Prairie Special 2500-3000L

OPERATOR'S MANUAL MY25

GA9500070 REV 00
JANUARY 2025
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GOLDACRES

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www.goldacres.com.au

Under: Parts & Service > Owner-Operator Manuals:

Model	Year	Revision	Part Number
Prairie Special 2500-3000L	2025	01	GA9700070

Under: Parts & Service > Parts Manuals:

Model	Year	Revision	Part Number
Prairie Special 2500	2024	00	GA8701078
Prairie Special 3000	2024	00	GA8701573

CONTENTS

1 Foreword - **Important Information**

Welcome

Congratulations on your Selection of the Goldacres Prairie Special 2500-3000L 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 spayer 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 2500-3000L 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 instuctional 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 2500-3000L Trailed Sprayer instructing you of risks, procedures & operator safely.

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!

⚠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

⚠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!

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 2500-3000L 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 2500-3000L must **read all Operator Manuals** for this machine including but not limited to:

- This Prairie Special 2500-3000L Operators Manual
- Delivery & Warranty Registration Manual
- Prairie Special 2500-3000L 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.

1 Foreword - **Important Information**

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.

Tyre Size	Load Index	Model (L)	Recommended Pressure @ (kPa/PSI)
14.9 x 24		2500	138 / 20
420/85R34		3000	200 / 29
540/65R x 28		2500 3000	138 / 20 165 / 24
380/90R x 46		2500	138 / 20
380/90R x 46		3000	138 / 20

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 Indiex.

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

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

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

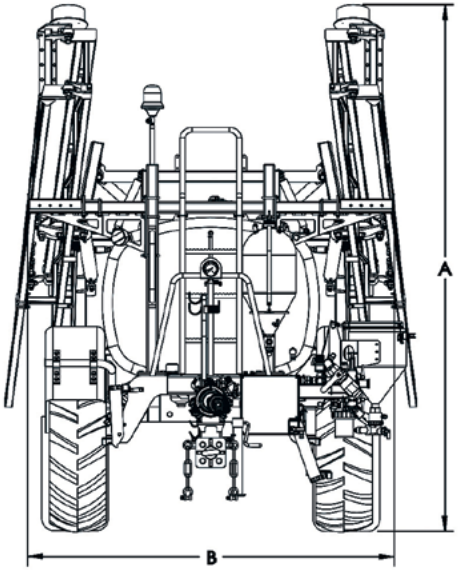
Sprayer Dimensions

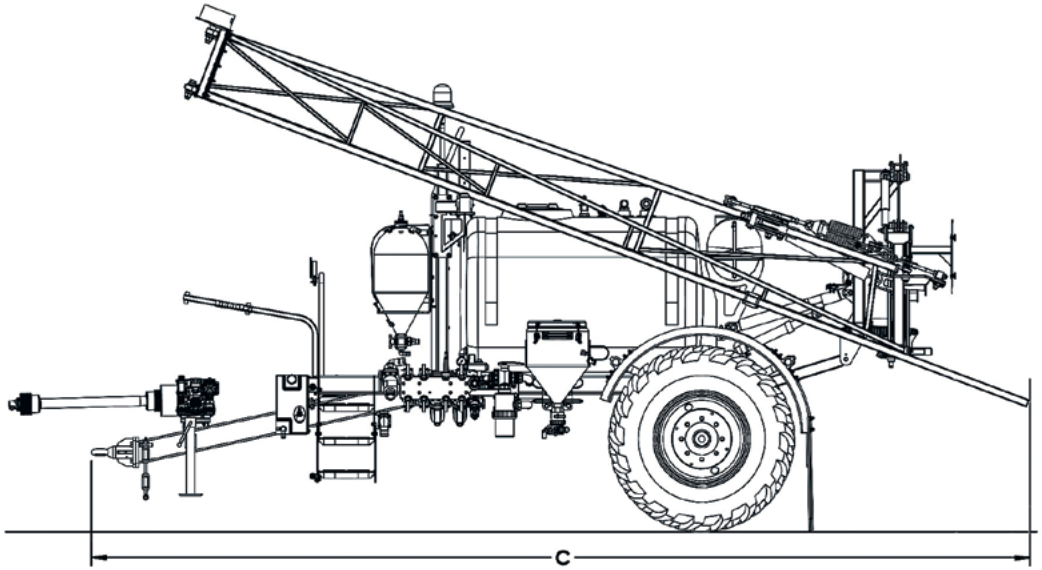
The following Prairie Special 2500-3000L Trailed Sprayer dimensions are provided as a guide only.

Variations in mass & dimensions may occur without notification.

Dimensions show 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		
					A	B	C
Model (L)	Boom (m)	Drawbar Load (kg)	Axle-Load (kg)	Total (kg)	Height (mm)	Width (mm)	Length (mm)
2500	12						
	15						
	18	220	1930	2150	3200	2750	5500
	21						
	24						
3000	18						
	21	266	2460	2726	3480	2760	7200
	24				3480	2760	7500

At time of publishing, table information was incomplete -

Contact your Goldacres Dealer for up-to-date Weights & Dimensions.

NOTE

Sprayer dimension are based on 16.9 x 34 tyres fitted. Other tytre options will increase sprayer height.

Be aware that dimensions given have no aerials fitted.

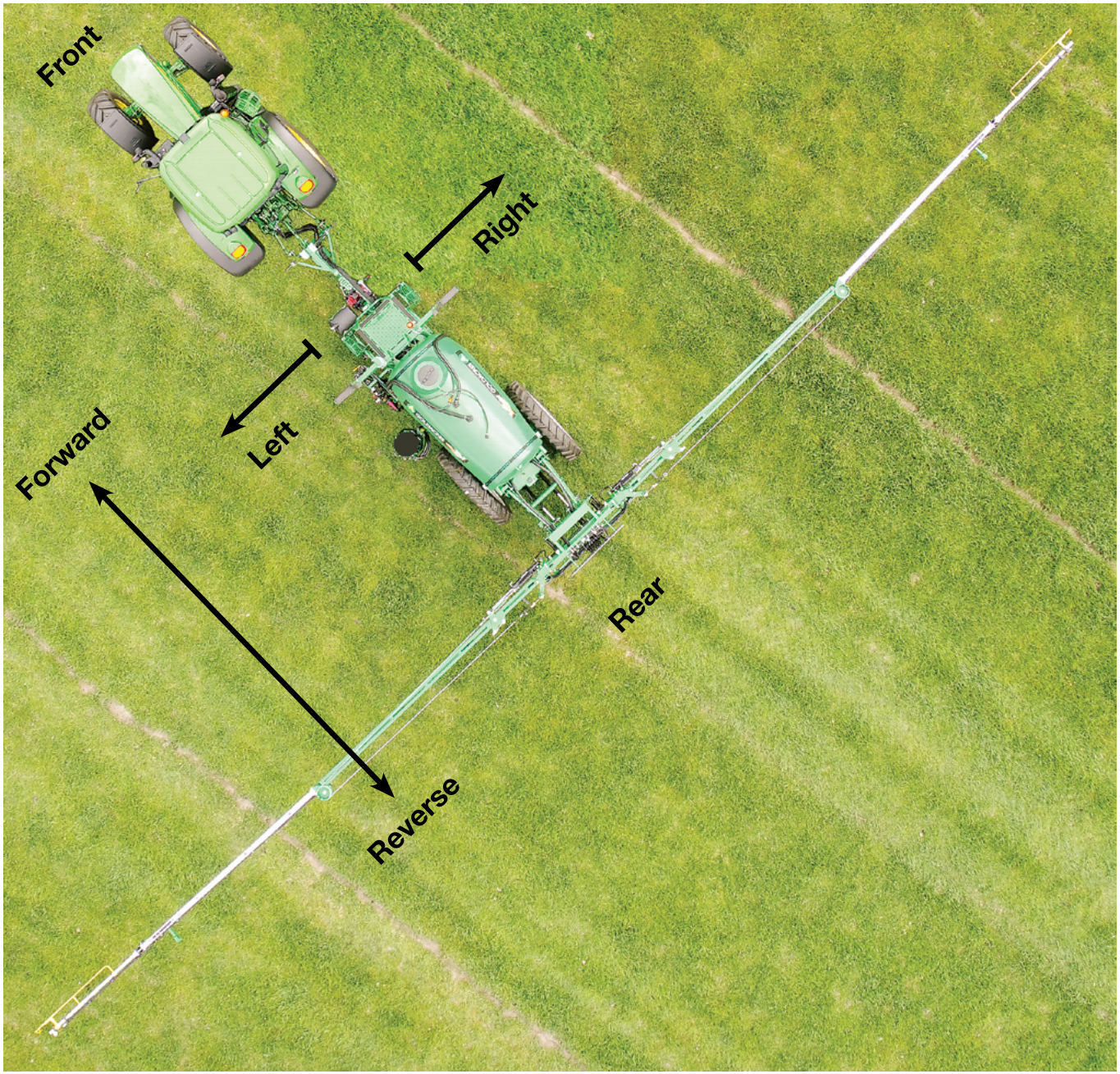
NOTE

The Prairie Special 2500 - 3000L sprayer is approximately 3.5m 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.

2 Essential Risk Management - **Safety**

Prairie Special 3000 litre, 21m boom.

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

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.

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 specificatons & 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 – Absorbtion 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.

2 Essential Risk Management - **Safety**

Prairie Special 3000 litre, 24m boom - Rowcrop option.

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?	☐	☐
Are humidity and Delta T in the appropriate operating range?	☐	☐
Are weather conditions likely to change before the task is complete?	☐	☐
Have all pre-start checks been undertaken?	☐	☐
Is the sprayer in good working order?	☐	☐
Is the operator fit for work?	☐	☐
Has the operator been trained in the use of this machine & the chemicals?	☐	☐
Have all appropriate PPE items been made readily available?	☐	☐
Is the operator aware of the risks posed by the chemical(s) being used?	☐	☐

Physical risks and the work environment		
Is there any danger posed by power lines?	☐	☐
Is there any uneven terrain to be considered?	☐	☐
Is there any likelihood of untrained bystanders or children in the area?	☐	☐
Is there a first aid station nearby?	☐	☐

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 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 maintenace 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 spaying 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.

⚠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.

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 of 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.

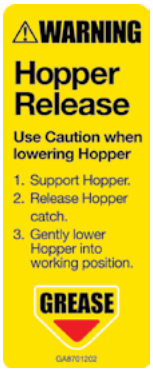
Use ladder or work platform to get access to parts or areas of the machine above local government restrictions.

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.



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 assists 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 triailed vehicle.

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.

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.

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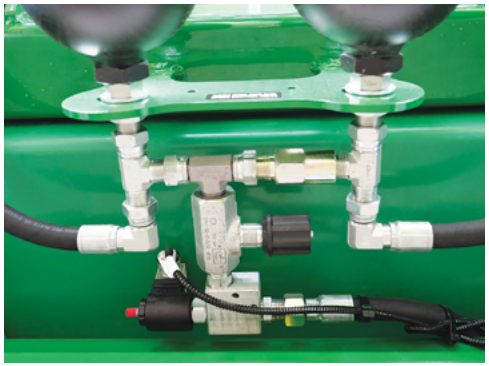


Hydraulic Safety

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 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.

Always ensure the fresh water tank is filled.

Take notice of warning signs for overhead power lines.

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 stropngly 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**.

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.

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.

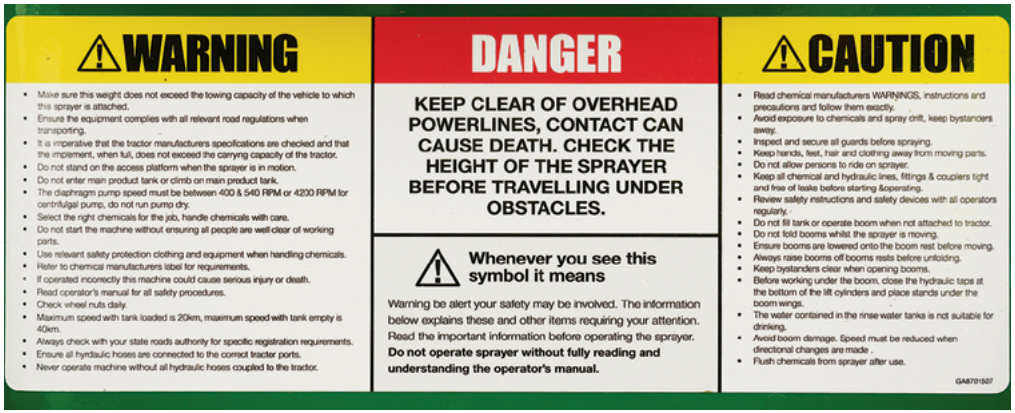
There is also a risk of towed vehicles sliding and/or pulling the towing vehicle sidways.

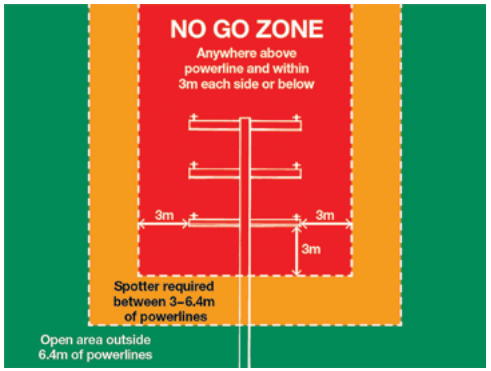
Always be aware of the ground conditions and grip levels of both personal footing and the sprayer.

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 unexpectantly 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 spayer 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 45º 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.`

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

Prairie Special 2500 - 3000L Hitch.

Prairie Special 2500 - 3000L with optional Rowcrop Hitch

Optional In-cab Raven SCS 450 Controller.

Introduction

The Prairie Special 2500 - 3000L Trailed Sprayer is available in 2500 & 3000 litre models with Goldacre's boom sizes ranging from 12 to 24 metres in width and other boom & nozzle options.

The Prairie Special 2500 - 3000L Sprayer can be fitted with an ISO BUS Control System which operates with all leading spray controlllers, steering & mapping providers using the ISO BUS protocol.

For standard & optional controls, refer to Chapter 4, 'Preparation for Use - Setting Up'.

Spray pump options include the 140L/min or 170L/min positive displacement oil backed diaphragm pump, PTO or hydraulically driven.

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

Each tractor & sprayer will vary according to size and options fitted. Illustrations & pictures used in this manual are representive and 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.

Standard Three Way Solenoid Electric Control.

Hydraulic Capacity

The hydraulic system must be closed centre with load sensing.

Required hydraulic capacities for the Prairie Special 2500 - 3000L Sprayers are:

- Diaphragm pump 40 l/min
- Boom function requirements.

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.

Optional 16 Pin AMP connector.

Optional 9 Pin ISO BUS connector.

Prairie Special 3000L Sprayer with 24m boom.

Standard Three Way Solenoid Electric Control.

Electrical Requirements

The Prairie Special 2500 - 3000L Sprayers may require up to 5 electrical tractor connection points depending on configuration:

1 If using the SCS 450 controller option, the tractor requires an optional 16 Pin AMP connector *(shown above)*.

2 If using the ISO BUS option, the tractor must be configured for ISO BUS which requires an optional 9 Pin ISO BUS connector *(shown above right)*.

The Prairie Special is not fitted standard with a sprayer console. To operate using the ISO BUS 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.

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

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

Total 12V maximum current draw is 23 amps.

3 A power connector.

4 A switch control connector.

5 Tail light adapter using the standard 7 pin round connector:

- Tail lights
- Brake lights
- Indicators.

Optional 7 Pin Tail Light connector.

Connecting Tractor & Sprayer

Ensure that the tractor being used is suitably rated to safely tow the sprayer and that the drawbar pin size matches the hitch on the sprayer. The standard hole size is 50mm.

A replaceable insert (Part number GA4582455) can be purchased to reduce wear if required.

A replaceable bush (GA5075075), reduces the size of the hole in the hitch if a smaller pin is to be used.

The 2500 & 3000 models of the Prairie Special are fitted standard with a manual 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).

1 Fit In-Cab Controllers & Harnesses

The Prairie Special 2500 - 3000L Trailed Sprayer options may include:

- Three Way Solenoid Electric Control Option (with electric regulator)
- Raven SCS 450 Controller Option
- Raven SCS 450 System Option without controller
- ISO BUS Contol System Option
- 7 Switch Console Option (hydraulic boom function).

Fit the In-Cab Controls/Consoles/Displays and Harnesses as required. Optional console/display mountings are available.

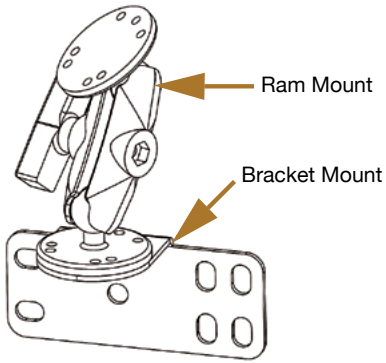
⚠ DANGER

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.

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

Optional In-cab Raven SCS 450 Controller.



In-cab Ram mount & Bracket mount options.

Manual Hitch Jack.

In-Cab Control Options

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

- Optional ISO BUS system
- Optional In-cab Raven SCS 450 Controller
- Optional Master On/Off foot switch can be purchased to bypass a console switch if required.

Sprayer Control Console

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

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

Mounting of in-cab consoles & displays in the tractor cabin is an important part of the setting up.

It is important all in-cabin 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 a sprayer is disconnected & consoles/ displays remain in the cab, ensure units are firmly mounted & cannot come loose.

For specific information on mounting the consoles, please refer installation & service manual instructions supplied.

A bracket (GA4522930) is supplied with the console mounting kit for pillar mounting.

2 Connect Drawbar & Hitch

Prairie Special 2500 - 3000L Sprayer is fitted standard fitted with a Manual Hitch Jack. Instructions for connecting an optional Rowcrop Hitch is provided at the end of this chapter.

To Connect Drawbar & Hitch Using the Manual Hitch Jack:

1 With the sprayer parked on a level surface, use the sprayer jack to raise the sprayer hitch in line with the tractor hitch.

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.

Optional ISO Bus System suitable for most controllers.

Optional Master On/Off Foot Switch.

Ensure the drawbar pin & safety chains are fitted and locked in position.

5 Ensure the drawbar pin is locked in position.

6 Remove the hitch jack mounting pin and rotate the jack 90 degrees to its horizontal postion.

7 Refit the hitch jack lock pin.

8 Unscew the D-shackles of the sprayer's safety chains to release them from the sprayer hitch.

9 Connect the safety chains to the tractor, then fully tighten the D-Shackle bolts.

Hydraulic Hose Connectors.

3 Connect Hydraulic Hoses

Tractor hydraulics are used to contol boom level, folding & unfolding functions and the hydraulic motor (if fitted) to drive the diaphragm pump.

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

Each hydraulic hose is tagged:

- PRESS
- CASE DRN
- LOAD SENSE
- LIFT
- FOLD
- TILT RH
- TILT LH

} EOHV options

- PUMP (optional)
- BRAKE (optional)

Each hydraulic hose is tagged for easy recognition - CASE DRN & LOAD SENSE hose tags shown above.

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 Pressure hose to the tractor.

3 Connect the Case Drain and Load Sensing hoses to the tractor.

4 Connect all required hydraulic hoses.

Tail Light Connector.

4 Connect Electrical Harnesses

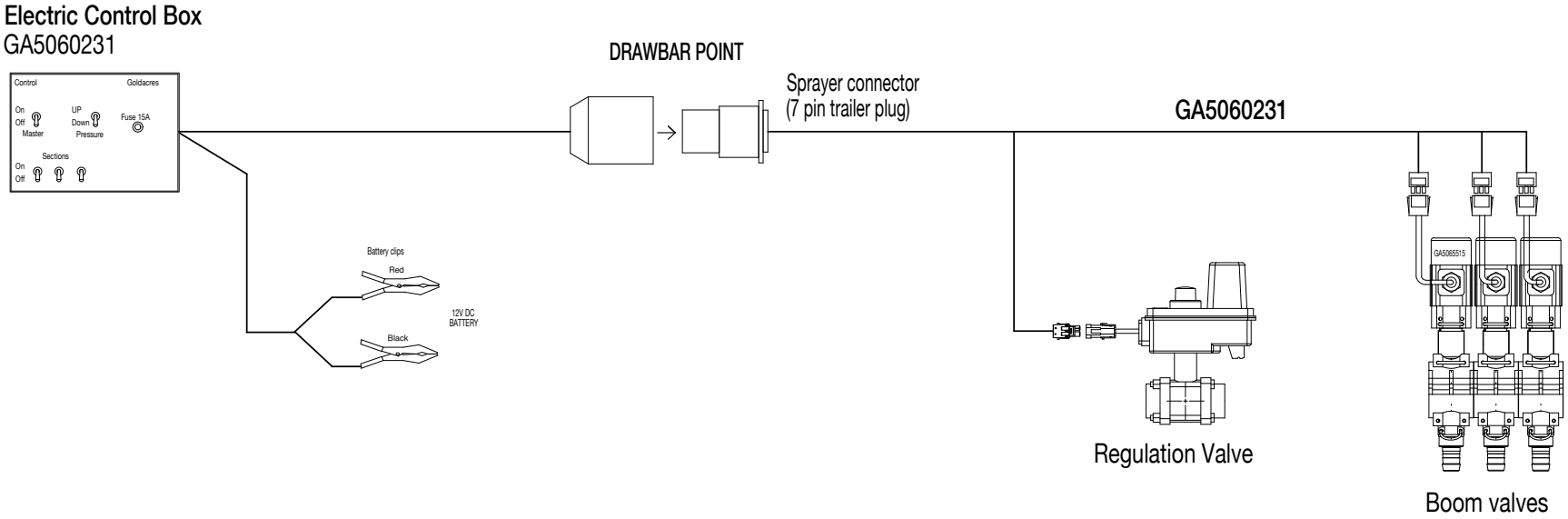
Connect the electrical harnesses of the sprayer to the connectors at the rear of the tractor according to options fitted:

- 3 Way Electric Control
- Raven SCS 450 Only ISO BUS
- Raven SCS 450/CR7 ISO BUS
- 7 Switch Console
- Tail Light Harness
- Master Switch.

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

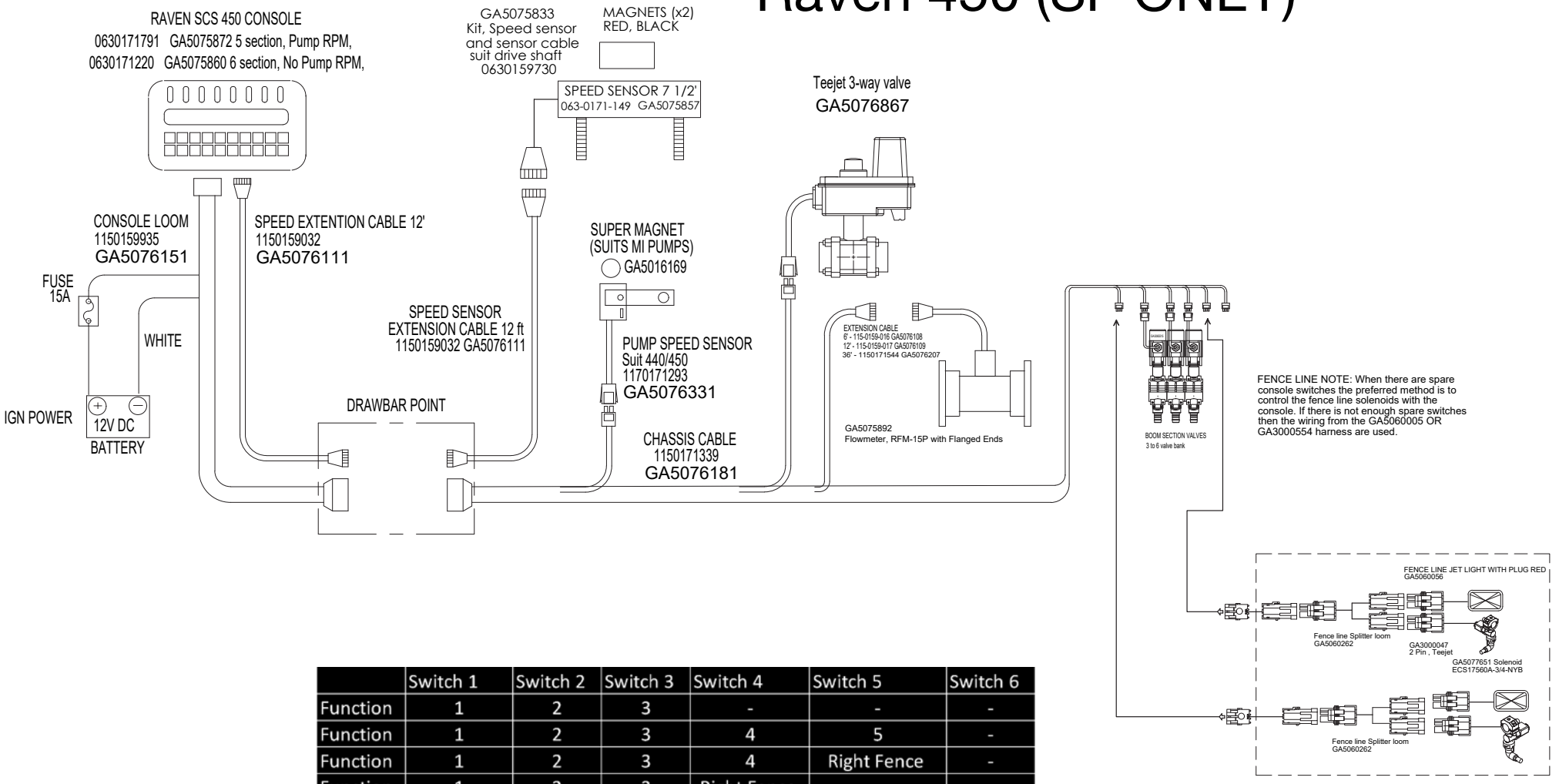
- 'Cabin Harness Electrical Layout' in this chapter
- Chapter 6, 'Operation'.

