been filled & spray mixture has settled, agitate for as long as it takes to pump the total quantity of water in the tank to remix the chemicals.

For example: For a tank with 6000 litres using a 250 L/min pump, agitate for  $6000 \div 250 = 15$  minutes



Rotate the 'Chemical Pump Outlet' valve to 'Product Tank'.

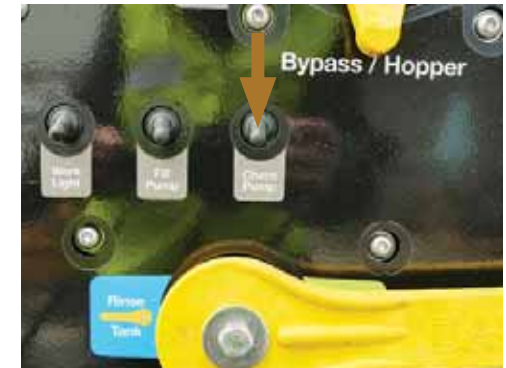
## To Add Liquid Chemical Directly to the Product Tank Using the Chemical Probe

- 1 Connect a Chemical Probe hose to the 1" Chemical Probe Inlet.
- 2 Open the Chemical Probe inlet valve.
- 3 Place the Chemical Probe at the chemical source.

**CAUTION**

Do not let the 'Chemical Pump' run with a closed suction inlet as it may damage the pump.

Open the Chemical Probe inlet valve.



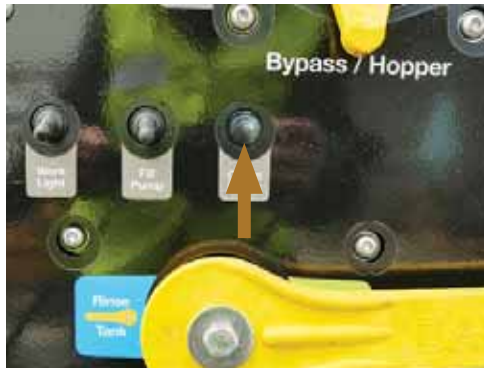
Switch On the 'Chemical Pump'.

- 4 Rotate the Chemical Pump Output valve to 'Product Tank' position.
- 5 Open the Chemical Probe Inlet Valve.
- 6 Switch On the 'Chemical Pump'.
- 7 Place the Chemical Probe into the chemical & Open the Probe Valve. Chemical will begin transferring to the Product Tank.
- 8 After the required amount of chemical has been transferred to the hopper, lift the Probe out of the drum to suck air and purge the system.

Open the Probe Valve to transfer chemical to the Hopper.



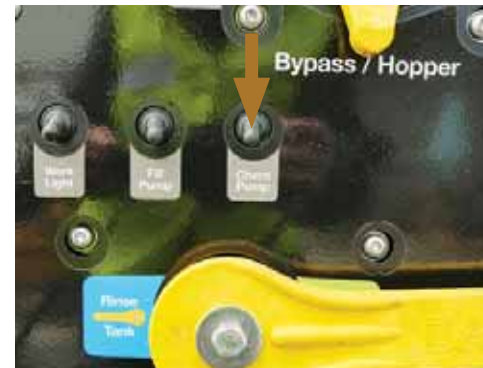
## Ready to Spray – Operation



Switch Off the 'Chemical Pump'.



Rotate the 'Chemical Pump Outlet' valve to 'Hopper'.



Switch On the 'Chemical Pump'.



Switch Off the 'Chemical Pump'.

- 9 To rinse the Chemical Probe and hose, place the Probe into a container of clean water, then Open the Probe to suck clean water through the Probe and hose.

On completion of rinsing, Close the Probe Valve.

- 10 Switch Off the 'Chemical Pump'.

- 11 Rotate the Chemical Probe valve to Off position.

- 12 Disconnect the Chemical Probe hose from the 1" Chemical Probe Inlet & replace the camlock cap.

### To Add Liquid Chemical Directly to the Chemical Induction Hopper Using the Chemical Probe

- 1 Connect a Chemical Probe hose to the 1" Chemical Probe Inlet.
- 2 Open the Chemical Probe inlet valve.
- 3 Place the Chemical Probe at the chemical source.

#### CAUTION

Do not let the 'Chemical Pump' run with a closed suction inlet as it may damage the pump.

- 4 Rotate the Chemical Pump Output valve to 'Hopper' position.

- 5 Open the Chemical Probe Inlet Valve.

- 6 Switch On the 'Chemical Pump'.

- 7 Place the Chemical Probe into the chemical & Open the Probe Valve to transfer chemical to the Hopper. Chemical will begin transferring to the Hopper.

- 8 After the required amount of chemical has been transferred to the Hopper, lift the Probe out of the chemical to suck air and purge the system.

- 9 To rinse the Chemical Probe and hose, place the Probe into a container of clean water, then Open the Probe to suck clean water through the Probe and hose.

On completion of rinsing, close the Probe Valve.

- 10 Switch Off the 'Chemical Pump'.

- 11 Rotate the Chemical Probe valve to Off position.

- 12 Disconnect the Chemical Probe hose from the 1" Chemical Probe Inlet & replace the camlock cap.

After completion of rinsing close the Probe Valve.



Open the Chemical Probe inlet valve.



Open the Probe Valve to transfer chemical to the Hopper.



After completion of rinsing close the Probe Valve.







The Hopper Rinse Nozzle located under the hopper lid.



Check the 'Hopper Rinse' valve on the top of the hopper is Closed.



Access the Drum Rinse Nozzle.



Empty Hopper rinse by transferring its contents to the Product Tank.

## Hopper Rinse Functions

The Chemical Induction Hopper provides several rinsing functions:

- Drum Rinse Nozzle
- Hopper Rinse Nozzle
- Wash Down Gun

After rinsing, the Chemical Induction Hopper can be emptied by:

- Transferring contents to the Product Tank (see previous instruction) or
- Emptying the Hopper via the Bottom Drain valve.

### a) To Use the Drum Rinse Nozzle

- Connect a 3" suction hose (not supplied) to the 'Clean Fill' camlock coupling with the other end connected to a clean water source.
- Open the 'Clean Fill' ball valves by moving the handles down (Prairie Special & Suction hose).
- Check the 'Hopper Rinse' valve on the top of the hopper is Closed.
- Open the Hopper lid to access the Drum Rinse Nozzle.
- Start the 'Fill Pump'.  
If required, partially close the Product Tank Fill valve to increase pressure at the hopper for rinsing.
- Place the opening of the chemical drum over & onto the Drum Rinse Nozzle inside the hopper.
- Press the drum down on the Drum Rinse Nozzle to engage the rinsing function.
- When the drum rinsing is complete, lift & remove the drum from the Drum Rinse Nozzle, then stop the 'Fill Pump'.

- Empty the Hopper rinse by:
- Emptying the Hopper to the Product Tank,
  - or
  - Draining the Hopper via the Bottom Drain valve.

Unlatch and open the Hopper lid.



## NOTE

Ensure the Rinse tank has a sufficient quantity of fresh water before using the rinse functions.

## Ready to Spray – Operation



Lift & remove the Wash Down Handgun from its holder on the side of the hopper.



Open the Rinse Valve on top of the hopper lid.



Lift & remove the Wash Down Handgun from its holder on the side of the hopper.



Point the Wash Down Gun & squeeze the trigger to spray.

### b) To Rinse the Chemical Induction Hopper

- 1 Connect a 3" suction hose (not supplied) to the 'Clean Fill' camlock coupling with the other end connected to a clean water source.
- 2 Open the 'Clean Fill' ball valves.
- 3 Close & lock down the Hopper lid.
- 4 Start the 'Fill Pump'.

- 5 Open the Rinse Valve on the top of the hopper.
- 6 Empty the rinse liquid from the hopper by:
  - Transferring contents of the Hopper to the Product Tank, or
  - Emptying the Hopper via the Bottom Drain valve.
- 7 Once the Hopper tank is clean, stop the 'Fill Pump'.
- 8 Close the Rinse Valve on the top of the hopper.
- 9 When all rinse functions are completed, close the 'Clean Fill' ball valves and disconnect the suction hose from the camlock coupling.

Close & lock down the hopper lid.



### c) To Use the Wash Down Gun

- 1 Connect a 3" suction hose (not supplied) to the 'Clean Fill' camlock coupling with the other end connected to a clean water source.
- 2 Open the 'Clean Fill' ball valves.
- 3 Start the 'Fill Pump'
- 4 Lift & remove the Wash Down Gun from its holder on the side of the hopper.
- 5 Check the hose is not kinked or pinched.

- 6 Point the Wash Down Gun towards the hopper area to be rinsed/cleaned, then squeeze the gun trigger to spray & wash as required.
- 7 Release the gun trigger to stop spraying.
- 8 On completion, stop the 'Fill Pump'.
- 9 Return the gun to its holder on the side of the hopper.

### CAUTION

Wash the spray gun with clean water, not rinsate  
Be mindful of where rinsate is deposited as it may contain chemical residue.



On completion, Close the 'Bottom Drain' valve & 'Bottom Hopper Drain' valve, then refit the camlock cap.

## To Empty the Hopper via the Bottom Drain Valve:

- 1 Lift up the lever to Open the foot operated 'Bottom Hopper Drain' valve at the base of the hopper.
- 2 Remove the camlock coupling plug & Open the Bottom Drain valve.  
This will drain the Hopper tank & hoses.
- 3 On completion Close the 'Bottom Drain' valve and 'Bottom Hopper Drain' valve.
- 4 Refit the camlock cap.



Close & lock down the hopper lid.

## To Raise the Chemical Induction Hopper into Transport Position

- 1 Ensure the hopper is empty.
- 2 Check the hopper lid is closed and latched.
- 3 Lift and push the hopper up until it latches into its transport position.
- 4 Refit the locking pin to lock-in the hopper lifting arms and refit the safety clip.

Raise the Hopper, then refit the locking pin & locking pin clip.



## Product Tank Agitation

It is vital tank agitators are used while filling the sprayer and during the majority of spray application.

Blocked filters, poorly dissolved, poorly mixed or suspended chemicals may result in uneven chemical application causing crop damage and chemical resistance.

Product agitation is controlled manually using the Agitator On/Off valve on the Fast Fill Station.

Check agitators for efficiency because agitator nozzles can block. Refer Chapter 8 'Lubrication & Maintenance' for details.



Standard In-Cab Sprayer Control Console (shown left) with Optional Raven Rate Controller screen (shown right).

## To Agitate While Stationary:

- 1 Add a minimum volume of 500 litres of fresh water to the Product Tank.
- 2 Start the Product Pump, then Open the 'Agitator' valve to On.
- 3 Add all chemicals.  
See instructions - 'Filling the Sprayer' & 'Adding Chemicals to the Product Tank'.
- 4 Add remaining water as required.

Open the main tank 'Agitator' valve.



## NOTE

If a tank has been filled & spray mixture has settled, agitate for as long as it takes to pump the total quantity of water in the tank to remix the chemicals.

For example: For a tank with 6000 litres using a 250 L/min pump, agitate for  $6000 \div 250 = 15$  minutes



## Ready to Spray – Operation



Use the Control Console 'Boom Height' switch to lower/raise boom height to desired height above target.



Use the Control Console switch 'Boom Recirc' to start boom recirculation.



Use the Control Console switch 'Spray' to start spraying.



Use the Control Console 'Fence Jet' switch to start and stop Left & Right Fenceline nozzles as required.

### Spraying Application with Standard Cabin Controls

After completion of filling, the Prairie Special is ready for spraying.

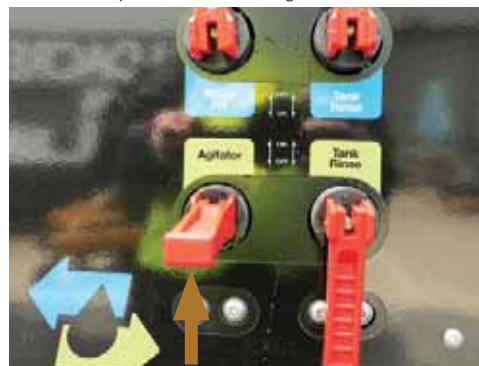
While travelling from filling to a field, both Product Pump & Agitator must be On to ensure chemicals are mixed adequately prior to spraying.

#### To Commence Spraying:

- 1 Enter the field and unfold the boom (for instructions, refer to 'Boom Folding/Unfolding'.
- 2 Set the boom to the desired height above the application target.

- 3 Switch On the Universal Terminal of the Raven PC1 ISO BUS.
- 4 Check to ensure correct application rates have been entered.
- 5 Start the 'Pump Product' (if not already started).
- 6 Open the main tank 'Agitator Valve'.
- 7 Press the 'Boom Recirc' switch On to start boom recirculation (priming). Refer to air pressure & spray pressure gauges to see when the machine is fully primed.

Open the main tank 'Agitator' valve.



- 8 When fully primed, press the 'Spray' switch On & commence travelling on the spray swath.  
The Raven PC1 ISO BUS & Universal Terminal now control the spraying application rate according to the preset values entered by the operator.
- 9 Fenceline nozzles can be switched On & Off as required by using the 'Fence Jet' push buttons.

Boom Master must be On for the fenceline nozzles to operate:

- Press the left hand (upper) 'Fence Jet' push button to switch On the left boom tip Fenceline nozzle.
- Press the right hand (lower) 'Fence Jet' push button to switch On the right boom tip Fenceline nozzle.

When activated, push buttons illuminate Blue and a red LED on the boom tip illuminated.

- To switch Off the fence line nozzle, press the push buttons.

### CAUTION

Always ensure the sprayer is properly calibrated & tested before beginning to spray (refer to chapter 5, "Calibration - Checking your Application Rates").

Failure to properly calibrate and test chemical mixtures & nozzles may result in undesirable & damaging outcomes.

### NOTE

This information is provided as a guide only.

It is the full responsibility of the operator to have correctly set-up & calibrated the sprayer and to assess the field conditions in all spraying applications.





Use push buttons to adjust boom tilt & height as required.

10 To make boom adjustments as required while spraying, use the push buttons:

- 'Left Tilt' Up/Down
- 'Right Tilt' Up/Down
- 'Boom Height' Up/Down

11 As the Product Tank gets closer to minimum tank level (300 litres), it may be necessary to push the 'Agitator Valve' to Off position to reduce foaming.

12 When the Product Tank is empty:

- Press the 'Boom Master On/Off' push button to stop spraying
- On the Auxiliary Switch box, press the 'Boom Recirc' push button to stop the boom recirculation
- Push the 'Agitator Valve' to Off position, then
- Stop the Product Pump, and
- Return to water source to refill (refer to 'Filling the Sprayer' & 'Adding Chemicals to the Product Tank'.



When the Product Tank is empty, shut off all spraying functions, then return to the clean water source to refill.

13 On completion of spraying at:

- End of the day
- End of a product or
- End of season,

follow the appropriate rinsing instructions to ensure all plumbing is flushed & completely clean.

## Rinsing the Sprayer After Spraying

Never leave chemical or contaminated liquid within the Prairie Special's spraying system. After spraying the spraying system must be rinsed clean. Three methods of rinsing are given:

- 1 Quick Rinse or Boom Rinse
- 2 Basic Rinse
- 3 Total Rinse & Decontamination.

### NOTE

After adding chemical to the Product Tank, ensure both Pump Product and Agitator push buttons are On to keep the chemical evenly mixed in the tank ready for spraying.

### NOTE

The operator must wear the operator safety belt at all times when seated in the cabin or when the machine is in motion.

### WARNING

The operator must take extra care to ensure no person is standing on or near the folding ladder when applying or releasing the sprayer's park brake (as folding is started by releasing & unfolding is started by applying the park brake). Failure to follow instructions may cause serious injury.

## Ready to Spray – Operation



Rotate the 'Pump Suction Valve' to 'Rinse Tank'.



Use the push buttons start Boom Recirculation, then 'Spray' when required.



Gauge Drain valve closed (shown left) & Gauge Drain valve open (shown right).



Pull out the 'Main Tank Drain Valve Lever' to safely & completely drain the Product Tank, then close the valve.

### Quick Rinse or Boom Rinse

Boom Rinse is recommend for use only at end of the day or for short operational breaks where it is intended to continue with the same chemicals.

Quick Rinse draws clean water from the Rinse Tank and requires the Rinse Tank to be full prior to start of Quick Rinsing (refer to 'Tank Filling' instructions earlier in this chapter).

### To Quick Rinse the Boom

- 1 Rotate the 'Pump Suction Valve' to 'Rinse Tank'.
- 2 Open the fresh water 'Tank Rinse' valve.
- 3 Start the Product Pump.
- 4 Press the 'Boom Recirc' push button On to flush boom recirculation system with fresh water.

- 5 Open the spray gauge valve (located on the side of the hitch) to flush out chemical, from the gauges, then close the valve.
- 6 Switch Boom Recirculation Off.
- 7 On completion of the boom rinse:
  - Close the 'Tank Rinse' valve
  - Stop the Product Pump.
- 8 Return the 'Pump Suction Valve' to 'Product Tank'.

### Basic Rinse

A Basic Rinse is necessary at end of the day operations if intending to later continue with the same chemicals.

Basic Rinsing draws clean water from an external source using a Fill Pump & 'Clean Fill Inlet'.

### To Basic Rinse the Spray System:

- 1 Safely park the Prairie Special & unfold the boom.
- 2 Pull out the 'Main Tank Drain Valve Lever' (next to the 'Clean Fill Inlet') to safely and completely drain the Product Tank, then close the valve.

Open the fresh water 'Tank Rinse' valve.



Return the 'Pump Suction Valve' to 'Product Tank'.



Main Tank Drain Valve (underneath the sprayer) in closed position.





Unhook & open the Sump Drain Valve - lowering it to completely empty the main tank sump.



Rotate the 'Pump Suction Valve' to 'Product Tank'.



Press the 'Boom Recirc' push button to start boom recirculation.



Gauge Drain valve closed (shown left) & Gauge Drain valve closed (shown right).

- 3 Unhook the 'Sump Hose Drain Valve', open the valve & lower it, to completely drain the Product Tank sump. When empty, close the valve & re-hook the hose into position.
- 4 Connect a 3" suction hose (not supplied) to the 'Clean Fill' camlock coupling with the other end of the hose connected to a clean water source (refer to 'Tank Filling' instructions in this chapter).
- 5 Open the 'Main Tank Fill Valve' and clean fill hose valves (refer to 'Tank Filling' instructions in this chapter).

- 6 Start the Fill Pump and fill the Product Tank with about 200 litres of clean water (refer to 'Tank Filling' instructions in this chapter).
- 7 Fill the Rinse Tank full of clean water (refer to 'Tank Filling' instructions in this chapter).
- 8 Stop the Fill Pump and close the 'Main Tank Fill Valve'.
- 9 Rotate the 'Pump Suction Valve' to 'Product Tank'.
- 10 Check the main tank 'Agitator' valve is open.
- 11 Start the Product Pump.

- 12 Press the 'Boom Recirc' push button On to flush the boom recirculation system.
- 13 Press left & right 'Spray Jet' push buttons to rinse fenceline nozzles. Press the push button again to stop nozzles spraying.
- 15 Open the spray gauge valve (located on the side of the hitch) to flush out chemical, then close the valve.  
After boom circulation system is flushed, press the 'Spray' push button to stop recirculation.

- 16 Turn Off all valves to allow the pressure relief valve to release and purge the pressure relief to line.
- 17 On completion of rinse, stop the Product Pump.
- 18 Open the 'Main Tank Drain Valve Lever' to completely drain the tank. Close the valves when completely empty.
- 19 Unhook the 'Sump Hose Drain Valve', open the valve & lower it, to completely drain the Product Tank sump. When empty, close the valve & re-hook the hose into position
- 20 Clean the suction & pressure filters.
- 21 Shut-down the Prairie Special and store as required.

Check the main tank 'Agitator' valve is open.



Press the 'Spray' push button to clean boom nozzles, as well as the left & right 'Spray Jet' push buttons.



## CAUTION

When rinsing, the rinsate is potentially very hazardous depending on chemical content. Use recommended personal protective equipment (PPE). For specific information on rinsing & decontamination of the chemicals being applied, it is recommended to consult the chemical manufacturer's label and/or your chemical supplier.

## CAUTION

Do not run a centrifugal pump dry as damage will occur to the pump.





*On completion of spraying, follow rinsing instructions to ensure all plumbing is flushed & completely clean.*



*Pull out the 'Main Tank Drain Valve Lever' to safely & completely drain the Product Tank, then close the valve.*



*Unhook & open the Sump Drain Valve - lowering it to completely empty the main tank sump.*



*Use the Chemical Induction Hopper to add & mix the appropriate decontamination agent.*

## Total Rinse & Decontamination

Total Rinse & Decontamination of the Prairie Special's spraying system is important whenever changing chemical applications and at the end of spraying applications.

Total Rinse & Decontamination draws clean water from an external source using the Fill Pump & 3" clean water inlet and uses an appropriate cleaner/decontaminant is added to clean & neutralise chemicals used.

The procedure requires a minimum of 1000 litres of clean water in the Product Tank and the Rinse Tank must be filled before proceeding.

## To Totally Rinse & Decontaminate the Spray System:

- 1 Safely park the Prairie Special & unfold the boom.

- 2 Pull out the 'Main Tank Drain Valve Lever' (next to the 'Clean Fill Inlet') to safely and completely drain the Product Tank, then close the valve.
- 3 Unhook the 'Sump Hose Drain Valve', open the valve & lower it, to completely drain the Product Tank sump. When empty, close the valve & re-hook the hose into position.
- 4 Open the hopper lid, then open the drain valve to empty the to the top of the tank.
- 5 Connect a 3" suction hose (not supplied) to the 'Clean Fill' camlock coupling with the other end of the hose connected to a clean water source (refer to 'Tank Filling' instructions in this chapter).
- 6 Open the 'Main Tank Fill Valve' and clean fill hose valves (refer to 'Tank Filling' instructions in this chapter).
- 7 Start the Fill Pump and fill the Product Tank with about 1000 litres of clean water (refer to 'Tank Filling' instructions in this chapter).
- 8 Fill the Rinse Tank full of clean water (refer to 'Tank Filling' instructions in this chapter).
- 9 Stop the Fill Pump and close the 'Main Tank Fill Valve'.
- 10 Rotate the 'Pump Suction Valve' to 'Product Tank'.
- 11 Open the main tank 'Agitator' valve.

*Open the main tank 'Agitator' valve.*



- 12 Use the Chemical Induction Hopper to mix & add the appropriate decontaminating agent to the Product Tank (refer to 'To Add & Mix Chemicals in the Chemical Induction Hopper' instructions in this chapter).
- 13 Start the Product Pump.
- 14 To ensure the decontaminating agent fully neutralises any chemicals previously used in the Hopper, Open the 'Mixing Jet' and allow it to fill the hopper to the top.

Once full, turn Off the 'Mixing Jet' and let the liquid remain in the Hopper a few minutes before transferring the liquid into the Product Tank.

*Open the Mixing Jet valve on the RHS of the Hopper.*







Press the 'Boom Recirc', 'Spray' & 'Spray Jet' push buttons to clean the boom lines & nozzles.

Continue to run the hopper to clean the hoses.

- 15 Press the 'Boom Recirc' push button On to clean the boom recirculation system.
- 16 After boom circulation system is cleaned, press the 'Spray' push button and switch the boom On (via the ISObus controller) to clean the boom nozzles. Then switch the boom recirculation back On.
- 17 Press left & right 'Spray Jet' push buttons to rinse fenceline nozzles.
- 18 Open the spray gauge valve (located on the side of the hitch) to clean out chemicals, then close the valve.

Gauge Drain valve closed (shown left) & Gauge Drain valve closed (shown right).



Pull out the 'Main Tank Drain Valve Lever' to safely & completely drain the Product Tank, then close the valve.

- 19 Close Off all valves to allow the pressure relief valve to release and purge the pressure relief to line.
- 19 On completion, Stop the Product Pump.
- 20 Open the 'Main Tank Drain Valve Lever' to completely drain the tank. Close the valve when completely empty.
- 21 Unhook the 'Sump Hose Drain Valve', open the valve & lower it, to completely drain the Product Tank sump. When empty, close the valve & re-hook the hose into position



Unhook & open the Sump Drain Valve - lowering it to completely empty the main tank sump.

- 22 Clean the suction & pressure filters (refer to 'Pressure Filter & Suction Filter Removal & Cleaning' instructions in this chapter).
- 23 After decontaminating the whole system, proceed to the next procedure 'Flushing the Spray System with Fresh Water'.

## Flush the Spray System with Clean Water

After the 'Total Rinse & Decontamination' procedure is completed, follow the 'Basic Rinse' procedure (steps 4 to 20) to completely flush the Spray System with clean water and remove any remaining rinsate & decontaminating agent.



Before cleaning filters, rotate the 'Pump Suction' valve to Off position to isolate the Product Tank.



Remove the holding pin & disconnect the Red On/Off valve from the base of the pressure filter.



Unscrew the bowl nut, then carefully remove the filter screen & clean the filter bowl, body, screen & O-rings.



Before cleaning filters, rotate the 'Pump Suction' valve to Off position to isolate the Product Tank.

### Pressure Filter Removal & Cleaning

Use PPE (Personal Protective Equipment). For more information refer to Chapter 2 Safety - Essential Risk Management.

It is recommended to remove & clean the Pressure Filter regularly - before each tank fill.

Frequency of cleaning will depend on the quality of water and chemicals used.

The Pressure Filter receives liquid from either the Product Tank or the Rinse Tank via the spray pump.

Prior to removal of the filter for cleaning, self clean the filter by opening the red handle valve on the pressure filter bowl.

### To Remove & Clean the Pressure Filter:

- 1 Ensure the Product Pump is Off.
- 2 Rotate the 'Pump Suction' valve to Off position to isolate liquid coming from the Product Tank.
- 3 Remove the holding pin & disconnect the Red On/Off valve from the base of the pressure filter.
- 4 Loosen the filter bowl nut slowly using the filter spanner supplied.  
Be aware some residual chemical may dribble out.  
Use supplied filter spanner if required.

- 5 Fully unscrew the filter bowl nut and remove the filter bowl.  
Be careful of any chemical and avoid any damage to the O-Rings.
- 6 Clean all filter components (filter bowl, nut, filter screen and O-rings), then refit the components making sure the filter bowl & O-rings are correctly placed.
- 7 Fully tighten the filter bowl nut.
- 8 Refit the Red On/Off valve to the base of the pressure filter, then fit the holding pin.

### Suction Filter Removal & Cleaning

Use PPE (Personal Protective Equipment). For more information refer to Chapter 2 Safety - Essential Risk Management.

It is recommended to remove & clean the Suction Filter regularly - before each tank fill.

Frequency of cleaning will depend on the quality of water and chemicals used

The Suction Filter receives liquid from either the Product Tank or the Rinse Tank. All liquid to be sprayed or flushed through the system passes through this filter.



*Open the drain valve of the Suction Filter.*

## To Remove & Clean the Suction Filter:

- 1 Ensure the Product Pump is Off.
- 2 Rotate the 'Pump Suction' valve to Off position to isolate liquid coming from the Product Tank.
- 3 Open the drain valve on the filter & allow the filter liquid to drain fully.  
Be sure to collect any hazardous chemical and wear appropriate PPE.
- 4 Close the drain valve and loosen the filter bowl collar slowly using the spanner provided.  
Be aware some residual chemical may dribble out.
- 5 After liquid stops flowing from the filter, fully unscrew the filter bowl collar and remove the filter bowl.  
Be careful not to damage the O-Rings.



*Carefully remove the filter screen, then clean the filter bowl, body, screen & O-rings.*

- 6 After removing the filter bowl, carefully remove the filter screen, then clean the filter bowl, body, screen & O-rings.
- 7 After cleaning, refit the components making sure the filter bowl & O-rings are correctly placed.
- 8 Fully tighten the filter bowl collar & close the drain valve.



*Ensure the Prairie Special is properly cleaned and stored at the end of day & end of season.*

## End of Day

At the end of each spraying day, follow the instructions for Basic Rinsing or Total Rinse & Decontamination.

## End of Season

If the Prairie Special is to be stored for a long period of time without use, several procedures must be performed.

- 1 Follow the instructions for Total Rinse & Decontamination.
- 2 Thoroughly examine the Prairie Special to determine if there is any damage.
- 3 Park the Prairie Special where it will not be affected by frosts, and preferably out of direct sunlight.
- 4 Ensure all tanks are empty.

*To empty the Rinse Tank, open its drain valve.*



## Ready to Spray – Operation



- 5 If necessary, remove Prairie Special switches & Controllers from the tractor cabin and store them in a safe & secure location.

### Sprayer Transportation

Ensure all safety precautions are observed when transporting - including:

- 1 Make sure the tractor has sufficient towing and braking capacity to tow the Prairie Special.
- 2 All relevant transport regulations must be adhered to when transporting the sprayer, including speed regulations, oversize signs, flashing light, etc.  
It is the operator's responsibility to know the relevant regulations.
- 3 Make sure the sprayer is securely hitched to the tractor.

- 4 Before travelling, ensure the boom is securely supported and isolation ball valves on the hydraulic lift cylinders are closed.
- 5 Ensure the Tail Light harness is connected to the tractor and lights are working.

#### CAUTION

It is the operator's responsibility to know the tare weight and gross weight of the sprayer.  
If any alterations are made to the sprayer, it is the operator's responsibility to know the tare weight & the gross weight of the modified sprayer at all times.

#### CAUTION

Take care when reversing 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.



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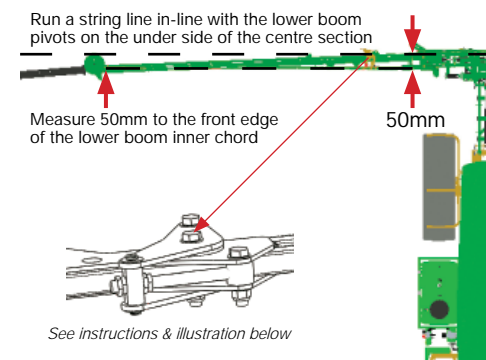
Goldacres Parallift Rear connection to the boom.



On level ground, engage tractor park brake, chock wheels & have the boom in working position before making adjustments.



'Smiling Forward' view on a 36m boom.



Adjust both 1st boom wing sections forward 50mm.