3 Way Electric Control Harness Option - Manual Pressure Regulation (2500L Special only)



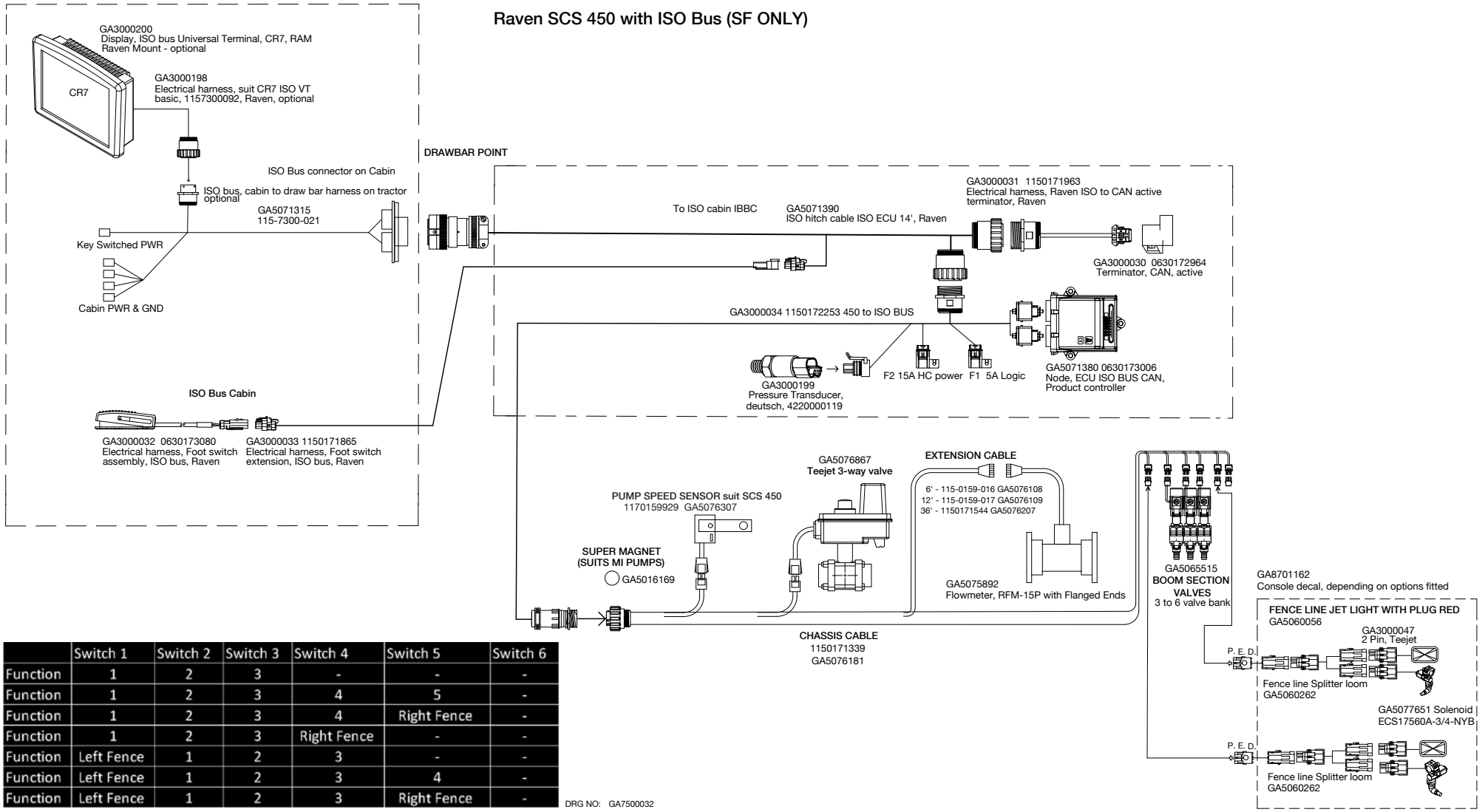
Raven SCS 450 Only Harness Option

Raven 450 (SF ONLY)



	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6
Function	1	2	3	-	-	-
Function	1	2	3	4	5	-
Function	1	2	3	4	Right Fence	-
Function	1	2	3	Right Fence	-	-
Function	Left Fence	1	2	3	-	-
Function	Left Fence	1	2	3	4	-

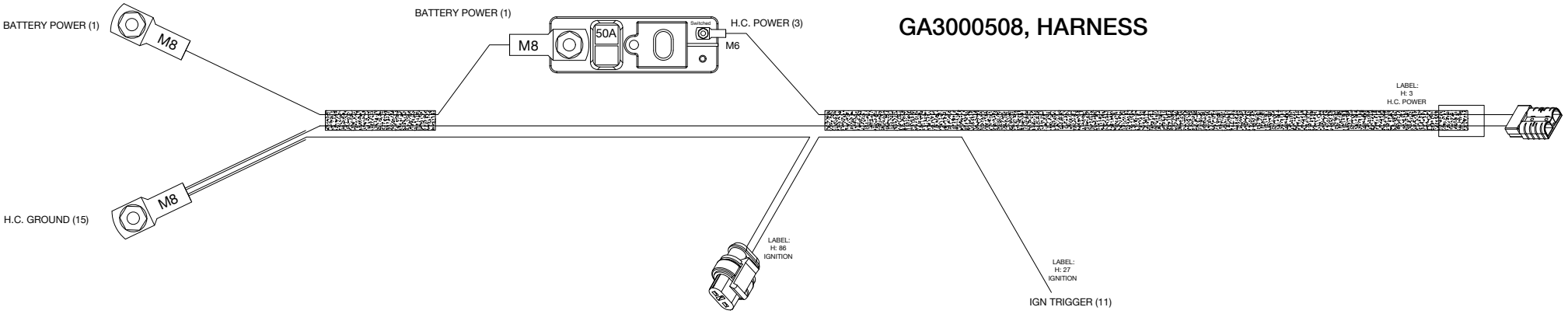
Raven SCS 450/CR7 - ISO Bus Harness Option



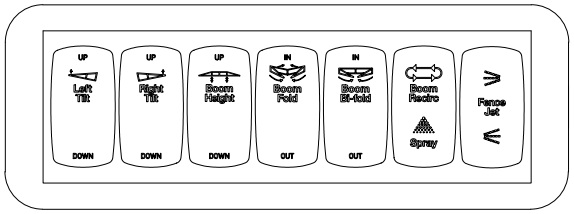
	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6
Function	1	2	3	-	-	-
Function	1	2	3	4	5	-
Function	1	2	3	4	Right Fence	-
Function	1	2	3	Right Fence	-	-
Function	Left Fence	1	2	3	-	-
Function	Left Fence	1	2	3	4	-
Function	Left Fence	1	2	3	Right Fence	-

DRG NO: GA7500032

7 Switch Console Harness Option

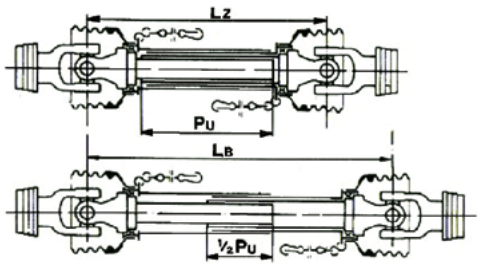


GA4903721, SWITCH BOX SUIT BASIC 3PL SPECIAL

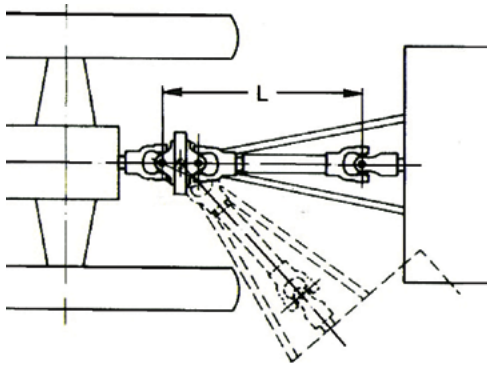


GA3000505, HARNESS

GA3000505-1, HARNESS



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



Important joint operating information for Wide Angle PTO shafts.

5 Fit the PTO Shaft Option

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

Maximum PTO Operating Length

Maximum PTO Operating Length must be correctly set so the 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.

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

NOTE

Measuring & cutting a PTO shaft to the correct length requires knowlege and experience of the procedures required.

If you have never carried out these procedures before, ensure your Dealer performs this important process.

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.

⚠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.

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.

3 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.

4 Place the PTO shaft in a safe position.

⚠CAUTION

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

A detachable drawbar is bolted to the base optional Rowcrop Hitch to enable vehicle transport without 3 point linkage arms. The detachable drawbar must be removed before connecting the sprayer to the tractor 3 point linkage arms.

6 Rowcrop Hitch Option

The Rowcrop Hitch utilises an articulating hitch assembly with greater end row turning angles connected to the tractor 3 point linkage arms. It's supplied with a detachable drawbar bolted to the base of the sprayer hitch for transport. The transport hitch must be removed for spraying operations *(see next page for 'Details of Rowcrop Hitch Assembly').*

To Connect the Rowcrop Hitch:

1 With the sprayer parked on a level surface, remove the detachable hitch.

2 Use 3 sprayer hitch jacks to raise the sprayer hitch to a suitable height to connect the tractor.

3 Reverse the tractor and raise or lower the 3 point linkage arms to align the lower linkage arm holes with the linkage pin attachment of the 3 point linkage hitch.

4 Fit the linkage pins to attach the sprayer to to the lower linkage arms, then lock each in place with a lynch pin.

5 Fit the 3rd linkage arm to the sprayer using the linkage pins then lock each pin in place with lynch pins.

6 Adjust the length of the 3rd linkage arm as required to ensure the linkage A-frame is in vertical working position.

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

Optional Rowcrop Hitch connected to a tractor with hitch jacks in fold-up away position.

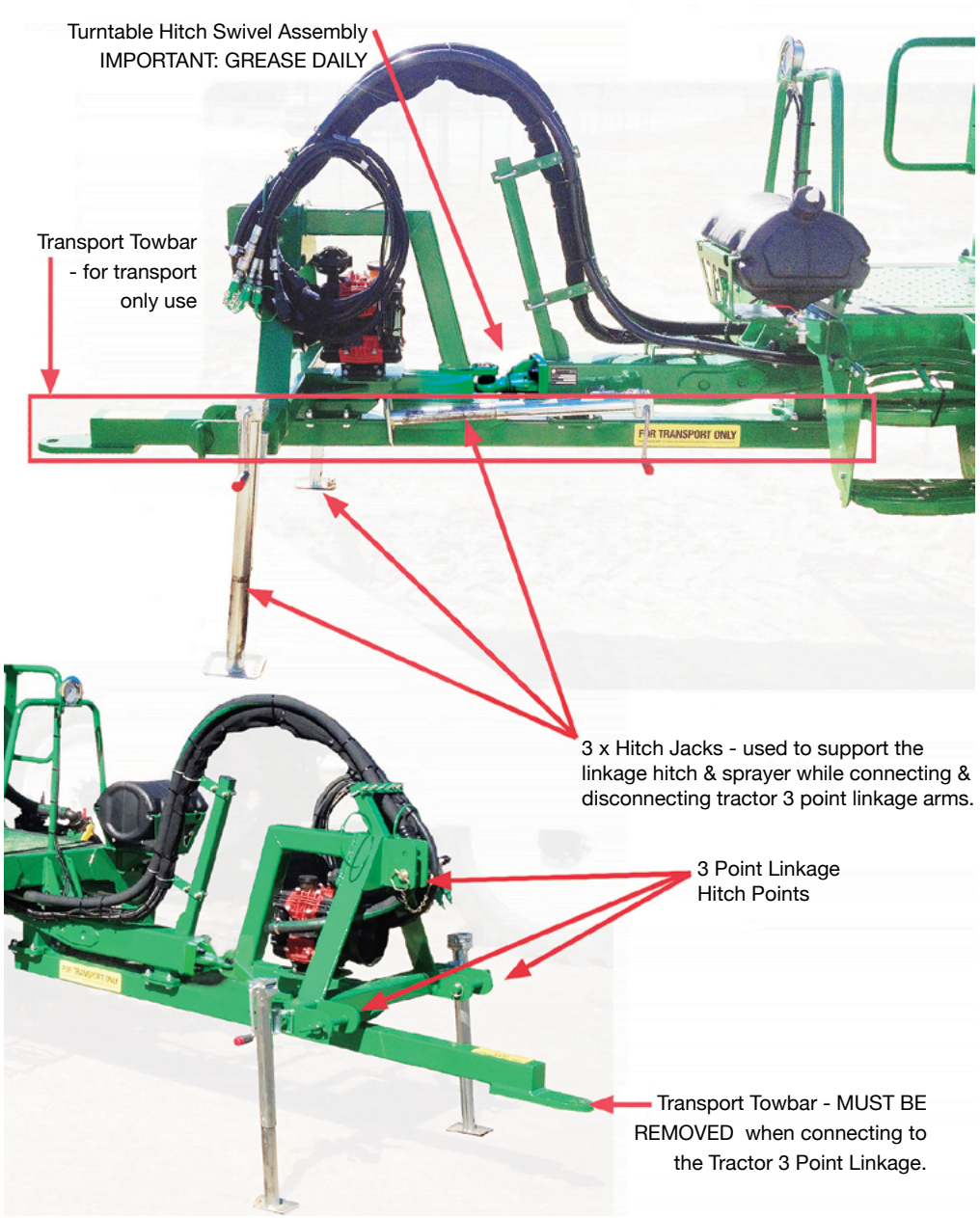
7 Rotate the hitch jack handles anti-clockwise to fully raise the hitch jack bases.

8 Remove the 3 point linkage hitch jack pins, then remove each hitch jack & relocate them upside down in transport position on the linkage A-frame. Fit the pins & R-clips to secure each jack in transport position.

9 Remove the R-clip & pin of the third hitch jack on the sprayer and rotate into its horizontal transport position,then fit the pin & R-clip to secure the jack in transport position.

10 Make any final adjustments to the tractor linkage arm height to ensure linkage A-frame is vertical and the sprayer is slightly lower at the front for operation.

Details of Rowcrop Hitch Assembly



Optional Three Way Solenoid Electric Control.

Optional In-cab Raven SCS 450 Controller.

Prairie Special Controls

The Prairie Special 2500 & 3000 litre models may be fitted with an optional Three Way Solenoid Electric Control, optional SCS 450 Contoller or optional Raven ISO Bus system which operates with all leading spray controllers, steering & mapping providers using the ISO Bus protocol.

In-Cab Controls

In-Cab Controls may include:

- Optional 3 Way Solenoid Electric Control
- Control Console with 7 rocker switches used to operate boom (EOHV option).

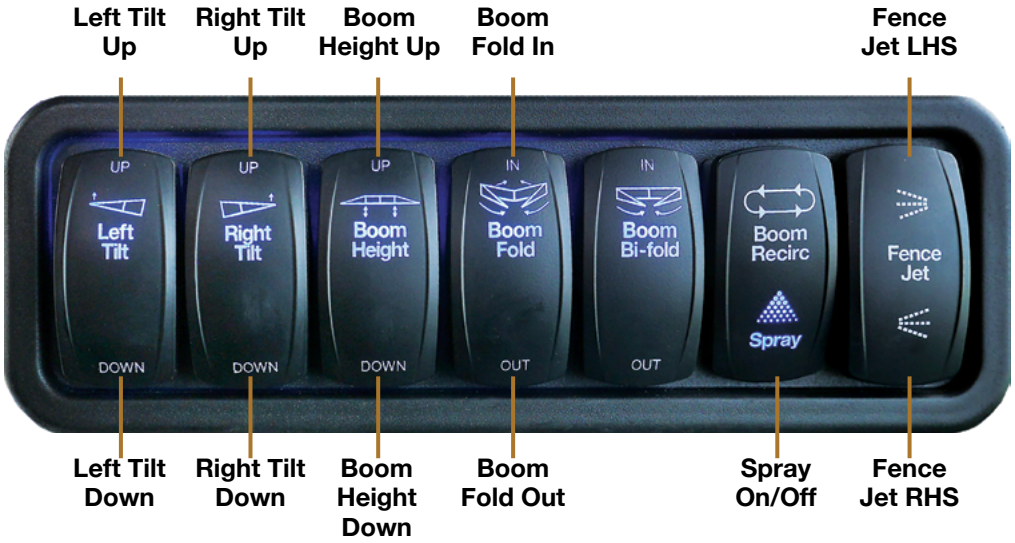
Other possible options include:

- Raven SCS 450 Controller
- Raven ISO Bus System
- On/Off foot switch.

Optional Master On/Off Foot Switch.

Seven Switch Console Option

If EOHV fitted, the 7 Switch Console comprises 7 rocker switches for operating boom and spray functions.



Switch functions of the 7 Rocker Switch Console option.

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** (optional)

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.

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/Out** (not available)

6 **Boom Recirculation** (not available)

7 **Fence Jet LHS On or Off & Fence Jet RHS On or Off** (optional)

Press the top of the switch to start the LHS Fence Jet spraying - illluminates blue.

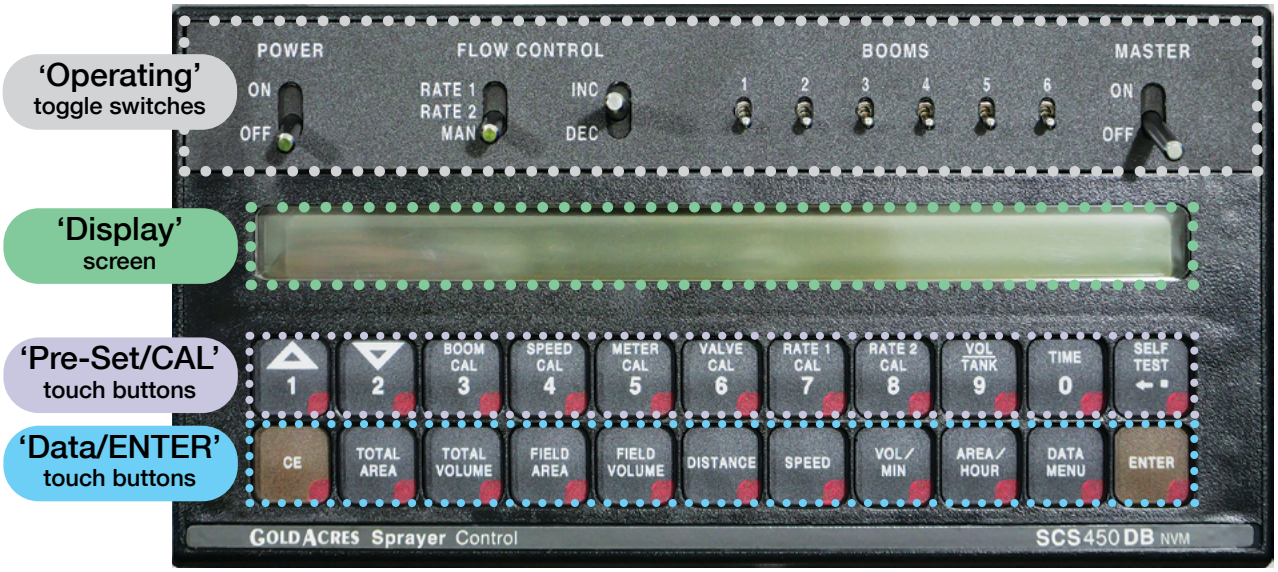
Press the switch again to stop LHS Jet.

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

Press the switch again to stop RHS Jet.

Boom must be spraying for the Fence Jets to spray.

Refer to Chapter 6 Operation - Ready to Spray for ‘Boom Folding/Unfolding instructions.



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

Pre-Set the Raven SCS 450 Controller Option

If ordered, the Raven SCS 450 Controller (Spray Rate Controller) is fitted, tested, then values are cleared prior to delivery.

All Pre-Set values for spaying applications must be entered, checked & tested for accuracy for each application prior to spraying.

It is the operator's responsibility to correctly operate the sprayer at all times - which includes pre-setting, calibrating, testing all functions to be used with the controller and sprayer.

NOTE

It is recommended to record all "Pre-Set' values (entered & saved) on 'Pre-Set SCS 450 Record Sheets' for future reference.

Record sheets are provided near the end of this chapter.

Copy & use the 'Pre-Set SCS 450 Record Sheets' near the end of this chapter for your records.

To Pre-Set the SCS 450

1 Turn On the ignition power.

2 Move the 'POWER' toggle switch to On postion to start the SCS 450 Controller.

Before pre-setting the controller after powering up, a message "CAL US -VOLUME PER ACRE" will appear in the console's display. This indicates that the console must be calibrated (or programmed) before it can be operated.

Move the 'POWER' toggle switch to On position to start the SCS 450 Controller.

Press the 'CE' touch button, repeatedly, until the desired unit of measure appears eg, SI (HECTARES). Press the ENTER touch button & 'CAL SP 1-WHEEL DRIVE' is displayed (see above).

3 Press the 'CE' touch button, repeatedly, until the unit of measure desired, eg, 'SI (HECTARES)' appears in the display, then press the 'ENTER' touch button.

The Speed sensor message 'CAL SP 1-WHEEL DRIVE' will be displayed *(see above)*.

4 Press the 'CE' touch button, repeatedly, to select the desired Speed sensor type: 'CAL SP 1-WHEEL DRIVE' or 'CAL SP 2-RADAR')

When the correct Speed sensor type is displayed, eg, 'CAL SP 1-WHEEL DRIVE', press the 'ENTER' touch button and 'CAL C-SD-STANDARD VALVE' will be displayed *(see below)*.

Alternatively, if using radar, select the speed sensor, eg, 'SP 2-RADAR', then press the 'ENTER' touch button and 'CAL C-SD-STANDARD VALVE' will be displayed *(see next page)*.

When the correct Speed sensor is displayed, eg, 'CAL SP 1-WHEEL DRIVE', press the 'ENTER' touch button & 'CAL C-SD-STANDARD VALVE' is displayed (see below).

Alteratively, if using a radar Speed sensor, select 'SP 2-RADAR' (shown above). press the 'ENTER' touch button and 'CAL SELF TEST 00' will be displayed (see aboveright).

5 Press the 'CE' touch button, repeatedly, to select the desired valve type (list options [5]: 'C-SD-STANDARD VALVE', 'C-F-FAST VALVE', 'C-FC-FAST CLOSE VALVE', 'C-P-PWM VALVE' or 'C-PC-PWM CLOSE VALVE').

When the correct Valve type "appears in the display, eg, 'CAL C-SD-STANDARD VALVE', press the 'ENTER' touch button and 'CAL SELF TEST 00' will be displayed *(see above right)*.

NOTE

If an entry or selection error is made during the first six steps of this procedure, turn the POWER ON/OFF switch to the OFF position, then press CE and hold while turning the POWER ON/OFF switch to the ON position to reset the console.

When the correct Valve type is displayed, eg, 'C-SD-STANDARD VALVE', press the 'ENTER' touch button & 'CAL SELF TEST 00' will be displayed (see above right).

Press the 'BOOM CAL' touch button, then press the ENTER touch button and 'CAL BOOM CAL 1 E' will be displayed (see below).

6 Press the 'BOOM CAL' touch button *(shown above)* and 'CAL BOOM 1 CAL 0' will be displayed *(shown below)*.

7 Press the the ENTER touch button and 'CAL BOOM 1 CAL E' will be displayed *(shown above right)*.

NOTE

'BOOM CAL' requires each boom section width to be entered - multiply the number nozzles x nozzle spacing to calculate section widths in centimetres (cm).

Nozzle numbers & spacing differ according boom size and plumbing.

A table & illustrations of Broadacre & Centreline (Rowcrop) plumbing with a 24m boom is shown next page. Use only information of the boom fitted to your sprayer.

Press the ENTER touch button and 'CAL BOOM CAL 1 E' will be displayed (shown above right).

Press the appropriate 'NUMBER' touch buttons to enter the 1st Boom Section Width value eg, '500' (cm), then press the ENTER touch buttonto save the entered value (shown below)

8 Press the appropriate 'NUMBER' touch buttons *(shown above)* to enter the 1st Boom Section Width value, eg, '500' (cm) *(shown below)*.

9 Press the ENTER touch button *(shown below)* to save the entered value and 'CAL BOOM 2 CAL E' (next boom section) will be displayed *(shown next page)*.

NOTE

The Raven SRS 450 Controller operates with up to 5 boom sections.

To measure each boom section width, count the number of nozzles in the section, then multiply by the nozzle spacing, eg, 10 nozzles in one section at 500mm (50cm) nozzle spacings is 10 x 50cm = 500cm

Press the ENTER touch button to save the enter value and 'CAL BOOM 2 CAL 0' (next boom section) will be displayed (shown next page) .

Press the ENTER touch button (shown above) and 'CAL BOOM 2 CAL E' will be displayed (shown far right)

10 Press the ENTER touch button *(shown above)* and 'CAL BOOM CAL 2 E' will be displayed *(shown far right)*.

Section Details of a 24m Boom with Broadacre Plumbing			
Section Number (L to R)	Nozzle Spacing (mm)	No Nozzles in Section	Section Width (cm)
1	500	10	500
2	500	10	500
3	500	8	400
4	500	10	500
5	500	10	500
Total No of nozzles: 48			
Spray Application Width: 24.0m			

Section Details of a 24m Boom with Centreline Plumbing			
Section Number (L to R)	Nozzle Spacing (mm)	No Nozzles in Section	Section Width (cm)
1	500	10	500
2	500	10	500
3	500	9	450
4	500	10	500
5	500	10	500
Total No of nozzles: 49			
Spray Application Width: 24.5m			

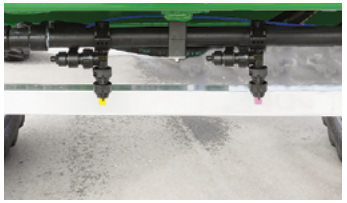


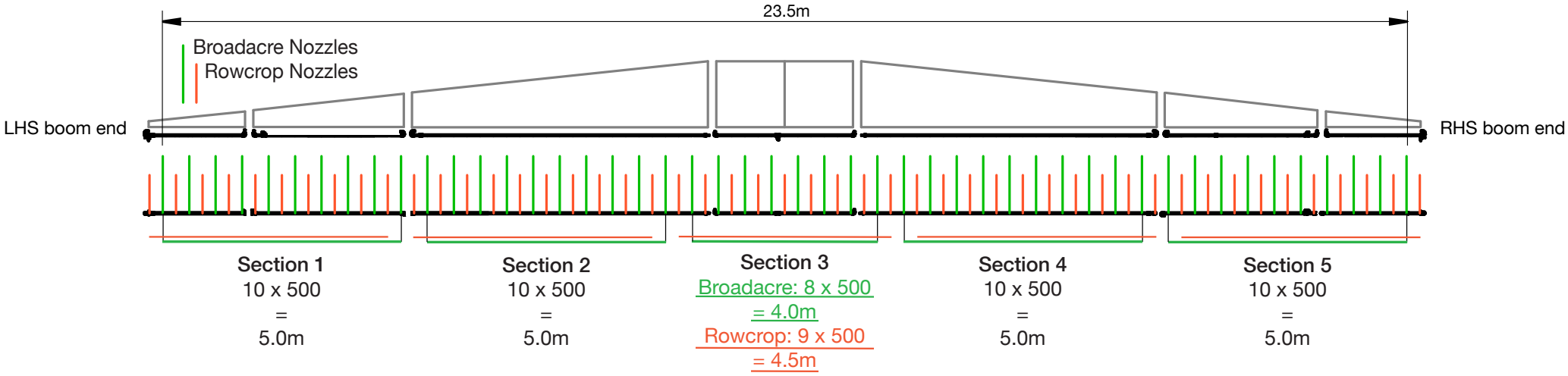
Photo Right: Two nozzles plumbed either side of the centre of the boom - is refered to as Broadacre plumbing.

Photo Left: A nozzle plumbed to the boom centre - is refered to as Centreline or Rowcrop. plumbing.

Press the appropriate 'NUMBER' touch buttons to enter the 2nd Boom Section Width value eg, '500' (cm) (shown next page).

11 Press the appropriate 'NUMBER' touch buttons *(shown above)* to enter the 2nd Boom Section Width value, eg, '500' (cm) *(shown next page)*.

Boom Illustration Below: A 24m 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 lines illustrate the Broadacre plumbing nozzle location option. Red lines illustrate Centreline (Rowcrop) plumbing nozzle locations.



Press the ENTER touch button (shown above) to save the entered value and 'CAL BOOM 3 CAL 0' will be displayed (shown below) .

12 Press the ENTER touch button *(shown below)* to save the entered value and 'CAL BOOM 3 CAL 0' (next boom section) will be displayed *(shown below)*.

13 Press the ENTER touch button *(shown below)* and 'CAL BOOM 3 CAL E E' will be displayed *(shown above right)*.

Press the appropriate 'NUMBER' touch buttons (shown above) to enter the 3rd Boom Section Width value eg, '400' (cm) (shown below).

14 Press the appropriate 'NUMBER' touch buttons to enter the 3rd Boom Section Width value, eg, '400' (cm) *(shown below)*.

15 Press the ENTER touch button *(shown below)* to save the entered value and 'CAL BOOM CAL 4 0' (next boom section) will be displayed *(shown above right)*.

Press the ENTER touch button and 'CAL BOOM 4 CAL E' will be displayed (shown below).

16 Press the ENTER touch button *(shown above)* and 'CAL BOOM 4 CAL E ' will be displayed *(shown below)*.

17 Press the appropriate 'NUMBER' touch buttons *(shown below)* to enter the 3rd Boom Section Width value, eg, '400' (cm) *(shown next page)*.

NOTE

For more detailed information on the SCS 450 controller refer to the Raven SCS 450 Installation & Service Manual.

Press the ENTER touch button and 'CAL BOOM 3 CAL E' will be displayed (shown above right).

Press the ENTER touch button (shown below) to save the entered value and 'CAL BOOM 4 CAL 0' will be displayed (shown above right).

Press the appropriate 'NUMBER' touch buttons to enter the 4th Boom Section Width value eg, '500' (cm) (shown above right).

Press the ENTER touch button (shown above) to save the entered value and 'CAL BOOM 5 CAL 0' will be displayed (shown below) .

18 Press the ENTER touch button to save the entered value and 'CAL BOOM 5 CAL 0' (last boom section) will be displayed *(shown below)*.

19 Press the ENTER touch button *(shown below)* and 'CAL BOOM 5 CAL E' will be displayed *(shown above right)*.

Press the ENTER touch button (shown below) and 'CAL BOOM 5 CAL E' will be displayed (shown above right).

Press the appropriate 'NUMBER' touch buttons (shown above) to enter the 5th Boom Section Width value eg, '500' (cm) (shown below).

20 Press the appropriate 'NUMBER' touch buttons to enter the 5th Boom Section Width value, eg, '500' (cm) *(shown below)*.

21 Press the ENTER touch button *(shown below)* to save the entered value.

This completes the BOOM Cal settings.

Press the appropriate 'NUMBER' touch buttons to enter the 3rd Boom Section Width value eg, '450' (cm) (shown next page).

Press the 'SPEED CAL' touch button (shown above) to display 'CAL BOOM 3 CAL 0' will be displayed (shown below) .

22 Press the 'SPEED CAL' touch button *(shown above)* to display the 'SPEED CAL 0' *(shown next page)*.

'SPEED CAL' of the SCS 450 provides two options:

- SP 1 - Wheel-Drive Speed Sensor
- SP 2 - Radar Speed Sensor

Wheel Drive 'SPEED CAL' is the rolling circumference of the sprayer's sensor wheel. Accurate 'SPEED CAL' value requires measuring the circumference of the wheel as it rolls across the ground. Refer to intructions in Chapter 8 Lubrication & Maintenance, Ground Drive 'SPEED CAL' Calibration. It is recommended to:

- Half fill the spray tank with water to provide an average wheel diameter between full & empty loading
- Measure 10 revolutions of the speed sensor wheel on soils typical of those to be encountered for spraying.

It is recommended to record & maintain tyre pressure and to check 'SPEED' CAL at beginning of each season to make any changes necessary for varying seasonal & soil conditions, tyre wear, etc.

NOTE

The Speed Sensor fitted (Wheel Drive or Radar) determines the 'SPEED CAL' value. Wheel Drive 'SPEED CAL' is the rolling circumference of the sprayer's sensor wheel. Refer to the instructions for calculating the Wheel Drive 'SPEED CAL' value.

Raven radar 'SPEED CAL' initial value is 598 [152].

To refine this value, refer to instructions Chaper 8 'Lubrication & Maintenance' - 'Ground Drive SPEED CAL Calibration' in this manual and/or Raven SCS 450 Installation & Service Manual.

Press the ENTER touch button and 'CAL BOOM 2 CAL E' will be displayed (shown below)

23 Press the 'ENTER' touch button *(shown above)* to display the 'CAL SPEED CAL E' *(shown below)*.

24 Press the appropriate 'NUMBER' touch buttons *(shown below)* to enter the 'SPEED CAL' value, eg, '320' (cm) *(shown above right)*.

NOTE

The Speed Sensor fitted (Wheel Drive or Radar) determines 'SPEED CAL' value.

Wheel Drive 'SPEED CAL' is detrmined by wheel circumference & number of speed sensor magnets used. The value '320' decimeters (10 decimetres = 1 metre) is used here as an example only. For further intructions refer to Chapter 8 'Lubrication & Maintenance' - Ground Drive 'SPEED CAL' Calibration.

Raven Radar 'SPEED CAL' use initial value is 598 [152]. For further instructions on refining this value, see the 'Raven SCS 450 Installation & Service Manual'.

Press the appropriate 'NUMBER' touch buttons to enter the 2nd Boom Section Width value eg, '320' (decimeters) (shown above right).

Press the ENTER touch button (shown above) to save the entered value then press the 'METER CAL' touch button to display 'METER CAL 0' (shown above).

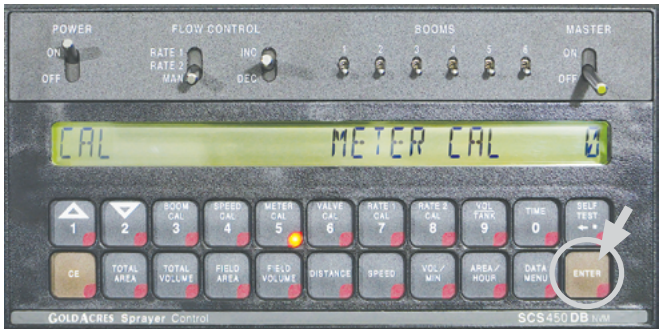
25 Press the ENTER touch button *(shown above)* to save the entered value.

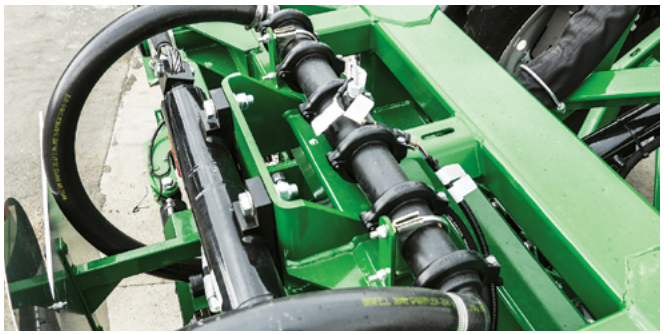
This completes the 'SPEED CAL' settings.

26 Press the 'Meter CAL' touch button *(shown above)* to display 'METER CAL 0' *(shown below)*.

27 Press the 'ENTER' touch button *(shown below)* to display 'METER CAL E' *(shown below right)*.

Press the ENTER touch button (shown below) and 'METER CAL E' will be displayed (shown below right).





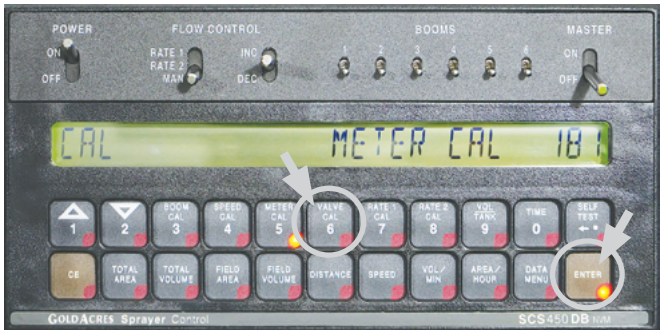
Flow Meter located on top to the boom centre section (shown above).

The 'METER CAL' value is the Flow Meter Calibration Value stamped on the white tag attached to the Flow Meter which is located on top of the boom centre section *(shown below)*.

Locate the number and record it for future reference. The required number is the number in square brackets.

28 Press the appropriate 'NUMBER' touch buttons *(shown below)* to enter the 'METER CAL' value, eg, '181' *(shown next page)*.

Press the appropriate 'NUMBER' touch buttons (shown below) to enter the 'METER CAL' value eg, '181'(shown next page).



Press the ENTER touch button to save the entered value, then press the 'VALVE CAL' touch button to display 'VALVE CAL 0' (shown below).

29 Press the ENTER touch button *(shown above)* to save the entered value.

This completes the 'METER CAL' settings.

30 Press the 'VALVE CAL' touch button *(shown above)* to display 'VALVE CAL 0' *(shown below).*

31 Press the 'ENTER' touch button *(shown below)* to display 'VALVE CAL E' *(shown above right)*.

If Stardard Valve is fitted, enter value 2123.

If Fast Valve or Fast Close Valve is fitted, enter value 743.

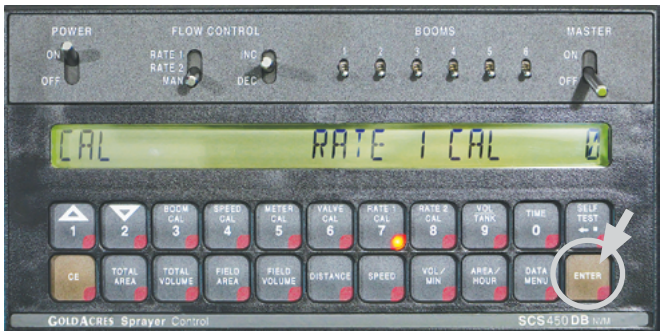
Press the appropriate 'NUMBER' touch buttons (shown above) to enter the 'VALVE CAL' value eg, '2123' (shown below).

32 Press the appropriate 'NUMBER' touch buttons *(shown above)* to enter the 'VALVE CAL' value, eg, '2123' (cm) *(shown below)*.

33 Press the ENTER touch button *(shown below)* to save the entered value.

This completes the 'VALVE CAL' settings.

34 Press the 'RATE 1 CAL' touch button *(shown below)* to display 'CAL RATE 1 CAL 0' *(shown above right).*

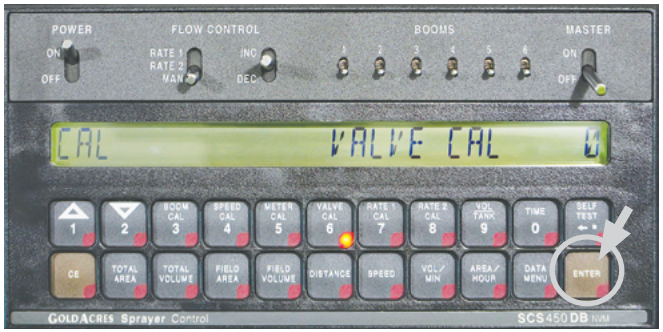


Press the ENTER touch button (shown above) and RATE 1 CAL E' will be displayed (shown below).

35 Press the 'ENTER' touch button *(shown above)* to display 'CAL RATE 1 CAL E' *(shown below)*.

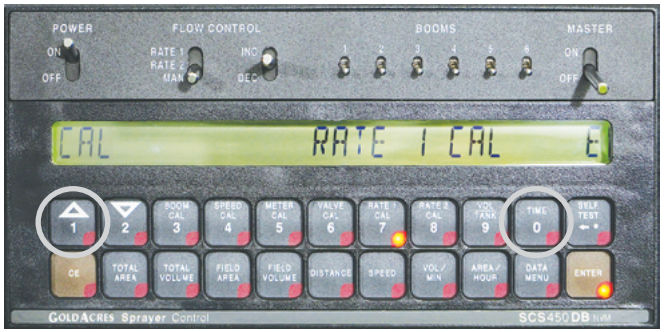
36 Press the appropriate 'NUMBER' touch buttons *(shown below)* to enter the 'RATE 1 CAL' value, eg, '100' (l/ha) *(shown next page)*.

Press the ENTER touch button (shown below) and 'VALVE CAL E' will be displayed (shown above right).



Press the ENTER touch button (shown below) to save the entered value, then press the 'RATE 1 CAL' touch button to display RATE 1 CAL 0' (see above right).

Press the ENTER touch buttons (shown below) to enter RATE 1' value, eg, 100 (l/ha) (shown next page).



Press the ENTER touch button (shown above) to save the entered value, then press the 'RATE 2 CAL' touch button to display RATE 2 CAL 0' (shown below).

37 Press the ENTER touch button *(shown above)* to save the entered value.

This completes the 'RATE 1 CAL' settings.

38 Press the 'RATE 2 CAL' touch button *(shown above)* to display 'CAL RATE 2 CAL 0' *(shown below).*

39 Press the 'ENTER' touch button *(shown below)* to display 'CAL RATE 2 CAL E' *(shown above right)*.

Press the appropriate touch buttons (shown above) to enter RATE 2' value, eg, 80 (l/ha) (shown below).

40 Press the appropriate 'NUMBER' touch buttons *(shown below)* to enter the 'RATE 2 CAL' value eg, '80' (l/ha) *(shown below)*.

41 Press the ENTER touch button *(shown below)* to save the entered value.

This completes the 'RATE 2 CAL' settings.

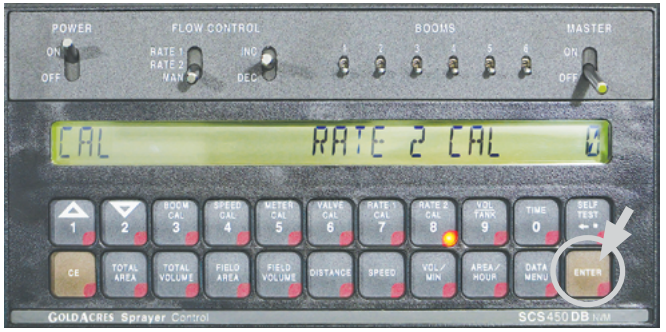
42 Press the 'VOL TANK' touch button *(shown below)* to display 'CAL VOL/TANK 0' *(shown above right).*

Press the ENTER touch button (shown above) and RATE 2 CAL E' will be displayed (shown below).

43 Press the 'ENTER' touch button *(shown above)* to display 'CAL VOL/TANK E' *(shown below)*.

44 Press the appropriate 'NUMBER' touch buttons *(shown below)* to enter the 'CAL VOL/TANK' value eg, '3000' (litres) *(shown next page)*.

Press the ENTER touch button (shown below) and RATE 2 CAL E' will be displayed (shown above right).



Press the ENTER touch button (shown below) to save the entered value, then press the 'VOL TANK' touch button to display 'CAL VOL/TANK 0' (shown above right).

Press the appropriate touch buttons (shown below) to enter the 'CAL VOL/TANK' value, eg, 3000 (litres) (shown next page).

Press the ENTER touch button (shown above) to save the entered value, then press the 'TIME' touch button to display 'TIME 0:00' (shown below).

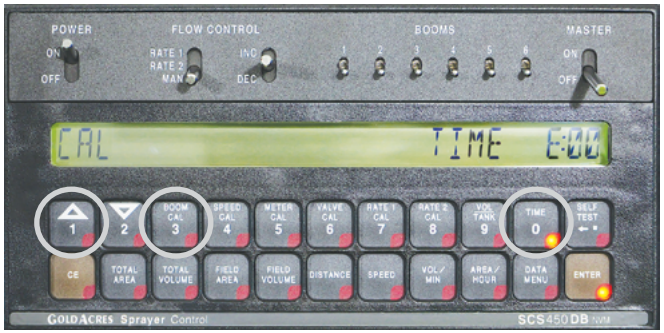
45 Press the ENTER touch button *(shown above)* to save the entered value.

This completes the 'VOL/TANK' settings.

46 Press the 'TIME' touch button *(shown above)* to display 'CAL TIME 0:00' *(shown above right).*

43 Press the 'ENTER' touch button *(shown below)* to display 'CAL TIME E:00' *(shown above right)*.

Press the ENTER touch button (shown below) and 'TIME E:00' will be displayed (shown above right).



Press the appropriate touch buttons (shown above) to enter the current 'TIME' value, eg, 10:30 (shown below).

44 Press the appropriate 'NUMBER' touch buttons *(shown above)* to enter the current 'TIME' value eg, '10.30' (litres) *(shown below)*.

45 Press the ENTER touch button *(shown below)* to save the entered value.

This completes the 'TIME' setting.

NOTE

To prevent the self-test speed from clearing itself out automatically, disconnect the speed connector on the back of the console when radar speed sensors are used.

Press the ENTER touch button (shown below) to save the entered value to complete the 'TIME' setting.

Press the 'SELF TEST touch button to display 'CAL SELF TEST 0.0' (shown above), then press ENTER (shown above) to display 'CAL SELF TEST E' (shown below).

SELF TEST push button

The 'SELF TEST' push button allows the Controller to simulate speed so the system can be tested without moving.

The 'SELF TEST' setting will clear itself when vehicular motion is detected by the speed sensor. A speed cal value of 230 or greater is recommended when operating in this mode.

To set the 'SELF TEST' speed:

1 Press the 'SELF TEST' touch button *(shown above)* to display 'SELF TEST 0.0' *(shown above).*

2 Press the 'ENTER' touch button *(shown below)* to display 'SELF TEST E' *(shown below)*.

3 Press the appropriate 'NUMBER' touch buttons *(shown below)* to enter desired simulated speed eg, 20.0 (km/hr) *(shown next page)*.

Press the appropriate touch buttons (shown below) to enter the desired simulated speed, eg, 20.0 (km/hr) (shown next page).

Press the ENTER touch button (shown above) to save the entered value, then press the SPEED' touch button (shown above) to verify the vehicle's simulated speed.

4 Press the ENTER touch button *(shown above)* to save the entered value.

5 Press the SPEED touch button *(shown above)* to verify the vehicle's simulated speed.

This completes the desire simulated speed setting.

To Review Pre-Set Values:

Press the 'DATA MENU' touch key four times [x4] *(shown below)* to display & review a summary screen of saved/pre-set values.

If a value requires alteration, proceed to the appropriate touch button and make the desired changes.

Press the 'DATA MENU' touch button four times [x40] (shown below) to review a summary screen of the the saved Pre-Set values.

Preset/Calibration Touch Button Summary

A summary of Touch Buttons (shown on previous pages) to Pre-Set/Calibrate the Controller is listed below:

- BOOM CAL — Boom width entered comprising up to 5 boom sections
  Select boom sections using Up [1]/Down [2] arrow keys
- SPEED CAL — Ground Drive or Radar speed sensor
- METER CAL — Flow Meter's calibration number
- VALVE CAL — Valve response time
- RATE 1 CAL — Target application rate
- RATE 2 CAL — Target application rate
- TIME — 24 hour clock (military time).

NOTE

Pre-Set values must be entered for all boom sections.

If a boom section is not in use, enter '0' as the value for that boom section.

Pre-Set values must be entered in all Pre-Set/Calibration touch buttons for the Controller to operate correctly.

To Change Pre-Set/Calibration Values:

1 Press the touch button (numbered) to be changed:
- 3 BOOM CAL
- 4 SPEED CAL
- 5 METER CAL
- 6 VALVE CAL
- 7 RATE 1 CAL
- 8 RATE 2 CAL
- 0 TIME

2 Press the 'ENTER' touch button, then the name of the value being changed will appear with the letter ' E' in the display.

3 Press appropriate 'NUMBER' touch buttons to enter the new value.

4 Press the 'ENTER' touch button to save the new value.

Press the 'TOTAL AREA' touch button (shown above) to display total area of application. Press ENTER, then 0, then ENTER to reset TOTAL AREA to 'zero'.

Data Menu Display

DATA MENU touch buttons used to display the data on a various aspects of spray application include:

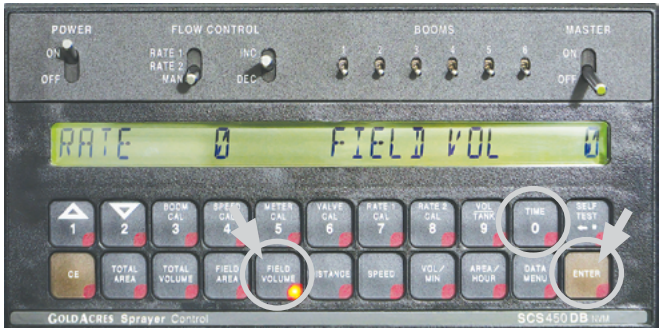
- TOTAL AREA — Displays total area applied *(see above)*
  To reset to 'zero', press ENTER, then press 0, then press ENTER
- TOTAL VOLUME — Displays total volume applied *(see below)*
  To reset to 'zero', press ENTER, then press 0, then press ENTER
- FIELD AREA — Displays field area applied *(see above right)*
  To reset to 'zero', press ENTER, then press 0, then press ENTER

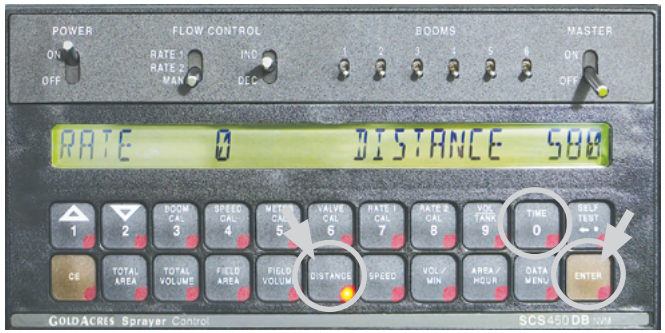
Press the 'TOTAL VOLUME' touch button (shown below) to display total volume of application. Press ENTER, then 0, then ENTER to reset total volume to 'zero'.