## Boom Settings & Adjustments

Boom Settings & Adjustments include:

- 1 Smiling Forward Settings (24-36m).
- 2 Tilt Angle Settings (24-36m).
- 3 Yaw Alignment.
- 4 Yaw Hydraulic Pressure.
- 5 Tilt Arm Guide Adjustment.
- 6 Three-Way Tip Breakaway.
- 7 Boom Fold Alignment.
- 8 Boom Cable Settings.
- 9 Stainless Steel Protection Plates.
- 10 Boom Centre Levelling.
- 11 Optional Bi-Fold.

### Before Making Boom Adjustments:

- Park the sprayer on a flat level surface with the tractor park brake engaged & wheels chocked.
- Place the boom in its working (unfolded) position.

### NOTE

It is recommended all relevant adjuster nuts and threads be lubricated prior to making adjustments.

### CAUTION

When folding the boom, either manually or automatically, ensure the sprayer chassis is laterally level. If the chassis is sloping laterally, sprayer stability and boom folding can be compromised.

### CAUTION

Before adjusting the boom alignment, the hydraulic fold and bi-fold circuit must be free of air. Hydraulic circuits that contain air can make the boom appear that it is too far forward.

Adjustment of the boom without "bleeding" the hydraulic circuit first will result in a boom that becomes misaligned after a short period of use.

## 1 Smiling Forward Setting (24-36m)

The wings of the 24m - 36m booms comprise two sections and a breakaway end. The first and second sections are adjusted forward at the inner pivot points.

Adjuster bolt used to adjust the 1st boom section forward.

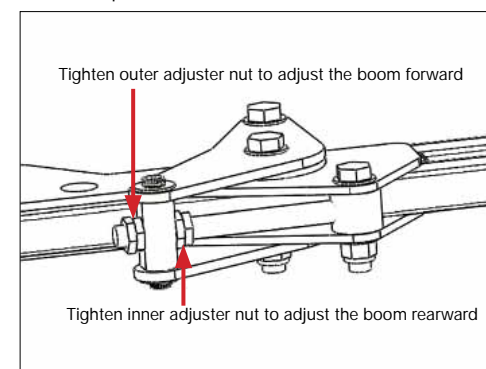


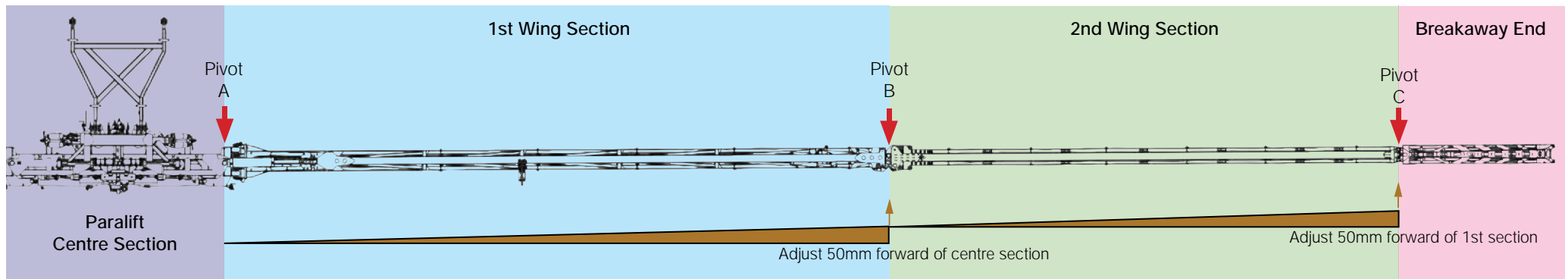
### To Adjust the First Section of the Boom Wings:

- 1 Follow the 'Before Making Boom Adjustments' instruction on this page.
- 2 The first wing section adjustment should bring outer end of the section 50mm forward of the centre section.

A string line can be used as a guide. Alternatively, it may be helpful to observe the boom from underneath as the bottom chords are 50mm wide along the section and provide a visual reference for the forward offset.

- 3 If adjustment is required, loosen the two lock-nuts on the boom fold adjuster bolt on top of the boom.





36 metre Boom: Plan view of right hand side boom wing & the 'Smiling Forward' adjustment points (Pivot A & B).

- 4 To adjust the boom forward, loosen the inner adjuster nut, then tighten the outer adjuster nut.  
To adjust the boom rearward, loosen the outer adjuster nut, then tighten the inner adjuster nut.
- 5 When the 1st section of the boom is in the required position, tighten the opposite adjuster nut, then both locknuts to securely hold its position.
- 6 Once the correct adjustment is achieved, Repeat the process for the LH side inner boom wing.

After adjustment of first boom sections is completed, proceed to align the second sections of the boom wings.

## To Adjust the Second Section of the Boom Wings:

- 1 Using a string line is recommended for achieving correct measurements:
  - 24m, 28m & 30m Trittech booms must be 30-50mm forward of the inner boom section.
  - 36m Trittech booms must be 50mm forward of the inner boom section.

- 2 The cable adjusters and boom stopper bolt are used to align the outer booms:

- To adjust the outer boom forward, loosen the lock nut and wind-in the boom stopper bolt.

At the same time, the turnbuckle (connected to the cable damper springs at the front of the boom) must be shortened and the rear turnbuckle must be lengthened to maintain cable tension.

- To adjust the outer boom rearward, loosen the lock nut and wind-out the boom stopper bolt.

At the same time, the rear turnbuckle (connected to the cable damper springs at the front of the boom) must be shortened and the turnbuckle at the front lengthened to maintain cable tension.

After correct alignment has been achieved on both second wing sections, the cable spring tension must be set so there is a 3mm gap between the coils.

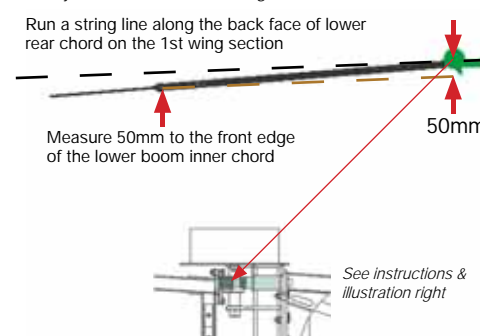
## NOTE

It is important that both wings are adjusted the same. If one wing is adjusted further forwards or rearwards than the other, the boom may not sit level.

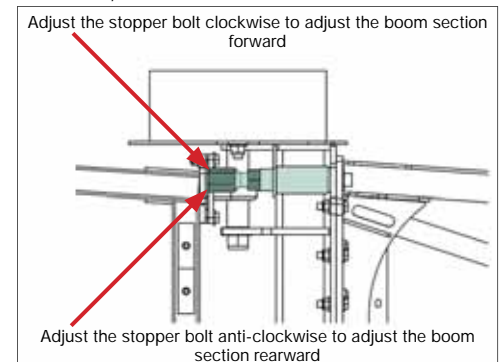
Stopper bolt used to adjust the 2nd boom section forward.

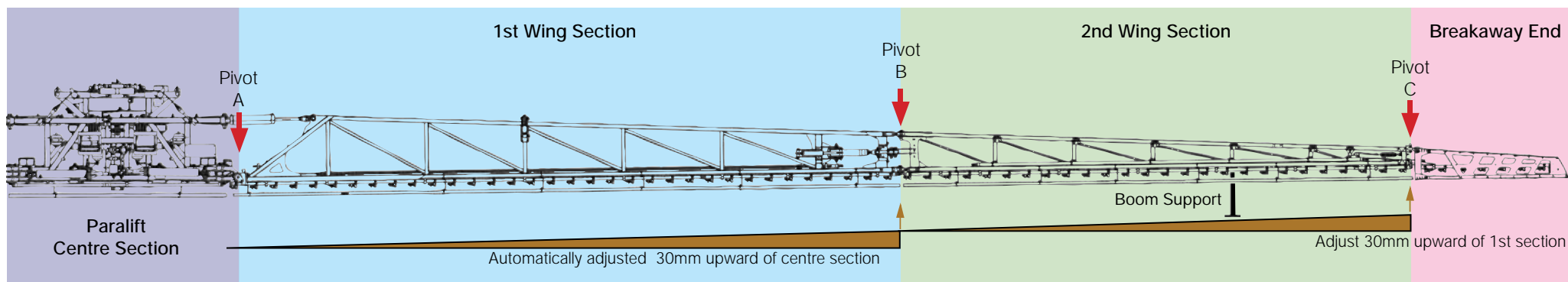


Adjust both 2nd boom wing sections forward 50mm.



Release the locknut, then adjust the stopper bolt as required to move the 2nd section forward.





36 metre Boom: Rear view of right hand side boom wing Tilt Angle adjustment points (Pivot A & B). Use a solid boom support under 2nd wing section for tilt adjustment.

## 2 Tilt Angle Setting (24-36m)

The wings of the 24m - 36m booms comprise two sections and a breakaway end. The first & second wing sections are adjusted upward at the inner pivot point.

The first section tilt angle, at pivot A, is factory set and can be adjusted manually if required.

The second stage tilt angle is also factory set and can be adjusted using the clevis joint threads at pivot B if required.

The boom centre section must be level with the chassis before any boom adjustments are made.

The inner booms must be adjusted first so they are the same height as the centre section or slightly increasing in height from the centre section (to allow for boom stretch). These adjustments are made by lengthening or shortening tilt adjustment on the tilt cylinders.

### NOTE

It is important that both wings are adjusted the same. If one wing is adjusted higher or lower than the other, the boom may not sit level.

### To Adjust the First Section of the RH Wing (Pivot A):

- 1 Follow the 'Before Making Boom Adjustments' instruction at the beginning of this chapter.
- 2 The first wing section adjustment brings the outer end of the section 30mm upward of the centre section. The adjustment is made on the adjustable tilt cylinder rod.

Use a horizontal string line and measure the upward incline of the first boom section.

*The 1st section tilt angle of the RH wing is adjusted manually on the RH wing tilt cylinder rod.*



- 3 If adjustment is required, use the hydraulic tilt adjustment to lower both outer wings onto supports.
- 4 With both booms safely supported, loosen the locknut on the tilt cylinder rod adjustment
- 5 Loosen the lock nut using a 17/8" spanner, then rotate the cylinder rod using a 1 1/2" spanner:
  - Clockwise (inwards) to raise the end of the wing section, or
  - Anti-clockwise (outwards) to lower the end of the wing section.

*Loosen the lock nut using a 17/8" spanner, then rotate the cylinder rod using a 1 1/2" spanner:*



- 6 Use the tilt cylinder hydraulics to raise the boom section, remove the support and level the boom. Re-check the outer end of the section is 30mm upward of the centre section (step 2).

If correct, tighten the locknut using a 17/8" spanner.

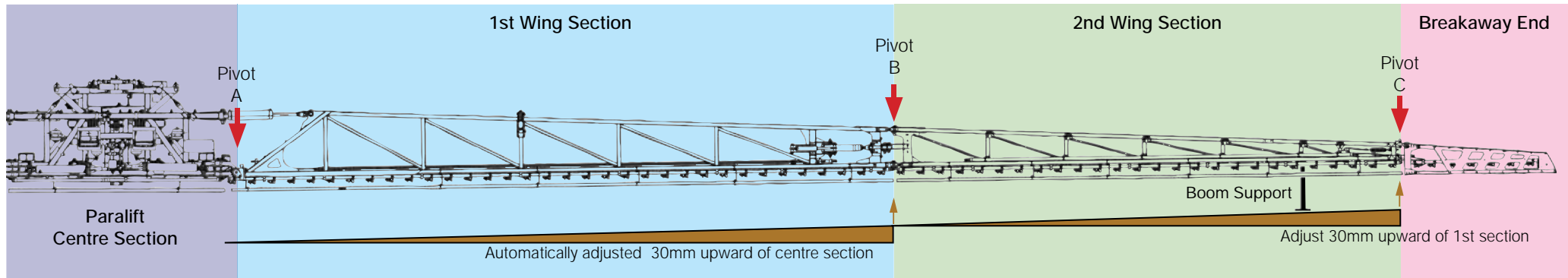
If further adjustment is required, repeat steps 3-6 until 30mm upward tilt is achieved.

**To Adjust the First Section of the LH Wing:**  
Repeat above procedure on the LH wing.

*After adjustment is completed, tighten the lock nut using a 17/8" spanner,*







36 metre Boom: Rear view of right hand side boom wing Tilt Angle adjustment points (Pivot A & B). Use a solid boom support under 2nd wing section for tilt adjustment.

## To Adjust the Second Section of the RH Wing (Pivot B):

The height of the outer booms in the working position are adjusted by adding or removing shims at the cable drum (Pivot B).

Boom cables may need to be loosened to enable easier removal of the shims.

- 1 Follow the 'Before Making Boom Adjustments' instruction in this chapter.
- 2 The second wing section adjustment brings the outer end of the section 30 mm upward of the first section.

Use a string line and measure the upward incline of the second boom section. If adjustment is required, proceed to step 3.

- 3 Use the tilt cylinder hydraulic adjustment to lower the end of the second wing section onto a solid wing support.

- 4 With the boom section safely supported, loosen & remove the nuts & bolts from the bracket holding the:
  - Upper joint, if the shims need to added to lower the boom section end, or
  - Lower joint, if the shims need to added to raise the boom section end.
- 6 Add or remove shims as required, then refit and tighten the bolts and nuts.

- 7 Use the tilt cylinder hydraulics to raise the boom section, remove the support and level the boom.

Re-check the outer end of the section is 30mm upward of the first section (step 2).

If further adjustment is required, repeat steps 3-7 until 30mm upward tilt is achieved.

## To Adjust Second Section of the LH Wing:

Repeat the above procedure on the LH wing.

Add shims to the upper joint bracket to tilt the end of 2nd wing section downwards.



Add shims to the lower joint bracket to tilt the end of 2nd wing section upwards.





Remove the hydraulic manifold cover to access the adjustment valves.



Two Yaw hydraulic cylinders (located on the boom centre section) & an accumulator form the independent pressurised Yaw hydraulic circuit.

### 3 Yaw Alignment

The boom should be positioned parallel to the rear of the sprayer chassis.

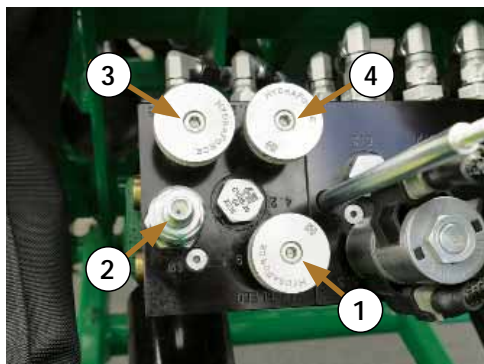
To check Yaw Alignment, measure the exposed cylinder rods on both the left & right Yaw hydraulic cylinders.

Each cylinder rod extension should be the same if the boom is running parallel to the end of the chassis.

#### To Adjust the Yaw Alignment:

- 1 Follow the 'Before Making Boom Adjustments' instruction at the beginning of this chapter.
- 2 Boom yaw is controlled by a pair of hydraulic cylinders & accumulators located on the boom centre section.
- 3 Remove the hydraulic manifold cover to access the adjustment valves on the manifold.

The adjustment valves of the hydraulic manifold.



Identification of valves on the hydraulic block (shown left).

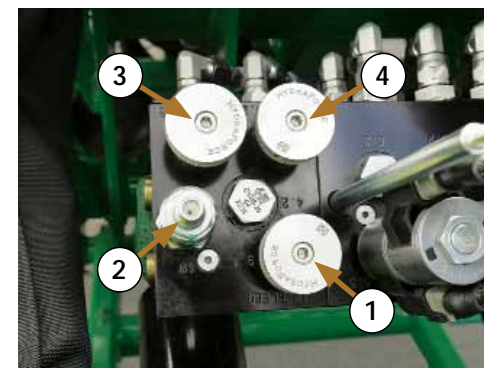
- 1 Yaw Bleed Valve
- 2 Pressure Reducing Valve
- 3 Yaw A Valve
- 4 Yaw B Valve



Loosen the locknut, then wind out (counterclockwise) the 'Yaw Bleed Valve' until fully open.

- 4 Loosen the locknuts, then wind out (counterclockwise) both 'Yaw A' and 'Yaw B' valves (items 3 & 4 shown below) until fully open.
- 5 Move the boom until it is sitting parallel to the chassis line of the machine - each Yaw cylinder rod extension must be the same.
- 6 Close (wind-in [clockwise]) both 'Yaw A' and 'Yaw B' valves (shown above 3 & 4) until fully closed, then tighten the locknuts. The default Aligned Yaw position is now set.

Move the boom by hand to adjust the Yaw Alignment.



Adjustment valves of the hydraulic manifold:

- 1 Yaw Bleed Valve
- 2 Pressure Reducing Valve
- 3 Yaw A Valve
- 4 Yaw B Valve

### 4 Yaw Hydraulic Pressure

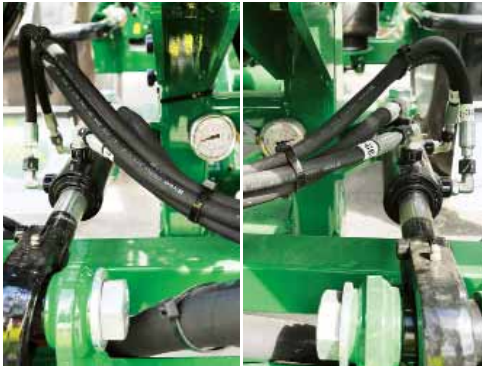
The Yaw Hydraulic Pressure controls the Yaw suspension

Two hydraulic cylinders and accumulators are charged with hydraulic pressure and closed off creating a closed circuit for the yaw suspension.

The base end of each yaw cylinder is connected to the rod end of the opposite cylinder with one nitrogen charged (70 bar) accumulator connected separately to each.

When the rod end of one cylinder compresses, it causes the base end of the opposite cylinder to extend and vice versa.





Pressure gauges fitted to the Yaw hydraulic cylinders.

The accumulators help dampen movement & keep the boom centred.

Three valves are normally closed to create a closed circuit so oil movement is restricted to the precharged pressure in the accumulator.

The precharged pressure restricts the ease of boom yaw movement away from the centered position. This pressure needs to be monitored and maintained.

A pressure gauge on the manifold displays the closed loop hydraulic yaw pressure.

If set too high the boom centre damping will be too stiff and the boom will be prone to damage under normal operating conditions.

If set too low the boom will move too easily and not return to centre properly - making booms more vulnerable to damage.

## NOTE

When the hydraulic yaw system is installed or any components are replaced, the Yaw Pressure closed loop hydraulic circuit needs to be bled of any air:

- The maximum pressure needs to be reset
- The system re-charged and
- The booms re-aligned.



Loosen the locknuts, then wind out (counterclockwise) both 'Yaw A' & 'Yaw B' valves until fully open.

## To Set the Yaw Hydraulic Pressure:

The Hydraulic Yaw Pressure determines the effective stiffness of the Yaw damping.

Pressure gauges capable of reading up to 3000 PSI are fitted to the hydraulic manifold and both Yaw hydraulic cylinders.

- 1 Follow the 'Before Making Boom Adjustments' instruction in this chapter.
- 2 Check the test port gauges are fitted to hydraulic manifold and both Yaw cylinders.
- 3 Loosen the locknuts and wind out (counterclockwise) both 'Yaw A' (3) & 'Yaw B' (4) valves on the manifold until fully open. The Yaw bleed valve (1) must be fully closed (clockwise).

## NOTE

If the pressure is too high then wind out (counterclockwise) the 'Breakaway bleed' valve to reduce it in addition to the pressure reducing valve. Then, close the 'Breakaway bleed' valve and check the maximum pressure achieved again. Pressure will not decrease on the gauge if only the pressure reducing valve is wound out.



Press the 'Boom Fold OUT' button to build pressure.

- 4 The hydraulic system will build pressure when a boom function is activated. Preferably press 'Boom Fold' OUT' button (as the boom is folded out & therefore, will not move in a hazardous way).



Set the Yaw Pressure with the Pressure Reducing Valve, then re-tighten the locknut.

- 5 Once pressure has built up fully, use the Pressure Reducing Valve (item 2 above left) to set pressure higher or lower as necessary.

Loosen the lock nut, then:

- Wind in (clockwise) - to increase pressure or
- Wind out (counterclockwise) - to decrease pressure.

Target pressure is 103 Bar (1500 psi)

- 6 Re-tighten the lock nut of the pressure reducing valve once correct pressure is achieved, then close & lock valves A & B.

Close (wind-in [clockwise]) both 'Yaw A' & 'Yaw B' valves until fully closed, then tighten both locknuts.



Use the Yaw Pressure gauge when setting Yaw pressure.





Check rubber bumpers for wear. Replace if worn.

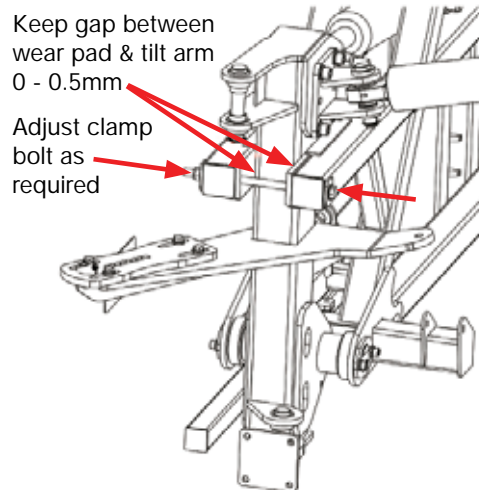
### Paralift Rubber Bumpers

Overall Yaw travel is limited by rubber bumpers mounted on the Paralift boom centre section.

If the boom centre section yaws excessively, the centre section will come into contact with the bumpers which will cushion the travel by collapsing the blocks. If the blocks collapse totally, the yaw travel will be stopped.

If the boom is excessively & continually yawed, the bumpers will wear out and require replacement.

Front view of Tilt Arm Guide wear pads - RHS boom.



Ensure Tilt Arm Guide wear pad gap is 0 - 0.5mm.

### 5 Tilt Arm Guide Adjustment

Tilt Arm Guides fitted with wear pads/strips require regular inspection & maintenance.

Keep the gap between the guides & tilt arm between 0 - 0.5mm to ensure the tilt arm cannot twist.

To adjust the clamp pressure, tighten or loosen the clamping bolt.

Perform the adjustment on both LH & RH sides.

Rear view of Tilt Arm Guide wear pads - RHS boom.



Three Way Tip Breakaway mechanism of the Trittech boom.

### 6 Three-Way Tip Breakaway

Each boom wing tip or end incorporates a three-way tip breakaway hinge which allows the wing tip to break-away:

- Forward,
- Rearward and/or
- Upward
- minimising possible damage to the boom should an obstacle be hit.

It is important the breakaway hinge is properly adjusted for operating (just tightening the spring does not facilitate the breakaway function).

Rearward & Upward Breakaway.



Close the ball valve on each lift cylinder (2) for safety.

### To Set-Up the Three-Way Tip Breakaway:

- 1 Follow the 'Before Making Boom Adjustments' instruction in this chapter.
- 2 Lower the boom to a good working height fully opened (working position).
- 3 Close the ball valves of the two hydraulic parallel lift cylinders for safety.
- 4 Check the lower pivot plates are properly aligned [see (A) on diagram next page].
- 5 If the rose end [see (B) on diagram next page] is removed for any reason, anti-seize should be applied to the thread before it is screwed into the boom end.

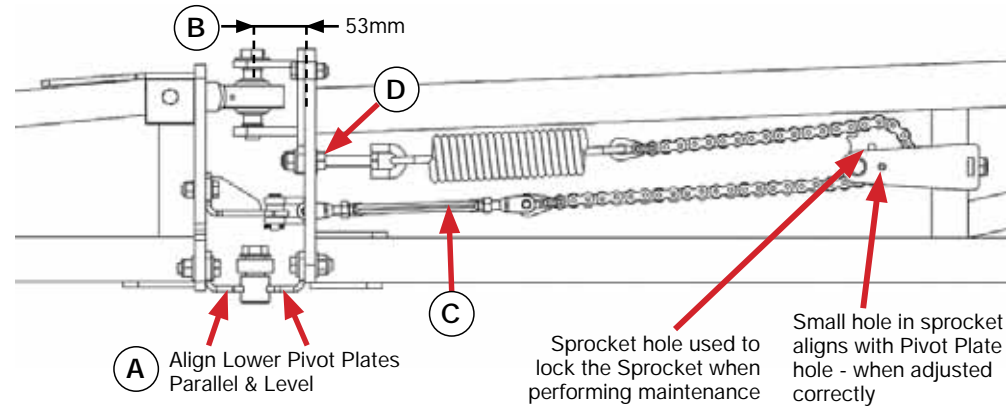
Forward & Upward Breakaway.







Check the lower pivot plates are properly aligned.



Check the lower pivot plates are properly aligned.

The rose end should be screwed into the breakaway tip so that it measures 53 mm from the boom end face plate to the centre of the rose end (B) or until correct vertical alignment is achieved.

- 6 The small hole in the sprocket must align with the hole in the pivot plate. This is adjusted by shortening or lengthening the eye bolt (D) position and tightening or loosening the turnbuckle (C).

Adjust spring tension so there is 1-2 mm gaps between spring coils to apply ideal resistance for breaking away. This will vary as springs may stretch over time.

Upward Breakaway.



## To Adjust the Turnbuckle:

- 1 Use an assistant to pull the boom wing tip back until the large hole in the sprocket aligns with the hole in the pivot side plate, then place a pin (such as an Allan key or screwdriver) through the holes to lock the sprocket position.
- 2 Have the assistant carefully return the wing tip only enough to remove spring tension. Do not fully return the wing tip, otherwise the chain may jump off its sprocket & may cause injury.
- 3 Now, release the locknuts and make the appropriate adjustments to turnbuckle. Re-tighten the turnbuckle locknuts.
- 4 Pull the wing tip back to remove the pin, then release the tip. Check spring tension and alignment of the small hole in sprocket with pivot plate hole.
- 5 Repeat steps 1 - 4 until desired spring tension is achieved and the small hole in the sprocket aligns with the hole in the side plate.

Place a pin (eg, Allan key or screwdriver) through the aligned holes to lock the sprocket position.



## Maintenance

Several things are required to ensure that the breakaway will be functioning properly.

Two things are critical to the breakaway functioning correctly:

- The small hole in the sprocket must align with the hole in the side of the pivot plate, and
- Appropriate spring tension.

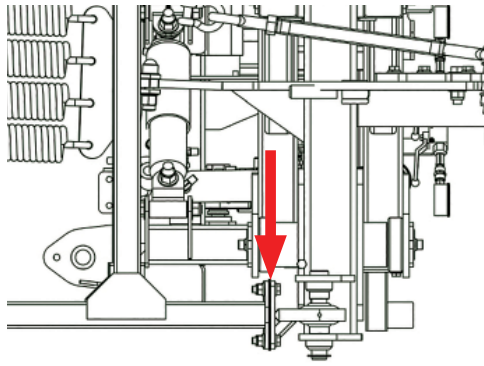
Check these on a regular basis and adjust as required.

## **⚠ DANGER**

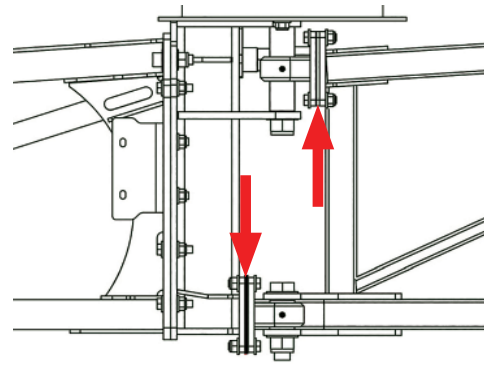
Adjusting the Turnbuckle is a 2 person job:  
Firstly, one person is required to pull the wing tip back while the other person places the pin.  
Secondly, one person must hold wing tip to just release the spring tension while the other person adjusts the turnbuckle.  
Do not let the wing tip fully return fully while making adjustment, otherwise the chain may jump off its sprocket and cause injury.



Regularly lubricate the Three Way Tip Breakaway mechanisms.



'Diagram A' - Add or subtract shims to the lower pivot point to raise or lower the boom as required.



Add or subtract shims to both the upper & lower cable drum pivots to raise or lower support saddles as required.



Eyebolt Cable Adjusters to tension the boom cables.

Spring will stretch over time and will lose tension. Worn springs & chain should be replaced if there is insufficient tension on the spring to fully retract.

Lubricate the Three-Way Breakaway mechanisms on a regular basis to ensure smooth & long lasting operation:

- **Oil** the sprocket pivot, chain and lower rose joints with a wet lubricant **every 8 hours**.
- **Grease** the upper rose joint **every 8 hours**.

## 7 Boom Fold Alignment

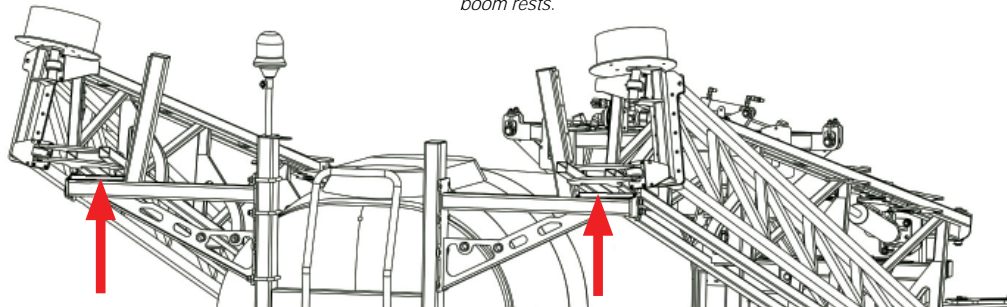
When the boom is folded into transport position, the full weight of the boom must be supported by the inner boom sections. The outer aluminium section may sit on the boom rest but must not support any weight.

### To Align an Inner Boom

If the boom sits level in working position but when folded, one side is lower than the other, shims can be placed at the bottom inner boom mount of lowest boom (Diagram A). This will raise the boom in working position.

If a boom is not level in the working position, it is most likely out of balance. Refer to '9 Boom Balance'.

When folded into transport position, the full weight of the boom must be supported by the inner boom sections resting on the boom rests.



## To Align an Outer Boom

When the boom is folded into transport position, the outer boom sections must saddle onto the inner boom. A boom support saddle couples to the inner boom when fully folded. Saddles must slide onto the inner boom freely to prevent damage to the booms.

If alignment of the outer boom does not saddle correctly, it will not be supported in transport.

If an outer boom hangs too low when folding, shims must be added to cable drum pivots. To raise the outer boom, add shims to both the upper & lower pivots. This adjusts the angle of the pivot axis causing the outer boom to fold up higher. One x 1mm shim at upper & lower pivots equals approximately 15mm change in folded height.

To lower the outer boom in the folded position, remove shims from both upper & lower pivots.

Inner boom folded & supported on the boom rest.



## 8 Boom Cable Settings

Boom cables play a critical part in boom function and it is important these cables are correctly adjusted prior to operation for both:

- Working position &
- Folded position.

Loose boom cables may result in unnecessary stress on the boom, lift & chassis and shorten working life.

Cable tension must be checked & adjusted for:

- a) Working position cable tension &
- b) Folded cable tension.

Outer boom saddle support in folded position.







Undo the locknuts of the Cable Eyebolt Adjuster, then rotate the adjuster to tension the cable & retighten the locknuts.

## a) Working Position Cable Tension

The Eyebolt Cable Adjuster is used to tension the cable to keep the outer boom aligned in working position.

If too loose, damage may occur if the outer boom sections hang out-of-alignment or 'break away' too easily.

### To Adjust Working Cable Tension:

- 1 Follow the 'Before Making Boom Adjustments' instruction at the beginning of this chapter.
- 2 Undo the locknuts of the cable eyebolt.
- 3 Adjust the cable tension to align the outer boom arm.
- 4 Check the tension setting of the boom breakaway by pulling the outer boom rearward.
- 5 Once set correctly, tighten both locknuts of the cable eyebolt.
- 6 Proceed to check Folded Cable Tension.

### NOTE

Re-alignment of outer boom sections for folding will be required within the first 6 months of beginning operation as the booms sections stretch and wear-in.



LHS Cable Adjustment Plate.

## b) Folded Cable Tension

The Cable Adjustment Plate is used to adjust the outer boom arm in its folded position.

When folding the boom, if the outer boom:

- Does not fold all the way in & contact the boom stop, the Cable Adjustment Plate must be adjusted outwards
- OR
- Contacts the boom stop too early or places too much tension on the boom & cable, then the Cable Adjustment Plate must be adjusted inwards.

### ⚠ DANGER

Adjusting the Cable Adjuster Plate is a 2 person job: Firstly, one person is required to pull the outer wing back while the other person removes the cable from the plate. The second person removes & refits the cable attachment, adjusts the Cable Adjuster Plate and Cable Eyebolt. Do not let the outer wing return abruptly, otherwise injury may occur from boom or cable whipping.



Use an assistant to pull back the outer boom arm to release tension on the cable.

### To Adjust Folded Cable Tension:

The boom must be in its working position to adjust the Cable Adjustment Plate.

- 1 Follow the 'Before Making Boom Adjustments' instruction at the beginning of this chapter.
- 2 Use an assistant to pull back the outer boom arm to release tension on the cable - enables adjustment of the plate.
- 3 Undo the nut and remove the Cable Turnbuckle from the plate.

Undo the nut & remove the end of the Cable Turnbuckle Adjuster.

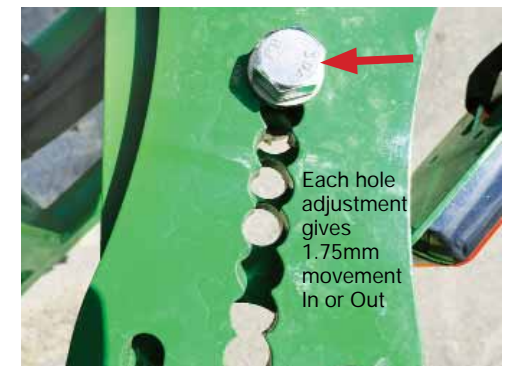


Loosen 4 corner bolts of the Cable Adjuster Plate.

- 4 Loosen 4 x corner bolts of the Cable Adjuster Plate.
- 5 Remove the central locator bolt and move the plate In or Out as required.
- 6 Refit the central locator bolt.
- 7 Tighten the 4 x corner bolts of the Cable Adjuster Plate.
- 8 Use an assistant to pull back the outer boom arm, then refit the end of the Cable Turnbuckle Adjuster and refit the bolt, washer & nut. Tighten the nut.

When adjustment is completed, release the outer boom arm carefully so it does not spring forward dangerously.

Remove central locator bolt, move the plate In or Out as required, then replace locator bolt.



Each hole adjustment gives 1.75mm movement In or Out



Fold the boom to re-check boom alignment in the folded position.



Check there is a 3 mm gap in the spring coils and adjust if required.



Check tension on the left hand folded outer boom section by pulling the end outwards.



The outer boom rest protection plate must be correctly positioned on each side.

- 9 Re-adjust the cable eyebolt to align the outer boom arm, then tighten the locknuts on the cable eyebolt.
- 10 Fold the boom to re-check boom alignment in the folded position.

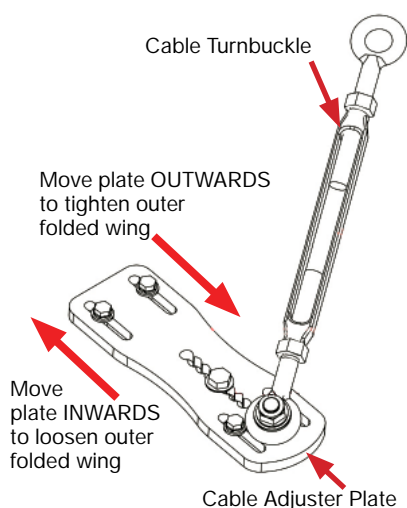
- 11 Repeat the procedure if necessary, until the outer boom arm assumes the correct alignment for both working and folded positions.
- 12 Coil spring tension may alter when moving the Cable Adjuster Plate.  
  
Check there is a 3 mm gap in the spring coils. Adjust if required.

- 13 Check the tension on the left and right hand folded outer boom sections by pulling each end outwards. If too tight or too loose, adjust the tension.

## 9 Stainless Steel Protection Plates

Stainless steel protection plates fitted to the boom, protect the boom when being folded & when resting in transport position.

It is important to ensure both outer boom rest protection plates and inner boom rest protection plates are correctly positioned.



### CAUTION

If an outer boom arm contacts the boom stop too early and too much tension is placed on the cable, then the hydraulic cylinder may fail to bring both arms all the way in or damage the boom arm and cable.

### DANGER

Outer boom sections must be firmly held in their mounting. If too loose (not firmly held in position), outer wing sections may dislodge while transporting. Serious damage and/or serious injury may occur if an outer wing dislodges from its mounting while travelling.

Check tension on the right hand folded outer boom section by pulling the end outwards.



Inner boom rest protection plates must be correctly positioned on each side.







Loosen the bolt & nut clamping the top centre level support (on the centre section side the boom is low).

## 10 Boom Centre Levelling

The Boom Centre Levelling system keeps the boom in the same plane as the sprayer chassis so that the boom folds evenly.

If one side is heavier than the other, the boom will tend to hang lower on the heavy side, therefore, both sides need to be levelled to maintain boom ends at the same height.

If the centre and the booms tilt excessively during folding, the centre level supports may need to be adjusted.

Supports can be adjusted by tightening or loosening the nuts on the end of the chain bolts on either side.



Undo the adjuster locknuts and adjust the support to raise & level the boom. After adjustment retighten the locknuts.

### To Adjust Boom Level in Working Position:

- 1 Follow the 'Before You Begin Making Boom Adjustments' instruction.
- 2 Lower the boom to a suitable working level.
- 3 Check the level of the boom in its working position
- 4 If the boom is lower on one side, loosen the top bolt & nut holding the centre level support (on the side the boom is low).
- 5 Undo the adjuster locknuts on each side of bolt, then adjust the support to raise and level the low side of the boom.
- 6 Retighten the adjuster locknuts, then fully tighten the bolt and nut to lock the support into position.

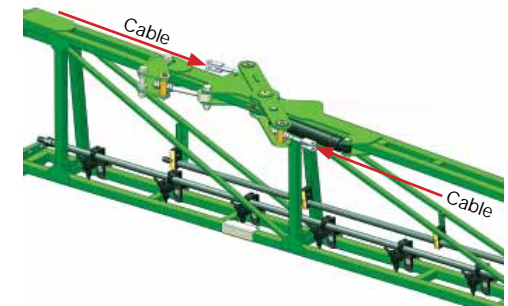


From behind the sprayer, watch if one side of the boom tilts excessively downwards when folding.

- 7 Now check the boom folds correctly.

Get someone to stand behind the sprayer (out of the booms reach) and watch which side the boom is tilting excessively down when folding.

- 8 Repeat steps 2 - 7 until the boom is level when folding.



Hydraulic Bi-Fold Option.

## 11 Optional Hydraulic Bi-Fold

The Optional Bi-Fold mechanism incorporates an hydraulic cylinder and cables on each wing.

Follow the instructions for **Boom Settings & Adjustments** in this chapter to correctly set this boom option.

To operate the Boom Bifold function, follow the Boom Bifold operating instruction in Chapter 6.

### NOTE

Adjustment of Boom Centre Levelling chains in folded position only applies if Optional Hydraulic Bifold is fitted. Adjust LH or RH chain tensioner as required to level the boom when being folded.

## 7 Service – Boom Settings

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*Regularly do the routine checks on the Prairie Special while stationary.*



*Check all light functions on the Prairie Special.*



*Check air, hydraulic & spray operating pressures.*



*Air tank drain valve.*

## Pre-Operation Checklist

### Stationary Checks

The following should be routinely done while the Prairie Special is stationary:

- Check all tyre pressures for the recommended pressures in the manual
- Check all wheel nut torque (320 ft lb)
- Check mudguard mountings (where fitted)
- Inspect axles for fractures or cracks
- Check axle retaining hardware
- Check all pump mounting bolt tensions
- Check tension of tank straps
- Check all fasteners are tight
- Check & tighten hose clamps on main hose from pump to manifold
- Check pump (diaphragm) oil level
- Clean suction filter
- Clean pressure filter
- Check all filter bowl nuts and O-rings
- Check boom alignment.

### Running Checks

The following should be routinely done while the Prairie Special is in operation:

- Check all light functions
- Check air operating pressures
- Check hydraulic operating pressures
- Check spray operating pressures
- Check all electrical functions
- Check boom functions operate
- Check all hoses for leaks and/or excessive movement
- Check air bag axle ride height (if fitted)
- Check air bag system for air leaks (if fitted)
- Inspect air tank reservoir & drain any liquid.

## Maintenance

Correct & timely service & maintenance of the Prairie Special are among the most important elements of safe, efficient & accurate operation.

Servicing and maintenance should be carried out according to the schedules in this chapter 'Lubrication & Maintenance'.

*Inspect rear axles.*





*During the first 8 hours of operation, check wheel (shown above) & other retaining nuts frequently - until fully imbedded.*

## First 8 Hours Of Operation

During the first 8 hours of operation, it is important to closely check the following:

### 1 Torque Settings

- Check the torque on retaining nuts frequently
- Wheel nuts should be checked to ensure 320 ft/lb is maintained.



*Check all pump oil levels.*

### 2 Lubrication Fluids

- Ensure grease points are lubricated effectively
- Inspect for leaks in the hydraulic system
- Check pump oil level



*Check the tank restraining straps - front & rear (shown above).*

### 3 Tank Retaining Straps

- Check tank retaining strap bolts to ensure they are not loose. Tighten if loose.



*Check the pump & other mounting bolts.*

### 4 Pump Mounting Bolts

- Check all pump mounting & other mounting bolts to ensure they are not loose.

### 5 Lights

- Check each light around the sprayer for correct function.

## NOTE

Goldacres recommends a multi-purpose grease should be used for all grease lubrication. Make sure all open-end bearings are lubricated their full length by forcing lubricant into them until it begins to appear at the sides.  
Protect all surfaces with corrosion inhibitor G15.

## CAUTION

Before doing maintenance on the Prairie Special, read this manual & be aware of the encumbent risk of injury with all sprayer maintenance. Refer to the 'Crush, Pinch, Burn, Injection, Hose Whip Striking Hazards' in Chapter 2 'Safety'.



*Check the Prairie Special lights.*

## Maintenance Schedule - First 50 Hours

Chassis	50 Hours
Tow Eye Bolts	Check
Pull Mounting bolts	Check
Tank Retaining Straps	Check
3D Breakaway adjustment	Check

Pumps	50 Hours
Pump 1 - Zeta 260	
Pump 1 - Oil	Check
Pump 1 - Speed RPM	Check
Pump 1 - Centrifugal Arag MSP400	
Pump 1 - Speed RPM	Check

Booms	50 Hours
Boom Alignment	Check
Boom Level	Check
Boom Centre Yaw Alignment	Check
Hydraulic Yaw Pressure	Check
Breakaway Hinge Mechanism	Lubricate
Boom Plumbing	Inspect
3D Breakaway adjustment	Check
Boom lower limit	Check

Pneumatic System	50 Hours
Pneumatic Reservoir	Drain
Compressor Air Filter	Clean
Airbag Ride Height	Check
Pneumatic Plumbing Leaks	Inspect
Compressor cut out pressure	Check

Hydraulics	50 Hours
Hydraulic Hose Leaks	Inspect
Hydraulic Cylinders Leaks	Inspect
Hydraulic Manifold Leaks	Inspect
Hydraulic Filter	Change

Wheels & Axles	50 Hours
Tyre Pressures	Check
Wheel Nuts	Check
Axle Retaining Bolts	Check



## Ongoing Maintenance Schedule

Chassis	10 Hr Daily	50 Hr Weekly	250 Hr 3 Month	500 Hr 6 Month	750 Hr 9 Month	1000 Hr 1 Year
<b>Pull</b>						
Tow Eye Bolts	x	x	Inspect	Inspect	Inspect	Inspect
Tow Eye Wear	x	x	Inspect	Inspect	Inspect	Inspect
Pull Mounting bolts	x	x	Inspect	Inspect	Inspect	Inspect
Jack (Hydraulic & Mechanical)	x	x	Inspect	Inspect	Inspect	Inspect
<b>Chassis</b>						
Handrail Bolts	x	x	Inspect	Inspect	Inspect	Inspect
Ladders Bolts	x	x	Inspect	Inspect	Inspect	Inspect
Boom Support Frame Bolts	x	x	Inspect	Inspect	Inspect	Inspect
Boom Rest Wear Strips	x	x	Inspect	Inspect	Inspect	Inspect
Tank Retaining Straps	x	x	Inspect	Inspect	Inspect	Inspect
Paralift Arms	x	x	Inspect	Inspect	Inspect	Inspect

## Ongoing Maintenance Schedule cont.

Pumps	10 Hr Daily	50 Hr Weekly	250 Hr 3 Month	500 Hr 6 Month	750 Hr 9 Month	1000 Hr 1 Year
<b>Pump 1 - Zeta 260</b>						
Pump 1 - Oil	Inspect	Inspect	Replace	Replace	Replace	Replace
Pump 1 - Diaphragms	Inspect	Inspect	Inspect	Inspect	Inspect	Replace
Pump 1 - Check Valves	Inspect	Inspect	Inspect	Inspect	Inspect	Replace
Pump 1 - Seals	Inspect	Inspect	Inspect	Inspect	Inspect	Replace
Pump 1 - Drive Motor Shaft	x	x	Lubricate	Lubricate	Lubricate	Lubricate
<b>Pump 1 - Centrifugal Arag MSP400</b>						
Pump 1 - Impellers	x	x	x	x	x	Replace
Pump 1 - Seals	x	x	x	x	x	Replace
Pump 1 - Drive Motor Shaft	x	x	Lubricate	Lubricate	Lubricate	Lubricate

## Ongoing Maintenance Schedule cont.

Pumps	10 Hr Daily	50 Hr Weekly	250 Hr 3 Month	500 Hr 6 Month	750 Hr 9 Month	2000 Hr 1 Year
<b>Pump Chemical Transfer Graco</b>						
Diaphragms	x	x	x	x	x	Replace
Pneumatic Valve	x	x	x	x	x	Replace
<b>Pump 3" Fill</b>						
Motor Drive Shaft	x	x	Lubricate	Lubricate	Lubricate	Lubricate

Pneumatic System	10 Hr Daily	50 Hr Weekly	250 Hr 3 Month	500 Hr 6 Month	750 Hr 9 Month	1000 Hr 1 Year
Pneumatic Reservoir	Drain	Drain	Drain	Drain	Drain	Drain
Compressor Air Filter	Inspect	Clean	Replace	Replace	Replace	Replace
Airbag Ride Height	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Ride Height Valves	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Pneumatic Plumbing Leaks	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect

## Ongoing Maintenance Schedule cont.

Wheels & Axles	10 Hr Daily	50 Hr Weekly	250 Hr 3 Month	500 Hr 6 Month	750 Hr 9 Month	1000 Hr 1 Year
Tyre Pressures	x	Inspect	Inspect	Inspect	Inspect	Inspect
Wheel Nuts	x	Inspect	Inspect	Inspect	Inspect	Inspect
Wheel Bearings	x	x	x	x	x	Inspect
Axle Retaining Bolts	x	x	Inspect	Inspect	Inspect	Inspect

Hydraulics	10 Hr Daily	50 Hr Weekly	250 Hr 3 Month	500 Hr 6 Month	750 Hr 9 Month	1000 Hr 1 Year
Hydraulic Hose Leaks	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Hydraulic Cylinders Leaks	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Hydraulic Manifold Leaks	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect

## Ongoing Maintenance Schedule cont.

Booms	10 Hr Daily	50 Hr Weekly	250 Hr 3 Month	500 Hr 6 Month	750 Hr 9 Month	1000 Hr 1 Year
Boom Alignment	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Boom Level	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Boom Centre Yaw Alignment	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Hydraulic Yaw Pressure	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Fold Cylinder Rose Ends	x	Inspect	Inspect	Inspect	Inspect	Inspect
Fold Cylinder Adjuster Threads	x	Inspect	Inspect	Inspect	Inspect	Inspect
Tilt Cylinder Bearing & Knuckle	x	Inspect	Inspect	Inspect	Inspect	Inspect
Boom Pivot Bearings - Bi Fold	x	Inspect	Inspect	Inspect	Inspect	Inspect
Breakaway Hinge Mechanism	Lubricate	Lubricate	Lubricate	Lubricate	Lubricate	Lubricate
Boom Rest Rollers	x	Inspect	Inspect	Inspect	Inspect	Inspect
Boom Plumbing	x	Inspect	Inspect	Inspect	Inspect	Inspect
3D Breakaway adjustment		Inspect	Inspect	Inspect	Inspect	Inspect
Boom lower limit		Inspect	Inspect	Inspect	Inspect	Inspect

## Service Parts

Filters		
Part Number	Description	Quantity Required
GA5049460	Filter Element, Air Compressor Intake	1
GA2000347	Filter Element, Pressure Filter, Yellow, 80 Mesh, Arag	1
GA2000561	Filter screen 32 mesh, 3" Suction, 319 Arag	1

Lubricants			
Product:	Part Number	Description	Volume Required
Pump, Zeta 260	GA5012457	Oil, SAE 15W40 - 20L Drum	2.68L
Grease Nipples	GA5078604	Grease, General Purpose, SKF, 400g	1
Arag Pump Spline	GA5074395	Grease, Kluber paste, 46 MR 401, 750gm	1

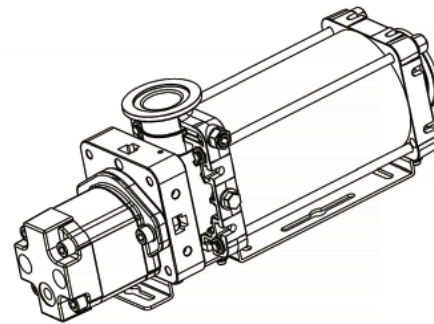
### Further Lubrication Recommendations:

- Ensure that lubricants are stored in a place where the lubricants are protected from contamination (such as dirt and moisture). Always use clean containers when handling lubricants
- Do not mix lubricants. Lubrication may be adversely effected by differences in chemical composition
- Seek advice from your petroleum dealer on the correct use of lubricants & additives
- At time of manufacture, G15 is applied to all fasteners (bolts, washers & nuts) and zinc plated components
- Onwards, G15 Anti-Corrosion Spray should be applied to the sprayer pre-season & post-season
- As a guide, application to following areas is recommended, but not limited, to these areas - pump mounting bolts, boom rests, left hand pod, mudguard mounting bolts, induction hopper bolts & latches, hydraulic manifold, boom hinge bolts, airbag hose fittings & hydraulic hose crimp fittings, etc.





*Pressure relief valve located on the diaphragm pump.*



*Centrifugal pump option.*



*Diaphragm pump.*

## Service Instructions

Maintenance & service instructions follow.

### Pressure Relief Valve

The Pressure Relief Valve provides relief when the pressure exceeds a pre-determined value. The pressure is preset to 110 psi and, in most conditions, should not be altered.

Turning the stem clockwise will increase the pressure relief setting. Altering the adjusting stem will affect the setting at which the relief valve will come into operation.

### To Check or Alter Pressure Setting:

- 1 Stop the pump, remove the pin & turn relief valve counter clockwise.
- 2 Turn the solenoids Off, then close all control manifold ball valves so that all flow passes through the relief valve.
- 3 Run the pump at maximum operating speed (540 rpm) and slowly turn the relief valve clockwise until the pressure is achieved.
- 4 Refit the pin so the setting is maintained.

If the relief setting is too low, the minimal pressure setting is maintained and excess flow bypasses back to the product tank.

## Spray Pump - Centrifugal

### 250 HOURS

- Remove hydraulic drive motor
- Clean out & lubricate drive splines
- Use GA5074395 (Klüberpaste 46 MR 401) or equivalent.

## Spray Pump - Diaphragm

### 8 HOURS

- Check pump oil level & condition.

### 50 HOURS

- Pump oil should be changed after the first of 50 hours of operation
- Pump oil level should be between the two level markers on the oil reservoir
- If the oil level continually gets low or is turning milky, there is possibly a split in a diaphragm. The oil will need to be drained and all the diaphragms replaced. Use SAE 15W40 oil

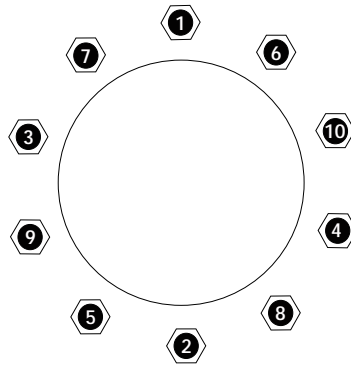
### 250 HOURS

- Change Pump oil. The pump oil should be changed every 250 hours
- Use SAE 15W40 oil

The oil drain plug is located between the two pump mounts on the underside.



Grease the wheel hubs.



Follow this tightening sequence to ensure even wheel nut torque distribution (320 ft/lb).



Grease the manual hitch jack.



Check braked axles.

## Chassis, Wheels & Brakes

### 8 HOURS

- Check tyre pressure. It is very important to maintain correct tyre pressures to optimize sprayer stability and the load rating.

To determine the required tyre pressure, refer to the tyre specification chart in the general information section of the operator manual.

- If the tyre has a constant leak, the valve may be loose or need replacing, or the tyre may have a puncture.
- Wheel nuts must be checked every 8 hours and re-torqued to 320 ft/lb if required.

Follow the sequence (*shown above*) to ensure an even torque distribution.

### 25 HOURS

- Grease the wheel bearings.
- Apply grease to the ADR axle bearing via a grease nipple on front of the hub
- Refer to lubricants in this chapter.

### 250 HOURS

- Check wheel bearings for sideways movement
- To check wheel bearings for free play, jack up that side of the sprayer until the wheel can spin freely

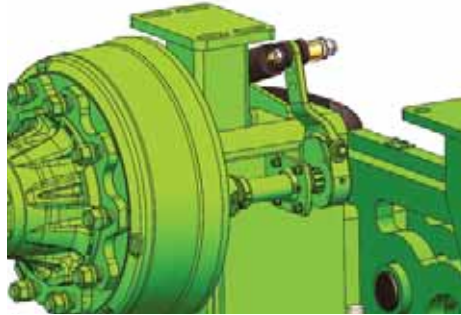
Rock the wheel from side to side. If there is any movement the bearings will need to be tightened or replaced.

### 3 MONTHS

- Grease the manual jack - two grease nipples (one on the winding mechanism & the other on the jack swing pivot). Grease every three months to ensure easy operation
- Check bolts on axle bearing cap bolts. Checked & tightened if required  
If dust enters axle bearings it will increase wear & contribute to bearing failure
- If the dust cap gasket is damaged or not sealing properly, it must be replaced.

## Check Brake System & Service Braked Axles

- The brakes should be tested before using for the first time and after the first laden journey
- Check the actuator and return spring mountings
- Check the actuator stroke and return travel. Check it operates and releases correctly
- Tighten screws & nuts (covers, fulcrum, etc)
- Check the cotter pins, pins, circlips, etc
- Check for hydraulic fluid & air leaks



### 250 HOURS

- Check brake clearance & wear. Check & test the brakes before intensive use and thereafter, every 3 months
- Visually check for brake wear & clearance between brake linings and drum (through the inspection hole in the dust cover at the rear of the drum). It is probable that linings are worn when the actuator travel has significantly increased
- Check thickness of brake shoe linings (minimum allowable 5 mm)
- Brake shoes should be replaced as soon as the minimum lining thickness is reached
- Check brakes are clean.  
Clean if necessary. Do not clean with compressed air because it contains small amounts of oil
- Lightly lubricate brake cam shaft bearings with grease. Avoid grease deposits forming on brake linings & drums.

### Fixed Lever Brake Adjustment

- Take up actuator slack when its stroke reaches about two thirds of the maximum travel
- To take up slack, turn the lever by one or more splines. Ensure brakes are not touching when released (to avoid brake overheating & excessive wear)
- Never change the linkage position of the actuator on the lever without authorization from the vehicle manufacturer.

The vehicle has been tested with the actuator at this position (the brake operating levers have several holes, always use the original hole)

- For braking systems with a yoke, the yoke must remain parallel with the axle especially when the brakes are fully applied.

This means that the stroke of the levers on the brakes at each side must be identical.

### Adjustable Lever Brake Adjustment

- Take up actuator slack when its stroke reaches about two thirds of the maximum travel
- To take up slack, turn the adjustment screw on the lever adjusting the relative position of cam & lever. The direction of screw turning depends on its configuration.

Push the lever to turn in the direction required to take up slack

Ensure brakes are not touching when released (to avoid brake overheating & excessive wear)

- Never change the linkage position of the actuator on the lever without authorization from the vehicle manufacturer

The vehicle has been tested with the actuator at this position (the brake operating levers have several holes, always use the original hole).

### Wheel Bearings SEASONALLY

- Clean wheel bearings, inspect, re-grease & re-set the bearing pre-load
- Replace axle bearings if worn or damaged.

The following procedure should be followed:

- 1 Ensure the Prairie Special is on hard, flat level ground and wheels are chocked at the opposite end of lifting.
- 2 Ensure the boom is fully closed before raising the machine off the ground.  
Empty the spray tank if possible before lifting the machine.
- 3 The sprayer must be hitched to the appropriate towing vehicle & the engine of the towing vehicle must be turned off & park brake applied.
- 4 Chock the tractor wheels.
- 5 Use a rated jack to lift the sprayer.
- 6 Remove wheel as per instructions.



Recommended wheel nut torque tension is 320 ft/lb.

- 7 Remove bolts from bearing dust cap & clean out as much grease as possible.
- 8 Remove the split pin, castle nut & washer.
- 9 Slide the outer bearing & hub off the axle (a bearing puller may be required).
- 10 Remove the inner bearing.
- 11 Remove the seal. if it is to be replaced during this service.
- 12 Clean all existing grease from the axle & hub, then wash in solvent.
- 13 Insert a new rear seal.
- 14 Pack the two new bearings with grease prior to fitting on the axle.  
Ensure grease has penetrated completely through the bearing.
- 15 Slide new inner bearing onto the shaft.
- 16 Place hub back onto axle and fill the cavity with grease.
- 17 Insert new outer bearing.
- 18 Fit washer & nut, then firmly tighten.

- 19 Perform a Pre-load Test on the hub to determine how tightly to set the nut.  
Pre-load must be:
  - 90 Series = 10 - 15 kg
  - 110 Series = 15 - 25 kg.
 Perform the Pre-load Test by tying a string or rope to a stud, then wrapping it around the outside of all studs.  
With a set of tension scales connected to the rope, pull the scales until the hub begins to turn.  
The hub should begin to rotate at the pre-load specified in step 14.  
Tighten or loosen the axle nut to achieve this setting.
- 18 Fit the split pin & bolt the bearing dust cap in place.
- 19 Finally, grease the hub until grease emerges from the rear seal.



Chock opposite wheel of the sprayer before raising the other wheel off the ground.

## Changing Wheels

Changing of wheels should only be done by an experienced person safely using rated and approved equipment.

### To Remove a Wheel

Follow this procedure to safely remove a wheel:

- 1 Ensure the Prairie Special is on hard, flat level ground and wheels are chocked at the opposite end of lifting.
- 2 Ensure the boom is fully closed before raising the machine off the ground.  
Empty the spray tank if possible before lifting the machine.
- 3 The sprayer must be hitched to the appropriate towing vehicle & the engine of the towing vehicle must be turned off & park brake applied.

- 4 Chock the tractor wheels.
- 6 With a wheel nut wrench, loosen all the wheel nuts on the wheel to be removed.  
Do not remove wheel nuts until the tyre is lifted off the ground.
- 7 Place a rated jack on a level, firm and stable foundation under the sprayer axle - between two axle bolts near the wheel to be removed.  
A large piece of timber or steel placed under the jack may be needed to prevent the jack from sinking into the soil.
- 8 Use the jack to raise the sprayer axle so the wheel and tyre is off the ground.
- 9 Place an auxiliary jack block under the axle so that if the jack fails the sprayer will not fall.

### **⚠ DANGER**

When the tank is fully loaded each wheel may support a weight up to approximately 5 tonnes.  
Always ensure that the jack is designed to operate under this pressure.

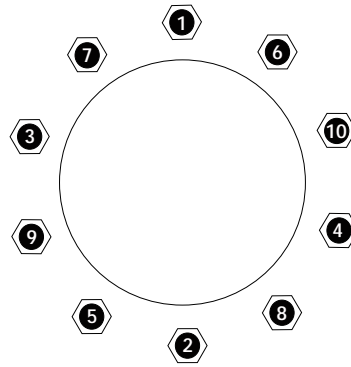
### **⚠ DANGER**

Do not chock or support the machine using materials that may crumble.  
Use only load rated supports.  
Do not work under the machine when supported solely by a jack.