Press the 'FIELD AREA' touch button (shown above) to display application field area. Press ENTER, then 0, then ENTER to reset field area to 'zero'.

- FIELD VOLUME — Volume applied to the field *(see below)*
  To reset to 'zero', press ENTER, then press 0, then press ENTER
- DISTANCE — Displays distance travelled *(see above right)*
  To reset to 'zero', press ENTER, then press 0, then press ENTER
- SPEED — Displays current vehicle speed
- VOL/MIN — Displays volume/minute being applied
- AREA/HOUR — Calculates total area being covered per hour at current speed
- DATA MENU — Used for data logging & variable rate commands
- SELF TEST — Displays data after selecting volume rate, speed sensor type or valve type

Press the 'FIELD VOLUME' touch button (shown below) to display application field volume. Press ENTER, then 0, then ENTER to reset field volume to 'zero'.





Press the 'DISTANCE' touch button (shown above) to display DISTANCE travelled. Press ENTER, then 0, then ENTER to reset DISTANCE to 'zero'.

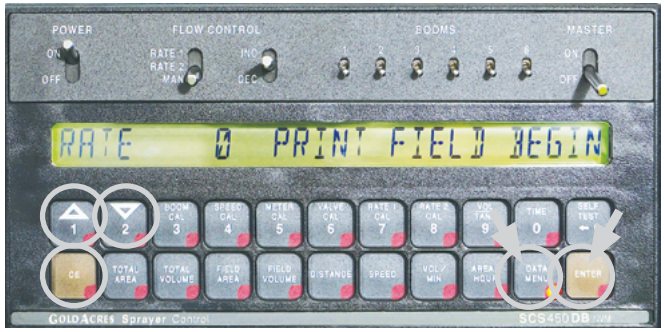
Data Menu Settings

The 'DATA MENU' is used for printing, alarms, display, rate change, field refence, data values, pressure, RPM & tier rates.

Press the 'DATA MENU' touch button to display menu options by name & default setting. Use the 'ARROW ' touch buttons to scroll through the menu options:

- PRINT FIELD BEGIN *(shown below)*
  Volume sends data through the serial port to an attached printer (optional - not supplied) to 'Print Field Begin' & 'Print Field End' pages.
  Press the 'CE' touch button to toggle between pages.
  1 Press ENTER to print the Print Field Begin & the display will show PRINT FIELD END
  2 Press ENTER to print the Print Field End.

Press the 'DATA MENU' & 'ARROW' touch buttons (shown below) to display 'PRINT FIELD BEGIN'. Press 'CE' touch button for page required, then press ENTER to print.



Press the 'DATA MENU', then 'ARROW' touch buttons to display desired alarm. Press the 'CE' touch button to select 'On' or 'Off', then press ENTER to save setting.

- ALARM ON *(shown above)*
  Turns the audible alarms On & Off for:
  - Vol/Minute Rate Fault
  - Volume/Area Rate Alarm
  - Low Tank Fault features

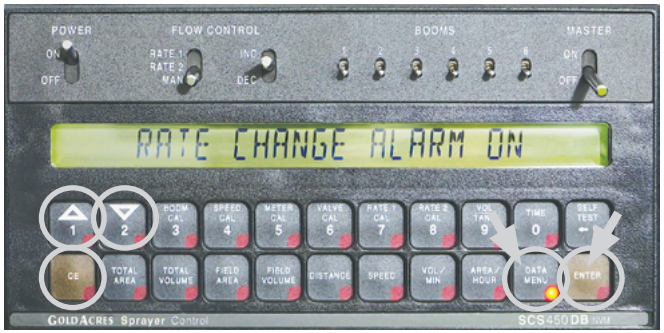
  Use the 'ARROW ' touch buttons to select desired alarm

  Press the 'CE' touch button to select Alarm On or Off.
- DISPLAY SMOOTHING ON *(shown below)*
  Turns display smoothing On & Off.

  Display Smoothing On - adjusts the console to display target rate when actual rate is within 10% of target rate.

  Display Smoothing Off - displays the actual target rate.

  Press the 'CE' touch button to select On or Off.



Press 'DATA MENU', then 'ARROW' touch buttons for 'RATE CHANGE ALARM ON'. Press the 'CE' touch button to select 'On' or 'Off', then press ENTER to save setting.

- RATE CHANGE ALARM ON *(shown above)*
  Turns the rate change alarm On & Off.

  When the Rate Change Alarm is On, the alarm emits four long beeps when the RATE 1 calibration number is changed via the serial port using a valid change request data string.

  Press the CE touch button to select On & Off.
- FIELD REF *(shown below)*
  Allows the user to enter up to a four-digit number to represent a field.

  Field reference is included in the Field Begin & Field End pages & data logger time/date string.

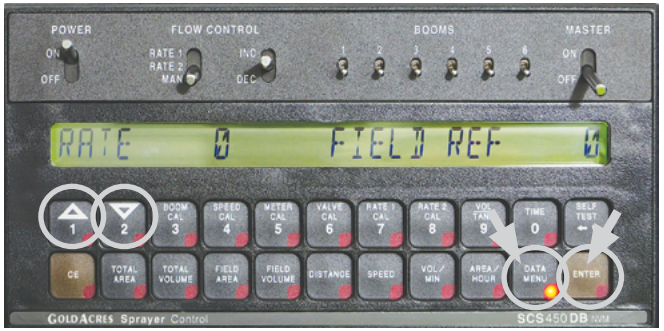
Press 'DATA MENU', then 'ARROW' touch buttons for 'BAUD RATE 9600',then press ENTER to display 'E', then enter numbers. Press ENTER to save setting.

- BAUD RATE 9600 *(shown above)*
  Used in the GPS logging mode.
  The baud rate option is 1200 - 9600 baud.
- DATA LOG TRIGGER VALUE 0 *(shown below)*
  Used in data logging mode. The trigger determines how often the actual rate data string is sent to the serial port. The trigger may be in meters or seconds. The default value is set to zero.

  This value must be changed to a number ranging from 1 -9999, or the data logger feature will not work.

Press the 'DATA MENU', then 'ARROW' touch buttons for 'DISPLAY SMOOTHING ON'. Press 'CE' touch button to select 'On' or 'Off', then press ENTER to save setting.

Press the 'DATA MENU', then 'ARROW' touch buttons for 'FIELD REF 0', then press ENTER to display 'E', then enter numbers. Press ENTER to save reference entered.



Press 'DATA MENU', then 'ARROW' touch buttons for 'DATA LOG TRIGGER VALUE 0',then press ENTER to display 'E', then enter numbers. Press ENTER to save setting.

Press 'DATA MENU' & 'ARROW' touch buttons for 'DATA LOG TRIGGER UNITS METER'. Press 'CE' touch button for settting required, then press ENTER to save setting.

- DATA LOG TRIGGER UNITS METER *(shown above)*
  Used in the data logging mode. The trigger may either be in feef (metres) or seconds.
  Press the CE touch button to toggle between METER & SEC.
- DATA LOG OFF *(shown below)*
  Turns the data logger On & Off.
  The trigger value must be set to a figure other than zero in order to toggle DATA LOG to On.

Press 'DATA MENU' & 'ARROW' touch buttons for 'PRESS TO ENTER CAL PRESSURE', then press ENTER to display 'E', then enter numbers. Press ENTER to save setting.

- PRESS TO ENTER CAL PRESSURE *(shown above)*
  Used to set the 'zero point' of the pressure transducer for pressure display.
- OFF RATE PERCENT 30 *(shown below)*
  Used to set the percentage 'Off-Target' value.
  The alarm sounds when the actual rate is Off from the target rate by a specified percentage.
  The Off-Target value is preset to 30%, but may be changed to a different number.

Press 'DATA MENU' & 'ARROW' touch buttons for 'HIGH PWM OFFSET 253' and follow instructions below. Press ENTER to save settings.

- HIGH PWM OFFSET 253 *(shown above)*
  Used to set maximum desired RPM or hydraulic output of the Pulse-Width Modulated (PWM) control valve.
  1 Press 'DATA MENU', then press ARROW touch buttons to display 'HIGH PWM OFFSET 253'.
  2 Move the Product switch to MAN, then Boom & Master switches to On.
  3 Hold the 'INC/DEC' toggle switch to increase RPM. If the motor exceeds the desired RPM, decrease the number by 10 and press 'INC' again.
  4 Decrease the 253 value displayed until the motor runs at the desired RPM.
  5 Enter a number of 10 or greater.
  6 Press the ARROW Up touch button to display 'LOW PWM OFFSET 1'.

Press 'DATA MENU' & 'ARROW' touch buttons for 'DATA LOG OFF'. Press 'CE' touch button for settting required, then press ENTER to save setting.

Press 'DATA MENU' & 'ARROW' touch buttons for 'OFF RATE PERCENT 30', then press ENTER to display 'E', then enter numbers. Press ENTER to save setting.

NOTE

For more detailed information on 'Other Data Menu Settings' refer to the Raven SCS 450 Installation & Service Manual.

Press 'DATA MENU' & 'ARROW' touch buttons for 'LOW PWM OFFSET 1, and follow instructions below. Press ENTER to save settings.

- LOW PWM OFFSET 1 *(shown above)*

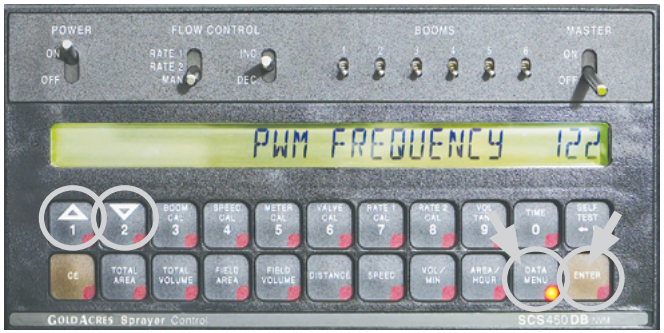
  Used to set the minimum desired RPM or Hydraulic output of the control valve.

  Used to set the zero point or shut-off point of the PWM control valve.

  1 Press 'DATA MENU', then press the ARROW touch buttons to display LOW PWM OFFSET 1.
  2 Move the product switch to MAN, then Boom & Master switches to On.
  3 Hold the INC/DEC toggle switch to decrease RPM until the motor stops.
  4 Increase displayed value until motor runs at desired RPM.
  5 Enter a number - 10 or lower.
  6 Hold the INC/DEC toggle switch to decrease. If the motor does not stop, lower the offset number by 10 & press INC/DEC toggle switch to decrease.
  7 Press the ARROW Up touch buttone to display 'LOW PWM OFFSET 1'.

NOTE

For more detailed information on 'Other Data Menu Settings' refer to the Raven SCS 450 Installation & Service Manual.



Press 'DATA MENU' & 'ARROW' touch buttons for 'LOW PWM OFFSET 1', then press ENTER to display 'E', then enter numbers. Press ENTER to save setting.

- PWM FREQUENCY 122 *(shown above)*
  Used to enter the coil frequency of the PWM valve type being used.

  The default frequency is 122 Hz.

- PRESS ENTER FOR DATA-LOCK *(shown below)*
  Sequence to activate the Data-Lock code. Data entry is prohibited without the Data-Lock code.

  The four-digit code must be entered within 15 seconds.

Press 'DATA MENU' & 'ARROW' touch buttons for 'LOW PWM OFFSET 1', then press ENTER to display '...E', then enter numbers. Press ENTER to save setting.

Press 'DATA MENU' & 'ARROW' touch buttons to display 'TIER 1 MAX RATE', then press ENTER to display 'E' (not shown) .

- TIER 1 MAX RATE *(shown above & below)*

  Used to enter maximum flow rate of Tier 1 when using tiered booms.

  To set the TIER 1 MAX RATE:

  Press the 'DATA MENU' touch button, then 'ARROW' touch buttons to display 'TIER 1 MAX RATE 0' *(shown above)*

  Press the 'ENTER' touch button to display the letter ' E' and press appropriate 'NUMBER' touch buttons to enter the desired value, eg, 50 *(shown below)*.

Press the NUMBER push buttons to enter the desired rate, eg, 50, then press ENTER to save setting.

Optional Raven CR7 In-Cabin Controller.

Pre-Set Raven ISO BUS System Option

The optional Raven ISO BUS system 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

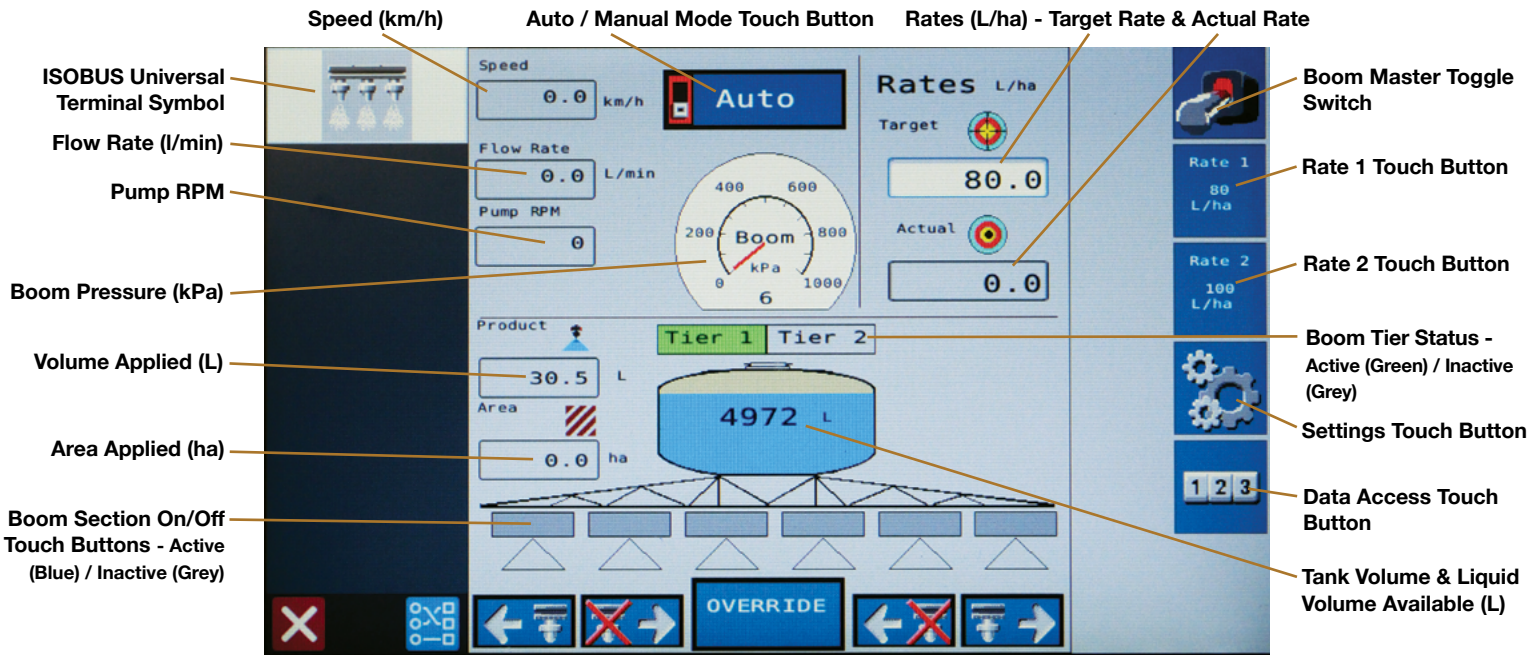
The easiest way to determine the Width of a Section is to count the nozzles.

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.



'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 2500 - 3000L sprayer.

To Pre-Set the Raven ISO BUS System 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:

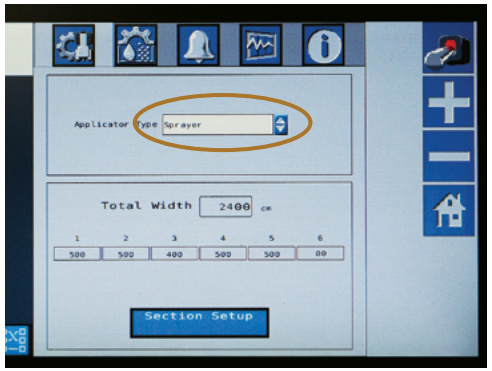
- Boom Settings (Opening screen)
- Product Settings
- Alarm Settings
- Diagnostics
- Information

Section Details of a 24m Boom with Broadacre Plumbing			
Section Number (L to R)	Nozzle Spacing (m)	Number of Nozzles in Section	Section Width (m)
1	0.5	10	5.0
2	0.5	10	5.0
3	0.5	8	4.0
4	0.5	10	5.0
5	0.5	10	5.0
Total No of nozzles:		**48**	
Spray Application Width:			**24.0m**

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

Section Details of a 24m Boom with Centreline Plumbing			
Section Number (L to R)	Nozzle Spacing (m)	Number of Nozzles in Section	Section Width (m)
1	0.5	10	5.0
2	0.5	10	5.0
3	0.5	9	4.5
4	0.5	10	5.0
5	0.5	10	5.0
Total No of nozzles:		**49**	
Spray Application Width:			**24.5m**

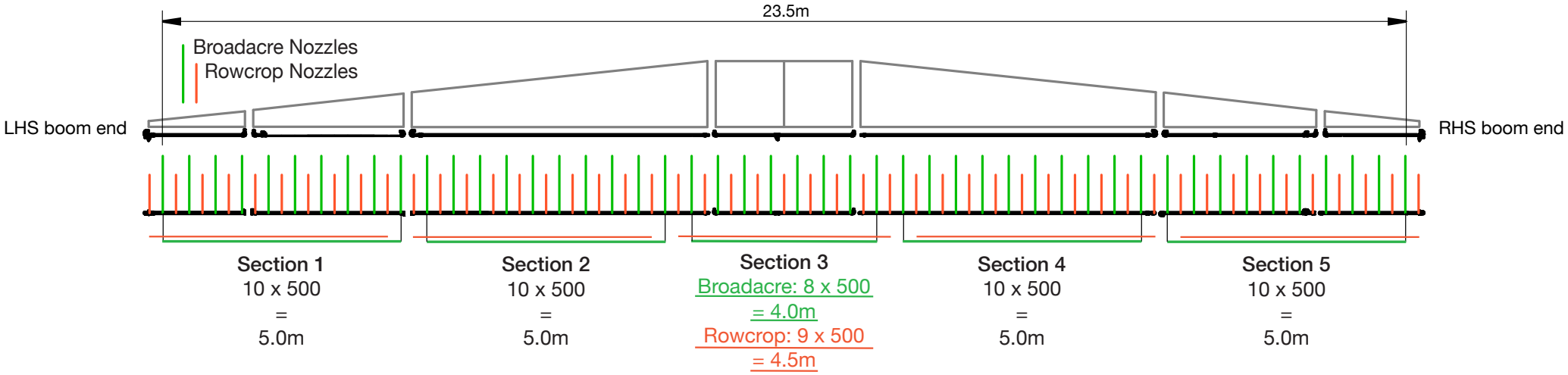
Photo Left: A single nozzle plumbed to the centre of the boom - refered to as Centreline or Rowcrop. plumbing.



Press the 'Applicator Type' touch button.

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

Boom Illustration Below: A 24m 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.

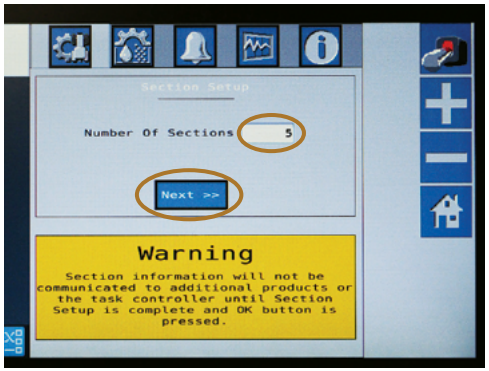


Press the 'Sprayer' touch button to select it.

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.



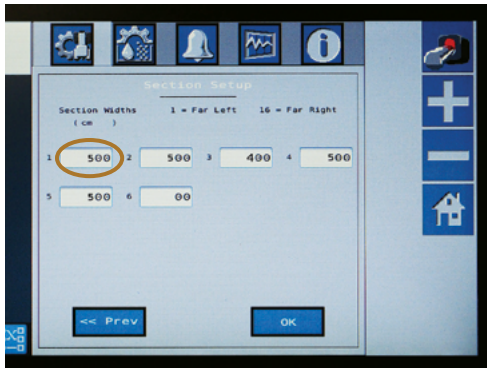
Enter the number of boom sections, then press the 'Next' touch button to enter boom section widths.

7 Press the 'Number of Sections' touch button and an numerical keypad appears.

8 Press the appropriate touch button to enter the number of boom sections, eg, '5', then press the 'Tick' touch button.

The screen returns to the 'Section Setup' screen with the value, eg, '5' showing in the 'Number of Sections' window.

9 Press the 'Next' touch button to enter the boom section widths.



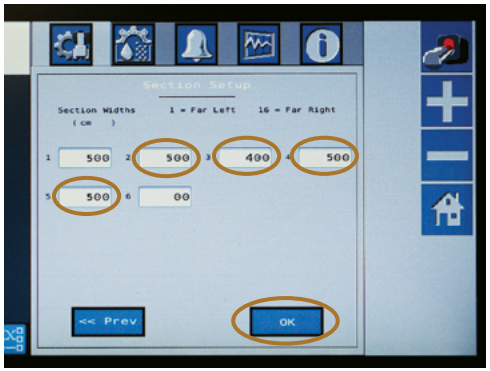
Press the 'Section 1' touch button to enter the width of Section 1.

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, '500', then press the 'Tick' touch button.

The screen returns to the 'Section Widths screen with the value eg, '500' showing in the 'Section 1' window.



Repeat step 12 to enter the width of each section 2 - 5, then press the 'OK' touch button.

12 Repeat the previous step 11 for each of the remaining sections, eg, 2 - 5.

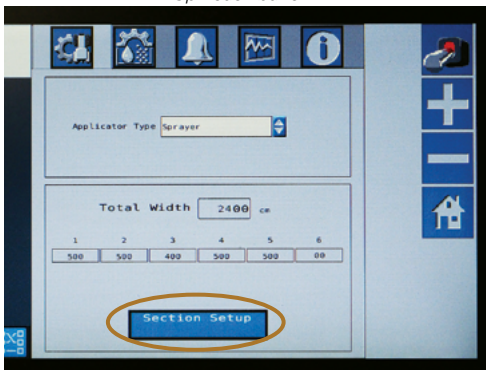
The last section (eg, 5) is the outer section of the right hand side of the boom.

13 After all section widths have been entered, press the 'OK' touch button.

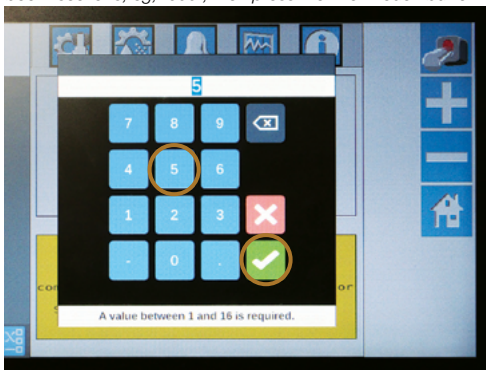
The screen returns to the 'Settings' screen with 'Total Width' & each 'Section Width' displayed.

14 Press the 'Product Settings' touch button and a Product Control screen is displayed.

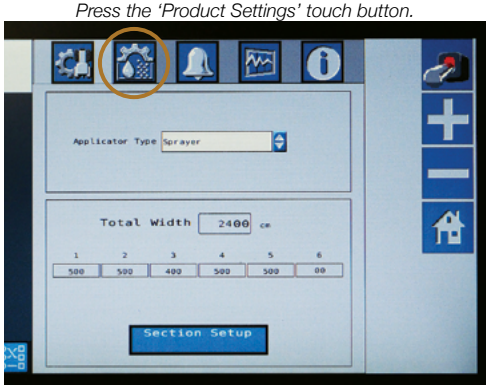
Ensure 'Sprayer is selected, then press the 'Section Set-Up' touch button.



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.



Check 'Liquid' is displayed in 'Control Type'. Press the 'Valve Cal' touch button.