Regularly check tyre pressure and wheel nut tension.



Follow this tightening sequence to ensure even wheel nut torque distribution (320 ft/lb).

- 10 Remove all wheel nuts & remove wheel from sprayer.

Be careful the wheel does not fall on anyone or cause bodily harm.

- 11 Ensure the sprayer is stable, safe & not able to be moved if being left for an extended period of time.

#### To Refit a Wheel

- 1 Check the sprayer is stable with both jack & jack block in place and hitched to its appropriate towing vehicle.
- 2 Ensure the replacement wheel is in good condition & the tyre is inflated to its correct tyre pressure.
- 3 Clean the contact surfaces between the wheel & hub.
- 4 Carefully lift the replacement wheel up to align the centre rim holes and fit the wheel onto the studs of the hub.

#### NOTE

Tension wheel nuts daily when new & whenever wheel nuts are removed and refitted. Follow the wheel nut tightening sequence to ensure even wheel nut torque distribution. Once wheel nuts hold tension, inspection can be done at approx 50 hours. Wheel nut tension specification on the Prairie Special wheels is 320 ft/lb.

- 5 Carefully refit all wheel nuts to finger tight.
- 6 Use a torque wrench to tighten the wheel nuts alternately (sequence shown above) and evenly to a torque rating of 320 ft/lb.
- 7 Remove the jack block from under the sprayer.
- 8 Carefully lower the sprayer slowly with the jack until the tyre touches the ground.
- 9 Re-tighten all wheel nuts to the required torque rating.
- 10 Lower the jack completely so that all weight is off the jack, then remove the jack (& any supports from under the jack) from under the sprayer.
- 11 Remove all wheel chocks (placed to prevent the sprayer from moving).
- 12 Check the tyre pressure before moving sprayer.
- 13 Check & re-tighten all wheel nuts to the required torque rating:

- One hour after refitting the wheel,
- Before filling the main spray tank & again
- After emptying the first tank load.

Tyre Size	Model (L)	Recommended Pressure @ (kPa/PSI)
18.4 x 38	4000	290 / 42
18.4 x 38	5000	290 / 42
18.4 x 38	6500	315 / 46
480/80R46	5000	140 / 20
480/85R42	5000	190 / 29

See Chapter 1, 'Important Information' for full details of tyre options & recommended tyre pressures for the Prairie Special.

#### Tyre Maintenance

All tyres used on Goldacres sprayers have been designed to carry the maximum loaded weight of the sprayer when travelling at 25 km/h. The load capacity of the tyres decreases as travelling speed increases so it is important to heed the travelling speed limit.

Rated tyre pressure & capacity shown in charts is applicable for stationary machines.

Tyre pressure is the most important factor for maintaining correct load rating of the tyre.

Tyres should be checked regularly as per the maintenance schedules outlined in this chapter.

Correct tyre pressures maintained at all times. Inflation above or below recommended pressures may cause damage to the tyres.

480/80R46	6500	240 / 35
480/85R42	6500	220 / 32
480/80R46	8500	260 / 38
480/85R42	8500	310 / 45
480/85R46	8500	410 / 65
520/85R42	8500	140 / 20
480/80R50	10000	410 / 60
710/70R42	10000	315 / 46

High road speeds & heavy loads may cause tyres to wear prematurely.

If a tyre is replaced with a different brand or size, please contact the supplier for correct air pressures to suit the load carrying capacity of the Prairie Special.

Protect the tyres as much as possible to minimise wear and deterioration.

Chemicals are harmful to the rubber in the tyres and should be washed off immediately after use.

Refer to the weight chart at the start of this manual for calculating load weights.

Allow for each tyre to carry half the maximum loaded weight when calculating tyre loads.

#### ⚠ DANGER

Take extreme care when inflating tyres and use an accurate inflation gauge when doing so. If tyres are inflated at a rapid rate then the tyre rim combination may explode. This can result in serious or fatal injuries.

#### NOTE

If a tyre is replaced with a different brand or size, please contact the supplier for correct air pressures to suit the load carrying capacity of this sprayer.  
1 psi = kPa x 0.145, eg. 240 kPa x 0.145 = 34.8 psi



Fresh water tank (left) & Pressure Filter (right).



Open the drain valve to drain the Suction Filter.



Carefully remove the Suction Filter screen for washing & cleaning.



Carefully remove the Pressure Filter screen for washing & cleaning.

## Filter Maintenance

It is essential to maintain all filters and filter screens in good condition. Filters & screens not regularly cleaned can severely impede liquid flow & delivery pressure.

Worn or damaged screens will allow foreign materials to enter the pumping system which in turn can damage pumps, solenoids, valves & cause blockages in nozzle tips.

Always safely unfold & lower the boom before attempting to unscrew and service filters.

First remove the filter bowl, then the filter screen for cleaning.

Filter screens are best washed & cleaned with a soft brush in clean water and using compressed air after washing.

Ensure the filter screens, o-rings and bowls are correctly re-fitted after cleaning.

Filter screens & components not properly fitted, may allow air to enter the pumping lines reducing pump and spraying performance.

## Suction Filters

Always ensure suction filter and screen are clean & in good condition. Filters & screens not regularly cleaned can severely impede liquid flow & delivery pressure.

Follow these steps to clean the filter & screen:

- 1 Ensure the spray pump is Off & its three-way ball valve Off - to prevent liquid flow to the filter.
- 2 Open the filter drain valve to drain the filter.
- 3 Carefully unscrew filter nut & remove the bowl, then carefully remove the screen.
- 4 Wash & clean the screen.
- 5 Check the screen, bowl, body & O-rings for any damage. Replace if damaged.
- 6 Carefully re-fit screen ensuring the O-ring is in position for proper seal.
- 7 Replace bowl, filter nut, then tighten the nut but do not over-tighten.

### ⚠ CAUTION

Read and heed the chemical label warnings regarding PPE before cleaning any filter.

## Pressure Filters

Always ensure pressure filter and screen are clean & in good condition. Filters & screens not regularly cleaned can severely impede liquid flow & delivery pressure.

Follow these steps to clean the filter & screen:

- 1 Ensure the Product Pump is Off.
- 2 Rotate the 'Pump Suction' valve to Off position to isolate liquid coming from the Product Tank.
- 3 Remove the holding pin & disconnect the Red On/Off valve from the base of the pressure filter.
- 4 Loosen the filter bowl nut slowly using the filter spanner supplied.

Be aware some residual chemical may dribble out.

Use supplied filter spanner if required.

### ⚠ CAUTION

Always wear gloves and other recommended protective clothing before attempting to remove and clean filters. Be careful of chemicals and avoid any damage to the O-Rings when cleaning filters.

- 5 Fully unscrew the filter bowl nut and remove the filter bowl.  
Be careful of any chemical and avoid any damage to the O-Rings.
- 6 Clean all filter components (filter bowl, nut, filter screen and O-rings), then refit the components making sure the filter bowl & O-rings are correctly placed.
- 7 Fully tighten the filter bowl nut.
- 8 Refit the Red On/Off valve to the base of the pressure filter, then fit the holding pin.

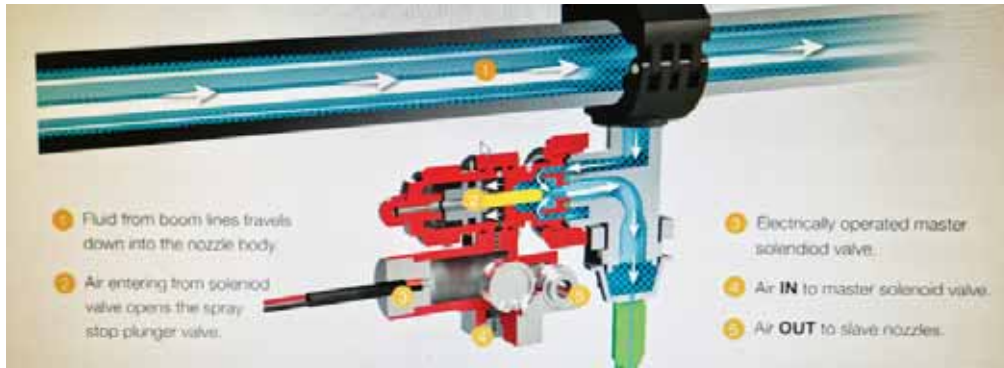


Illustration of the RapidFlow and RapidFire nozzle technologies.

### RapidFlow

RapidFlow boom recirculation fitted as standard, allows the sprayer boom lines to be fully primed without spraying a single drop, significantly reducing wastage at the start of spraying, changing chemicals and cleaning.

RapidFlow is used to thoroughly flush out the boom lines without the need to physically spray on the ground.

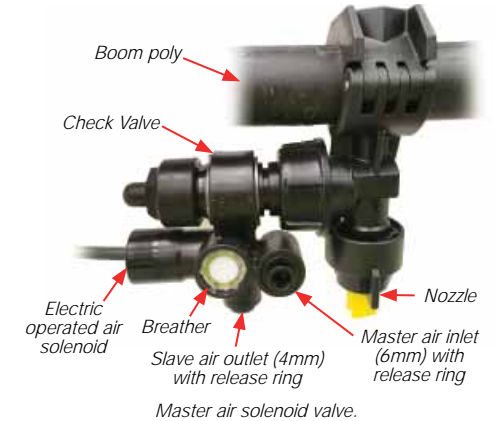
### RapidFire - Air Solenoid Nozzles

The nozzle system contains a master and slave arrangement for each section. One master air solenoid per section is electrically operated, which sends air to activate a number of slave cylinders which are pneumatic only.

Master solenoids are mounted on the boom centre section.



RapidFire control centre.



### RapidFire - Nozzle & Air Check

Test the air check nozzles for instantaneous response at the nozzle tip. With the lines at spraying pressure switch the nozzles On & Off. Each nozzle must respond quickly without dribbling, as the pressure builds up or subsides.

The air checks close under a spring tension of 45 psi. This traps the liquid in the spray line at the same pressure that it was being applied.

When the booms are turned On, air pressure (acting against the 45 psi springs) instantly opens flow to the nozzle applying the boom line liquid pressure at the rated pressure and droplet size with full fan angle.

The air check valve is located on the side of the nozzle, it has 2 O-rings in it. Over time, the O-ring may swell or be damaged which may result in a nozzle dripping or being slow to shut when it has been turned off.

If a nozzle leaks the outer O-ring requires replacement. If the air shut off has poor or delayed response, the inner O-ring requires replacement.





Air compressor located on the left hand side of the sprayer.

## Pneumatic System

The Pneumatic System of the Prairie Special is used for:

- Airbag suspension
- RapidFire system
- Auxiliary Air Outlet.

## Air Compressor

Follow the maintenance schedules outlined in this chapter.

Regularly clean the air filter of the air compressor.



Manual drain valve (at the base of the Air Tank) in closed position.

## Air Tank

The Air Tank (located on the rear of the chassis) is a reservoir of compressed air used to supply pneumatic all functions on the Prairie Special.

A manual drain tap at the bottom of the air tank, can be used to decompress the pneumatic system or check for presence of any moisture and debris.

## Pressure Relief Valve

A Pressure Relief Valve incorporated on the Air Tank tank prevents air pressure within the system acceptable limits.

The valve is set to open if 150 PSI is reached.

## CAUTION

Beware when releasing air from the air tank, there can be dangerous particles being released at high-speed.  
Be aware due to the rapid expansion of air, the tank release valve may become very cold.



Air gauge showing RapidFire pressure on the left hand side at the front of the sprayer.

## Setting Air System Pressure

Adjust the compressor cut-out pressure to 830 kPa (120 psi).

## Setting RapidFire Pressure

Adjust the pressure regulator on the boom centre section to 550 kPa (80 psi).

Confirm the setting on the gauge on front of the sprayer.



Left hand airbag inflated is 250mm (10"). Measure from the base of the top plate to the bottom of the airbag.

## Airbag Ride Height Adjustment

A Ride Height Valve regulates the air pressure within the airbags to achieve a consistent ride height.

The Ride Height Valve is located underneath, on the inside left hand suspension arm.

Ride Height is adjusted by loosening the bolt attaching the linkage rod to the chassis.

Left hand airbag fully deflated (140mm). Measure from the base of the top plate to the bottom of the airbag.







Adjustment to ride height is made by adjusting the linkage bolt in the slot where it attaches to the chassis.



Open the Airbag Dump Valve to lower a sprayer for trailer transport & end of season storage.



One of the shock absorbers shown under the sprayer.



Rear Manifold on top & in the front of the boom centre section.

### To Adjust the Ride Height:

- 1 Park the Prairie Special on a flat level surface.
- 2 Loosen the bolt attaching the linkage rod to the chassis.
- 3 Slide the attaching bolt up or down in the slot to either raise or lower the ride height. Inflated airbag ride height is 250mm +/- 5mm (measuring from the base of the top plate to the bottom of the airbag).
- 4 Re-tighten the linkage bolt to fix the position.
- 5 Retighten the lock nuts on completion of the adjustment.

### NOTE

The ride height valve has a dead band position where the valve does not let air in or out of the airbags. Over time, seals in the ride height valve may wear causing the dead band to decrease. If this is occurs, the ride height valve requires re-adjustment or possibly replacement.

### To Deflate Air Bags for Trailer Transport:

- 1 Load and park the Prairie Special on transport platform.
- 2 Open the drain valve on the air tank and let the air empty out.
- 3 Open the air dump valve of the airbags on the rear LHS of the sprayer
- 4 The air bags will lower on to the bump stops.
- 5 Once the Prairie Special is on the bump stops, close the air tank & dump valves.

### NOTE

When the Prairie Special has been unused for a period of time, the air bags may deflate. This is normal. The airbags will re-inflate after the engine is started.

## Shock Absorbers

Shock absorbers are fitted to the Prairie Special on each side of the axle. These dampen movement of the air bags & prevent recoil.

Shockers absorbers should be regularly checked for damaged rubbers or oil leaks.

If leakage or damage occurs replace the shock absorber.

### CAUTION

When deflating the air bags, keep clear of all chassis parts as the machine can move suddenly downwards. Failure to heed this caution may result in personal injury.

## Rear Hydraulic Manifold

The Rear Manifold with compact cartridge style valves, located on top & in the front of the boom centre section, controls all boom functions including lift, fold, tilt, bi-fold, centre level and hydraulic yaw.

The hydraulic block is divided into left and right sections with hydraulic hoses directed to each side of the boom.

Manual overrides are fitted to the solenoids.

Refer to Chapter 7, 'Boom Settings' for Hydraulic Manifold, instructions.

### ⚠ DANGER

Due to the crush hazard that exists from working on the centre section, hydraulic functions should NOT be overridden at the spool block.

### ⚠ DANGER

DO NOT operate the hydraulic functions while adjusting the flow. All people & objects should be clear of the boom wing radius while operating the hydraulic functions.



Thoroughly clean & corrosion protect the Prairie Special for storage for long trouble free operation.

## Corrosion Prevention

Goldacres apply G15 anti corrosion spray to all fasteners (bolts, washers and nuts) and zinc plated components at the time of manufacture.

G15 should also be applied to the sprayer pre-season & post-season.

Use the following as item/area guide list to apply corrosion inhibitor:

- 1 Towing eye bolts.
- 2 Jack mounting bolts & locking pins.
- 3 Spray pump.
- 4 Steps & hand rails.
- 5 Handrails.
- 6 Boom rests.
- 7 Pod frame mounting bolt.
- 8 Induction hopper bolts & latches.
- 9 Mudguard mounting bolts.
- 10 Right hand pod frame mounting bolts.

- 11 Wheel nuts.
- 12 Axle airbag frame mounting.
- 13 Breakaway hinges & boom end protectors.
- 14 Nozzle bracket bolts.
- 15 Hydraulic manifold.
- 16 Hydraulic cylinder fittings.
- 17 Hydraulic hose crimp fittings on all hoses.
- 18 Centre section paralift rear pins & bolts.

This guide is not necessarily comprehensive and the amount of corrosion protection necessary ultimately depends on local climate & operating conditions.

Boom grease points.



Boom grease points.



Boom grease points.

## Boom Lubrication

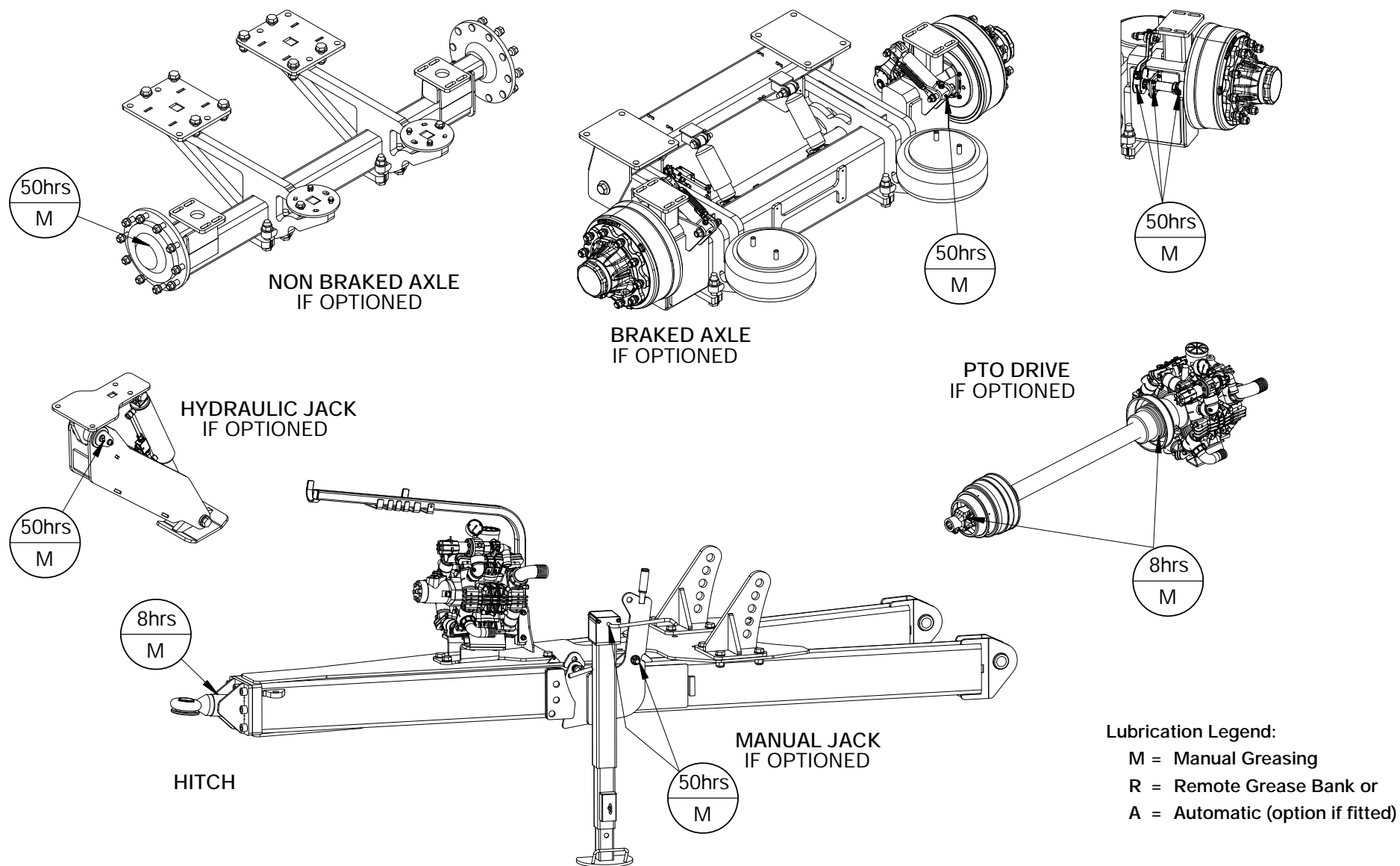
Refer to 'Grease Points' shown on the following pages.

## Grease Points

The location & greasing schedules of the Prairie Special Series 2 grease nipples are shown in the following illustrations:

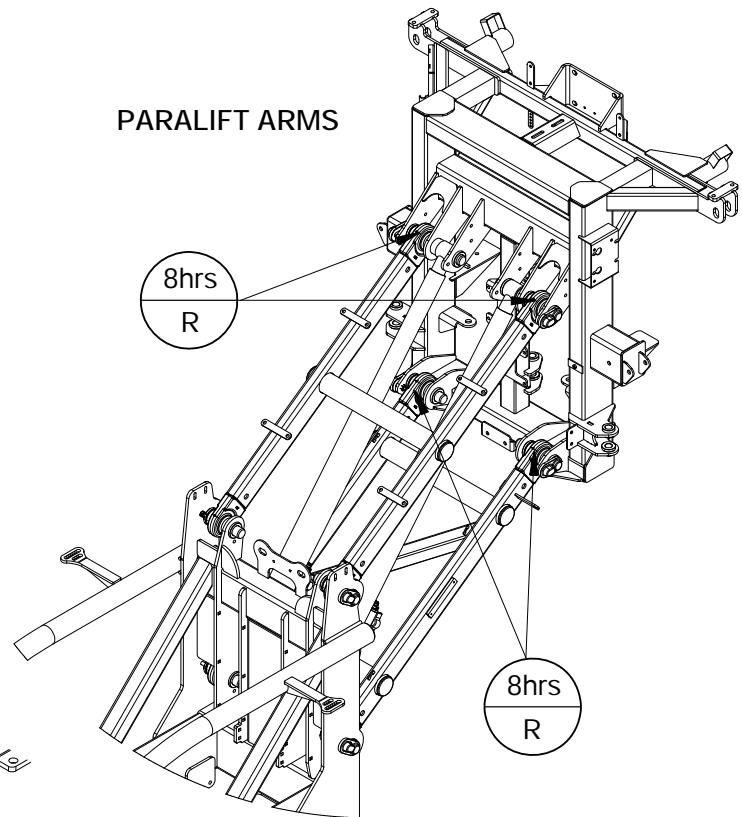
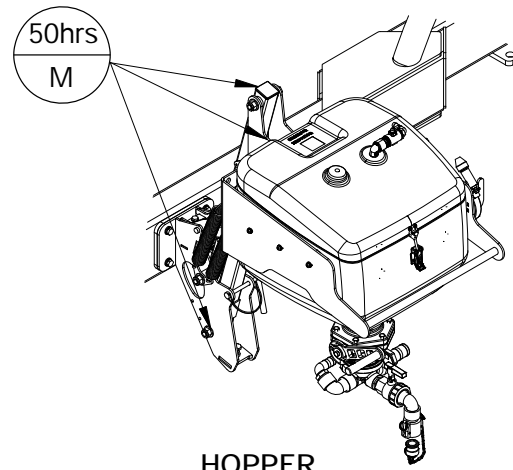
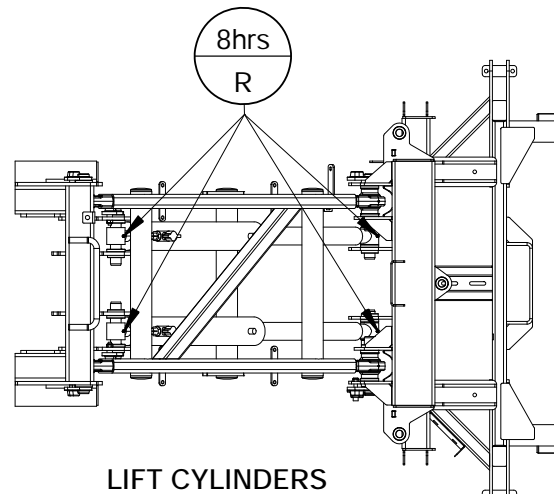
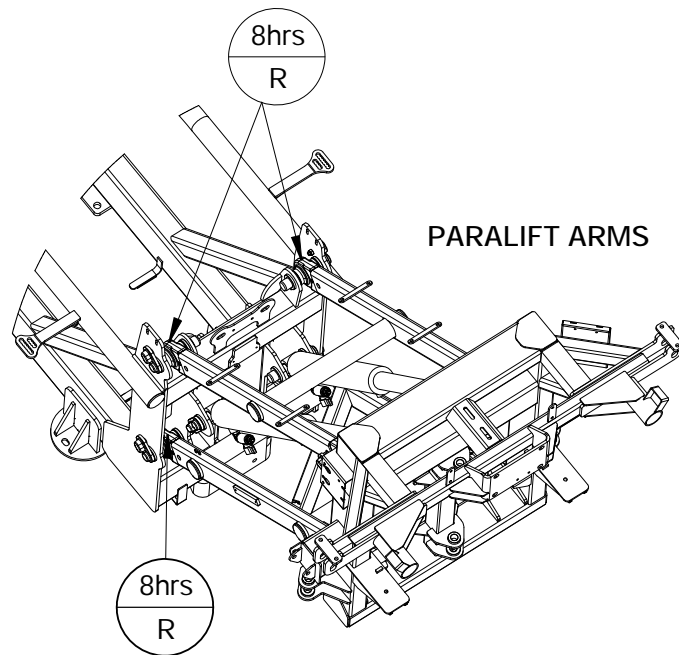
- 1 Chassis & Suspension Points
- 2 Boom Paralift Grease Points
- 3 Boom Centre Grease Points 1
- 4 Boom Centre Grease Points 2
- 5 24m - 36m Boom Wing Grease Points.

## 1 Chassis &amp; Suspension Grease Points





## 2 Boom Paralift & Hopper Grease Points

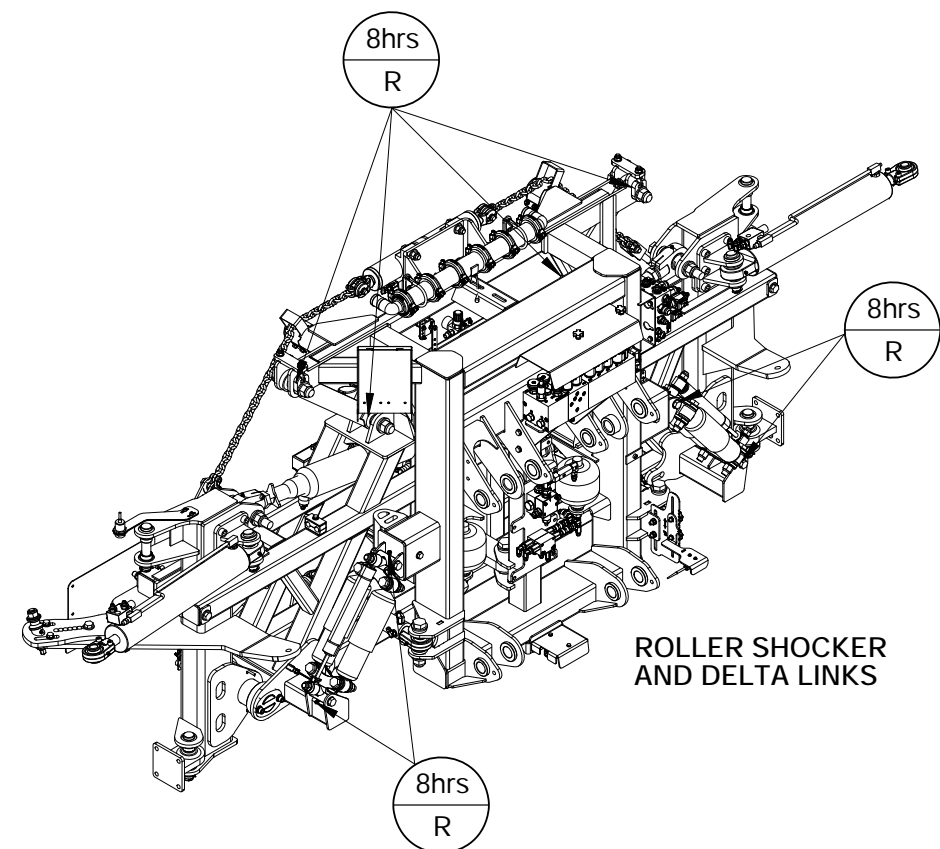
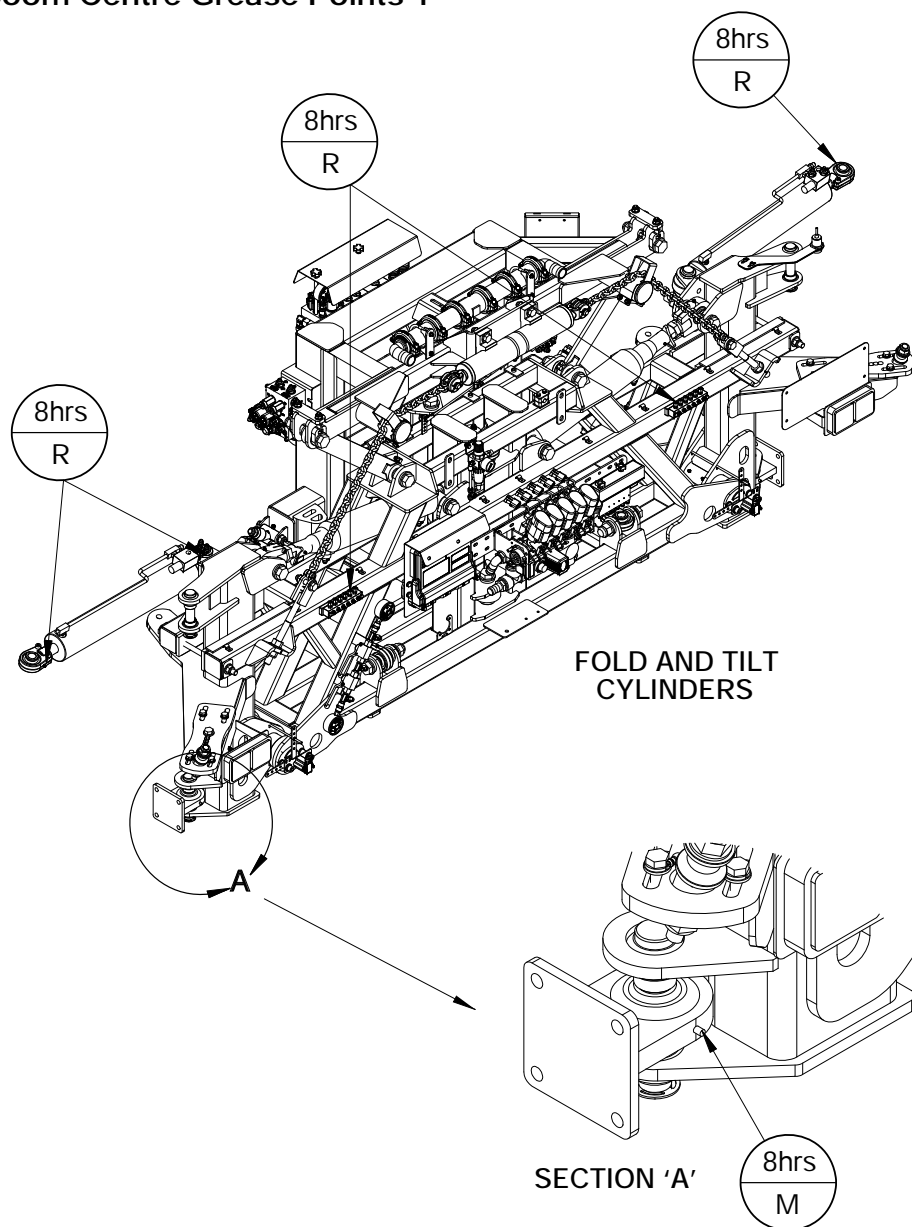


### Lubrication Legend:

- M = Manual Greasing
- R = Remote Grease Bank or
- A = Automatic (option if fitted)



## 3 Boom Centre Grease Points 1



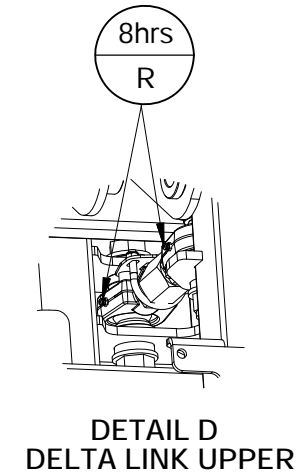
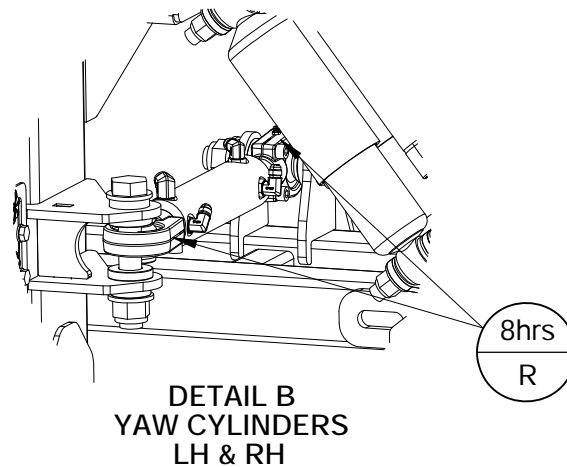
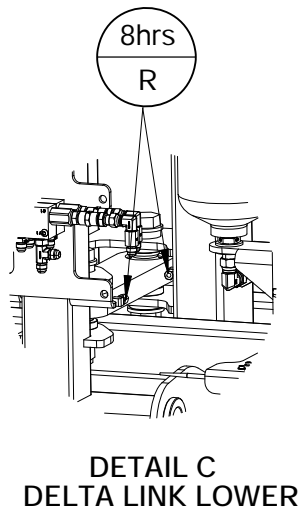
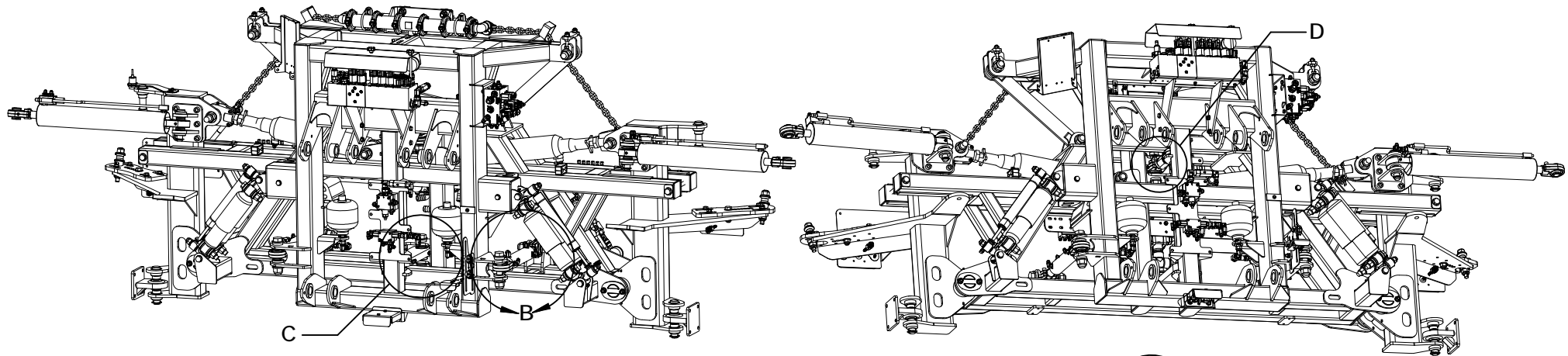
## Lubrication Legend:

M = Manual Greasing

R = Remote Grease Bank or

A = Automatic (option if fitted)

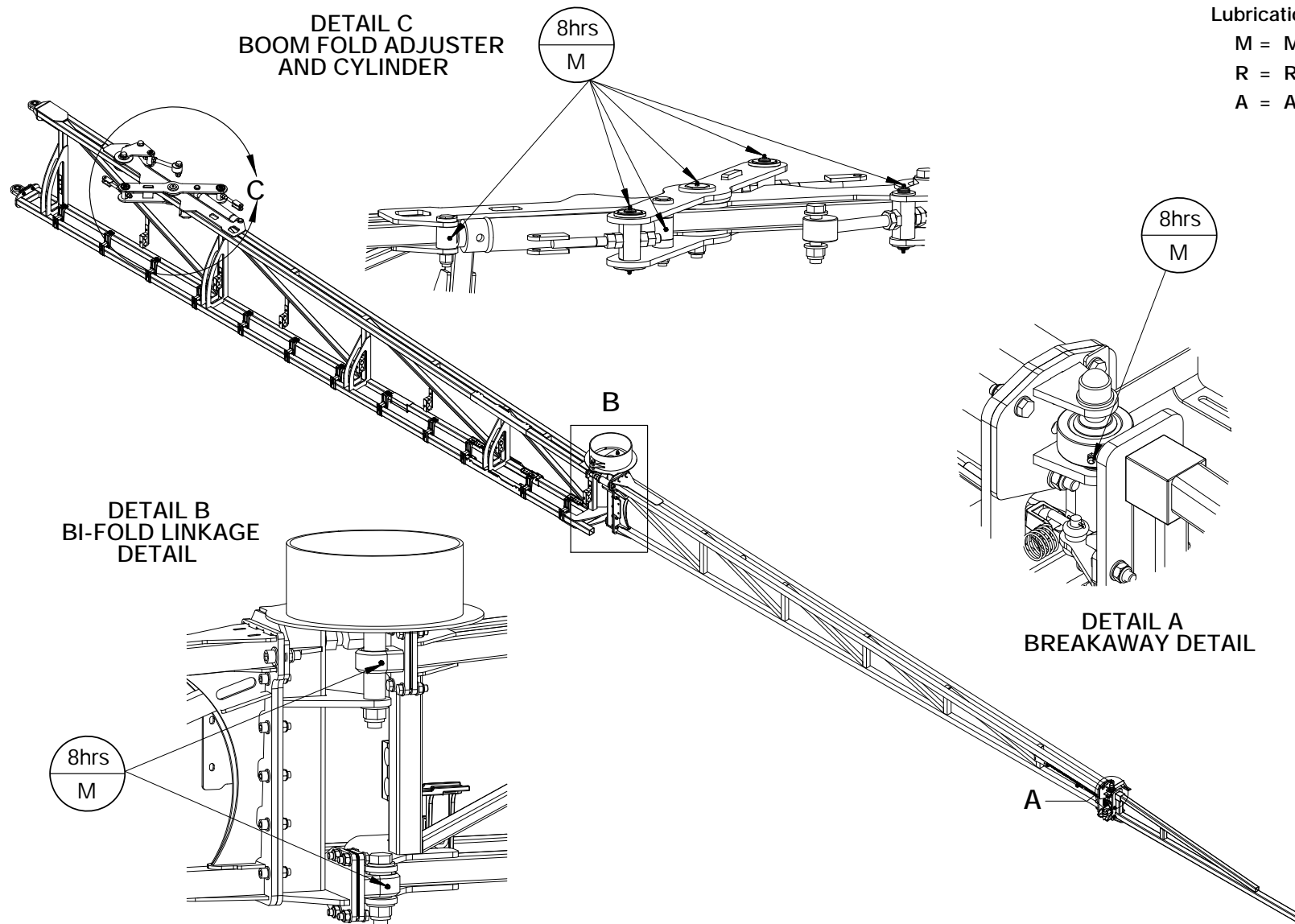
## 4 Boom Centre Grease Points 2



### Lubrication Legend:

- M = Manual Greasing
- R = Remote Grease Bank or
- A = Automatic (option if fitted)

## 5 24m - 36m Boom Wing Grease Points



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## 9 Fast Tracking Problems – Trouble Shooting

### Trouble Shooting Preface

The following troubleshooting information is provided as a reference if your machine is not functioning correctly.

To ensure that you receive the best possible service, it is recommended that you exhaust all applicable troubleshooting solutions shown in this chapter prior to calling your dealer, or Goldacres for service advice

Parts information and schematics can be found in the Parts Manual supplied.

### Spray Pump - Diaphragm

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Pump is noisy	Low oil level	Refill or replace oil
	Damaged pump valves	Replace pump valves
	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
Pressure & Flow rate are too low	Diaphragm pump speed	Check pump speed is 400 - 540 RPM.
	Diaphragm pump diaphragms	Check oil for colour change. If the oil appears milky, a diaphragm will be damaged and needs to be replaced
	Diaphragm pump valves	Check pump valves for wear or blockage

### Spray Pump - Diaphragm

PROBLEM	COMMON CAUSES	COMMON SOLUTION
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
The flow rate is correct but my pressure is too low or high.	Nozzles	Check nozzle chart for correct nozzle size.
Pressure fluctuation	Air leak on suction side of pump	Check suction pump for air leaks.
	Incorrect pump speed	Adjust speed to 400 - 540 RPM range
	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 speed to 400 - 540 RPM range
	Air leak on suction side of pump	Check pump suction for air leaks
Pump oil is becoming milky	Cracked diaphragm	Replace all diaphragms

## Spray Pump - Centrifugal

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Pressure & Flow rate are too low	Incorrect pump speed	Check pump speed is 4000 - 4200 RPM
	Suction line air leak	Check suction line for air leak.
	Suction blockages	Check the tank sump, suction line & suction filter for blockage
	Nozzle wear	Measure the flow per minute coming out of one nozzle, then check the nozzle chart for the corresponding flow.
	Regulator valve function	Check the regulator valve is rotating the full 90 degrees when the boom valves are switched Off
	Excessive bypass on pressure manifold	Verify the Console calibration settings
Pressure & Flow rate are too high	Bypass line is restricted or blocked.	Verify console calibration settings Check for restriction in bypass line Check pump speed is not too fast Check if Bypass valve is turned On
Pressure gauge reads 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 & filters.	Check and clean all pressure and nozzle filters

## Spray Pump - Centrifugal

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Pressure fluctuation	Air leak on suction side of pump	Check suction pump for air leaks.
	Incorrect pump speed	Adjust pump speed: 4000 - 4200 RPM
Pump pressure pulsating	Incorrect pump speed	Adjust pump speed: 4000 - 4200 RPM
	Air leak on suction side of pump	Check pump suction for air leaks
	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

## 9 Fast Tracking Problems – Trouble Shooting

### Booms

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Inner and outer wing are not in line with each other when the boom is unfolded	Stopper bolt holding out the boom	Adjust the boom stopper bolt
Booms will not fully fold to the boom rests	Insufficient lubrication	Lubricate all boom pivots
	Fold cylinder adjusters have moved	Adjust fold cylinder mounts
Boom unfolds unevenly	Air trapped in the hydraulic lines	Unfold booms completely and hold switch for a few seconds. Then, fold booms completely and hold switch for a few seconds. Do this multiple times as necessary to purge any air out of the hydraulic lines
	Centre section level chains loose	Re-tension chains
Outer boom does not line up with the inner wing when unfolded	Incorrect boom adjustment	Fold the boom out and note the position the outer boom is in. Fold the boom in to transport position and note position outer boom is in. Follow the table below to adjust boom so it sits level in the out (work) position and to have the bottom chords sitting parallel in the folded (transport) position
Boom inners folding unevenly	Centre level chains loose	Re-adjust centre level chains to level centre when folding
Boom outers folding unevenly	Centre level chains loose	Re-adjust centre level chains to level centre when folding

### Spray Nozzles

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Streaky pattern coming from nozzle	Nozzle tip blockages.	Check for blockages by removing the nozzle, rinsing thoroughly with water and cleaning with compressed air. DO NOT clean by blowing into nozzle with mouth.
	Nozzle worn or damaged.	Visually inspect nozzle for damage or wear, conduct a jug test if necessary.
No spray coming from nozzle	Nozzle tip blockages.	Check for blockages by removing the nozzle, rinsing thoroughly with water and cleaning with compressed air.
	Check valve blockages.	Remove the check valve and clean as required.

### Wing Adjustment

Use the table below to adjust rose end mounts.

The table shows the position of the boom & the adjustment necessary to bring them level.

#### NOTE

Hold the boom fold switch for a few seconds after the first boom has folded completely to give the other boom the chance to match the fully folded position.

OUTER WING POSITION (UNFOLDED)	OUTER WING POSITION (FOLDED)	TOP PIVOT SHIMS	BOTTOM PIVOT SHIMS
Up	Up	NIL	Shorten (Remove)
Up	Down	Lengthen (Add)	NIL
Level	Up	Shorten (Remove)	Shorten (Remove)
Down	Down	NIL	Lengthen (Add)
Down	Up	Shorten (Remove)	NIL
Level	Down	Lengthen (Add)	Lengthen (Add)

## Hydraulics & Pneumatics

PROBLEM	COMMON CAUSES	COMMON SOLUTION
	Yaw valves open	Close yaw valves on rear boom manifold
	Load sense signal bleeding off	Fit smaller orifice in chassis manifold
		Adjust tractor internal load sense bleed
<b>The air bags are not inflating</b>	Low system pressure	The bags will not inflate until the pressure in the system is above 75 psi. Check system pressure is set to 120 psi.
	Compressor not working correctly	Check the compressor is working correctly. Check 12V fuse and power.
<b>Vehicle sits unevenly</b>	Incorrectly adjusted ride height valves.	Adjust the ride height valves as per the instructions in the Lubrication and Maintenance chapter.

## Plumbing

PROBLEM	COMMON CAUSES	COMMON SOLUTION
<b>No water at boom.</b>	No Tier valve value entered or is at 0	Enter value greater than 0

## Induction Hopper

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Induction hopper is not performing as well as it should	Insufficient flow to venturi in the hopper bottom	Check minimum pressure supplied to the hopper is 550 kPa (80 PSI).
	Air leaks on induction system	Check all hoses, clamps, and cam lever fittings are sealed

## Tanks, Chassis & Wheels

PROBLEM	COMMON CAUSES	COMMON SOLUTION
<b>The drawbar of the sprayer has become noisy and loose</b>	Worn, or missing, plastic insert in towing eye	Replace plastic insert



## 9 Fast Tracking Problems – Trouble Shooting

### Flow Meter

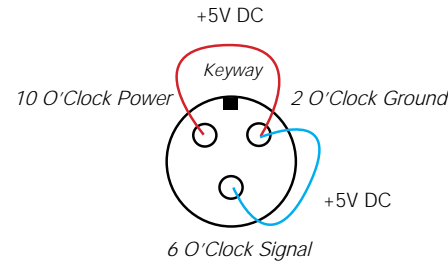
PROBLEM	COMMON CAUSES	COMMON SOLUTION
Application rate is inaccurate, unstable or zero	Incorrect console calibration	Re-calibrate console
	Inconsistent ground speed reading	Check cabling
	Inconsistent flow meter reading	Replace flow meter
	Faulty control valve	Replace control valve Check - manual increase/decrease flow control
Speed sensor display is inaccurate, unstable or zero	Incorrect speed calibration	Re-calibrate console speed
	Faulty cable	Test cable as per instructions following
Volume display is inaccurate, unstable, zero or not changing	Meter calibration is incorrect	Reset meter calibration
	Flow meter cable pins are corroded	Replace flow meter plugs & pins
	Flow meter is pointing the wrong way	Disconnect flow meter and reinstall in the correct orientation
	Faulty cable	Manually test the cable
Flow meter appears not to be working	Flow meter is seized or blocked	Remove and clean any foreign materials so the turbine spins freely
	Faulty cable	Test cable as per instructions following
	Calibration figure is incorrect	Reset meter calibration
Application rate or pressure will not alter	Faulty control valve	Test valve manually and replace if required

### Flow Meter cont.

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Control valve has failed	Faulty cable Faulty valve	Replace control valve
		Temporary solution - Remove the motor from the 3 way ball valve & manually adjust the flow by turning the shaft with a spanner.
Raven Console not working	No power supply	Check loom connection at the back of the console
		Check connection to battery terminals
		Check the fuse in the back of the console
		With a multi meter, check the voltage potential across pins 1(-) and 16(+) on the 16 pin plug going into the console (Should be at least 12v)

If a flow meter fails to give accurate readings, the following actions should be taken:

- Adjust the spraying pressure by putting the flow control switch into manual and using the increase/decrease switch to adjust to the desired pressure shown on the pressure gauge of the sprayer.
- Drive the sprayer at a constant speed in order to apply the required application volume as determined by the nozzle selection chart.
- The sprayer should then be operated to empty the tank.  
Once the sprayer is empty of chemical, partially fill the tank with fresh water so that the test can be performed in order to correct the problem.  
Repair or replace the flow meter as soon as possible.



Voltage Readings:

2 o'clock - 6 O'clock (+5V DC)

10 o'clock - 2 O'clock (+5V DC).

*Cable connector test points.*

## Flow Control Valve Override

### To Override the Flow Control Valve:

- 1 Remove electric motor from three way fast close valve, and manually rotate valve until desired spraying pressure is achieved.
- 2 Drive sprayer at a constant speed in order to apply the required application volume as determined by the nozzle selection chart.
- 3 The sprayer should then be able to be operated in order to empty the tank.
- 4 Once the sprayer is empty of chemical, partially fill the tank with fresh water (no chemical) so further testing can be performed to correct the problem.
- 5 Repair or replace the Raven console as soon as possible.

## Testing Raven Flow Meter Cable

### To Test the Raven Flow Meter Cable:

- 1 Change meter Cal number (in the Raven console) to 1 with the [Meter Cal] key.
- 2 Press [total volume] key & place the boom switches ON.
- 3 With a jumper wire (eg, paper clip), short between the 6 O'clock & 2 O'clock sockets with a short", then "no short" motion.

Each time contact is made the [total volume] should move up in increments of 1 or more.

- 4 If total volume does not count up, the previous section of cable must be faulty & should be repaired.
- 5 Perform the voltage checks shown above.
- 6 Change [Meter Cal] number back to previous number.

## NOTE

Care should be taken because there is no agitation while the nozzles are not spraying.

## 9 Fast Tracking Problems – Trouble Shooting

### Chemical Probe

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Chemical probe is not working or is working too slow	Air leak in the vacuum system	Check all hose clamps and fittings are tight
	Lack of pressure to venturi in top of tank	Check there are no kinked hoses and the water pressure is about 100 PSI

#### To Isolate Possible Probe Air Leaks:

- 1 Check the operation of the chemical probe. If this will transfer water at a minimum of 30 L/min then this part of the system is okay.

If not check for air leaks at:

- Cam lever fitting of the probe
- Hose fittings

- 2 If the probe works correctly but an Envirodrum will not operate, check for air leaks in the Envirodrum fitting (this must be thoroughly cleaned after each use).

Also check interior pipes of the Envirodrum for air leaks or damage.

#### To Summarise:

Firstly, check the flow of water into venturi.

Secondly, check the probe only.

Thirdly, check both the probe and Envirodrum section.

#### NOTE

All tests must be done with water because the speed of the transfer is affected by the increased viscosity of added chemicals.

#### NOTE

For further information on troubleshooting for Universal Terminals or optional Raven Controller CR7, refer to the 'Raven ISOBUS Product Control Installation and Operation Manual' supplied with the Prairie Special sprayer.

### Universal Terminal (Raven CR7)

PROBLEM	ACTION
1 Rate reads "0."	<ul style="list-style-type: none"> <li>• Verify SPEED is registering accurately. If SPEED is zero, refer to the VT display troubleshooting procedure in the Raven ISOBUS Product Control Installation &amp; Operation Manual.</li> <li>• Verify TOTAL VOLUME is registering flow. If not, refer to problem 6.</li> </ul>
2 Rate inaccurate or unstable.	<ul style="list-style-type: none"> <li>• Verify that all calibration numbers and settings keyed into the console are correct. Verify SPEED is registering accurately. If SPEED is inaccurate, refer to the VT display troubleshooting procedure.</li> <li>• In MAN (manual) operation, verify that RATE display holds constant. If not, refer to problem 7.</li> <li>• Confirm that boom section status shown on the display is not changing.</li> <li>• In MAN (manual) operation, check low end and high end pressure range. If pressure cannot be adjusted manually, refer to problem 6.</li> </ul>
3 Cannot verify rate in manual operation or in auto.	<ul style="list-style-type: none"> <li>• Check cabling to motorized control valve for breaks.</li> <li>• Check connections in cabling for cleanliness.</li> <li>• Verify that there is voltage at the valve connector by toggling master switch ON; AUTO/MAN switch to MAN; and POWER ON. Manually operate INC/DEC switch to verify voltage.</li> <li>• Verify that valve is turning, if not, replace control valve.</li> </ul>
4 Sprayer pressure is correct but RATE is low.	<ul style="list-style-type: none"> <li>• Verify that nozzle strainer screens or check valves are not plugged.</li> <li>• Verify that pressure at each boom is the same.</li> <li>• Verify all nozzles are of proper and same orifice size. See Chapter 5, Calculating the Calibration Values.</li> </ul>
5 Total volume does not register.	<ul style="list-style-type: none"> <li>• Check flow meter/encoder cable for breaks and shorts. See the Testing the Flow Meter/Encoder Cable section on page 72 of the Raven ISOBUS Product Control Installation &amp; Operation Manual for details.</li> <li>• Check the internal components of the flow meter/encoder; clean and adjust. Chapter 9, Flow Meter Maintenance and Adjustment Procedure for flow meter cleaning and adjustments.</li> <li>• Replace flow meter transducer/encoder.</li> </ul>
6 Total volume registers flow inaccurately.	<ul style="list-style-type: none"> <li>• Verify that arrow on flow meter is pointing in direction of flow.</li> </ul>
7 Motorised control valve rotates more than 1/4 turn.	<ul style="list-style-type: none"> <li>• Replace motorised control valve.</li> </ul>
8 Water inside cover of motorized control valve.	<ul style="list-style-type: none"> <li>• Replace isolation flange assembly and coupler shaft.</li> <li>• Replace entire motorized control valve if PC board or motor is corroded and will not run.</li> </ul>
9 Boom valve(s) will not operate.	<ul style="list-style-type: none"> <li>• Check cable for wires with breaks.</li> <li>• Check connectors for cleanliness.</li> <li>• Check BOOM switch and MASTER switch for operation.</li> <li>• Replace boom valves.</li> </ul>
10 System does not enable in 'Liquid Applicator' or 'NH3 Applicator' mode.	<ul style="list-style-type: none"> <li>• If the control type is set to 'Liquid Applicator' or 'NH3 Applicator,' and no proximity switch has been installed, disable the 'Implement Switch' feature on the Product Control Calibration Tab. See Feature Settings on page 31 of the Raven ISOBUS Product Control Installation &amp; Operation Manual for details.</li> </ul>
11 Boost pump pressure (AccuFlow HP systems) does not increase or reach target pressure.	<ul style="list-style-type: none"> <li>• Refer to AccuFlow and AccuFlow HP Installation and Operation manual for boost pump troubleshooting procedures.</li> <li>• Verify that the pressure cal is calibrated correctly and the correct and the correct target pressure is entered.</li> <li>• The low limit pressure is not set correctly for operating conditions. The low limit will shut down the system if the limit is reached.</li> </ul>

**10 - Integrated Systems – Appendix 155**

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The Raven PC1 ISO BUS Control Centre, located on the LHS side on the sprayer chassis.



In-cab Sprayer Control Console (left) & optional Raven CR7 Controller (right).

## Raven PC1 ISO BUS System

The Prairie Special Series 2 Sprayer is fitted with a Raven PC1 ISO BUS system which operates with all leading spray controllers, steering & mapping providers using the ISO BUS protocol.

Each tractor & sprayer will vary according to its size and the options fitted. Illustrations & pictures used in this manual are representative but may not be exactly the same as your machine.

For information on standard & optional controllers, refer to Chapter 4, 'Preparation for Use - Setting Up'.

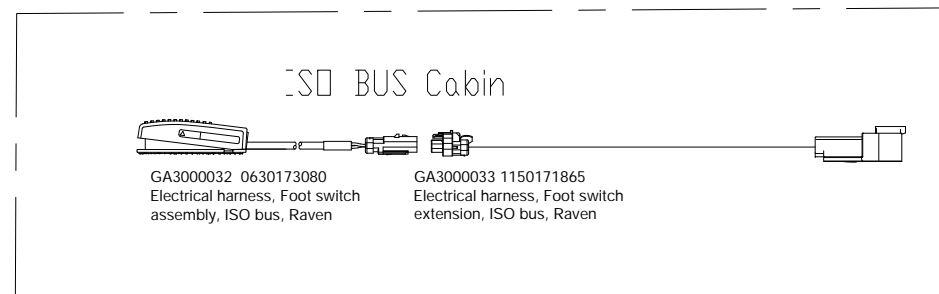
Optional In-Cabin Raven CR7 Controller.



Optional In-Cabin Raven SCS 4400 Controller.



### OPTIONAL FOOT SWITCH SUIT RCM



Optional Foot Switch schematic.