15 Check that 'Liquid' is displayed in the 'Control Type' window.

16 Press the 'Valve Cal' touch button and a 'Valve Calibration' screen is displayed.

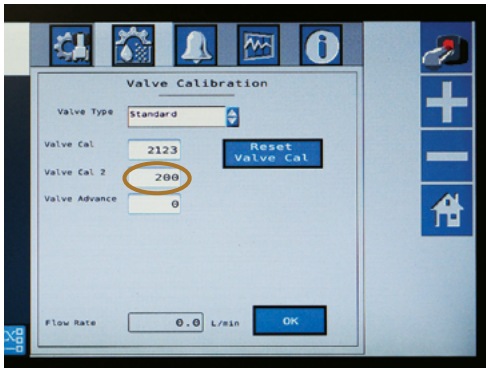
Press the 'Fast Close' touch button to select it.

17 Press the 'Fast Close' touch button and Fast Close is displayed in the 'Valve Type' window.

18 '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 identificaiton label.



Press the 'Valve Cal 2' touch button.

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

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.

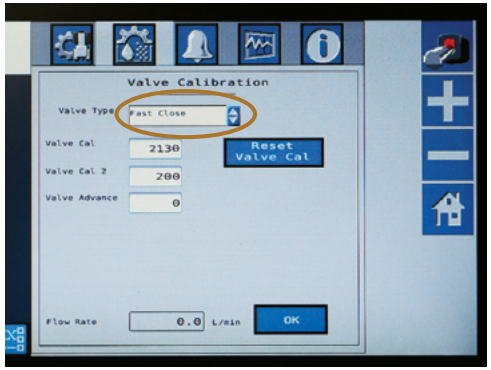
A zero value will disable this feature.

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

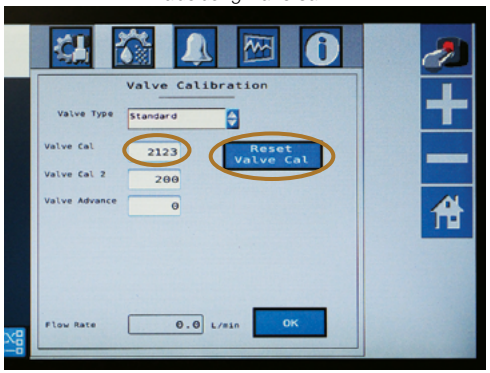
The screen returns to the 'Section Widths screen with the value eg, '200' showing in the 'Valve Cal 2' window.

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

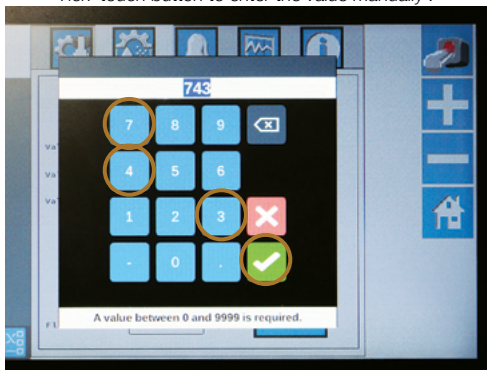
Press the 'Valve Type' touch button.



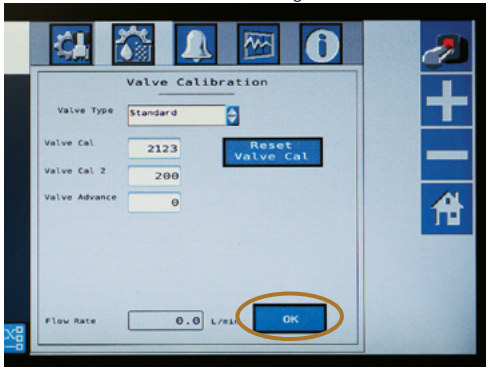
Press the 'Reset Valve Cal' touch button or manually enter the value using 'Valve Cal'.



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



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



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

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

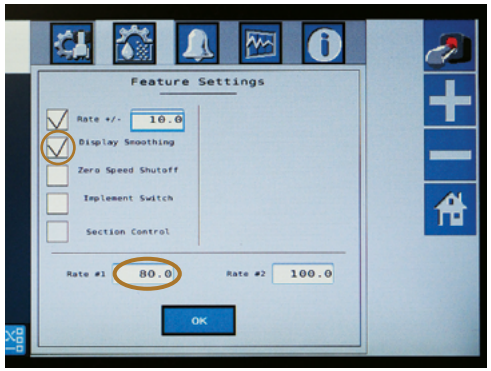
23 Press the 'Rate =/-' window to active the Rate Bump feature (ticked).

24 Press the 'Rate =/-' window touch button to enter a Rate Bump value and a numerical keypad appears.

25 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

26 Press the 'Display Smoothing' window to active the Display Smoothing feature (ticked).

Other features available are:

- 'Zero Speed Shutoff'
- 'Implement Switch'
- 'Section Contol'

27 Press the 'Rate #1' window touch button to enter a application rate and a numerical keypad appears.

28 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.

29 Press the 'Rate # 2' window touch button to enter an application rate and a numerical keypad appears.

30 Press the appropriate touch buttons to set the application rate in litres/ha, eg, '100', then press the 'Tick' touch button.

31 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 'Tank Fill Config' touch button.

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

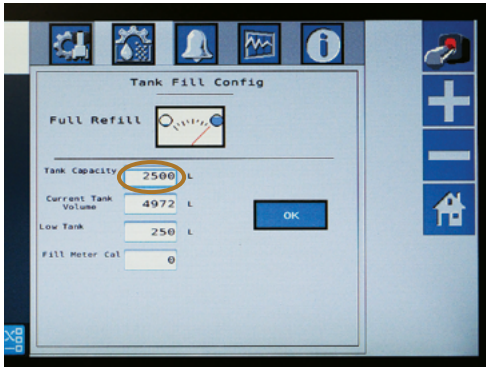
33 Press the 'Tank Fill Config' touch button and the 'Tank Fill Config' screen appears.

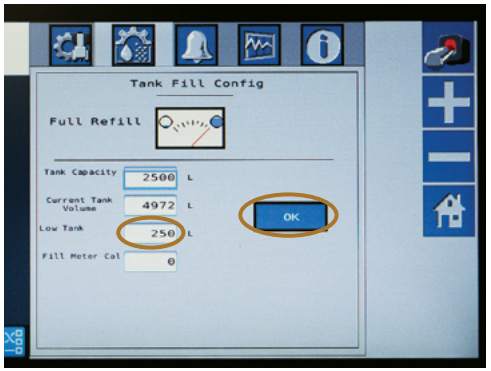
34 Press the 'Tank Capacity' touch button and a numerical keypad appears.

35 Press the appropriate touch buttons to set the 'Tank Capacity' value in litres, eg, '2500', then press the 'Tick' touch button.

The 'Tank Fill Config' screen returns with the value eg, '2500' showing in the 'Tank Capacity' window.

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





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

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

37 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.

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

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

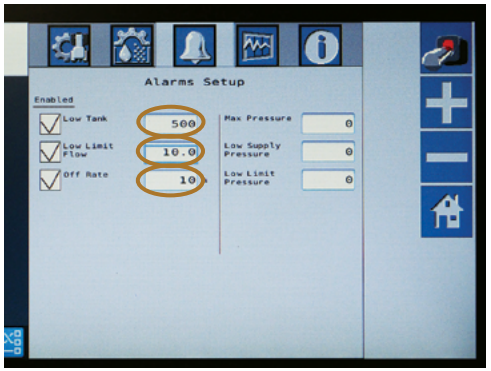
39 Press the 'Alarms' touch button and the Alarms Setup screen appears.

40 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).



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

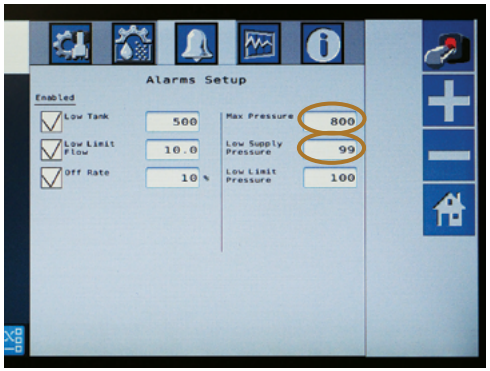
41 To set desired alarm values, press the desired alarm touch button and a numerical keypad appears.

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.

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

43 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.

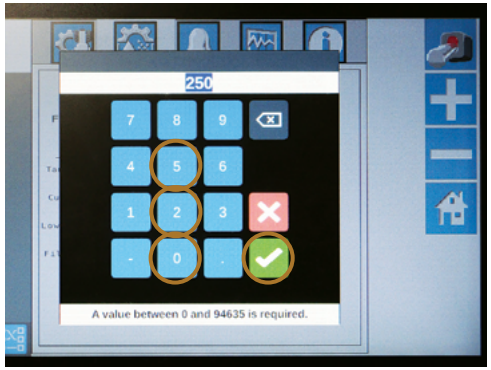
44 Press the 'Low Supply Pressure' touch button and a numerical keypad appears.

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

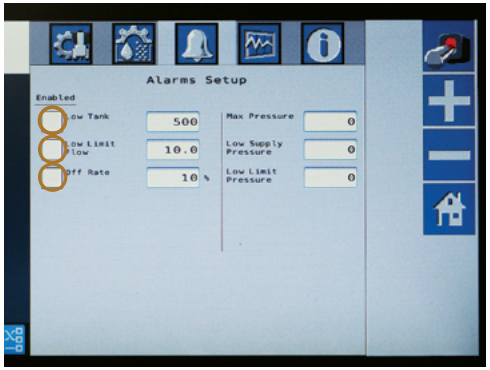
45 Press touch buttons to enter a 'Low Supply Pressure' value in kPa, eg, '99', then press the 'Tick' touch button.

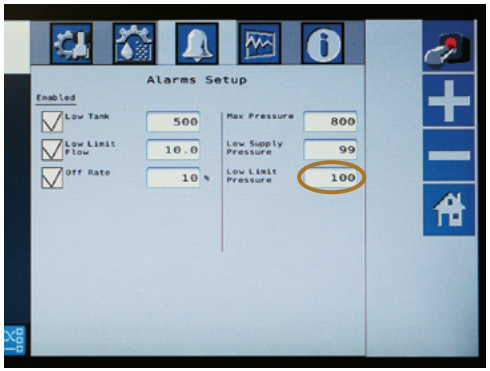
The 'Alarms Setup' screen returns with '99' displayed in 'Low Supply Pressure' display.

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



Press desired alarm touch buttons to enable or disable alarms.





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

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

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

47 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.

48 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.

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

Data Recording

The Controller & PC1 ISO BUS system records data relating to applicaiton 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.

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

To Re-Set the Totals Data:

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 'Information' touch button and the 'Total Data' menu appears.

4 Record desired information, then press the desired 'Zero' touch buttons to reset totals to zero when starting a new load or application area.

The Totals Data screen with totals reset to zero.

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

Diagnostics

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

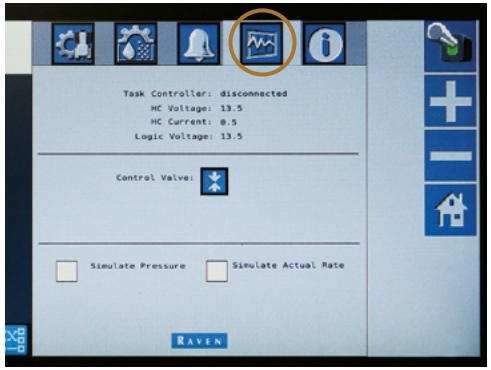
To Access Diagnostics:

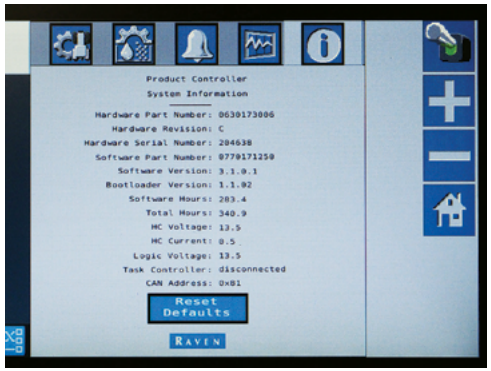
1 Start the tractor engine and Universal Terminal fitted.

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.

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





Product Controller System Information screen.

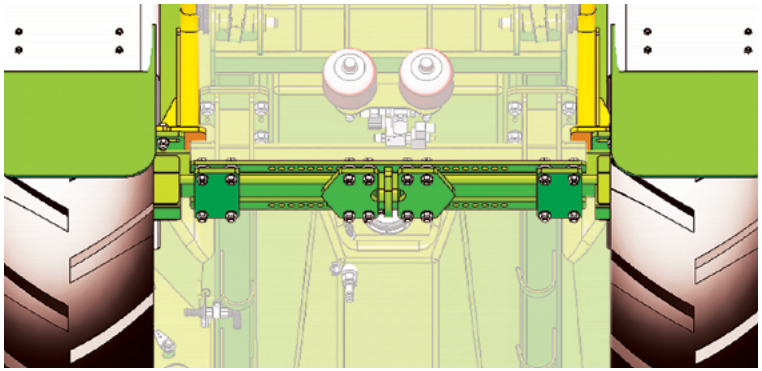


Illustration showing axle clamps & minimum 1600mm wheel track setting.

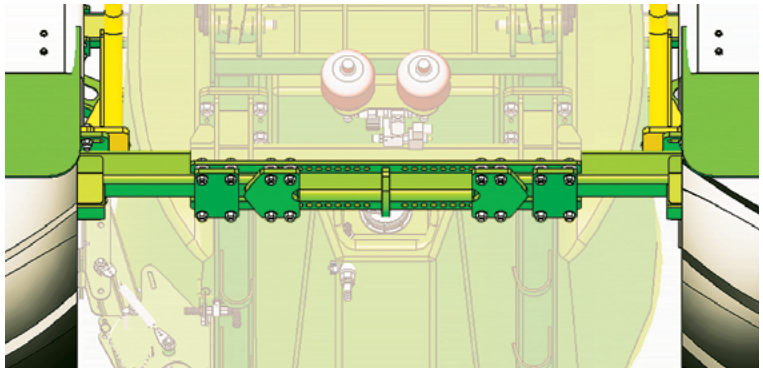


Illustration showing axle clamps & maximum 2000mm wheel track setting.

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.

Wheel Track Settings

Available wheel track settings of the Prairie Special Series 2 are:

- 1600mm
- 1700mm
- 1800mm
- 2000mm.

To Adjust Wheel Track Width

Depending on application, the wheel track width can be adjusted on wheel at a time.

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 The sprayer must be hitched to the appropriate towing vehicle & the engine of the towing vehicle must be turned off & park brake applied.

3 Ensure the boom is fully closed before raising the machine off the ground.

Empty the spray tank if possible before lifting the machine.

4 Chock the tractor wheels & the sprayer wheel opposite the one being adjusted.

5 Use a rated jack to lift the sprayer, then support the sprayer chassis with a rated jack stand.

6 Remove the wheel. Refer to "Chapter 8 Lubrication & Maintenance" under "Changing Wheels" for more detailed instructions.

7 Loosen the four bolts of the Outer Axle Clamp.

8 Undo & remove the four bolts from the Inner Axle Clamp.

Slide the axle in or out to the desired position.

9 Re-install the four bolts of the Inner Axle Clamp and fully tighten.

10 Fully tighten the four bolts of the Outer Axle Clamp.

11 Refit the wheel. Refer to "Chapter 8 Lubrication & Maintenance" under "Changing Wheels" for more detailed instructions.

12 Repeat steps 4 - 11 for the other side axle adjustment.

Check Boom Settings

The Prairie Special can be fitted with 12, 15, 18, 21 & 24 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**

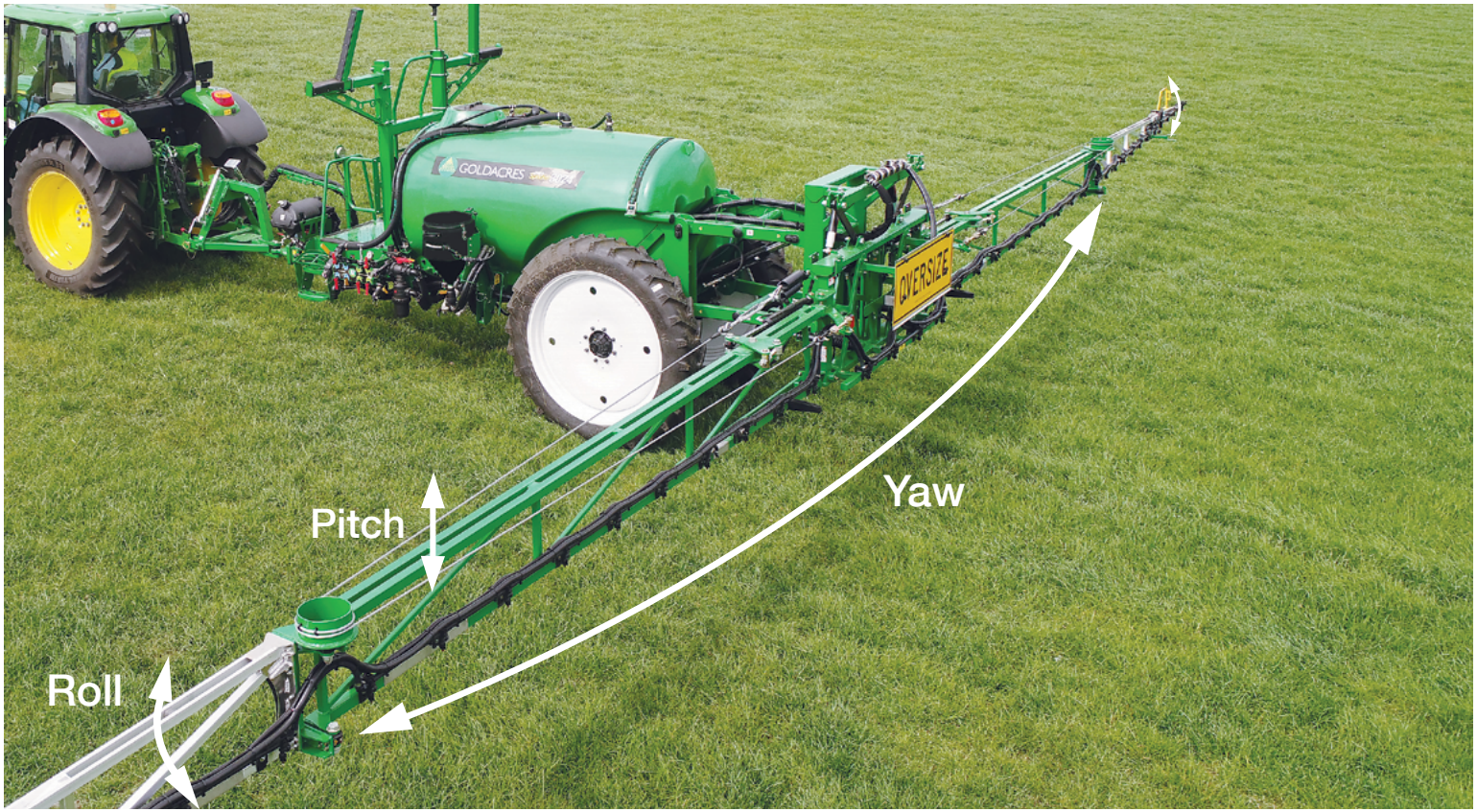
  Vertical boom movement & forces encountered over rough ground conditions are dampended using hydraulic cylinders connected to a nitrogen filled accumulator.

- **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 springs and dampers. Whipping of a boom can create undue stress on the boom frame and uneven spray application.



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

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

Pre-Set SCS 450 Record Sheet - Photocopy this page to record 'Pre-Set' values for future reference or contacting service technician.

Pre-Set/CAL Touch Buttons - SCS 450 Contoller		
UNITS OF MEASURE	SI (HECTARES)	SI (HECTARES)
VALVE TYPE	(eg, STANDARD VALVE)	
SPEED TYPE	SPEED SENSOR WHEEL SP-1	SPEED SENSOR RADAR SP-2
SPEED CAL	(eg, 320)	
BOOM CAL (Section Widths)	1 (eg, 500)	
	2 (eg, 500)	
	3 (eg, 400)	
	4 (eg, 500)	
	5 (eg, 500)	
METER CAL	(eg, 185)	
VALVE CAL	(eg, 2130)	
RATE 1 CAL	(eg, 100)	
RATE 2 CAL	(eg, 80)	
VOL TANK	(eg, 3000)	
TIME	(eg, 10:30)	
SELF TEST	(eg, 20.00 [kmh])	
DATA/ENTER Touch Buttons		
TOTAL AREA		
TOTAL VOLUME		
FILED AREA		
FILED VOLUME		
DISTANCE		
SPEED		
VOL/MIN		
AREA/HOUR		
DATA MENU:		
- ALARM ON		
- DISPLAY SMOOTHING ON		
- RATE CHANGE ALARM ON		
- FIELD REF		
- BAUD RATE		
- DATA LOG TRIGGER VALUE		
- DATA LOG TRIGGER UNITS		
- OFF RATE PERCENT		
- HIGH PWM OFFSET 253		
- LOW PWM OFFSET 1		
- TIER 1 MAX RATE		

Pre-Set/CAL Touch Buttons - SCS 450 Contoller		
UNITS OF MEASURE	SI (HECTARES)	SI (HECTARES)
VALVE TYPE	(eg, STANDARD VALVE)	
SPEED TYPE	SPEED SENSOR WHEEL SP-1	SPEED SENSOR RADAR SP-2
SPEED CAL	(eg, 320)	
BOOM CAL (Section Widths)	1 (eg, 500)	
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	5 (eg, 500)	
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VALVE CAL	(eg, 2130)	
RATE 1 CAL	(eg, 100)	
RATE 2 CAL	(eg, 80)	
VOL TANK	(eg, 3000)	
TIME	(eg, 10:30)	
SELF TEST	(eg, 20.00 [kmh])	
DATA/ENTER Touch Buttons		
TOTAL AREA		
TOTAL VOLUME		
FILED AREA		
FILED VOLUME		
DISTANCE		
SPEED		
VOL/MIN		
AREA/HOUR		
DATA MENU:		
- ALARM ON		
- DISPLAY SMOOTHING ON		
- RATE CHANGE ALARM ON		
- FIELD REF		
- BAUD RATE		
- DATA LOG TRIGGER VALUE		
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- HIGH PWM OFFSET 253		
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SPEED CAL	(eg, 320)	
BOOM CAL (Section Widths)	1 (eg, 500)	
	2 (eg, 500)	
	3 (eg, 400)	
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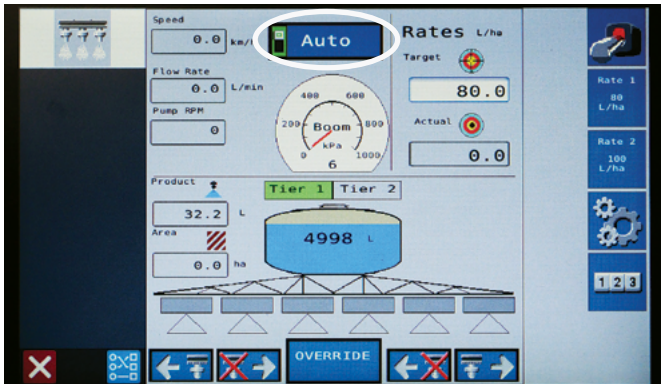
	5 (eg, 500)	
METER CAL	(eg, 185)	
VALVE CAL	(eg, 2130)	
RATE 1 CAL	(eg, 100)	
RATE 2 CAL	(eg, 80)	
VOL TANK	(eg, 3000)	
TIME	(eg, 10:30)	
SELF TEST	(eg, 20.00 [kmh])	
DATA/ENTER Touch Buttons		
TOTAL AREA		
TOTAL VOLUME		
FILED AREA		
FILED VOLUME		
DISTANCE		
SPEED		
VOL/MIN		
AREA/HOUR		
DATA MENU:		
- ALARM ON		
- DISPLAY SMOOTHING ON		
- RATE CHANGE ALARM ON		
- FIELD REF		
- BAUD RATE		
- DATA LOG TRIGGER VALUE		
- DATA LOG TRIGGER UNITS		
- OFF RATE PERCENT		
- HIGH PWM OFFSET 253		
- LOW PWM OFFSET 1		
- TIER 1 MAX RATE		

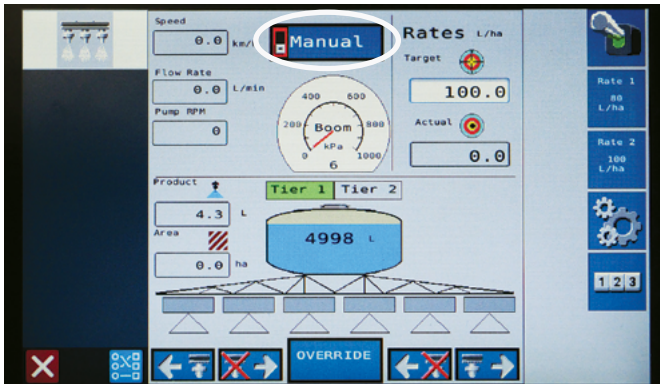
Pre-Set/CAL Touch Buttons - SCS 450 Contoller		
UNITS OF MEASURE	SI (HECTARES)	SI (HECTARES)
VALVE TYPE	(eg, STANDARD VALVE)	
SPEED TYPE	SPEED SENSOR WHEEL SP-1	SPEED SENSOR RADAR SP-2
SPEED CAL	(eg, 320)	
BOOM CAL (Section Widths)	1 (eg, 500)	
	2 (eg, 500)	
	3 (eg, 400)	
	4 (eg, 500)	
	5 (eg, 500)	
METER CAL	(eg, 185)	
VALVE CAL	(eg, 2130)	
RATE 1 CAL	(eg, 100)	
RATE 2 CAL	(eg, 80)	
VOL TANK	(eg, 3000)	
TIME	(eg, 10:30)	
SELF TEST	(eg, 20.00 [kmh])	
DATA/ENTER Touch Buttons		
TOTAL AREA		
TOTAL VOLUME		
FILED AREA		
FILED VOLUME		
DISTANCE		
SPEED		
VOL/MIN		
AREA/HOUR		
DATA MENU:		
- ALARM ON		
- DISPLAY SMOOTHING ON		
- RATE CHANGE ALARM ON		
- FIELD REF		
- BAUD RATE		
- DATA LOG TRIGGER VALUE		
- DATA LOG TRIGGER UNITS		
- OFF RATE PERCENT		
- HIGH PWM OFFSET 253		
- LOW PWM OFFSET 1		
- TIER 1 MAX RATE		

5 - **Calibration** – Set & Check Application Rates **67**

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 spray 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

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.