This chapter includes schematic drawings & layouts of systems & options used with the Prairie Special as follows:

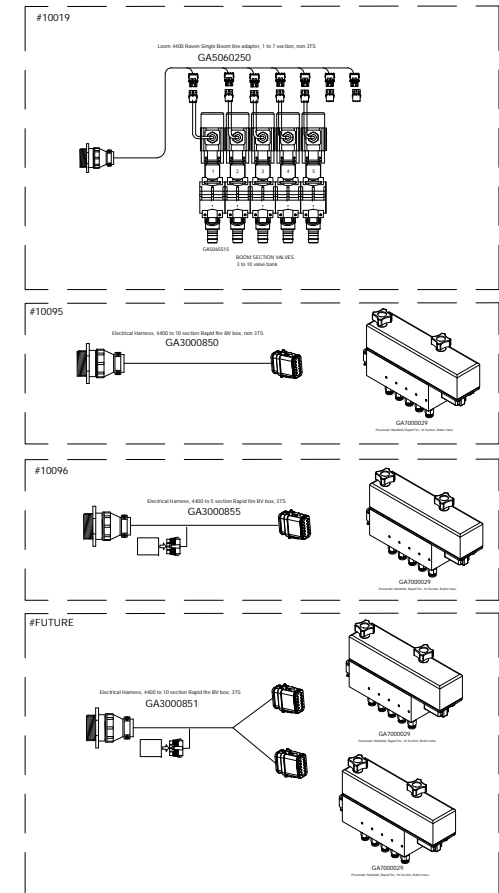
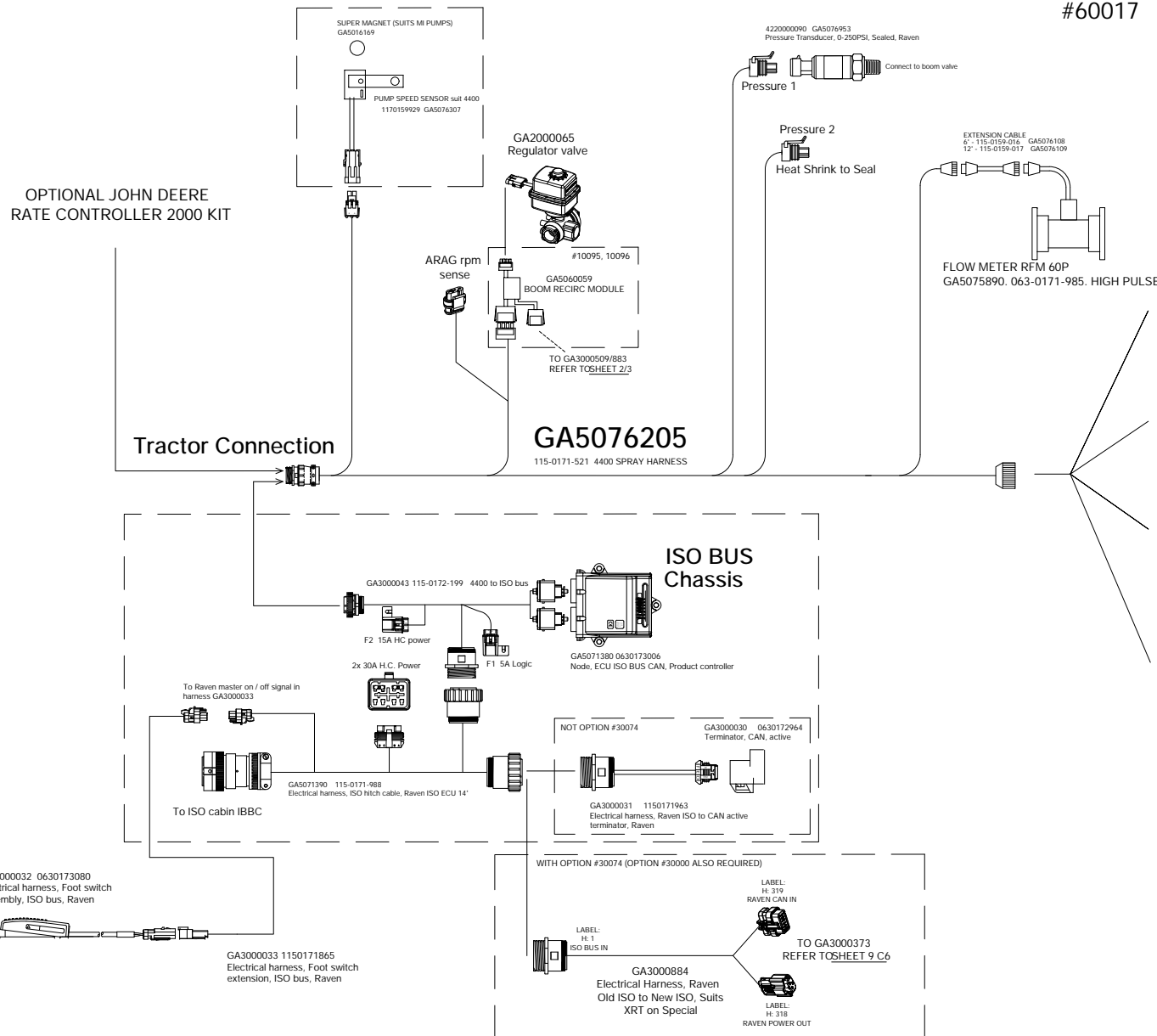
- Raven PC1 ISO BUS System
- Raven PC1 ISO BUS & Options
- Cabin ISO BUS Component Options
- Cabin Electrical Harness Options
- Chassis Electrical Harnesses 1
- Chassis Electrical Harnesses 2
- Hydraulic Block
- Hydraulic Cylinder Circuits
- Pneumatic System
- Pump Options & Circuits
- Raven XRT Boom Levelling Option
- Raven XRT UltraGlide Option
- Non-Raven XRT UltraGlide Option
- Air Compressor Connections
- Arag Low Pump Pressure Harness Option
- Plumbing Schematic - Diaphragm Pump Option
- Plumbing Schematic - Centrifugal Pump Option

## Raven PC1 ISO BUS & Options

## Raven ISO BUS, 4400 Base

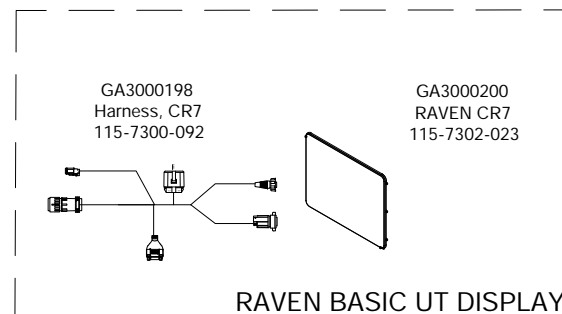
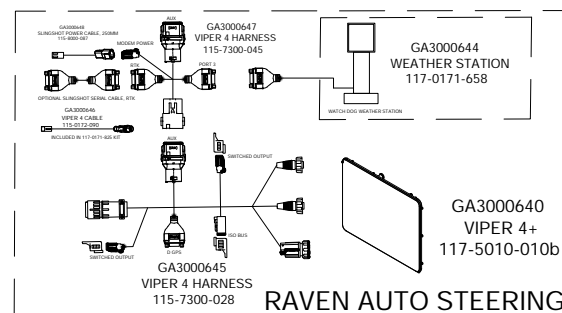
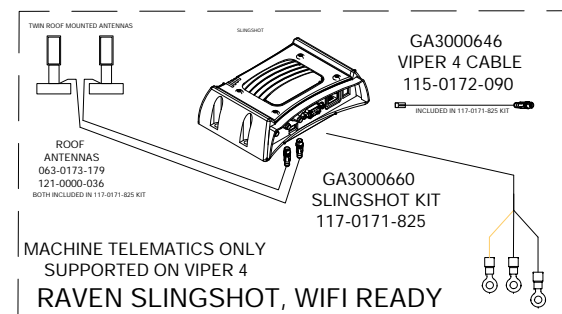
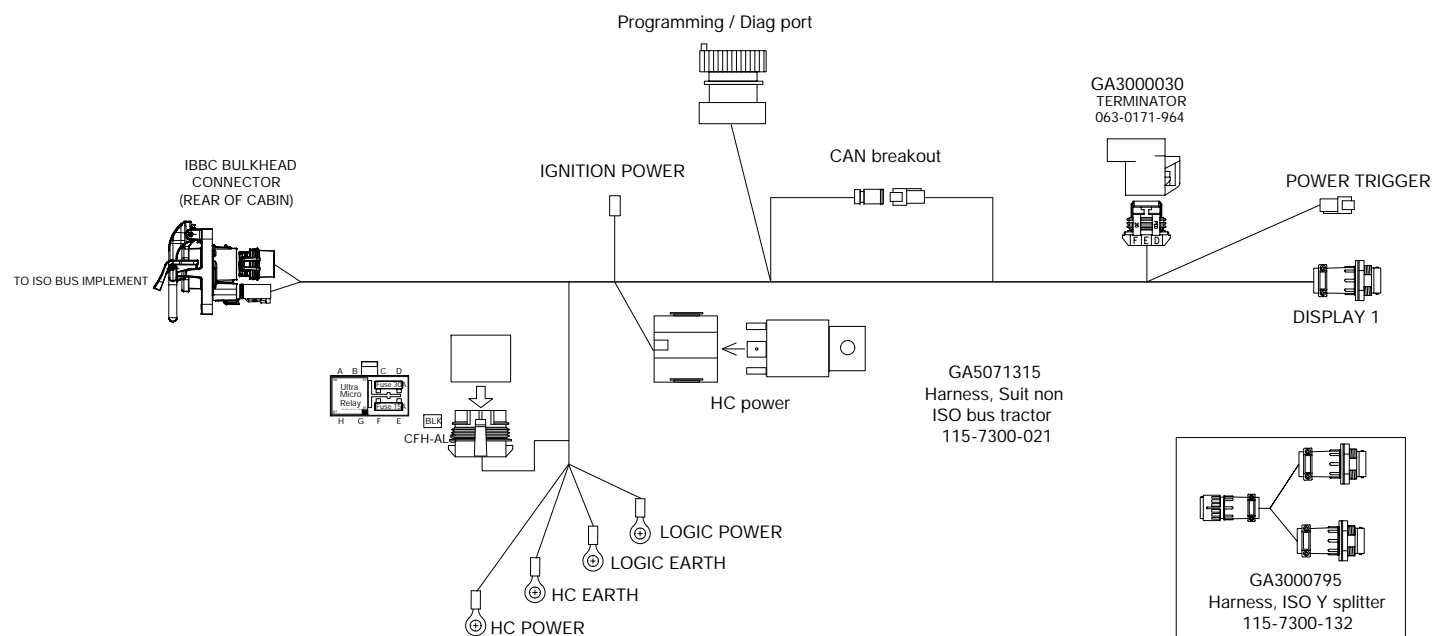
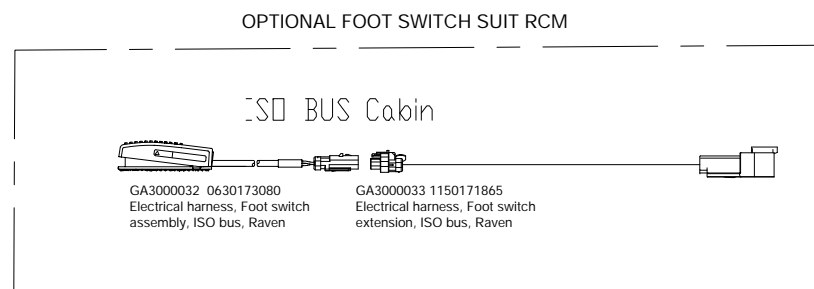
#60017

## Boom valve options



## Cabin ISO BUS Component Options

## IN CABIN ISO BUS COMPONENTS - OPTIONAL







## Hydraulic Controls - Chassis



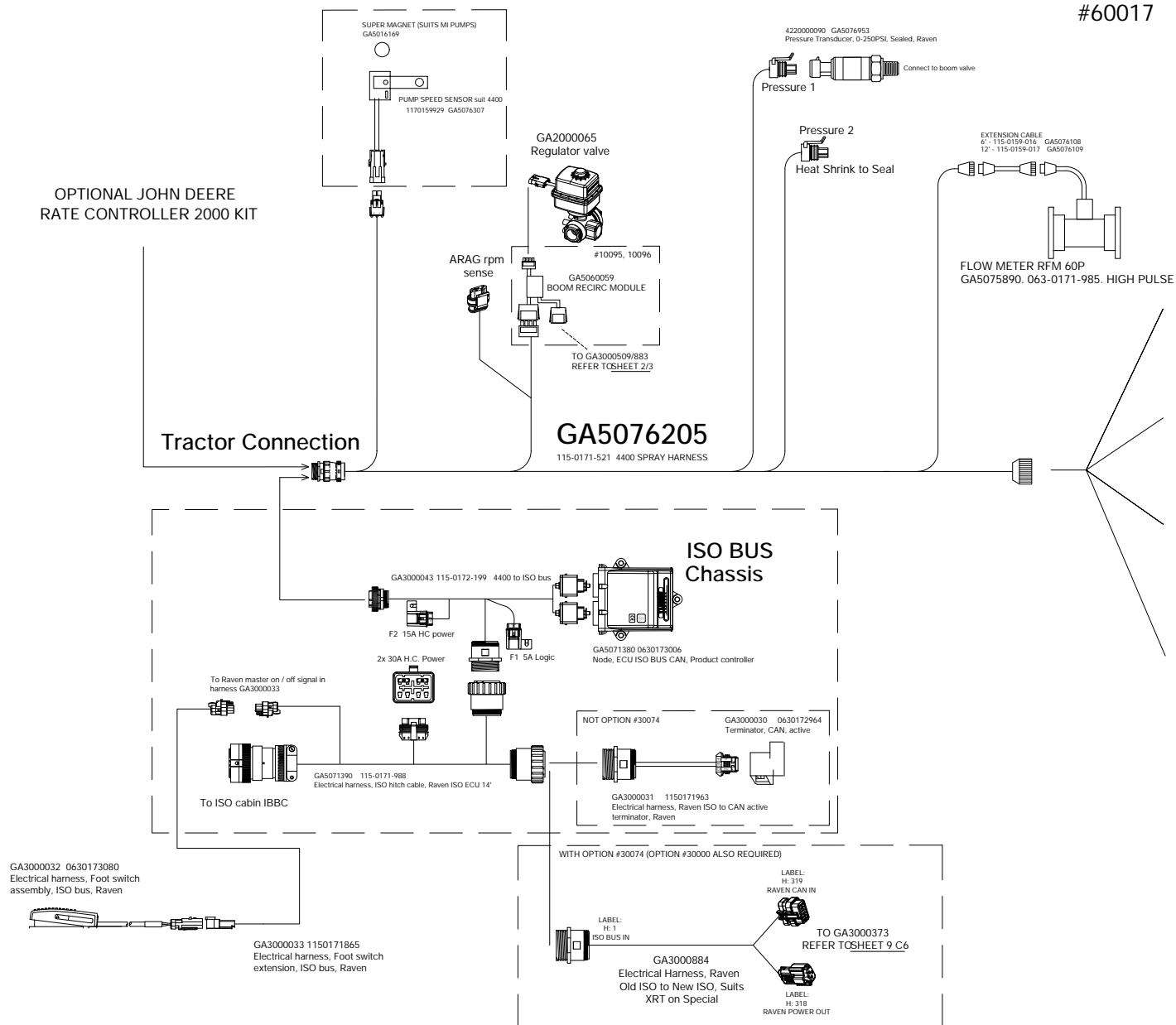


## Appendix – Integrated Systems

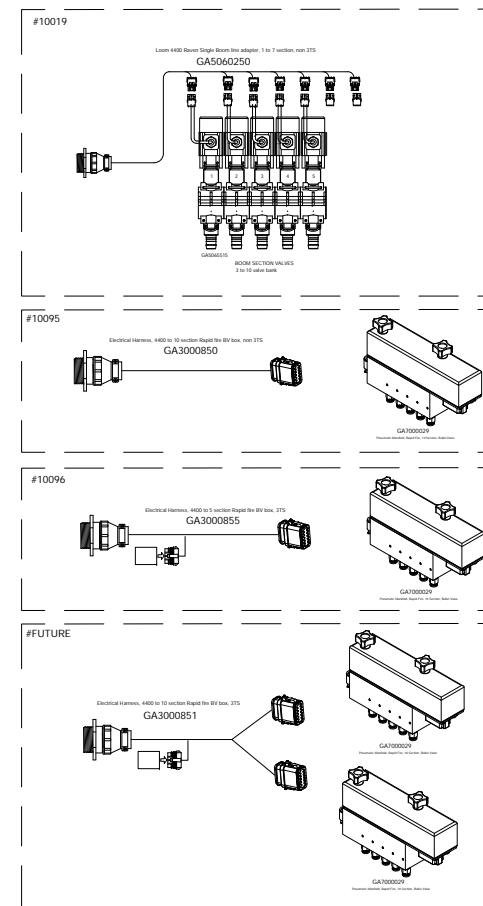
## Raven PC1 ISO BUS & Options

## Raven ISO BUS, 4400 Base

#60017



## Boom valve options





The main power fuse of the Prairie Special electrical system is fitted near the tractor battery.

## Fuses

The main power fuse protecting the Prairie Special electrical system is fitted near the tractor battery.



The RCM ISO BUS Control Centre fuse located on the harness.

The RCM ISO BUS Control Centre fuse is located on the harness below the ISOBUS Control Centre on the right hand side of the sprayer chassis.



Pump & switch fuse pod located under the Fast Fill Station cover.

The Pump and Switch fuse pod located under the Fast Fill Station cover.



Filling & Cleaning - Fast Fill Station.

## Liquid Application System

The Liquid Application System comprises a liquid & chemical:

- Fast Filling & Cleaning system
- Spraying system

## Fast Filling & Cleaning System

Fast Filling & Cleaning functions of the Prairie Special are primarily controlled at the Fast Filling Station on the left hand side of the sprayer.

Refer to chapter 6 'Operation - Ready to Spray' for operating details.

Components include:

- Fill pump - Optional
- Chemical transfer pump - Optional.

The main fuse of the electrical system with cover removed.



The ISO BUS Control Centre fuse with cover removed.



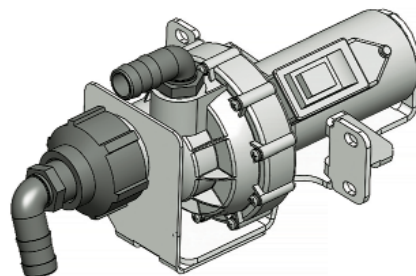




*Optional 3" Fill pump.*

### Fill Pump (Optional)

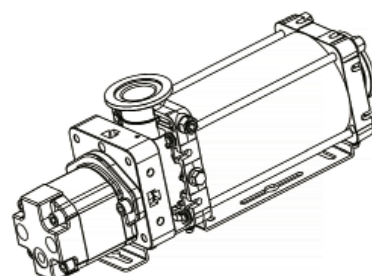
Aa optional 3" high-capacity fill pump combined with high flow fluid plumbing and hydraulics is capable of filling the sprayer at rates of up to 1150 l/min. Pump & distribution valves are located at the Fast Fill Station.



*Optional chemical transfer pump.*

### Chemical Transfer Pump (Optional)

An optional diaphragm chemical transfer pump (up to 40 l/min) ideal for high viscosity chemicals allows neat chemical to be delivered directly to the main product tank or diverted to the induction hopper to be measured before being transferred.



*Centrifugal pump (optional).*

### Spraying System

Optimum droplet sizing, pressure, nozzle flow rate and spray uniformity across the boom width are all critical to accurate chemical application.

Goldacres Rapid flow, boom recirculation, 3 tiered nozzle system (3TS, 3TS-Pro) options and Hawkeye Pulse Width Modulated (PWM) system option offer many application benefits.

All Spraying application functions of the Prairie Special are controlled and monitored through the integrated ISO BUS controller. Refer to chapter 6 'Operation - Ready to Spray' for operation details.

Primary components include:

- Spray pump, filters & valves
- Rate Control Module (RCM)
- Spray pump & liquid controls
- RapidFlow & RapidFire
- Boom sections & height control
- Driveline & speed control



*Diaphragm pump.*

### Spray Pumps

The Prairie Special is optioned with a diaphragm or centrifugal spray pump:

- A Udor Zeta 260 l/min diaphragm pump with nearly 85% of the pump capacity available to the spray line. This increased capacity allows spray application rates of up to 140 l/ha @ 25km/h to be achieved (220 l/min total flow rate across a 36m boom) OR
- A five-stage centrifugal pump can deliver up to 400 l/min at 8 bar of pressure. The multi-stage pump technology proved far more linear relationship between flow and pressure which is crucial in keeping large volumes of chemical in solution whilst spraying at relatively high pressures.

Both pumps are protected by a large suction filter as well as rpm and run-dry sensors for peace of mind spraying.



*The Prairie Special Fast Fill station.*

## Centralised Filters & Valves

Many filling, rinsing and spraying fluid circuits are controlled using motorised electric ball valves which are centralised to minimise pressure drop which is essential for maximising pump performance.

Electric motorised ball valves feature LED status lights and valve position indicators to aid trouble shooting.

A large single pressure filter featuring a self-flushing flushing function helps keep contaminants from blocking nozzles.

*The Pressure filter located at the Fast Fill Station.*



*Optional Raven CR7 Controller screen shown.*

## Raven PC1 ISO BUS

The Raven PC1 ISO BUS fitted as standard, uses innovative control algorithms for precise application including up to 16 section boom control to eliminate expensive skips and overlaps.

The Raven PC1 ISO BUS is compatible with most ISOBUS universal terminals on the market, including the optional screen CR7 from Raven - ISOBUS compliant CAN channel, plus 3 available CAN subnets.

Compatible with ISOBUS Universal Terminal and Task Controllers Integrated Bluetooth providing long range line-of-sight wireless connectivity for control, monitoring & testing.

Refer to the Raven Operation manual supplied for detailed setup and calibration information.



*Centreline plumbed boom with optional 3TS single nozzles at 250mm spacing.*

## 3 Tier System - 3TS (Optional)

The 3 Tier System (3TS) provides a wider range of flexibility with application rates and spraying speed. The 3TS effectively gives a much wider operating band whilst still maintaining optimum droplet size.

The 3TS might be described as a three step gearbox.

## 3TS Option

Each nozzle type on 2 tiers has an operating pressure band for a given droplet size. As the first nozzle set or tier reaches the top of its pressure band, the next larger size nozzle tier is activated.

When the second tier reaches the top of its pressure band, the first tier will be reactivated to spray at the same time. This effectively gives three operating bands.



*Flow Control Valve located under the Fast Fill station cover.*



*AutoBoom XRT radar sensor.*

## Speed Sensors

The Raven Automatic Rate Controller utilises a speed reading from the transmitted GPS speed over ISOBUS network.

The GPS system must be configured to transmit the ground speed over the ISOBUS network.

### Flow Control Valve

The flow control valve (located under the Fast Fill Station cover) regulates the amount of liquid going to the boom sections as directed by the system. It controls the flow to the boom by regulating the amount of liquid which bypasses and flows back to tank.

The flow control valve is a positive ball valve which means it can control flow infinitely to the boom from 0 L/min to the maximum pump output, dependant on the system pressure.

The flow control valve can be operated in manual mode from the console for boom priming, flushing & troubleshooting.

## XRT Auto Boom Height Control (Optional)

Boom height control is automated using the Raven AutoBoom XRT radar sensor system.

Centre section stability is physically managed using variable rate roll dampeners.

Variable rate dampeners are used to stiffen the centre section roll action which allows the boom wing tilts to be operated much faster without effecting the boom stability.

The XRT operating status is displayed on the G-Hub internal screen whilst the setup is configured through the ISO BUS terminal.

The XRT height sensors are radar based. They enable a larger height measurement range over ultrasonic types and can detect both ground and crop canopy and are less affected by spray drift, dust and mud.

The sensors are also very compact, allowing simple fitment along the boom.

The Raven XRT system uses extra sensors to monitor:

- The machine chassis rate of roll
- The boom centre position relative to the chassis &
- Boom wing tilt angle.

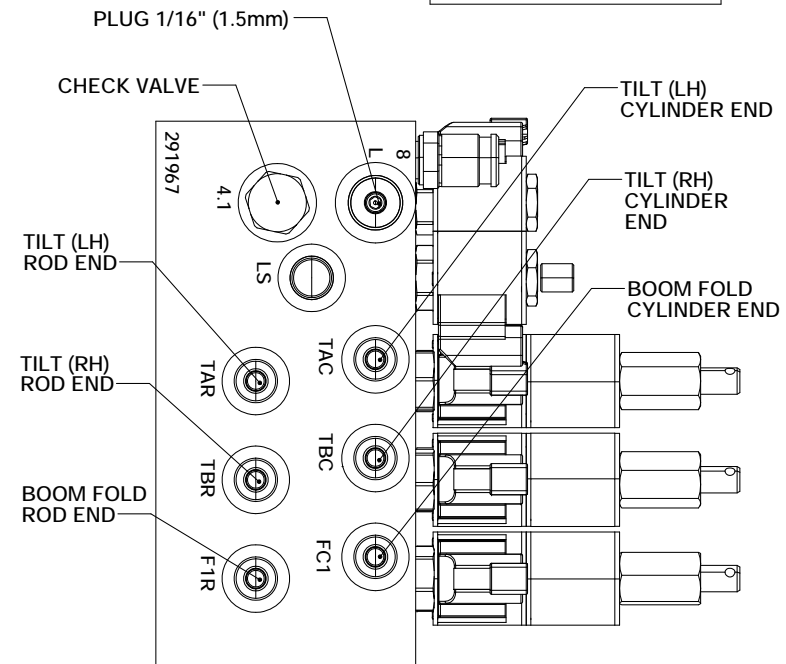
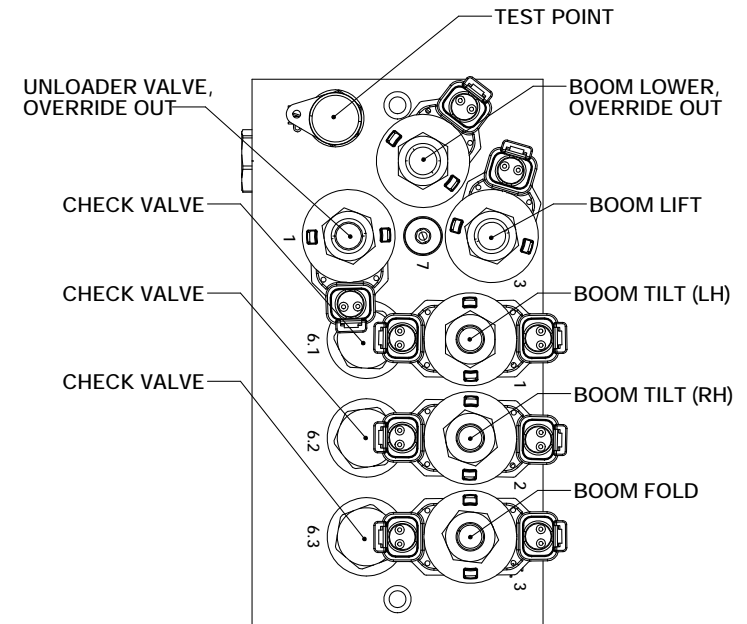
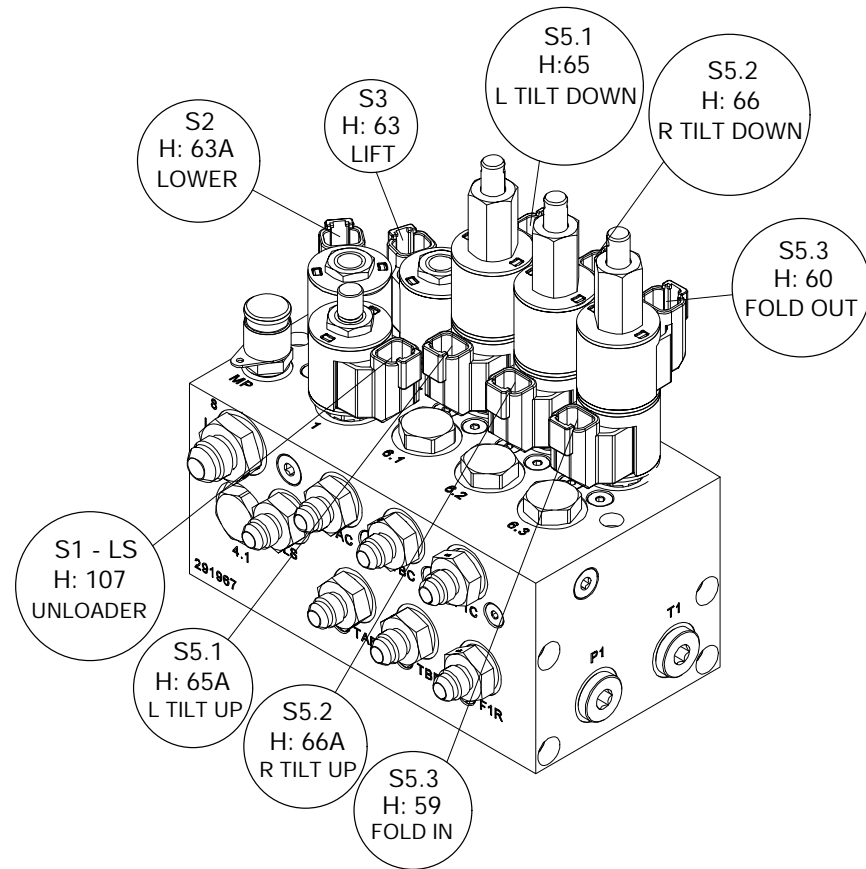
These extra sensors allow the computer to predict how the boom will react well before the radar sensors even see the change in boom height. The end result is a more stable boom in uneven terrain.

More detailed and specific information can be found in the product documentation from the Goldacres and Raven websites.

[www.goldacres.com.au](http://www.goldacres.com.au)

[www.ravenprecision.com](http://www.ravenprecision.com)

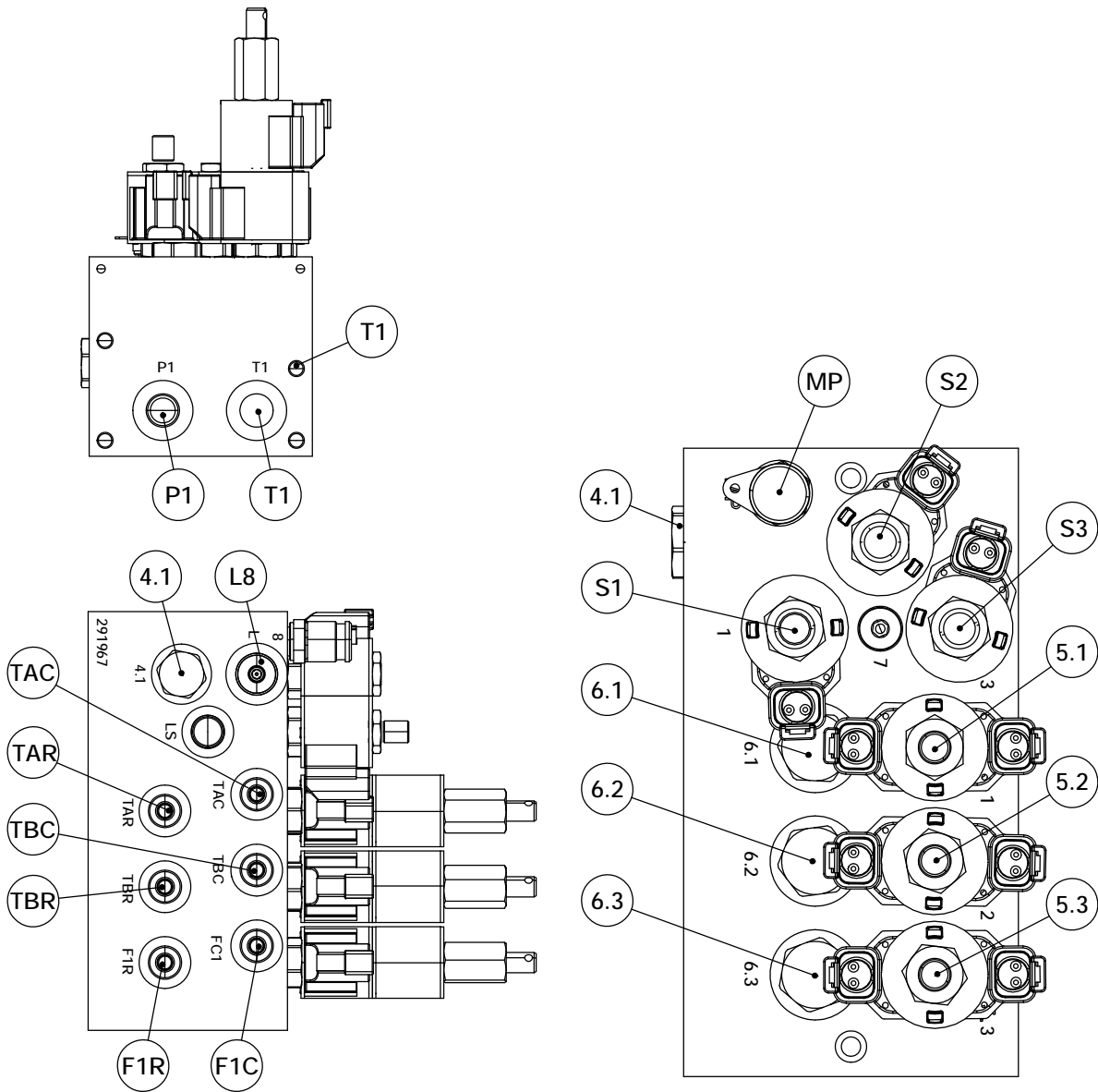
## Hydraulic Block





# 10 Appendix – Integrated Systems

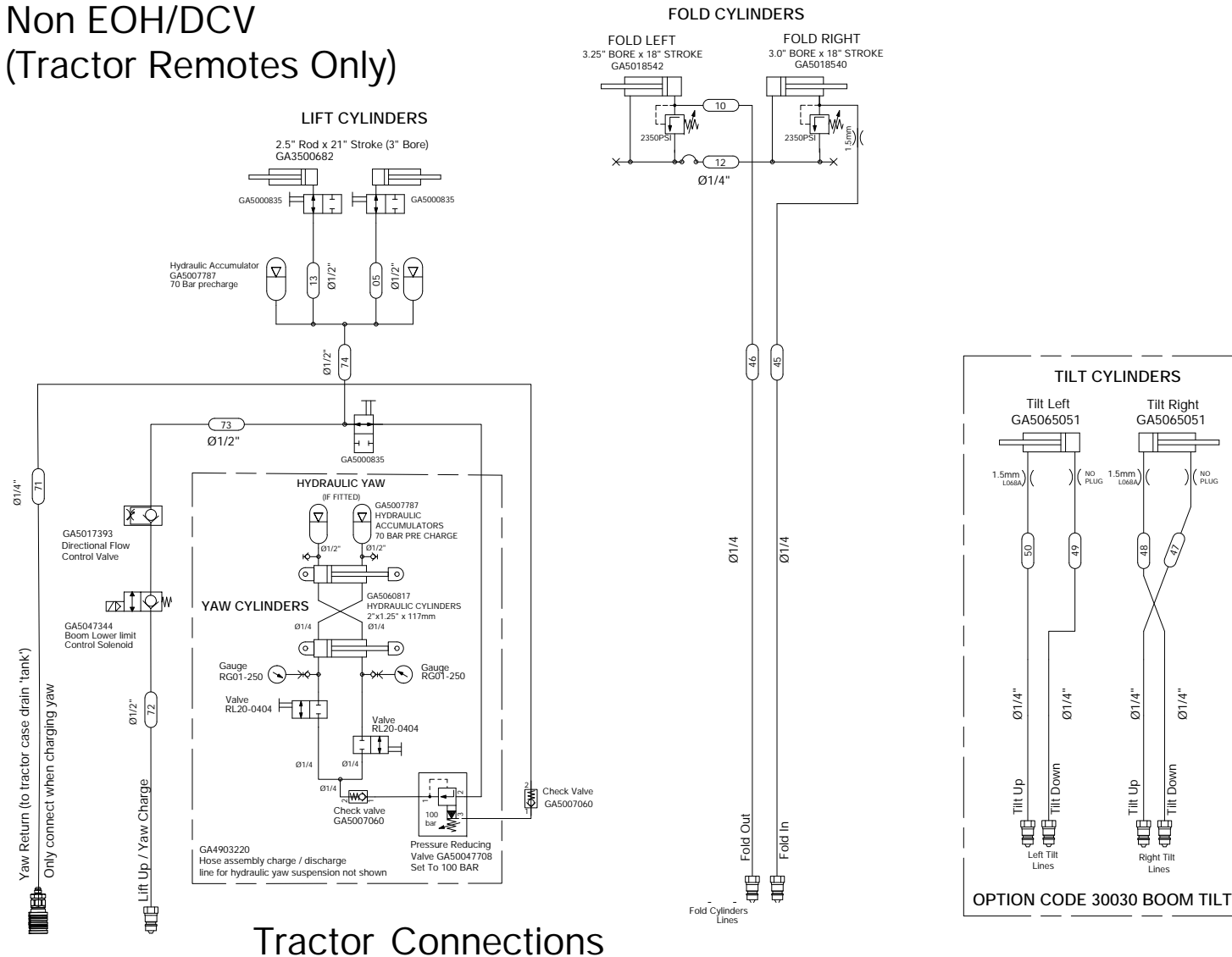
## Hydraulic Block Funtions



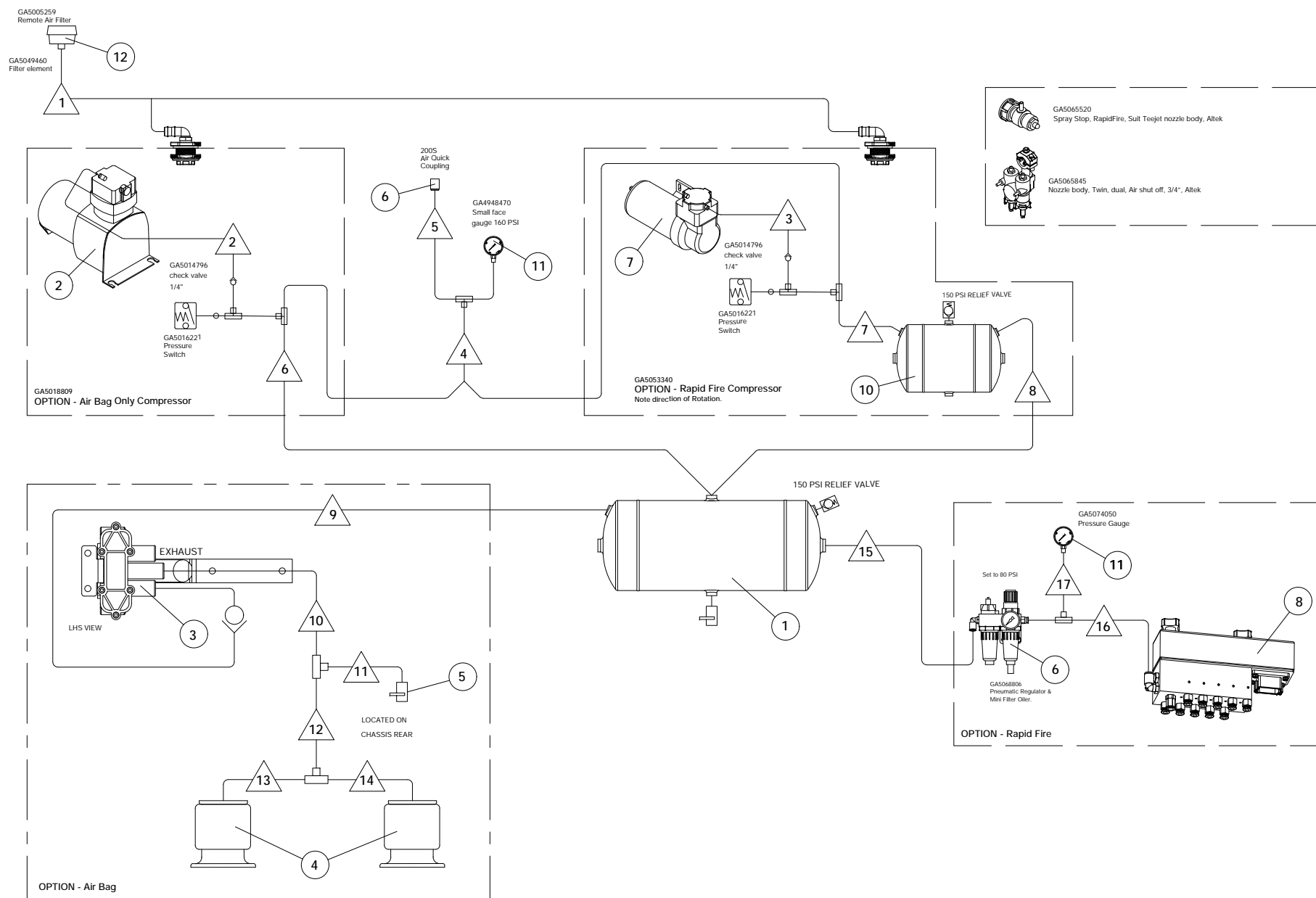
FUNCTION TABLE	
MP	SMK20-G1/4" TEST POINT
S1	SV08 - UNLOADER VALVE
S2	SV08 - CARTRIDGE SOLENOID VALVE, BOOM LOWER
S3	SV08 - HYDRAULIC CARTRIDGE SOLENOID VALVE, BOOM LIFT
4.1	CV08 - HYDRAULIC CHECK VALVE
5.1	SV08 - HYDRAULIC CARTRIDGE SOLENOID VALVE, BOOM TILT LH
5.2	SV08 - HYDRAULIC CARTRIDGE SOLENOID VALVE, BOOM TILT RH
5.3	SV08 - HYDRAULIC CARTRIDGE SOLENOID VALVE, BOOM FOLD
6.1	DC08 - DOUBLE PILOT CHECK VALVE
6.2	DC08 - DOUBLE PILOT CHECK VALVE
6.3	DC08 - DOUBLE PILOT CHECK VALVE
L8	1/16" NPT ORIFICE PLUG (1.5mm)
P1	3/8" BSPP HOLLOW HEX PLUG
T1	3/8" BSPP HOLLOW HEX PLUG
TAC	S5.1 - LH TILT, CYLINDER END (S2)
TAR	S5.1 - LH TILT, ROD END (S2)
TBC	S5.2 - RH TILT, CYLINDER END (S2)
TBR	S5.2 - RH TILT, ROD END (S2)
F1C	S5.3 - BOOM FOLD, CYLINDER END (S2)
F1R	S5.3 - BOOM FOLD, ROD END (S2)

## Hydraulic Cylinder Circuits

### Non EOH/DCV (Tractor Remotes Only)



## Pneumatic System



## Pneumatic System cont.

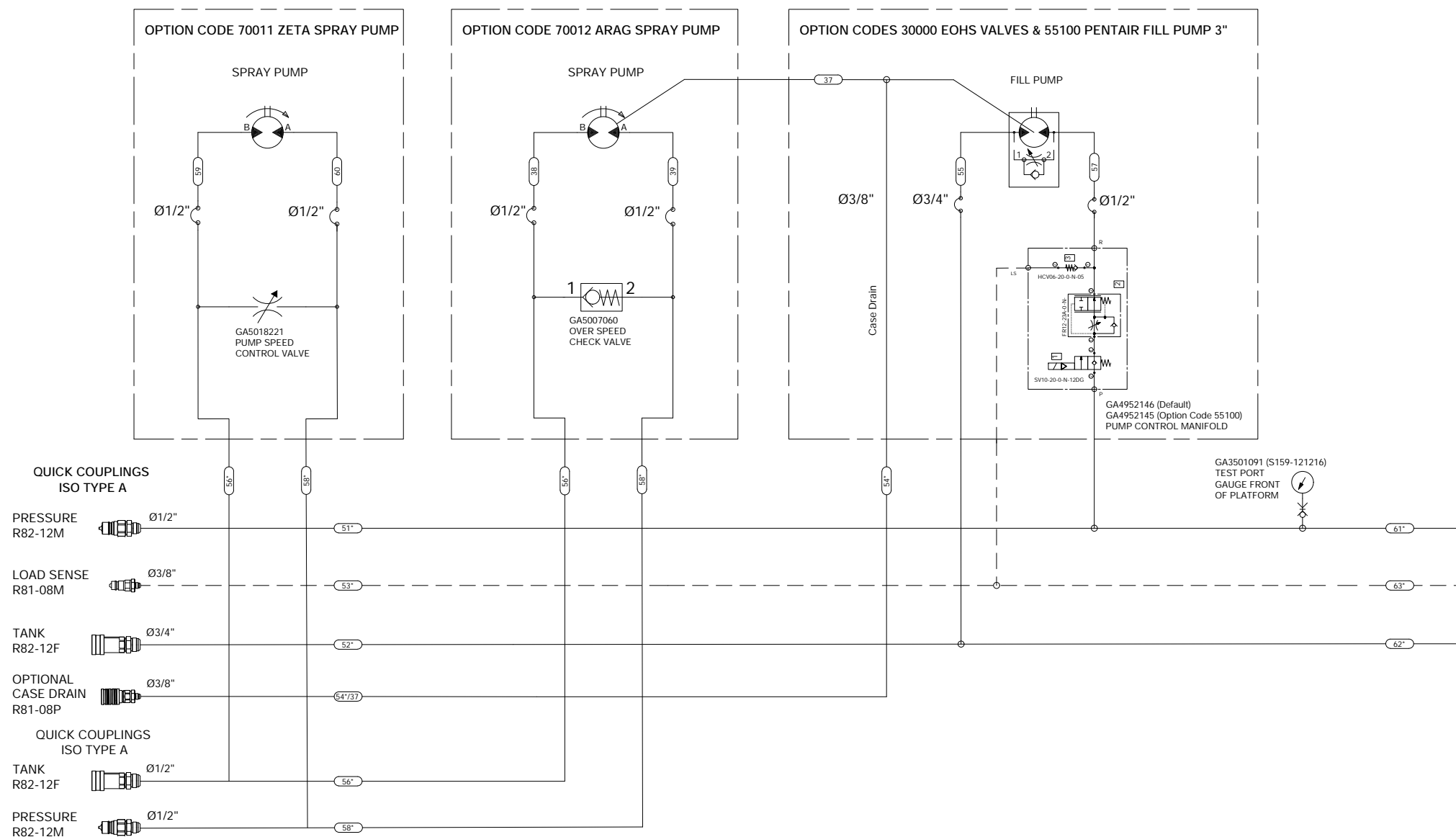
(X) ITEM	FEATURE DESCRIPTION	GA NUMBER
1	PRIMARY AIR RESERVOIR ASSEMBLY	GA6101560
2	AIR BAG AIR COMPRESSOR	GA5018809
3	RIDE HEIGHT VALVE (INCLUDING INLET CHECK VALVE)	GA4951385
4	SUSPENSION AIR BAGS	5000/6500L - GA5005311 8500/10000L - GA5005115
5	AIR BAG DUMP VALVE GA5018321	
6	AIR COUPLER - LH POD	GA5076620
7	RAPID FIRE AIR COMPRESSOR	GA5053340
8	PNEUMATIC MANIFOLD, RAPID FIRE, 10 SECTION, BULLET VALVE	GA7000029
9	PNEUMATIC REGULATOR & MINI FILTER OILER - SET TO 80 PSI	GA5068806
10	SECONDARY AIR RESERVOIR ASSEMBLY	GA4951990
11	PRESSURE GAUGE	GA5074050

(X) HOSE NUMBER	HOSE DESCRIPTION	HOSE SIZE	HOSE LENGTH 4000L	HOSE LENGTH 5000L	HOSE LENGTH 6500L	HOSE LENGTH 8500L	HOSE LENGTH 10,000L	END FITTING 1	END FITTING 2
1	AIR FILTER TO COMPRESSOR INLET 1	1" PVC							
2	COMPRESSOR OUTLET TO CHECK VALVE (AIR BAG) 1	1/4" BLUE	390	390	390	390	390	T2050-0404	T2020-0404
3	COMPRESSOR OUTLET TO CHECK VALVE (RAPID FIRE) 1	1/4" BLUE	390	390	390	390	390	T2020-0404	T2050-0404
4	TEE TO TEE 1	3/8 BLACK							
5	TEE TO QUICK CONNECT FITTING ON LH POD 1	3/8 BLACK							
6	TEE TO PRIMARY RESERVOIR (AIR BAG) 1	3/8 BLACK			4600				
7	TEE TO SECONDARY RESERVOIR (RAPID FIRE) 1	3/8 BLACK							
8	SECONDARY RESERVOIR TO PRIMARY RESERVOIR (RAPID FIRE) 1	3/8 BLACK			4100				
9	AIR RESERVOIR TO RIDE HEIGHT VALVE 1	3/8 BLACK			1000				
10	RIDE HEIGHT VALVE TO TEE 1	3/8 BLACK			1100				
11	TEE TO AIR BAG DUMP VALVE 1	3/8 BLACK			300				
12	TEE TO TEE 1	3/8 BLACK			60				
13	TEE TO LH AIRBAG 1	3/8 BLACK			650				
14	TEE TO RH AIRBAG 1	3/8 BLACK			650				
15	AIR RESERVOIR TO PNEUMATIC REGULATOR 1	3/8 BLACK			4400				
16	PNEUMATIC REGULATOR TO RAPID FIRE BULLET VALVE	3/8 BLACK							



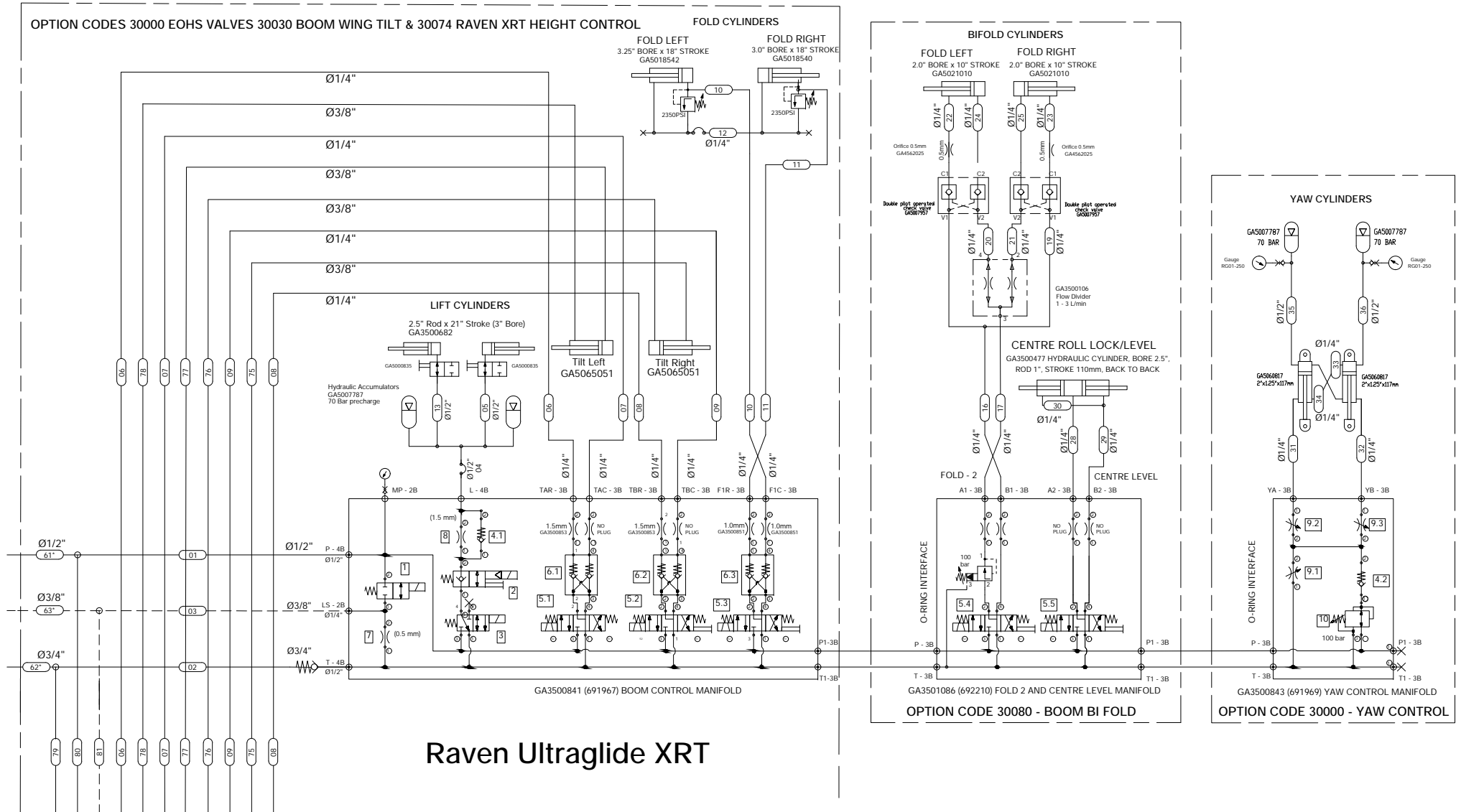
# 10 Appendix – Integrated Systems

## Pump Options & Circuits

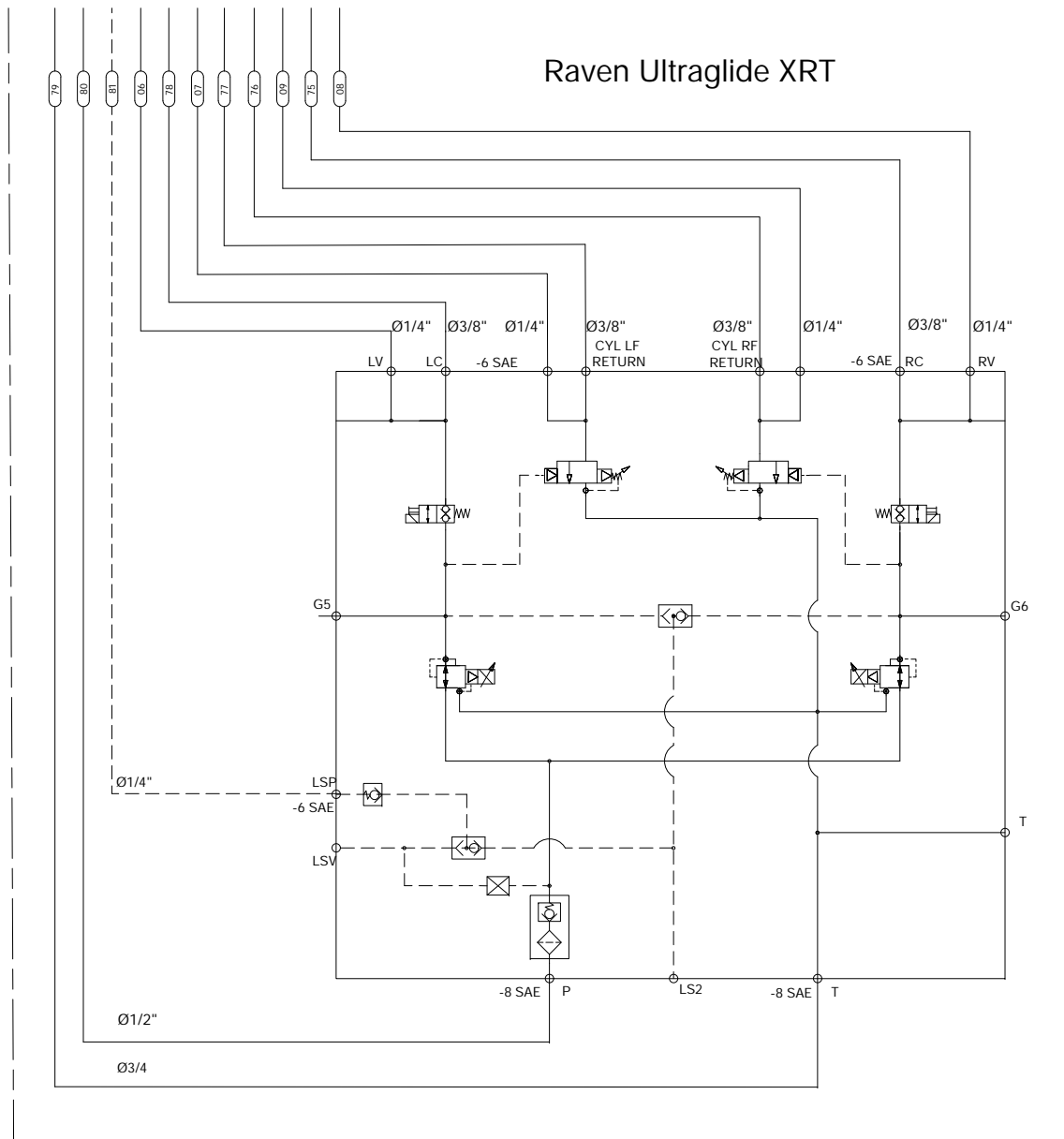




## Raven XRT UltraGlide Option



## Raven XRT UltraGlide Option cont.



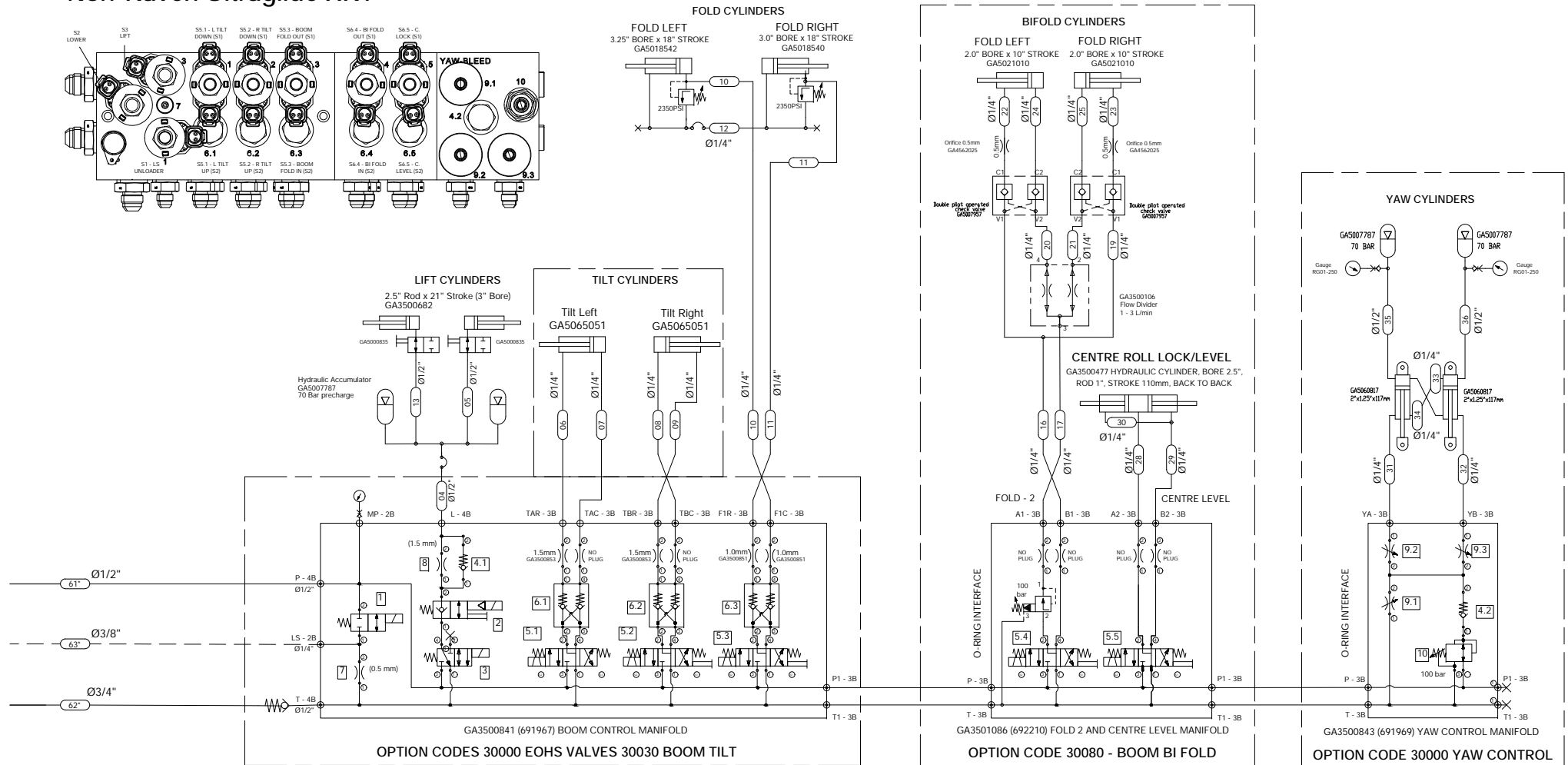
OPTION CODES:  
 30000 EOHS VALVES &  
 30030 BOOM WING TILT &  
 30074 RAVEN XRT HEIGHT CONTROL