NOTE

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

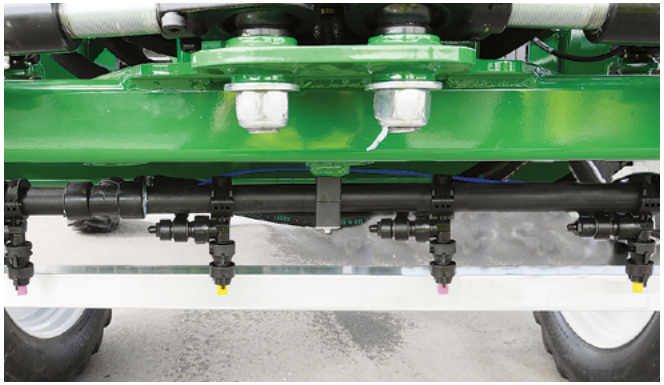
NOTE

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 acheive the best results. Ensure you have selected the nozzle which best suit the application to avoid any problems.



Calculate required nozzle output.

Selected & fit the appropriate nozzles for the application.

	bar	DROP SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	l/ha 50 cm 5 km/h	6 km/h	7 km/h	8 km/h	10 km/h	12 km/h	16 km/h
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 AXIR11002 nozzle @ 3 Bar gives 0.79l/min and an output of 0.91l/min @ 4 Bar.

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, 24m) and
- Number of nozzles on the boom (eg, 48).

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 x 24 x 80] ÷ 600) ÷ 48 = 0.8 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 x 50 x 80) ÷ 60,000 = 0.8 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 or 3TS 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.

Single Line Boom

Find one nozzle which is nearest to the applicaiton 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 AXIR11002 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 approxiamately 12 to 15kmh and with pressure range of 3 to 5 Bar.

Fit the selected nozzle to the boom.

Set & Check Application Rates – **Calibration**

Move the 'POWER' toggle switch to On position to start the SCS 450 Controller.

Press the ENTER touch button (shown above) and RATE 1 CAL E' will be displayed (shown below).

Press the ENTER touch button (shown above) to save the entered value, then press the 'RATE 2 CAL' touch button to display RATE 2 CAL 0' (shown below).

4 Controller Set-Up

Application rate values must be entered for automatic controller options (Raven SCS 450 Controller or Raven CR7/Universal) according to boom nozzle configuration.

If fitted, the Standard 3 Way Solenoid Control is manually controlled requiring no entry of values for application rate.

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.

To Enter Values for Optional Raven SCS 450:

1 Start the tractor engine.

2 Start the SCS 450 Controller *(shown above)*.

3 Press the 'RATE 1 CAL' touch button *(shown above)* to display 'CAL RATE 1 CAL 0' *(shown above).*

4 Press the 'ENTER' touch button *(shown above)* to display 'CAL RATE 1 CAL E' *(shown below)*.

5 Press the appropriate 'NUMBER' touch buttons *(shown below)* to enter the 'RATE 1 CAL' value, eg, '100' (l/ha) *(shown above right)*.

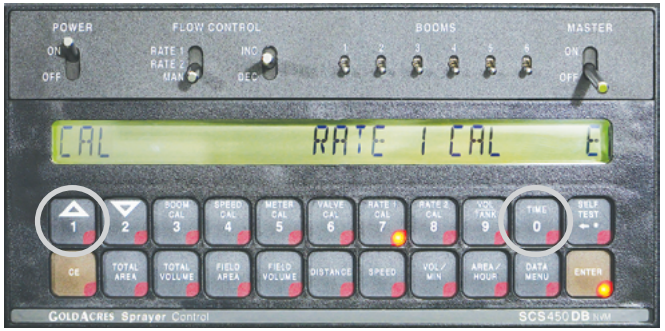
6 Press the ENTER touch button *(shown above)* to save the entered value.

7 Press the 'RATE 2 CAL' touch button *(shown above)* to display 'CAL RATE 2 CAL 0' *(shown below).*

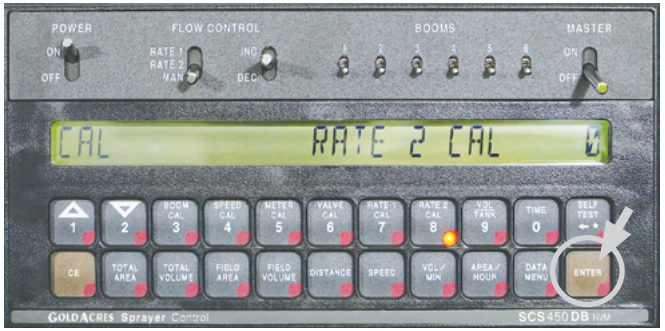
NOTE

For detailed instructions on entering values for the Raven CR7/Universal & Raven SCS 450 Controller options, refer to Chapter 4 Setting Up - Preparation for Use.

Press the ENTER touch buttons (shown below) to enter RATE 1' value, eg, 100 (l/ha) (shown above right).



Press the ENTER touch button (shown below) and RATE 2 CAL E' will be displayed (shown above right).



Press the appropriate touch buttons (shown above) to enter RATE 2' value, eg, 80 (l/ha) (shown below).

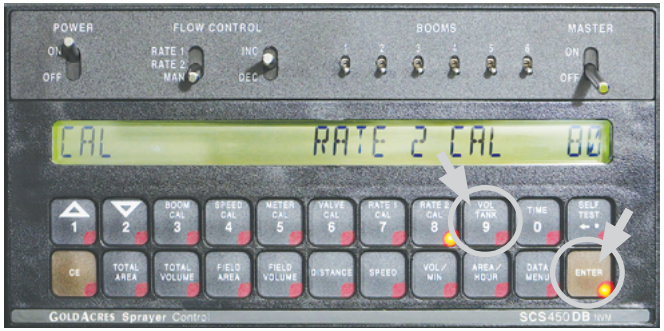
8 Press the 'ENTER' touch button *(shown below)* to display 'CAL RATE 2 CAL E' *(shown above right)*.

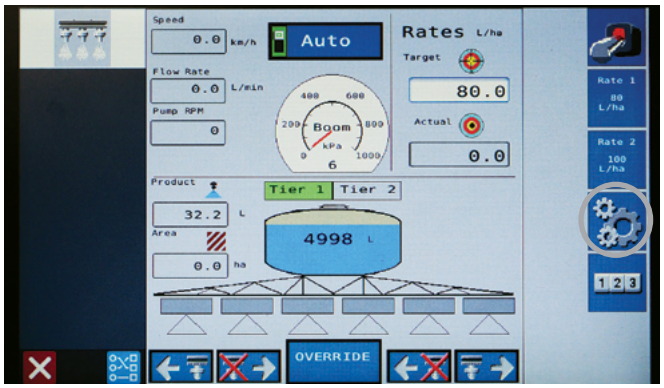
9 Press the appropriate 'NUMBER' touch buttons *(shown above)* to enter the 'RATE 2 CAL' value eg, '80' (l/ha) *(shown below)*.

10 Press the ENTER touch button *(shown below)* to save the entered value.

This completes the SCS 450 single line boom rate setting.

Press the ENTER touch button (shown below) to save the entered value, then press the 'VOL TANK' touch button to display 'CAL VOL/TANK 0' (shown above right).





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

To Enter Values for Optional Raven CR7/Universal Terminal:

1 Start the tractor engine.

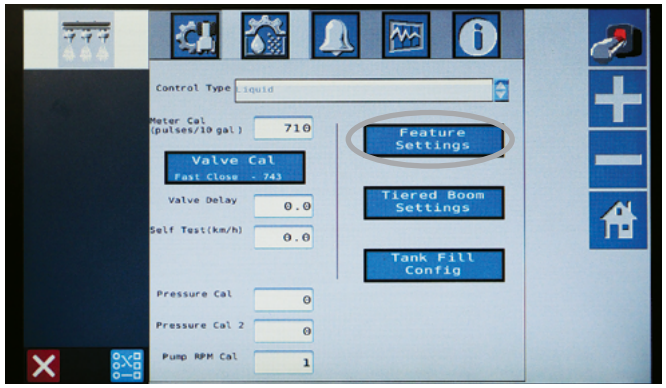
2 Start the Universal Terminal fitted.

3 Press the 'Settings' touch button on the CRC7/Universal Terminal 'Home' screen, and a Settings screen is displayed *(shown above)*.

4 Press the 'Product Settings' touch button and the 'Product Settings' icon touch button is displayed *(shown below)*.

5 Press the 'Product Settings touch button and a Product Control screen is displayed.

Press the 'Product Settings' touch button.



Press the 'Featured Settings' touch button.

6 Press the 'Featured Settings' touch button *(shown above)* and a Featured Settings screen appears *(shown below)*.

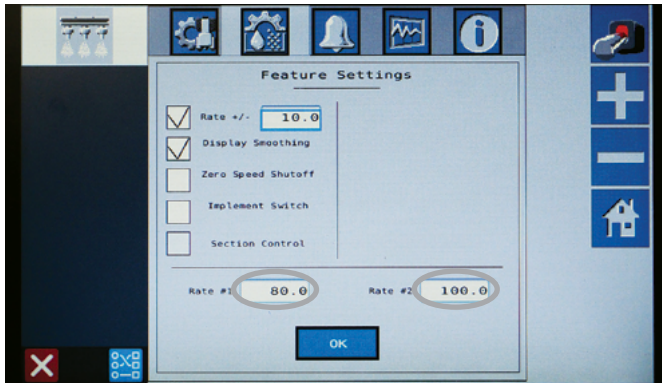
7 Press the 'Rate 1' touch button and a numerical keypad is displayed *(shown below)*.

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 *(shown above right)*.

The screen returns to the Feature Settings' screen with '80.0' in the Rate 1 display *(shown below)*.

9 Press the 'Rate 2' touch button and a numerical keypad is displayed *(shown below)*.

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



Set & Check Application Rates – **Calibration**

Press the touch buttons to enter the spray application rate required for Rate 1 (eg, 80 l/ha), then press the 'Tick' touch button, then set Rate 2 (eg, 100 l/ha).

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 *(shown above)*.

The screen returns to the Feature Settings' screen with '100.0' in the Rate 2 display *(shown below)*.

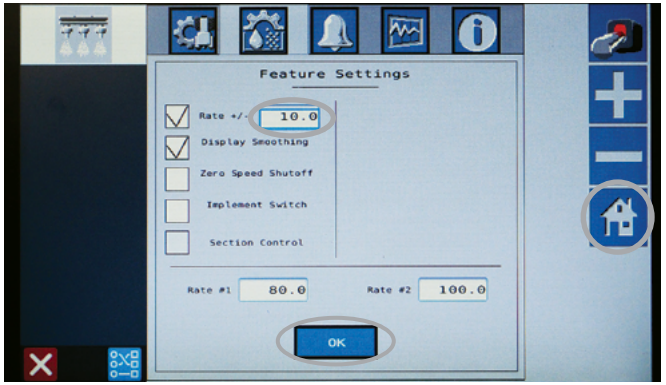
11 Press the 'Rate +/-' touch button to change the Rate Bump setting if required.

12 Press the 'OK' touch button to save values & the Product Settings screen return *(shown below)*.

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

Switch Boom 'SECTIONS' ON and 'MASTER ON/OFF' ON. Use the PRESSURE 'UP/DOWN' toggle switch to check the pressure relief valve function.

To Do the Jug Test - 3 Way Solenoid Electric Control Option

1 With sufficient clean water in the Prairie Special product tank, start the tractor, controller and unfold the boom in a suitable area & set the height of the boom to allow easy access to nozzles.

2 Move the required Boom 'SECTIONS' toggle switches to ON *(shown above)*.

3 Start the 'Product Pump', and move the 'MASTER ON/OFF' toggle switch ON to start spraying *(shown above)*.

4 Run pump at normal operating RPM.

5 Check each boom section operates correctly without any nozzles blockages by switching each 'BOOM section' toggle switch OFF & ON.

NOTE

While doing the 'Jug Test' visually check the nozzle spray patterns and spray angles for accuracy and, if necessary, replace any faulty nozzles.

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

6 Move PRESSURE 'UP/DOWN' toggle switch 'UP' then 'DOWN' to check pressure relief valve function *(shown left)*.

7 Before measuring 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.

8 Use the pressure switch to set the spray pressure to desired value.

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

10 Measure and record the nozzle output, nozzle size (Tier) and section location.

11 Repeat steps 9 & 10 for each nozzle in each of the 5 boom sections being used.

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

12 Compare 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

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

13 Test and check any replacement nozzles by collecting and measuring the output of each replacement.

14 Record each replacement and its output.

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

Press 'SELF TEST' touch button & enter normal sprayer operating speed, eg, 20 km/hr. Move BOOMS 'ON/OFF' switches to ON & move the FLOW CONTOL toggle switch to 'MANUAL'. Move 'MASTER ON/OFF' ON to start spraying.

To Do the Jug Test - Raven SCS 450 Control Option

1 With sufficient clean water in the Prairie Special product tank, start the tractor, controller and unfold the boom in a suitable area & set the height of the boom to allow easy access to nozzles.

2 Ensure 'BOOM CAL', 'SPEED CAL', 'METER CAL', 'VALVE CAL', 'RATE 1 CAL' & 'RATE 2 CAL' calibration values are correctly entered.

3 Move the required BOOMS 'ON/OFF' toggle switches to ON.

4 Move the FLOW CONTOL toggle switch to 'MANUAL'.

5 Start the 'Product Pump' and move the 'MASTER ON/OFF' toggle switch ON to start nozzles spraying.

6 Run pump at normal operating RPM and adjust the pressure relief valve (PRV) to 65 PSI [450 kPa].

⚠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.

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.

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

7 Check each boom section operates correctly without any nozzles blockages by switching each 'BOOM section' OFF & ON.

8 Use FLOW CONTROL 'INC/DEC' toggle switch to increase then decrease spray application rate to check flow control valve function.

9 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.

10 Use the INC/DEC toggle switch to set desired pressure.

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

12 Measure & record the nozzle output, nozzle size (Tier) and section location.

13 Repeat steps 11 & 12 for each nozzle in each of the 5 boom sections being used.

⚠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.

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

14 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.

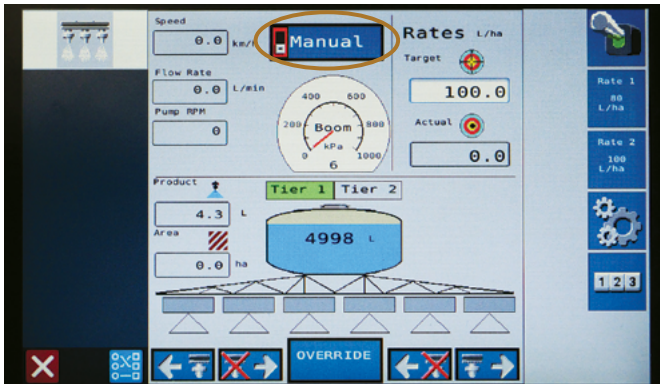
15 Test and check any replacement nozzles by collecting and measuring the output of each replacement.

16 Record each replacement and its output.

17 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.



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 - CR7/Universal Control Option

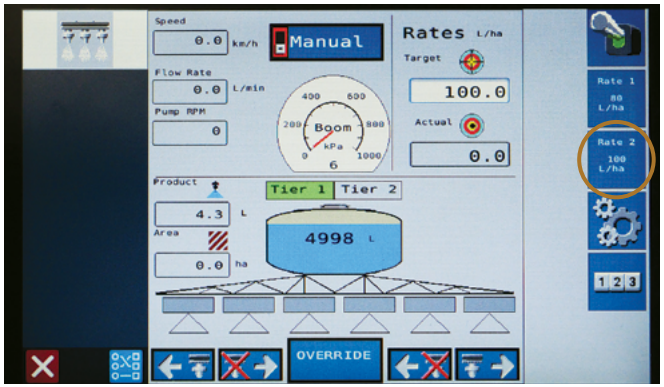
1 With sufficient clean water in the Product tank, start the tractor, Universal Terminal & Prairie Special hydraulics.

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 'Spray' switch to start nozzles spraying.

Start the 'Product Pump', then press 'Spray' to start the nozzles spraying.



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

4 Use the +/- to set the pressure to 3 Bar (300kPa).

5 Manually adjust the pressure until 300 kPa is achieved. Check the presure gauge is showing 300 kPa. Adjust if needed.

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

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

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.

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

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

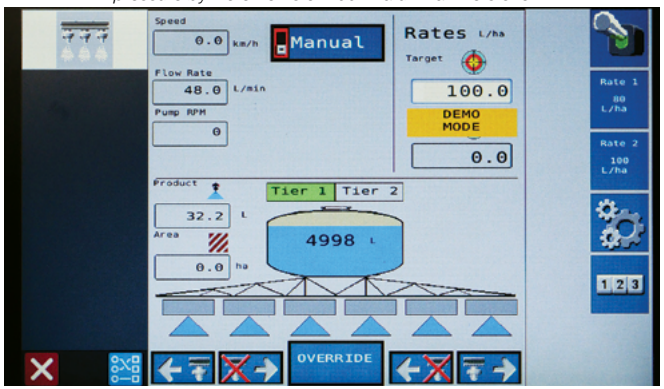
9 Measure and record the nozzle output, nozzle size (Tier) and section location.

10 Repeat steps 8 & 9 for each nozzle in each of the 6 boom sections being used.

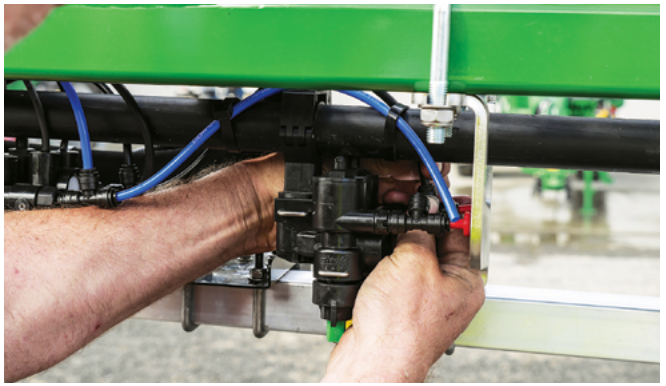
11 Compare the volume collected from each nozzle to the stated volume in the nozzle manufacturer's rate chart at the operating pressure used.

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

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



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.



⚠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.

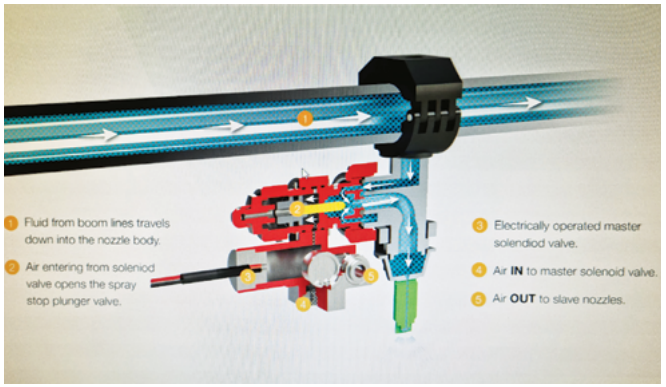


Illustration of the RapidFlow and RapidFire nozzle technologies.

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.

Check Boom Width & Boom Section Width values saved in the optional Raven SCS 450 Controller or other controller options (if fitted).

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 Rate controller during the initial set-up of the machine. Check controller settings have not been changed.

Refer to Chapter 4 'Setting Up'.

The Flow Meter, located on top of the boom centre section, should regularly checked & cleaned.

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 Operation Manual supplied with the Prairie Special .

See Chapter 8 'Lubrication & Maintenance', for 'Flow Meter' service information.

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.

NOTE

In the event of any nozzles not delivering the required volume, investigate futher, including but not be limited to;

- Cleaning the nozzles using a method recommended by the nozzle supplier
- Cleaning nozzle filters
- Replacing the nozzles.

The Boom Flow Regulating Valve should regularly checked & calibrated.

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.

[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 at the end of this chapter for operational use as required.

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.

NOTE

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

Set & Check Application Rates – **Calibration**

AIXR Teejet Application Chart

DROPLET SIZE CATEGORIES: XF EXTREMELY FINE | VF VERY FINE | F FINE | M MEDIUM | C COARSE | VC VERY COARSE | XC EXTREMELY COARSE | UC ULTRA COARSE

	bar	DROP SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	l/ha 50 cm 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	CAP PART NUMBER
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	114441A-*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	
	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	
	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	
	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	
	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	
	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	
	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	114443A-*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	
	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

USE WITH:
HERBICIDES
SYSTEMIC FUNGICIDES
SYSTEMIC INSECTICIDES

PRESSURE:
1.5-6 BAR

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.

TTJ60 Teejet Application Chart

DROPLET SIZE CATEGORIES: XF EXTREMELY FINE | VF VERY FINE | F FINE | M MEDIUM | C COARSE | VC VERY COARSE | XC EXTREMELY COARSE | UC ULTRA COARSE

	bar	DROP SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	l/ha 50 cm									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	

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**

Calibration/Application Work Sheets

Measured Boom Section Widths & No of Nozzles:

Boom section 1: Width (m)..... No. Nozzles: .....

Boom section 2: Width (m)..... No. Nozzles: .....

Boom section 3: Width (m)..... No. Nozzles: .....

Boom section 4: Width (m)..... No. Nozzles: .....

Boom section 5: Width (m)..... No. Nozzles: .....

Nozzle Type & Size:

- Chemical: .....
- Nozzle Type: .....
- Pressure Setting: .....
- Travel speed (km/hr): .....
- Total number of nozzles to be used: .....

Nozzle Flow Rate (l/min) =

Speed (km/hr) x Swath Width (m) x Application Rate (l/ha) ÷ 600 ÷ Number of nozzles

..... x ..... x ..... ÷ 600 ÷ .....

= ..... l/min for each nozzle

Boom Nozzles Fitted:

Set-Up Option: Single Line / 3TS

Nozzle Type: .....

Nozzle Sizes: .....

Nozzle Colours: .....

Photocopy this page to record 'Calibration' values for future reference.

Nozzle Accuracy & Nozzle Output (Jug Test):

Thoroughly check nozzles & test actual output of each nozzle:

- Pressure Setting: .....
- Individual Nozzle Outputs: .....

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- Sum of Nozzle Outputs: .....

Calculated Application Rate:

The automatic Spray Controller calculates & shows the rate of application.

Application Rate (l/ha) =

Spray Output (l/min) x 600 ÷ Speed (km/hr) x Swath Width (m)

[..... x 600] ÷ [..... x .....]

= .....l/ha

Add Correct Amount of Chemical:

- Chemical: .....
- Water Quantity: .....
- Chemical Added: .....

Boom Application Height: .....

Application Data:

Date: .....

Farm location: .....

Field Name/No: .....

Crop sprayed: .....

Spray Volume litres/ha: .....

Nozzle Pressure: .....

Tested Output (l/min): .....

Applied Litres per Hectare: .....

Notes:

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Calibration/Application Work Sheets

Measured Boom Section Widths & No of Nozzles:

Boom section 1: Width (m)..... No. Nozzles: .....

Boom section 2: Width (m)..... No. Nozzles: .....

Boom section 3: Width (m)..... No. Nozzles: .....

Boom section 4: Width (m)..... No. Nozzles: .....

Boom section 5: Width (m)..... No. Nozzles: .....

Nozzle Type & Size:

- Chemical: .....
- Nozzle Type: .....
- Pressure Setting: .....
- Travel speed (km/hr): .....
- Total number of nozzles to be used: .....

Nozzle Flow Rate (l/min) =

Speed (km/hr) x Swath Width (m) x Application Rate (l/ha) ÷ 600 ÷ Number of nozzles

..... x ..... x ..... ÷ 600 ÷ .....

= ..... l/min for each nozzle

Boom Nozzles Fitted:

Set-Up Option: Single Line / 3TS

Nozzle Type: .....

Nozzle Sizes: .....

Nozzle Colours: .....

Photocopy this page to record 'Calibration' values for future reference.

Nozzle Accuracy & Nozzle Output (Jug Test):

Thoroughly check nozzles & test actual output of each nozzle:

- Pressure Setting: .....
- Individual Nozzle Outputs: .....

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- Sum of Nozzle Outputs: .....

Calculated Application Rate:

The automatic Spray Controller calculates & shows the rate of application.

Application Rate (l/ha) =

Spray Output (l/min) x 600 ÷ Speed (km/hr) x Swath Width (m)

[..... x 600] ÷ [..... x .....]

= .....l/ha

Add Correct Amount of Chemical:

- Chemical: .....
- Water Quantity: .....
- Chemical Added: .....

Boom Application Height: .....

Application Data:

Date: .....

Farm location: .....

Field Name/No: .....

Crop sprayed: .....

Spray Volume litres/ha: .....

Nozzle Pressure: .....

Tested Output (l/min): .....

Applied Litres per Hectare: .....

Notes:

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5 Set & Check Application Rates – **Calibration**

Calibration/Application Work Sheets

Measured Boom Section Widths & No of Nozzles:

Boom section 1: Width (m)..... No. Nozzles: .....

Boom section 2: Width (m)..... No. Nozzles: .....

Boom section 3: Width (m)..... No. Nozzles: .....

Boom section 4: Width (m)..... No. Nozzles: .....

Boom section 5: Width (m)..... No. Nozzles: .....

Nozzle Type & Size:

- Chemical: .....
- Nozzle Type: .....
- Pressure Setting: .....
- Travel speed (km/hr): .....
- Total number of nozzles to be used: .....

Nozzle Flow Rate (l/min) =

Speed (km/hr) x Swath Width (m) x Application Rate (l/ha) ÷ 600 ÷ Number of nozzles

..... x ..... x ..... ÷ 600 ÷ .....

= ..... l/min for each nozzle

Boom Nozzles Fitted:

Set-Up Option: Single Line / 3TS

Nozzle Type: .....

Nozzle Sizes: .....

Nozzle Colours: .....

Photocopy this page to record 'Calibration' values for future reference.

Nozzle Accuracy & Nozzle Output (Jug Test):

Thoroughly check nozzles & test actual output of each nozzle:

- Pressure Setting: .....
- Individual Nozzle Outputs: .....

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  .....
- Sum of Nozzle Outputs: .....

Calculated Application Rate:

The automatic Spray Controller calculates & shows the rate of application.

Application Rate (l/ha) =

Spray Output (l/min) x 600 ÷ Speed (km/hr) x Swath Width (m)

[..... x 600] ÷ [..... x .....]

= .....l/ha

Add Correct Amount of Chemical:

- Chemical: .....
- Water Quantity: .....
- Chemical Added: .....

Boom Application Height: .....

Application Data:

Date: .....

Farm location: .....

Field Name/No: .....

Crop sprayed: .....

Spray Volume litres/ha: .....

Nozzle Pressure: .....

Tested Output (l/min): .....

Applied Litres per Hectare: .....

Notes:

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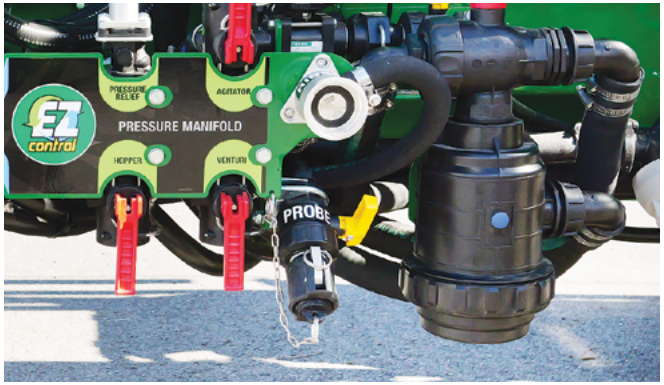
6 - **Operation** – Ready to Spray 83

Prairie Special 2500-3000L

OPERATOR'S MANUAL MY25

Prairie Special 2500 - 3000L 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 2500 - 3000L:

- Read the Prairie Special 2500 - 3000L Trailed Sprayer Operator's Manual thoroughly, before use
- 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 pressure filters are clean
- Check nozzles are spraying correctly
- Check all hydraulic connections
- Check all boom control functions
- Check all sprayer Controller 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 comprehesive checklist of routine checks & maintenance 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 2500 - 3000L Trailed Sprayer height is approximately 3.48m 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.

Optional 3 Way Solenoid Electric Control.

Optional In-cab Raven SCS 450 Controller.

Spray pressure gauge - located at the front the Prairie Special 2500 - 3000L.

Start-Up

Optional In-Cab Controls for the Prairie Special 2500 & 3000 litre models include:

- 3 Way Solenoid Electric Control
- 7 Switch Boom Console
- Raven SCS 450 Controller
- Raven ISO Bus System
- On/Off foot switch.

Instructions follow for operating with:

- Standard 3 Way Solenoid Electric Control
- Raven SCS 450 Controller, and
- Raven ISO Bus System/Raven Controller CR7

It is the responsibility of all operators to familiarise themselves with & understand information in this manual to ensure competent and safe operation.

Optional Master On/Off Foot Switch

Starting & Stopping the Prairie Special

Follow instructions for starting, driving, stopping & shutting-down the Prairie Special 2500 - 3000L.

To Start-Up the Prairie Special 2500 - 3000L:

1 Conduct the 'Pre-operation Check' of the sprayer.
2 Check the tractor park brake is On.
3 Start the tractor engine.
4 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 2500 - 3000L 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 2500 - 3000L 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 the 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.

The optional 7 Switch Boom Console which can be fitted for boom folding and unfolding functions.

7 Switch Console Boom Folding/ Unfolding Option

Tractor hydraulic remotes are standard for boom control. The 7 Switch Console Option (shown above) can be fitted for Boom Folding and Unfolding functions.

If fitted, Boom Folding & Unfolding is manually operated using the rocker switches on the 7 Switch Console option.

Always ensure the Prairie Special 2500 - 3000L Sprayer is stationary, on level ground with the tractor park brake engaged, before attempting to fold or unfold the boom.

NOTE

Some switches of the Sprayer Switch Console may not be functional depending on options chosen. Boom Tilt & Fence Jet are both options.

Boom Bifold & Boom Recirc switches are not used on the Prairie Special 2500 - 3000L models.

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 controlled using two switches on the Sprayer Control Console.

To Unfold the Boom:

i) Press & hold the 'Boom Height UP' switch to fully raise the boom then release the switch.

ii) 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.

iii) Press & hold the 'Boom Height DOWN' switch to lower the boom to the desired operating height, then release the switch.

⚠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.

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 controlled using two switches on the Sprayer Control Console.

To Fold the Boom:

i) Press & hold the 'Boom Height UP' switch on the Sprayer Control Console to raise the boom to its full height, then release the switch.

ii) Press & hold the 'Boom Fold IN' switch to fold the inner & outer boom sections to their folded position, then release the switch.

iii) Press the 'Boom Height DOWN' switch momentarily to lower the boom into its boom rests, then release the switch.

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⚠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.

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.

Use the 'Left Tilt UP' & 'Right Tilt UP' switches to lift boom ends as required. Use the 'Left Tilt DOWN' & 'Right Tilt DOWN' switches to lower boom ends as required.

Boom Tilt Option

When fitted the Boom Tilt switches can be used to raise & lower left and right boom ends individually as required.

The optional 'Fence Jet' switch (when fitted) is used to individually switch On & Off the Left & Right Fenceline Nozzles as required.

Fenceline Nozzle Option

The 'Fence Jet' switch (when fitted) is used to individually switch On & Off the Left & Right Fenceline Nozzles as required.

Pump, Spray and the Boom Master switch must be On before engaging Fenceline nozzles.

To Switch On/Off the Left Fenceline Nozzle:

i) 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.

ii) Press the 'Fence Jet' switch 'Left Spray Emblem' again to Stop the left Fenceline nozzle spraying.

To Switch On/Off the Right Fenceline Nozzle:

i) Press the 'Fence Jet' switch 'Right Spray Emblem' to start spraying from the left Fenceline nozzle.
When the Fenceline nozzle is spraying, the 'Jet' & 'Right Spray Emblem' on the switch illuminates Blue.

ii) Press the 'Fence Jet' switch 'Right Spray Emblem' again to Stop the right Fenceline nozzle spraying.

Switch Boom 'SECTIONS' ON & 'MASTER ON/OFF' ON for the Standard 3 Way Solenoid Control.

Boom Master On/Off

The Boom Master On/Off switch of each type of controller is used for switching boom spraying On & Off.

An optional Foot Switch is also available.

Optional 3 Way Solenoid Control

The Boom Master On/Off switch of the 3 Way Solenoid Control is used for switching boom spraying On & Off.

To Switch Boom Spray On & Off:

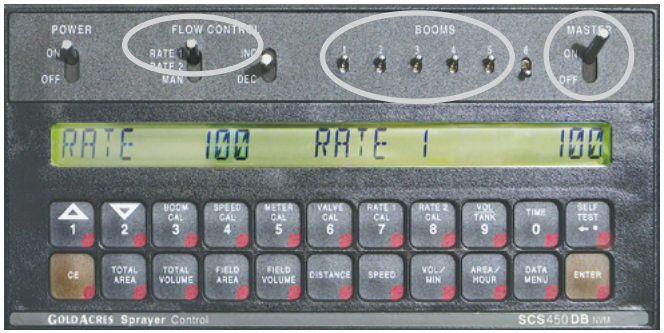
i) Ensure all required boom section switches are On.

ii) Switch the Boom Master Switch On to start the boom spraying.

iii) Switch the Boom Master Switch Off to stop boom spraying.

NOTE

The pump must be running for nozzles to spray.
Refer to instructions on engaging & disengaging the Main pump and boom On/Off switches.



FLOW CONTROL 'RATE 1' toggle switch, 'BOOMS' (sections) ON/OFF toggle switches & boom 'MASTER' ON/OFF toggle switch for the Optional SCS 450 Controller.

Optional Raven SCS 450

The Boom Master On/Off switch of the optional SCS 450 Controller is used for switching boom spraying On and Off.

To Switch Boom Spray On & Off:

i) Ensure all required boom section switches are On.

ii) Switch the Boom Master Switch On to start the boom spraying.

iii) Switch the Boom Master Switch Off to stop boom spraying.

Optional CR7 & 3rd Party Universal Terminals

The Boom Master On/Off switch of the optional Raven CR7 and other 3rd party Universal Terminals is used for switching boom spraying On & Off.

To Switch Boom Spray On & Off:

Follow the instructions for the controller used to switch boom spray On & Off.

NOTE

An optional Boom Master foot switch (if fitted) can also be used to switch boom spraying On & Off.

Optional Raven CR7 Controller.

Controller Operating Instructions

If using the Optional 3 Way Solenoid Control, Optional Raven SCS 450 or Optional Raven CR7 Controller, refer to:

- Chapter 4 'Setting Up – Preparation for Use' and
- Chapter 5 'Calibration – Set & Check Application Rates' for appropriate Controller operating instructions.

If using a 3rd party fitted Controller, follow the manufacturer's operating instructions.

Optional Master On/Off Foot Switch

Check items closely during the first 8 hours of operation as instructed in Chapter 8 'Lubrication & Maintenance'.

During First 8 Hours Of Operation

Refer to chapter 8, 'Lubrication & Maintenance' for the items to be checked closely during the first 8 hours of operation of the Prairie Special (from new).

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.

Filling Station - see next page for details.

Filling the Sprayer

All filling & cleaning procedures are conducted at the Filling Staton located on the left hand side of the Prairie Special 2500 - 3000L.

The Prairie Special 2500 - 3000L sprayers are fitted with a:

- Main tank (2500 or 3000 litre)
- Hand Wash tank (20 litre)

When filling, the Prairie Special must 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 - Test Actual Spraying Rates”).

Failure to properly calibrate and test chemical mixtures & nozzles may result in undesirable and damaging outcomes.

NOTE

Always use clean, fresh water, free of suspended organic matter or clay.

Some chemicals are deactivated when they contact these materials

Water Source

A clean external water source is required to fill the Prairie Special tanks ready for spraying.

Filling the Main Tank

The Main tank is filled through the 2” Clean Fill Inlet on the EZ Control Filling Station. Refer to the EZ Control Filling Station details shown next page.

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.

NOTE

All filling, adding chemicals and rinsing functions require the tractor engine to be running and the Park Brake applied.

The 2” Clean Fill inlet with camlock cap fitted.

Clean Fill Inlet

The Clean Fill Inlet must be used only with clean fresh water sources.

Do not contaminate fill, spray or rinse lines with dirty, contaminated or unclean liquid.

The Clean Fill Inlet requires an external fill pump.

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.

Use good quality suction hose and fittings.

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 2” to maximise pump performance.

Filling functions require the Prairie Special to be safely parked in an appropriate area with the tractor engine running.

⚠CAUTION

It is very inportant to understand that water weighs 1.0 kg per litre and conversion factors must be used when spraying liquids that are heavier than water.

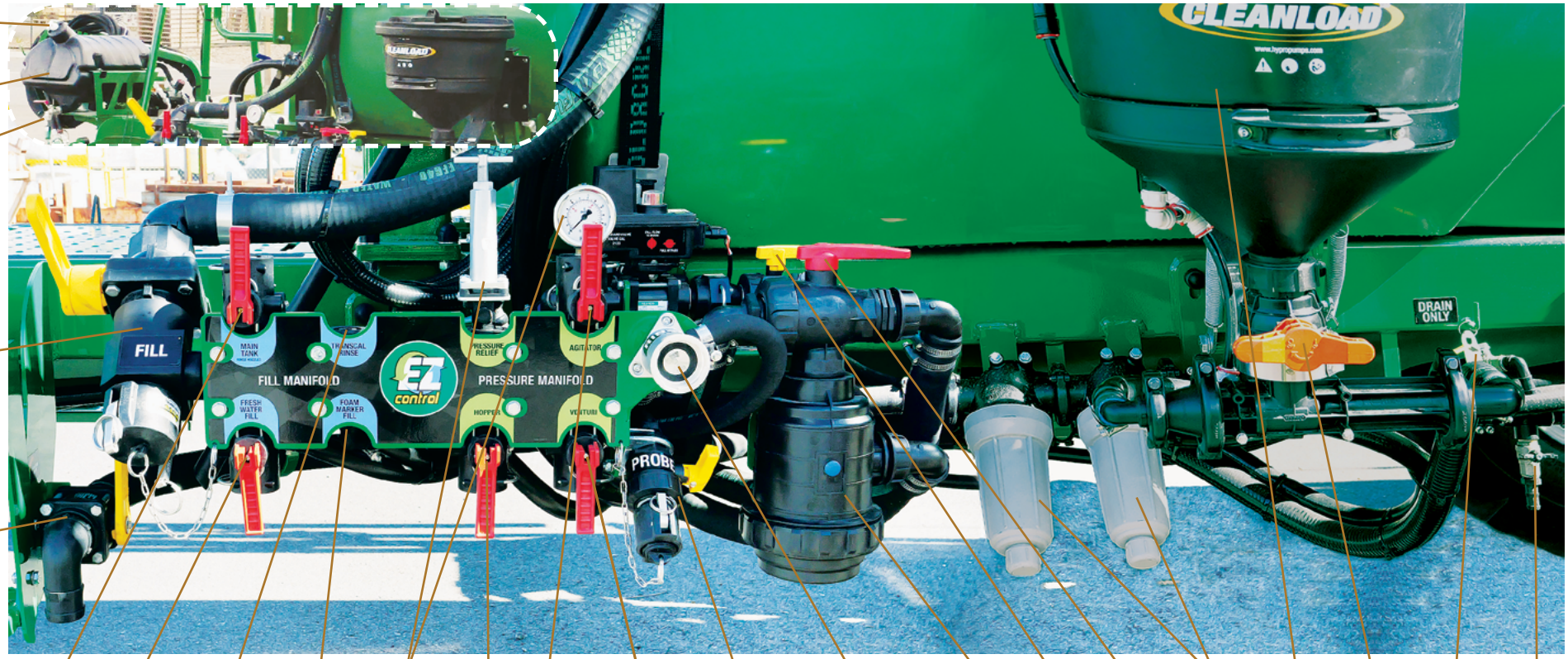
The **total weight of the liquid** being sprayed **must not exceed the equivalent weight of a full tank of water** Exceeding this weight can lead to machine damage.

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.



EZ Control Fill Station - showing hose connectors, valves, filters & chemical mixing hopper.

EZ Control Filling Station

The EZ Control Filling Station (show above) comprises valves and hose connectors used for all filling, rinsing & cleaning functions.

The Clean Fill Inlet requires an external pump for all filling and cleaning functions.

To Fill the Main Tank

1 Connect a 2" suction hose (not supplied) to the 2" 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 Clean Fill Valve at the left end of the Fill Manifold.

3 Fully open the ball valve' on the suction hose

4 Start the external fill pump at low idle.

5 Increase the speed of the external fill pump as required.

Fill speed can be reduced by rotating the sprayer Clean Fill Valve up to 50% closed, if more time or flow is required to fill or operate the Chemical Hopper & other functions.

6 The filling process can be stopped at any time by stopping the external pump.

7 When filling is completed, close the suction hose valve & Clean Fill Valve, disconnect the suction hose and refit camlock caps.

Rinse Tank (200 litres) located at the rear of the sprayer - clean water only for flushing the sprayer.

To Fill the Rinse Tank

1 While filling the Main Tank, open the 'Fresh Water Fill' valve (on the Fill Manifold) to fill the Rinse Tank with fresh water.

2 Close the 'Fresh Water Fill' valve when the Rinse tank is filled.

⚠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.

While filling the Main Tank, open the 'Fresh Water Fill' valve to fill the Rinse Tank.

Hand Rinse Tank (20 litres) located at the front of the sprayer - clean water only cleansing.

To Fill the Hand Wash Tank

1 Open the lid of the Hand Wash Tank *(shown below)*.

2 Fill the tank using a clean water hose and fresh water source.

3 Remove the hose and replace the tank lid.

4 To refill the soap container, remove the soap dispenser *(shown below right)*, then fill the soap container with a general hand wash cleaner. Refit the soap dispenser.

Remove the tank lid & fill the tank (20 litres) with fresh clean water using a clean hose from a fresh water source.

Pressure Relief Valve.

Check Pressure Relief Valve Setting

The setting of the pressure relief valve provides relief if pressure exceeds its pre-determined value.

It also determines maximum spray delivery pressures available.

Altering or adjusting the valve will affect both pressure at which the relief valve functions and the available pressure availabe for spraying.

Goldacres pre-sets its release pressure to 690 kPa (110 psi). This mostly requires no alteration.

Remove the soap dispenser and refill the soap container with general hand wash cleaner.

Hand Rinse Tank (20 litres) located at the front of the sprayer - clean water only cleansing.

To Check Pressure Relief Valve Setting:

1 Ensure there is suffient liquid in the Main tank to operate the pump.

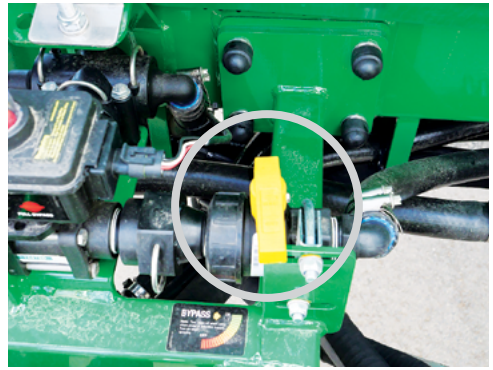
2 Turn the pump Off.

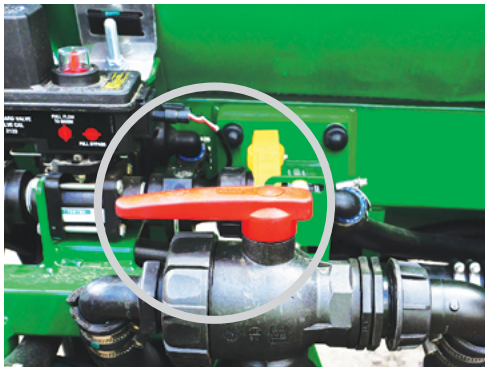
3 Loosen the Pressue Relieve Valve adjustment lock nut, then unscrew the valve counter clockwise until it is fully out.

4 To ensure all flow from the pump will pass through the relief valve:

- Close all Pressure Manifold valves
- Shut all Controller solenoid valves
- Turn the 'Bypass' valve to Off position.

Turn the 'Bypass' valve to Off position.





Turn the Three-way Red Handle ball valve (top of the suction filter) to draw from the Main tank (arrow pointing forwards).

5 Turn the Three-way Red Handle ball valve (top of the suction filter) to draw liquid from the Main tank (arrow pointing forwards).

6 Run the pump at maximum operating speed (540 RPM) and slowly turn the relief valve clockwise until the 690 kPa (110 psi) relief pressure is achieved.

7 Tighten the valve lock nut to Maintain the setting.

If the relief setting is too low, it will allow excessive flow through bypass back to the Main tank and limit the maximum obtainable pressure.

If set too high, it may cause damage to system componest from excessive pressure.

Adding Chemicals to the Main Tank

Chemicals are added to the Main Tank using:

- Chemical Mixing Hopper (granular & liquid)
- Chemical Probe (liquid only).

Before adding chemical to the Main tank, at least 500 litres of clean water must be in the Main Tank.

At least 500 litres is required for the Main tank to operate:

- The venturi effect required to transfer fluid from the Chemical Induction Hopper to the Main Tank and
- The agitator to keep added chemicals mixed.

All functions for adding chemicals to the Main tank require the sprayer to be safely parked in an appropriate area with the tractor engine running.

Chemical Induction Hopper in raised/transport position.

Chemical Mixing Hopper

The Chemical Mixing Hopper provides mixing, measuring and induction functions for adding required chemicals to the Main Tank.

Follow the instructions provided for using the chimical mixing hopper.

NOTE

Wear the necessary protective clothing and use the required safety equipment to avoid exposure to chemicals.

To lower the Chemical Induction Hopper, first remove the hopper safety pin & locking pin.

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 Carefully & slowly down the hopper to its working position.

4 Check the hoses connecting to the hopper are not restricted or kinked.

Use the hopper handle to support the hopper, unlock the latch lever, then carefully lower hopper to its working position.

6 Ready to Spray – **Operation**

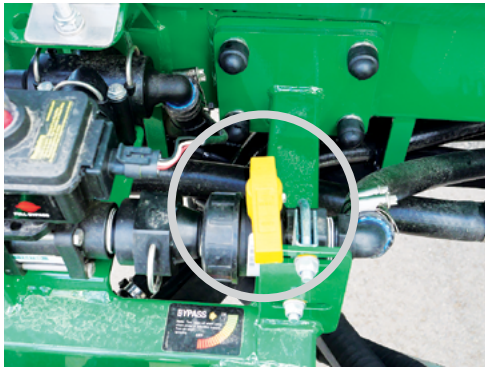
Release the hopper lid latch & open the lid.

To Add & Mix Chemicals using the Chemical Mixing Hopper

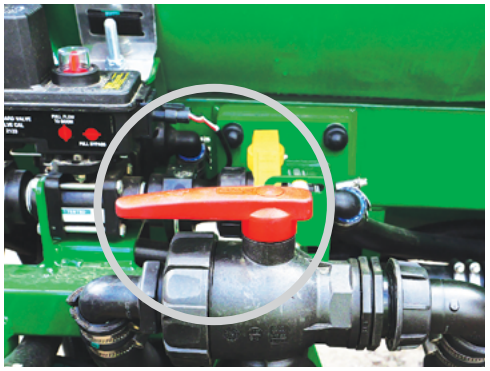
1 Add at least 500 litres of clean water to the Main spray tank. Initially there needs to be a sufficient amount of water in the tank in order for the pump delivery to create the venturi effect via the venturi fitting. This will also ensure that agitation takes place when the remaining water is added.

2 Release the hopper lid latch & open the lid.

3 Turn the 'Bypass' valve to Off position.



Turn the 'Bypass' valve to Off position.



Turn the Three-way Red Handle ball valve (top of the suction filter) to draw from the Main tank (arrow pointing forwards).

4 Turn the Three-way Red Handle ball valve (top of the suction filter) to draw liquid from the Main tank (arrow pointing forwards).

5 Open the 'Hopper' valve (located on the pressure manifold). Check the chemical mixing hopper transfer valve is closed.

6 Open the 'Agitator' valve (located on the pressure manifold) to ensure chemical agitation in the Main tank.

Open the 'Hopper' valve (located on the pressure manifold).

Open the 'Agitator' valve (located on the pressure manifold) to ensure chemical agitation in the Main tank.