GA3000385  
 Valve, Hydraulic, Raven XRT Ultraglide, Load sense, 334-0235-002

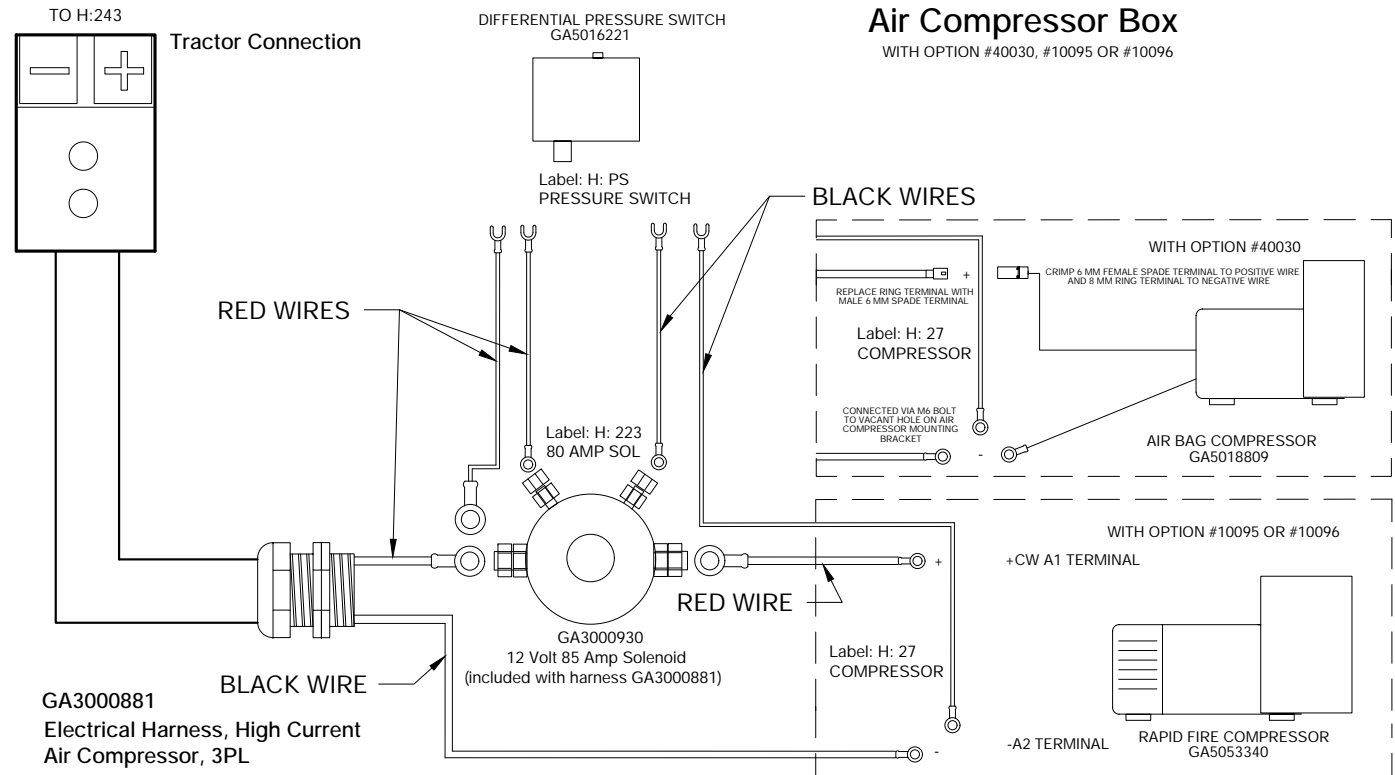


## Non-Raven XRT UltraGlide Option

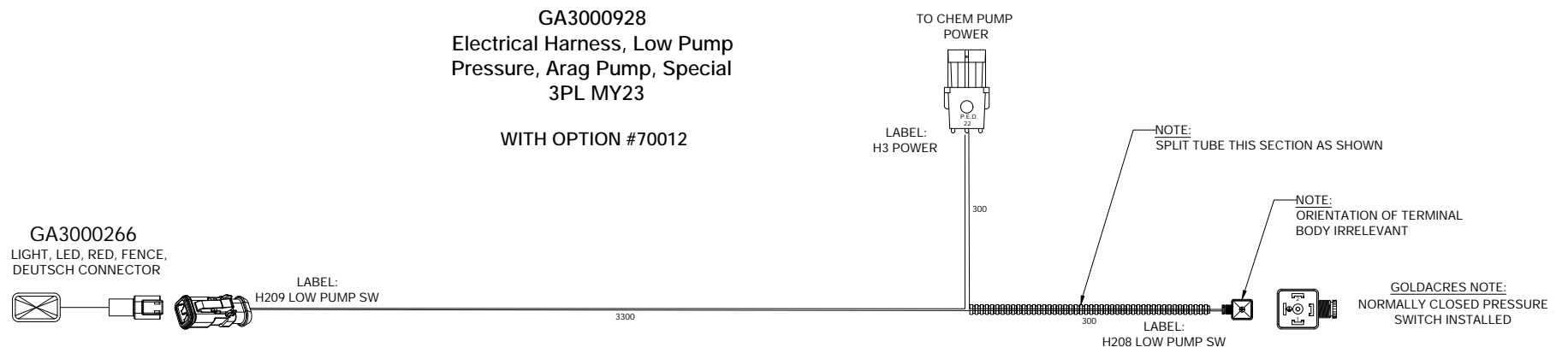
## Non-Raven Ultraglide XRT



## Air Compressor Connections

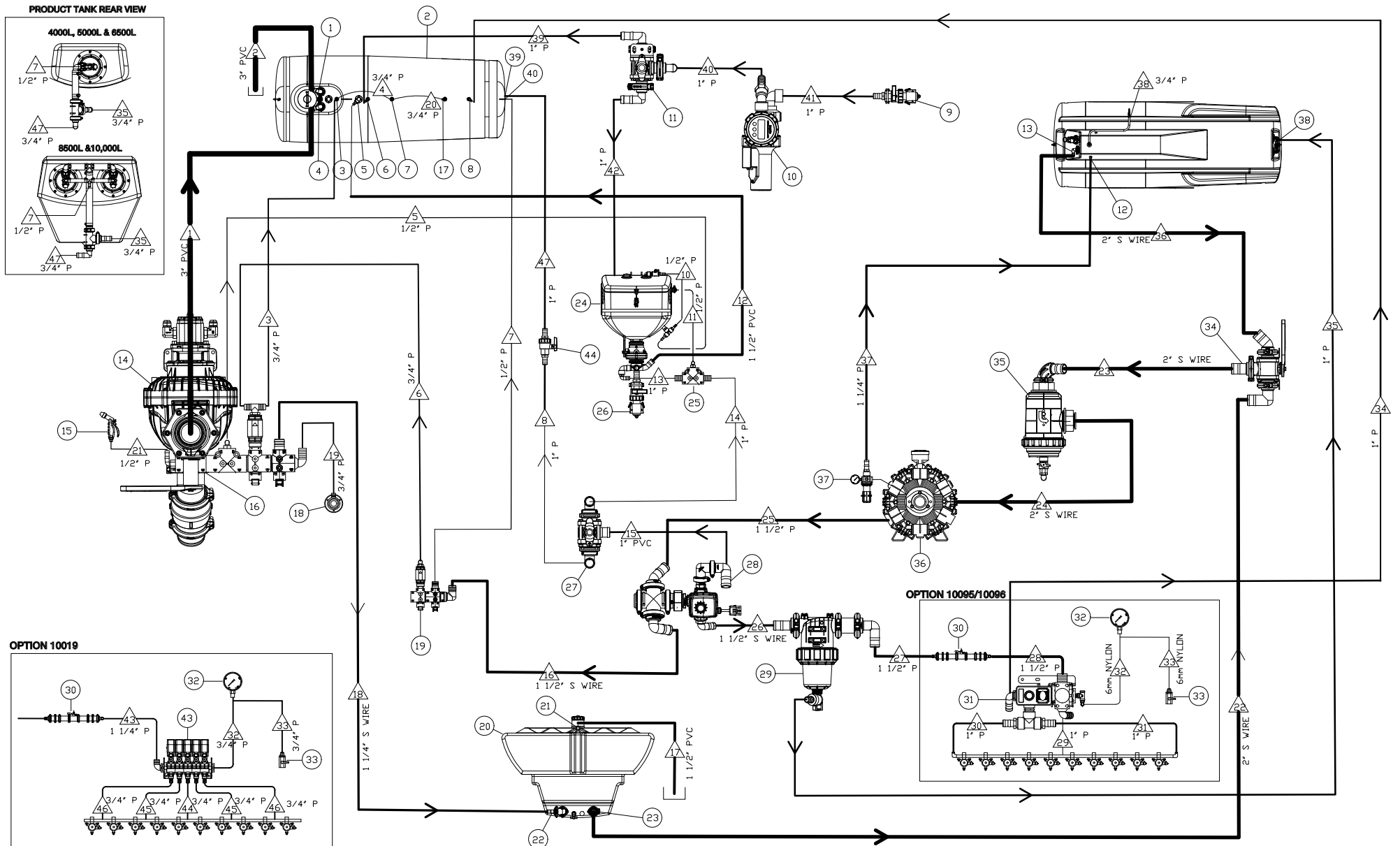


## Arag Low Pump Pressure Harness Option



# 10 Appendix – Integrated Systems

## Plumbing Schematic - Diaphragm Pump Option



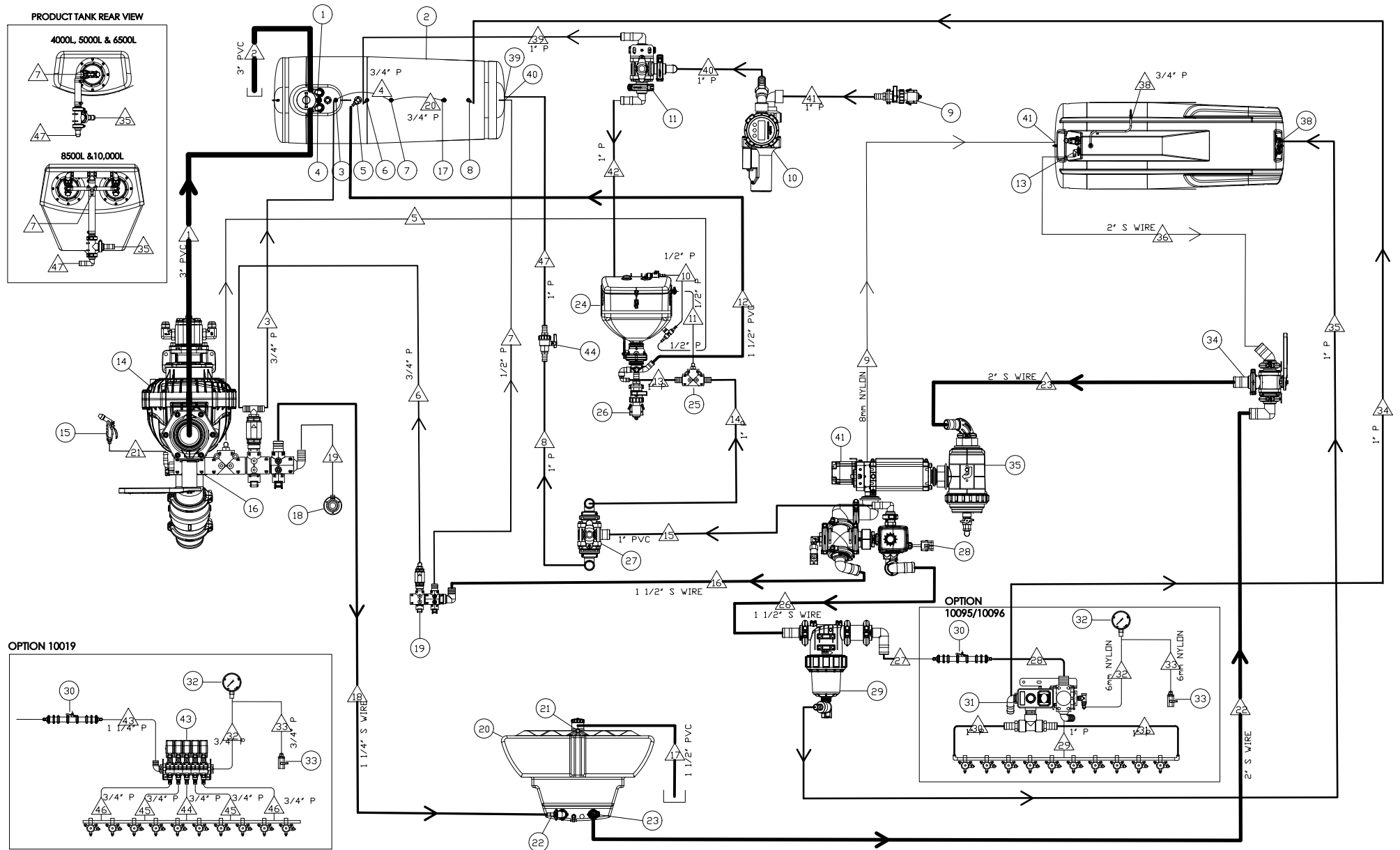
⊗ ITEM	GA NUMBER	FEATURE DESCRIPTION
1	GA4907845	TANK OVERFLOW, ASSEMBLY, 3"
2	GA6101320-30-40-50-60	TANK, MAIN ASSEMBLY, CONFIG, 4000L-5000L-6500L-8500L-10,000L
3	GA4901285-2	TANK, RINSING NOZZLE, ASSEMBLY WITH TEE CAM ADAPTER
4	GA4907840	TANK INLET, ASSEMBLY, 3"
5	GA4904815	TANK INLET FLANGE ASSEMBLY, HOPPER
6	GA4922140	TANK INLET, 1", CHEMICAL FILL POINT
7	GA4901285-2	TANK RINSING NOZZLE, ASSEMBLY WITH TEE CAM ADAPTOR
8	GA4922140	TANK INLET, 1", CHEMICAL FILL POINT
9	GA4952080	PRODUCTION DRAWING ONLY, CHEMICAL PUMP, CAM LOCK, LH POD
10	GA4909225	CHEMICAL PUMP, GRACO HUSKY, PRARIE PRO, MY21
11	GA4952055	PRODUCTION DRAWING ONLY, CONTROL VALVE, CHEM PUMP, LH POD
12	GA5077724	HOSE BARB, STRAIGHT, 1 1/4 MALE THREAD X 1 1/4 HOSE BARB
13	GA2000071	PLUMBING FITTING, SWEEP ELBOW, 90, 2" FLANGE TO 2" BARB
14	GA4952025	FILL PUMP WITH FLIP VALVES, SIDE POD
15	GA4950925	WASH GUN ASSEMBLY
16	GA4952075	FILL POINT ASSEMBLY, EXTERNAL PRESSURE SOURCE, SIDE POD
17	GA4901285-1	TANK FLUSHING NOZZLE (ELBOW) CAM ADAPTOR
18	GA5018800	RINSING SOCKET, 3 PIN, MICROMATIC / ENVIRO DRUM COUPLING
19	GA4952030	PRODUCTION DRAWING ONLY, FLIP VALVE BLOCK, LH POD
20	GA4951980-85	TANK ASSEMBLY, RINSE, 500L-800L
21	GA5077736	HOSE BARB, ELBOW, 90 DEGREE, 1 1/2 MALE THREAD X 1 1/2 HOSE
22	GA5077855	M220 MANIFOLD X 1-1/4 HB, M220125BRB
23	GA5077859	HOSE BARB, STRAIGHT, 2 FLANGE X 2 HOSE, BANJO, M220BRB
24	GA6101190	HOPPER ASSEMBLY, CONFIGURABLE
25	GA4902255	HOPPER TEE ASSEMBLY
26	GA4949285	HOPPER BOTTOM, ASSEMBLY
27	GA4952060	PRODUCTION DRAWING ONLY, CONTROL VALVE, HOPPER, LH POD
28	GA4952130	PRODUCTION DRAWING ONLY, SPRAY CONTROL VALVE, LH POD
29	GA4952045	PRODUCTION DRAWING ONLY, PRESSURE FILTER, LH POD
30	GA4908545	FLOW METER ASSEMBLY, RAVEN 60P HIGH PULSE WITH ROUND CONNECTOR
31	GA4907745	FLOW DISTRIBUTER AND BOOM RECIRCULATION VALVE ASSEMBLY
32	GA5074050	GAUGE PRESSURE, REAR MOUNT, 10 BAR
33	GA5018321	BALL VALVE, 1/4" FEMALE, BLACK LEVER HANDLE, CHROMED
34	GA4952090	PRODUCTION DRAWING ONLY, SUPPLY CONTROL VALVE, LH POD
35	GA4952085	PRODUCTION DRAWING ONLY, SUCTION FILTER, LH POD
36	GA5054500-505	PUMP, DIAPHRAGM TYPE, ZETA 260 (HYDRAULIC OR PTO DRIVE)
37	GA5075640	VALVE, PRESSURE RELIEF, 15 BAR
38	GA5077807	1" FLANGE X 1 1/4" BARB, ELBOW, 90 DEGREE, M100125BRB90
39	GA5077811	HOSE BARB, STRAIGHT, 1 FLANGE X 1 HOSE, BANJO, M100BRB
40	GA5077751	TEE, HOSE BARB, 1/2, BANJO, HBT050-050
41	N/A	PRODUCTION DRAWING ONLY, CENTRIFUGAL PUMP, LH POD
42	N/A	PNEUMATIC FITTING, ELBOW, 90 DEGREE
43	GA5065704	VALVE, BOOM SECTION, 3W 5 SECTION ASSEMBLY
44	GA4952190	PRODUCTION DRAWING ONLY, BALL VALVE, DEAD HEAD, IN LINE, BYPASS

△ HOSE	SIZE	HOSE DESCRIPTION	LENGTH 4000L	LENGTH 5000L	LENGTH 6500L	LENGTH 8500L	LENGTH 10,000L
1	3" P	MAIN TANK FILL	2600	2600	2600	3000	3000
2	3" P	MAIN TANK OVERFLOW HOSE	3000	3000	3000	3500	3500
3	3/4" P	FILL POINT ASSEMBLY TO MAIN TANK	1750	2000	2500	3000	3500
4	3/4" P	TANK INLET TO TANK RINSING NOZZLE	1050	1050	1830	1030	1030
5	1/2" P	FILL POINT ASSEMBLY TO HOPPER RINSE TEE	3900	3900	3900	3900	3900
6	3/4" P	FLIP VALVE BLOCK TO FILL POINT ASSEMBLY	170	170	170	170	170
7	1/2" P	FLIP VALVE BLOCK TO MAIN TANK	4000	4500	5000	5500	6000
8	1" P	CONTROL VALVE, HOPPER TO BALL VALVE, BYPASS	5000	5000	5000	5000	5000
9	8mm	NYLON CENTRIFUGAL PUMP TO MAIN TANK	N/A	N/A	N/A	N/A	N/A
10	1/2" P	HOPPER RINSE TEE TO HOPPER RINSE NOZZLE	850	850	850	850	850
11	1/2" P	HOPPER TEE ASSEMBLY TO HOPPER MIXING JET BALL VALVE	3700	3700	3700	3700 3700	
12	1 1/2" P	HOPPER OUTLET TO MAIN TANK	6500	6500	6500	7000	7000
13	1" P	HOPPER TEE ASSEMBLY TO HOPPER BOTTOM ASSEMBLY	3700	3700	3700	3700	3700
14	1" P	CONTROL VALVE, HOPPER TO HOPPER TEE ASSEMBLY	300	300	300	300	300
15	1" PVC	SPRAY CONTROL VALVE TO CONTROL VALVE, HOPPER	600	600	600	600	600
16	1 1/2" S	SPRAY CONTROL VALVE TO FLIP VALVE BLOCK	300	300	300	300	300
17	1 1/2" P	RINSE TANK OVERFLOW	1000	1000	1000	1000	1000
18	1 1/4" S	FILL POINT ASSEMBLY TO RINSE TANK	1100	1100	1100	1100	1100
19	3/4" P	FILL POINT ASSEMBLY TO RINSING SOCKET	530	530	530	530	530
20	3/4" P	TANK RINSING NOZZLE TO TANK FLUSHING NOZZLE	N/A	N/A	N/A	960	960
21	1/2" P	FILL POINT ASSEMBLY TO WASH GUN ASSEMBLY	4500	4500	4500	4500	4500
22	2" S	RINSE TANK TO SUPPLY CONTROL VALVE	1600	1600	1600	1600	1600
23	2" S	SUPPLY CONTROL VALVE TO SUCTION FILTER	590	590	590	590	590
24	2" S	SUCTION FILTER TO PUMP, DIAPHRAGM	2700	2700	2700	2700	2700
25	1 1/2" P	PUMP, DIAPHRAGM TO SPRAY CONTROL VALVE	3000	3000	3000	3000	3000
26	1 1/2" S	SPRAY CONTROL VALVE TO PRESSURE FILTER	860	860	860	860	860
27	1 1/2" P	PRESSURE FILTER TO FLOW METER ASSEMBLY	7800	7800	7800	10000	10000
28	1 1/2" P	FLOW METER ASSEMBLY TO FLOW DISTRIBUTOR	1200	1200	1200	1200	1200
29	1" P	FLOW DISTRIBUTOR TO BOOM POLY CENTRE	-	-	-	-	-
30	1" P	FLOW DISTRIBUTOR TO LEFT BOOM POLY END	-	-	-	-	-
31	1" P	FLOW DISTRIBUTOR TO RIGHT BOOM POLY END	-	-	-	-	-
32	6mm	NYLON FLOW DISTRIBUTOR TO PRESSURE GAUGE	7000	7500	8000	8500	9000
33	6mm	NYLON PRESSURE GAUGE TO DRAIN VALVE	5000	5000	5000	5000	5000
34	1" P	FLOW DISTRIBUTOR TO MAIN TANK	4500	4500	4500	4500	4500
35	1" P	PRESSURE FILTER TO MAIN TANK	3000	3500	4000	4500	5000
36	2" S	MAIN TANK TO SUPPLY CONTROL VALVE	1500	1500	1500	1500	1500
37	1 1/4" P	VALVE, PRESSURE RELIEF TO MAIN TANK	4000	4000	4000	4000	4000
38	3/4" P	MAIN TANK SUMP DRAIN TO DRAIN TAP	600	600	600	600	600
39	1" P	CONTROL VALVE, CHEM PUMP TO MAIN TANK	2000	2000	2500	3000	3000
40	1" P	CHEMICAL PUMP TO CONTROL VALVE, CHEM PUMP	600	600	600	600	600
41	1" P	CHEM PUMP, CAM LOCK TO CHEMICAL PUMP	600	600	600	600	600
42	1" P	CONTROL VALVE, CHEM PUMP TO HOPPER	3200	3200	3200	3200	3200
43	1 1/4"	P FLOW METER ASSEMBLY TO VALVE, BOOM 5 SECTION ASSEMBLY	1200	1200	1200	1200	1200
44	3/4" P	VALVE, BOOM 5 SECTION ASSEMBLY TO BOOM POLY CENTRE	-	-	-	-	-
45	3/4" P	VALVE, BOOM 5 SECTION ASSEMBLY TO BOOM POLY	-	-	-	-	-
46	3/4" P	VALVE, BOOM 5 SECTION ASSEMBLY TO BOOM POLY	-	-	-	-	-
47	1" P	BALL VALVE, BYPASS TO MAIN TANK	2500	2500	3000	3500	3500



# 10 Appendix – Integrated Systems

## Plumbing Schematic - Centrifugal Pump Option



⊗ ITEM	GA NUMBER	FEATURE DESCRIPTION
1	GA4907845	TANK OVERFLOW, ASSEMBLY, 3"
2	GA6101320-30-40-50-60	TANK, MAIN ASSEMBLY, CONFIG, 4000L-5000L-6500L-8500L-10,000L
3	GA4901285-2	TANK, RINSING NOZZLE, ASSEMBLY WITH TEE CAM ADAPTER
4	GA4907840	TANK INLET, ASSEMBLY, 3"
5	GA4904815	TANK INLET FLANGE ASSEMBLY, HOPPER
6	GA4922140	TANK INLET, 1", CHEMICAL FILL POINT
7	GA4901285-2	TANK RINSING NOZZLE, ASSEMBLY WITH TEE CAM ADAPTOR
8	GA4922140	TANK INLET, 1", CHEMICAL FILL POINT
9	GA4952080	PRODUCTION DRAWING ONLY, CHEMICAL PUMP, CAM LOCK, LH POD
10	GA4909225	CHEMICAL PUMP, GRACO HUSKY, PRARIE PRO, MY21
11	GA4952055	PRODUCTION DRAWING ONLY, CONTROL VALVE, CHEM PUMP, LH POD
12	N/A	HOSE BARB, STRAIGHT, 1 1/4 MALE THREAD X 1 1/4 HOSE BARB
13	GA2000071	PLUMBING FITTING, SWEEP ELBOW, 90, 2" FLANGE TO 2" BARB
14	GA4952025	FILL PUMP WITH FLIP VALVES, SIDE POD
15	GA4950925	WASH GUN ASSEMBLY
16	GA4952075	FILL POINT ASSEMBLY, EXTERNAL PRESSURE SOURCE, SIDE POD
17	GA4901285-1	TANK FLUSHING NOZZLE (ELBOW) CAM ADAPTOR
18	GA5018800	RINSING SOCKET, 3 PIN, MICROMATIC / ENVIRO DRUM COUPLING
19	GA4952030	PRODUCTION DRAWING ONLY, FLIP VALVE BLOCK, LH POD
20	GA4951980-85	TANK ASSEMBLY, RINSE, 500L-800L
21	GA5077736	HOSE BARB, ELBOW, 90 DEGREE, 1 1/2 MALE THREAD X 1 1/2 HOSE
22	GA5077855	M220 MANIFOLD X 1-1/4 HB, M220125BRB
23	GA5077859	HOSE BARB, STRAIGHT, 2 FLANGE X 2 HOSE, BANJO, M220BRB
24	GA6101190	HOPPER ASSEMBLY, CONFIGURABLE
25	GA4902255	HOPPER TEE ASSEMBLY
26	GA4949285	HOPPER BOTTOM, ASSEMBLY
27	GA4952060	PRODUCTION DRAWING ONLY, CONTROL VALVE, HOPPER, LH POD
28	GA4952050	PRODUCTION DRAWING ONLY, CONTROL VALVE, LH POD
29	GA4952045	PRODUCTION DRAWING ONLY, PRESSURE FILTER, LH POD
30	GA4908545	FLOW METER ASSEMBLY, RAVEN 60P HIGH PULSE WITH ROUND CONNECTOR
31	GA4907745	FLOW DISTRIBUTOR AND BOOM RECIRCULATION VALVE ASSEMBLY
32	GA5074050	GAUGE PRESSURE, REAR MOUNT, 10 BAR
33	GA5018321	BALL VALVE, 1/4" FEMALE, BLACK LEVER HANDLE, CHROMED
34	GA4952090	PRODUCTION DRAWING ONLY, SUPPLY CONTROL VALVE, LH POD
35	GA4952085	PRODUCTION DRAWING ONLY, SUCTION FILTER, LH POD
36	N/A	PUMP, DIAPHRAGM TYPE, ZETA 260 (HYDRAULIC OR PTO DRIVE)
37	N/A	VALVE, PRESSURE RELIEF, 15 BAR
38	GA5077807	1" FLANGE X 1 1/4" BARB, ELBOW, 90 DEGREE, M100125BRB90
39	GA5077811	HOSE BARB, STRAIGHT, 1 FLANGE X 1 HOSE, BANJO, M100BRB
40	GA5077751	TEE, HOSE BARB, 1/2, BANJO, HBT050-050
41	GA4952065	PRODUCTION DRAWING ONLY, CENTRIFUGAL PUMP, LH POD
42	GA5018339	PNEUMATIC FITTING, ELBOW, 90 DEGREE
43	GA5065704	VALVE, BOOM SECTION, 3W 5 SECTION ASSEMBLY

△ HOSE	SIZE	HOSE DESCRIPTION	LENGTH 4000L	LENGTH 5000L	LENGTH 6500L	LENGTH 48500L	LENGTH 10000L
1	3" P	MAIN TANK FILL	2600	2600	2600	3000	3000
2	3" P	MAIN TANK OVERFLOW HOSE	3000	3000	3000	3500	3500
3	3/4" P	FILL POINT ASSEMBLY TO MAIN TANK	1750	2000	2500	3000	3500
4	3/4" P	TANK INLET TO TANK RINSING NOZZLE	1050	1050	1830	1030	1030
5	1/2" P	FILL POINT ASSEMBLY TO HOPPER RINSE TEE	3900	3900	3900	3900	3900
6	3/4" P	FLIP VALVE BLOCK TO FILL POINT ASSEMBLY	170	170	170	170	170
7	1/2" P	FLIP VALVE BLOCK TO MAIN TANK	4000	4500	6000	5500	6000
8	1" P	CONTROL VALVE, HOPPER TO BALL VALVE, BYPASS	5000	5000	6000	5000	5000
9	8mm	NYLON CENTRIFUGAL PUMP TO MAIN TANK	600	600	600	800	800
10	1/2" P	HOPPER RINSE TEE TO HOPPER RINSE NOZZLE	850	850	850	850	850
11	1/2" P	HOPPER TEE ASSEMBLY TO HOPPER MIXING JET BALL VALVE	3700	3700	3700	3700	3700
12	1 1/2" P	HOPPER OUTLET TO MAIN TANK	6500	6500	6500	7000	7000
13	1" P	HOPPER TEE ASSEMBLY TO HOPPER BOTTOM ASSEMBLY	3700	3700	3700	3700	3700
14	1" P	CONTROL VALVE, HOPPER TO HOPPER TEE ASSEMBLY	300	300	300	300	300
15	1" PVC	SPRAY CONTROL VALVE TO CONTROL VALVE, HOPPER	600	600	600	600	600
16	1 1/2" S	SPRAY CONTROL VALVE TO FLIP VALVE BLOCK	300	300	300	300	300
17	1 1/2" P	RINSE TANK OVERFLOW	1000	1000	1000	1000	1000
18	1 1/4" S	FILL POINT ASSEMBLY TO RINSE TANK	1100	1100	1100	1100	1100
19	3/4" P	FILL POINT ASSEMBLY TO RINSING SOCKET	530	530	530	530	530
20	3/4" P	TANK RINSING NOZZLE TO TANK FLUSHING NOZZLE	N/A	N/A	N/A	960	960
21	1/2" P	FILL POINT ASSEMBLY TO WASH GUN ASSEMBLY	4500	4500	4500	4500	4500
22	2" S	RINSE TANK TO SUPPLY CONTROL VALVE	1600	1600	1600	1600	1600
23	2" S	SUPPLY CONTROL VALVE TO SUCTION FILTER	590	590	590	590	590
24	2" S	SUCTION FILTER TO PUMP, DIAPHRAGM	N/A	N/A	N/A	N/A	N/A
25	1 1/2" P	PUMP, DIAPHRAGM TO SPRAY CONTROL VALVE	N/A	N/A	N/A	N/A	N/A
26	1 1/2" S	SPRAY CONTROL VALVE TO PRESSURE FILTER	860	860	860	860	860
27	1 1/2" P	PRESSURE FILTER TO FLOW METER ASSEMBLY	7800	7800	7300	10000	10000
28	1 1/2" P	FLOW METER ASSEMBLY TO FLOW DISTRIBUTOR	1200	1200	1030	1200	1200
29	1" P	FLOW DISTRIBUTOR TO BOOM POLY CENTRE	-	-	-	-	-
30	1" P	FLOW DISTRIBUTOR TO LEFT BOOM POLY END	-	-	-	-	-
31	1" P	FLOW DISTRIBUTOR TO RIGHT BOOM POLY END	-	-	-	-	-
32	6MM	NYLON FLOW DISTRIBUTOR TO PRESSURE GAUGE	7000	7500	10000	8500	9000
33	6MM	NYLON PRESSURE GAUGE TO DRAIN VALVE	5000	5000	3500	5000	5000
34	1" P	FLOW DISTRIBUTOR TO MAIN TANK	4500	4500	4500	4500	4500
35	1" P	PRESSURE FILTER TO MAIN TANK	3000	3500	4500	4500	5000
36	2" S	MAIN TANK TO SUPPLY CONTROL VALVE	1500	1500	1500	1500	1500
37	1 1/4" P	VALVE, PRESSURE RELIEF TO MAIN TANK	4000	4000	4000	4000	4000
38	3/4" P	MAIN TANK SUMP DRAIN TO DRAIN TAP	600	600	600	600	600
39	1" P	CONTROL VALVE, CHEM PUMP TO MAIN TANK	2000	2000	2500	3000	3000
40	1" P	CHEMICAL PUMP TO CONTROL VALVE, CHEM PUMP	600	600	600	600	600
41	1" P	CHEM PUMP, CAM LOCK TO CHEMICAL PUMP	600	600	600	600	600
42	1" P	CONTROL VALVE, CHEM PUMP TO HOPPER	3200	3200	3200	3200	3200
43	1 1/4" P	FLOW METER ASSEMBLY TO VALVE, BOOM 5 SECT ASSEMBLY	1200	1200	1200	1200	1200
44	3/4" P	VALVE, BOOM 5 SECTION ASSEMBLY TO BOOM POLY CENTRE	-	-	-	-	-
45	3/4" P	VALVE, BOOM 5 SECTION ASSEMBLY TO BOOM POLY	-	-	-	-	-
46	3/4" P	VALVE, BOOM 5 SECTION ASSEMBLY TO BOOM POLY	-	-	-	-	-
47	1" P	BALL VALVE, BYPASS TO MAIN TANK	2500	2500	3000	3500	3500