7 Start the Product Pump (Hydraulic or PTO drive) to pump liquid from the Main tank.

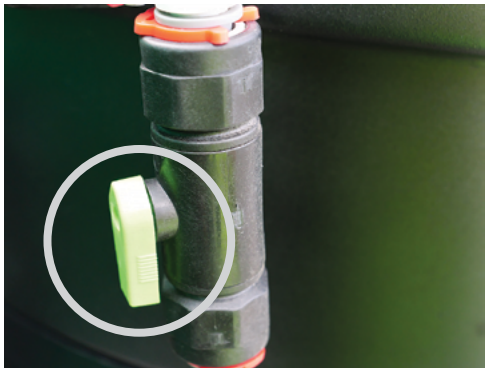
Operate pump speed to generate at least 80 psi (with hopper valves open).

Check the system pressure on the pressue pump gauge & adjust is necessary.

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 Mixing jet valve on the left hand side of the hopper to start mixing.

8 Open the Mixing Jet valve on the left hand side of the hopper to start mixing, if required.

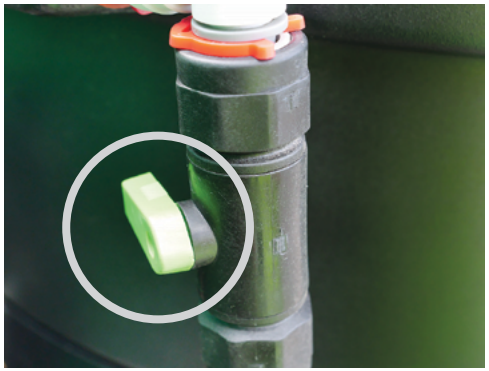
9 Add required chemical granules, powder or liquid into the flowing liquid.

Leave the Mixing Jet On when transfering to the Main tank to assist induction.

10 Open the 'Transfer' valve at the base of the Hopper to transfer chemicals to the Main Tank.

Avoid sucking air when transfering mixture to avoid foaming in the Main tank.

Open the 'Transfer' valve (at the base of the hopper) to transfer chemical mixture to the Main tank.



Close the Mixing jet valve on the left hand side of the hopper on completion of transfer.

11 On completion of transfer, close the Mixing Jet valve and 'Transfer' valve.

12 Rinse all chemicals from the Hopper (refer to instructions in this Chapter 'Hopper Rinse Functions').

NOTE

When transfering contents of the hopper to the Main Tank, avoid letting the hopper run empty or suck air because it may cause foaming in the Main Tank.

Close the 'Transfer' valve (at the base of the hopper) on completion of transfer to the Main tank.

Chemical Probe Inlet with Camlock cap fitted on the right hand side of the Pressure Manifold.

Chemical Probe

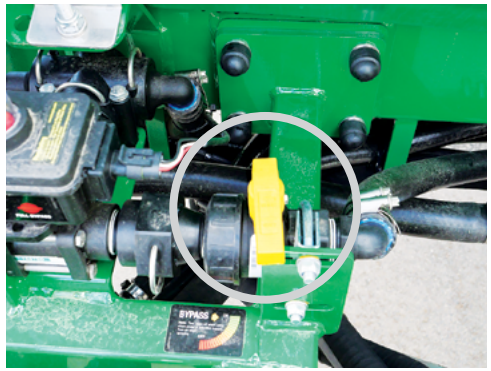
Follow these instructions for using the Chemical Probe to add liquid chemical to the Main tank.

To Add Liquid Chemical Directly to the Main Tank Using the Chemical Probe

1 Add at least 500 litres of clean water to the Main spray tank. Initially there needs to be a sufficient amount of water in the tank in order for the pump delivery to create the venturi effect via the venturi fitting. This will also ensure that agitation takes place when the remaining water is added.

NOTE

Wear the necessary protective clothing and use the required safety equipment to avoid exposure to chemicals.



Turn the 'Bypass' valve to Off position.

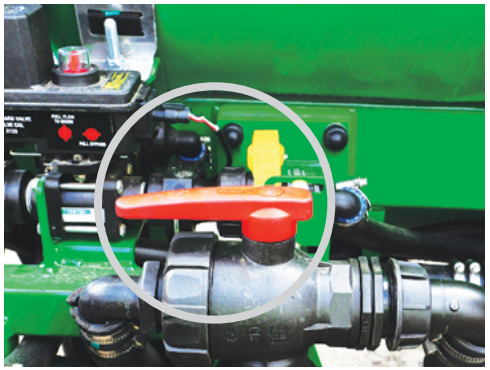
2 Turn the 'Bypass' valve to Off position.

3 Turn the Three-way Red Handle ball valve (top of the suction filter) to draw liquid from the Main tank (arrow pointing forwards).

⚠CAUTION

Do not let the 'Main Pump' run with the suction inlet closed because it may damage the pump.

Turn the Three-way Red Handle ball valve (top of the suction filter) to draw from the Main tank (arrow pointing forwards).



Remove the Camlock cap and connect a Chemical Probe hose to the 1" Chemical Probe Inlet.

4 Remove the Camlock cap and connect a Chemical Probe hose to the 1" Chemical Probe Inlet.

5 Open the 'Agitator' valve (located on the pressure manifold) to ensure chemical agitation in the Main tank.

Open the 'Agitator' valve (located on the Pressure Manifold) to ensure chemical agitation in the Main tank.

Open the Venturi Valve (Pressure Manifold) and open the Chemical Probe Inlet valve.

6 Open the Venturi Valve on the Pressure Manifold and open the Chemical Probe inlet valve.

7 Start the Main Pump (Hydraulic or PTO drive) to pump liquid from the Main tank.

Operate pump speed to generate at least 80 psi (with venturi valves open).

Check the system pressure on the pressue pump gauge & adjust is necessary.

8 Place the Chemical Probe into the chemical and open the Probe Valve.

Chemical will begin transfering to the Main Tank.

Place the Chemical Probe into the chemical source & open the Probe Valve.

On completion of rinsing, close the Probe valve.

9 After the required amount of chemical has transfered to the Main Tank, lift the Probe from the chemical source & allow air to suck & purge the system.

10 To rinse the Chemical Probe and hose, place the Probe into a container of clean water to suck clean water through the Probe and hose.

11 On completion, close the Probe Valve.

12 Close the Venturi valve & Probe Inlet valve, then disconnect the Chemical Probe hose from the 1" Chemical Probe Inlet & replace the Camlock cap.

Close the Venturi valve and Chemical Probe Inlet valve, then disconnect the Probe 1" hose & refit Camlock cap.

Disconnect the Micromatic coupler from the chemical source.

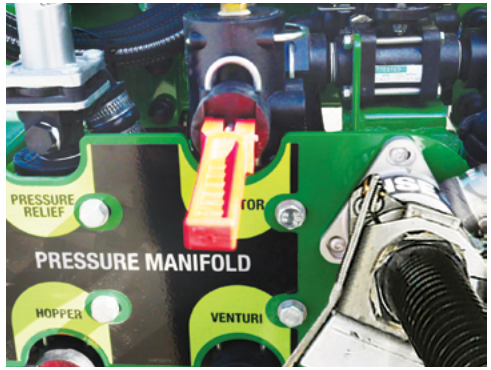
To Add Liquid Chemical to the Main Tank Using the Micromatic Coupling

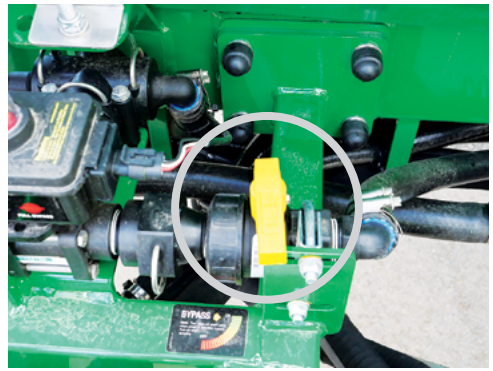
Follow previous instructions 1 to 9 under "To Add Liquid Chemical Directly to the Main Tank Using the Chemical Probe" using 'Micromatic' fittings lieu of 'Probe'.

To rinse the Micromatic Hose & Fittings:

1 Disconnect the Micromatic coupler from the chemical source and connect it to the Micromatic Rinse Coupling on the Pressure Manifold of the sprayer.

Connect the Micromatic coupler to the Micromatic Rinse Coupling on the Pressure Manifold of the sprayer.





Turn the 'Bypass' valve to Off position.

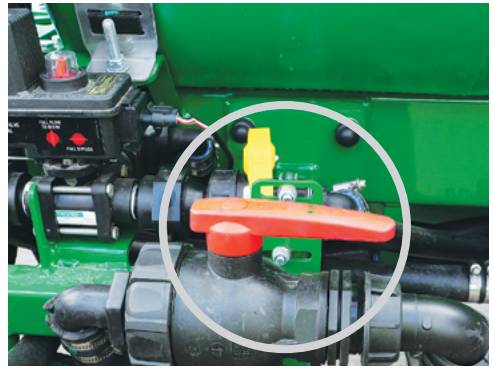
2 Turn the 'Bypass' valve to Off position.

3 Turn the Three-way Red Handle ball valve (top of the suction filter) to draw liquid from the Rinse tank (arrow pointing rearwards).

4 The Micromatic rinse socket must have Clean Fill water pressure to function.

Partially close the 2" Fill valve to achieve rinse back pressure required.

Turn the Three-way Red Handle ball valve (top of the suction filter) to draw from the Rinse tank (arrow pointing rearwards).



Open the Venturi Valve on the Pressure Manifold.

5 Open the Venturi Valve on the Pressure Manifold and open the Chemical Probe inlet valve.

6 Start the Product Pump (Hydraulic or PTO drive) to pump liquid from the Rinse tank.

Operate pump speed to generate at least 80 psi (with hopper valves open).

Check the system pressure on the pressue pump gauge & adjust is necessary.

7 On completion of rinsing, close the Venruri valve and return the Three-way Red Handle ball valve (top of the suction filter) to draw liquid from the Main tank (arrow pointing forwards).

8 Disconnect the Micromatic coupler.

Hopper Drum Rinse Function

The Chemical Induction Hopper provides a Drum Rinse Nozzle for rinsing empty chemical drums.

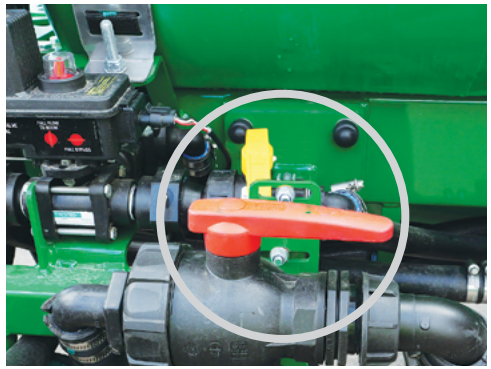
After rinsing, the contents of the Chemical Induction Hopper can be emptied by transfering contents to the Main Tank (see previous instruction).

The Micromatic rinse socket must have Clean Fill water pressure to function. Partially close the 2” Fill valve to achieve rinse back pressure required.

⚠CAUTION

Wash the sprayer & components with clean water, not contqaminated water or rinsate.

Be mindful of where rinsate is deposited as it may contain chemical residue.



Turn ‘Bypass’ valve to Off & the Three-way Red Handle ball valve to draw from the Rinse tank

a) To Use the Drum Rinse Nozzle

1 Ensure there is sufficient clean water in the Rinse tank.

2 The hopper must be in work position and hopper lid open.

3 Turn the ’Bypass’ valve to Off position.

4 Turn the Three-way Red Handle ball valve (top of the suction filter) to draw liquid from the rinse tank (arrow pointing rearwards).

5 Open the ‘Hopper’ valve (located on the pressure manifold). Check the chemical mixing hopper transfer valve is closed.

6 Start the Product Pump (Hydraulic or PTO drive) to pump liquid from the Rinse tank.

Operate pump speed to generate at least 80 psi (with hopper valves open).

If required, further increase pressure at the hopper for rinsing.

Hopper Drum Rinse Nozzle.

7 Place the opening of the empty 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.

8 When the drum rinsing is complete, lift & remove the drum from the Drum Rinse Nozzle, then stop the ‘Fill Pump’.

9 Open the ‘Transfer’ valve at the base of the Hopper to transfer rinsate to the Main Tank.

Avoid sucking air when transfering mixture to avoid foaming in the Main tank.

NOTE

Ensure the Rinse tank has a sufficient quantity of fresh water before using the rinse functions.

Raise the Chemical Induction Hopper to transport position.

Raise Chemical Induction Hopper for Transport

After completion of filling operations, raise the hopper into its 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.

Refit the hopper safety pin & locking pin to ensure the hopper is safely locked for transport.

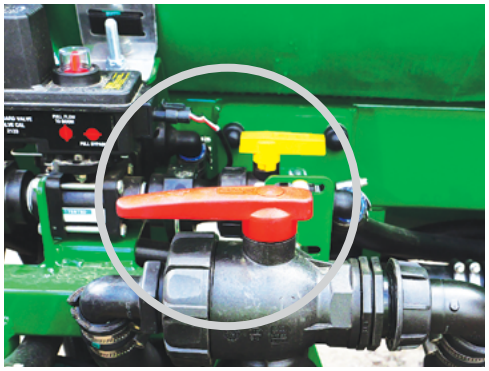
Main Tank Agitation

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.

Main agitation is controlled manually using the Agitator On/Off valve located on the Pressure Manifold.

Check agitators for efficiency because agitator nozzles can block. Refer Chapter 8 ‘Lubrication & Maintenance’ for details.



Turn the Three-way Red Handle ball valve to draw from the Main tank & turn the Bypass valve to On position.

To Agitate While Stationary:

1 Check there is a minimum volume of 500 litres of fresh water in the Main Tank.

2 Turn the Three-way Red Handle ball valve (top of the suction filter) to draw liquid from the Main tank (arrow pointing forwards).

3 Turn the Bypass valve to On position.

4 Start the Product Pump, then Open the ‘Agitator’ valve to On.

5 Add chemicals as required (refer to previous instructions in this chapter).

6 Add further clean water if required.

NOTE

If the Main 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 3000 litres using a 170 L/min pump, agitate for 6000 ÷ 170 = 18 minutes

Optional 3 Way Solenoid Electric Control.

To Spray Using 3 Way Solenoid Control Option

After calibration and 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.

Switch Boom 'SECTIONS' ON and 'MASTER ON to start boom nozzles spraying.

Press the 'Fence Jet' switch to start & stop fenceline nozzle spraying as required.

Press 'Left Tilt UP DOWN' & 'Right Tilt UP' switches to raise lower boom ends as needed & press 'Boom Height UP/ DOWN' to raise/lower the boom as required.

To Commence Spraying:

1 Enter the field and unfold the boom (for instructions, refer to 'Boom Folding/ Unfolding' instructions (in this chapter).

2 Set the boom to the desired height above the application target. Use the Boom Limit Height Setting to set the desired minimum boom height for each operation (refer to instructions Chapter 7 'Boom Settings' - Boom Limit Height Setting'.

3 With the Product Pump running & 'Agitator' valve open, switch On all required Boom Sections, then push the Boom Master toggle switch On to start spraying.

4 With Product pump speed & pressure correct and all nozzles spraying, drive forward at the correct speed calculated when fitting the nozzles for spraying.

Refer to the nozzle chart to determine spray pressure and travel speed.

NOTE

After adding chemical to the Main Tank, ensure both Pump Main and Agitator push buttons are On to keep the chemical evenly mixed in the tank ready for spraying.

5 If fitted, Fenceline nozzles (optional) can be switched On & Off as required by using the 'Fence Jet' push switches.

The Boom Master switch must be On for the fenceline nozzles to operate:

- Push the left hand (upper) 'Fence Jet' switch to start the left boom tip nozzle.
- Push the right hand (lower) 'Fence Jet' switch to start the right boom tip nozzle spraying.

  When On, the push switch illuminates Blue and a red LED on the boom tip Illuminates.

To switch Off a Fenceline nozzle, push the appropriate switch.

6 To make boom adjustments while spraying, use the push switches:

- 'Left Tilt' Up/Down (optional)
- 'Right Tilt' Up/Down (optional)
- 'Boom Height' Up/Down

7 As the Main Tank gets closer to minimum tank level (300 litres), it may be necessary to stop & close the 'Agitator Valve' to Off position to reduce foaming.

To Stop Spraying:

When the Main Tank is empty:

- Press the push 'Boom Master' toggle switch to Off' to stop spraying
- Stop the Product Pump, and
- Return to water source to refill (see to 'Filling the Sprayer' & 'Adding Chemicals to the Main Tank' instructions in this chapter.

On Completion of Spraying at:

- At the end of the day
- At the end of a Main &/or
- At the end of season:

  Follow the appropriate rinsing instructions provided (in this chapter) to ensure all plumbing is flushed & completely clean.

NOTE

If the Main 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 ÷ 250 = 15 minutes

Optional In-cab Raven SCS 450 Controller.

To Spray Using Raven SCS 450 Contoller Option

After proper calibration and 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.

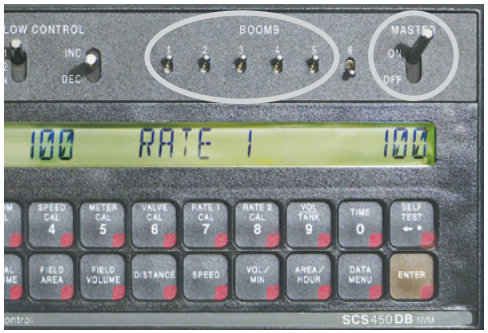
To Commence Spraying:

1 Enter the field and unfold the boom (for instructions, refer to 'Boom Folding/ Unfolding' instructions (in this chapter).

2 Set the boom to the desired height above the application target.

3 With the Raven SCS 450 Controller On, check to ensure correct application rates are entered.

4 With the 'Product Pump' running & 'Agitator Valve' open, switch On all required Boom Sections, then push the Boom Master toggle switch On to start spraying.



Push On each of the 'BOOMS' section toggle switches, then the 'MASTER' toggle switch to start spraying.

5 With all nozzles activated, drive forward. The Raven SCS 450 Controller now controls the spraying application rate according to the preset values entered

6 If fitted, Fenceline nozzles (optional) can be switched On & Off as required by using the 'Fence Jet' push switches.

If the boom is plumbed in 3 sections, then fence line jets will be wired to switches:

- L = 1
- R = 5

Boom Master must be On for the fenceline nozzles to operate:

- Push the left hand (upper) 'Fence Jet' switch to start the left boom tip nozzle.
- Push the right hand (lower) 'Fence Jet' switch to start the right boom tip nozzle spraying.

When On, the push switch illuminates Blue and a red LED on the boom tip Illuminates.

Press the 'Fence Jet' switch to start & stop fenceline nozzle spraying as required.

To switch Off fence line nozzle, press the appropriate push buttons.

7 To make boom adjustments as required while spraying, use the push switches:

- 'Left Tilt' Up/Down (optional)
- 'Right Tilt' Up/Down (optional)
- 'Boom Height' Up/Down

8 As the Main Tank gets closer to minimum tank level (300 litres), it may be necessary to stop & close the 'Agitator Valve' to reduce foaming.

Press 'Left Tilt UP DOWN' & 'Right Tilt UP' switches to raise lower boom ends as needed & press 'Boom Height UP/ DOWN' to raise/lower the boom as required.

To Stop Spraying:

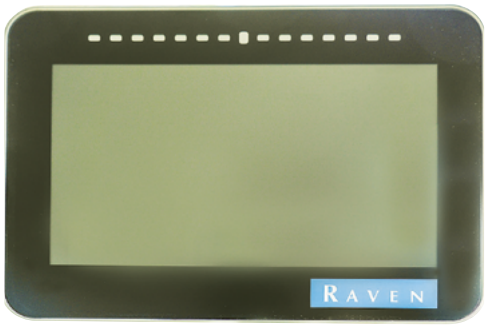
When the Main Tank is empty:

- Press the push 'Boom Master' toggle switch to Off' to stop spraying
- Stop the Product Pump, and
- Return to water source to refill (see to 'Filling the Sprayer' & 'Adding Chemicals to the Main Tank' instructions in this chapter.

On Completion of Spraying at:

- At the end of the day
- At the end of a Main &/or
- At the end of season:

  Follow the appropriate rinsing instructions provided (in this chapter) to ensure all plumbing is flushed & completely clean



Optional In-cab Raven CR7 Controller.

To Spray Using Raven CR7/Universal PC1 ISO Bus Option

After proper calibration and completion of filling, the Prairie Special is ready for spraying.

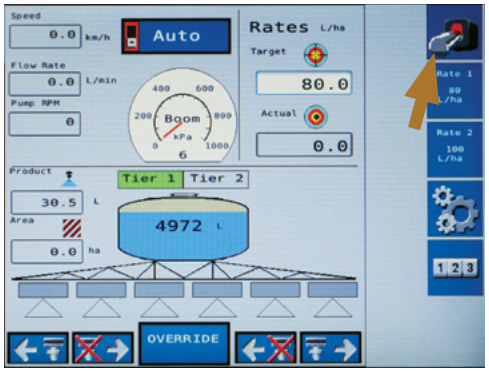
While travelling from filling to a field, both Product Pump & Agitator must be On to ensure chemicals are mixed adequately prior to spraying.

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 With the Raven CR7/Universal PC1 ISO Bus Terminal On, check to ensure correct application rates have been entered & desired boom sections are selected for spraying.



'Home' screen of optional Raven CR7/PC1 ISO BUS Terminal. Push Up the 'Boom Master' toggle switch' to start spraying.

4 With the 'Product Pump' is running & 'Agitator Valve' open, switch On all required Boom Sections, then push the Boom Master toggle switch On to start spraying.

The Raven CR7 / Universal PC1 ISO Bus Terminal now controls the spraying application rate according to the preset values entered.

5 If fitted, Fenceline nozzles (optional) can be switched On & Off as required by using the 'Fence Jet' push switches.

Boom Master must be On for the fenceline nozzles to operate:

- Push the left hand (upper) 'Fence Jet' switch to start the left boom tip nozzle.
- Push the right hand (lower) 'Fence Jet' switch to start the right boom tip nozzle spraying.

When On, the push switch illuminates Blue and a red LED on the boom tip Illuminates.

Press the 'Fence Jet' switch to start & stop fenceline nozzle spraying as required.

To switch Off a Fenceline nozzle, push the appropriate switch.

6 To make boom adjustments as required while spraying, use the push buttons:

- 'Left Tilt' Up/Down (optional)
- 'Right Tilt' Up/Down (optional)
- 'Boom Height' Up/Down

7 As the Main Tank gets closer to minimum tank level (300 litres), it may be necessary to stop & close the 'Agitator Valve' to reduce foaming.

Press 'Left Tilt UP DOWN' & 'Right Tilt UP' switches to raise lower boom ends as needed & press 'Boom Height UP/ DOWN' to raise/lower the boom as required.

To Stop Spraying:

When the Main Tank is empty:

- Press the push 'Boom Master' toggle switch to Off' to stop spraying
- Stop the Product Pump, and
- Return to water source to refill (see to 'Filling the Sprayer' & 'Adding Chemicals to the Main Tank' instructions in this chapter.

On Completion of Spraying at:

- At the end of the day
- At the end of a Main &/or
- At the end of season:

  Follow the appropriate rinsing instructions provided (in this chapter) to ensure all plumbing is flushed & completely clean.

NOTE

Ensure the Rinse tank has a sufficient quantity of fresh water before using the rinse functions.

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 provided:

1 Quick Rinse or Boom Rinse
2 Basic Rinse
3 Total Rinse & Decontamination.

NOTE

Always ensure the Rinse tank is filled with a sufficient amount of clean fresh water to perform required rinse functions.

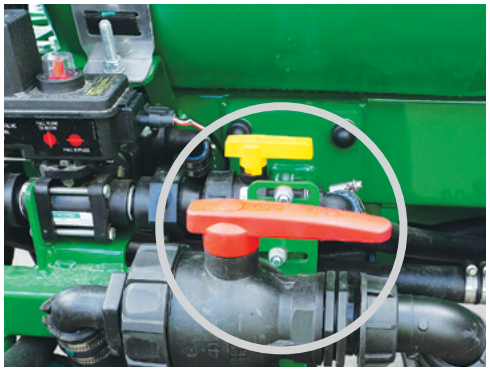
The Rinse Tank (200 litres) must be filled with clean water to do the Quick Boom Rinse.

Quick Rinse or Boom Rinse

For more specific information regarding flushing & decontamination specific to Mains you are applying, it is recommended to consult the chemical label or chemical supplier.

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).

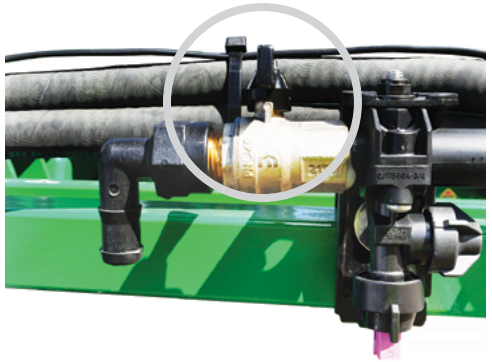


Rotate the Three-way Red Handle ball valve (top of suction filter) to draw from the Rinse tank (arrow pointing rearwards).

To Quick Rinse the Boom

1 Travel to an appropriate rinse area and unfold the boom and adjust the boom to a suitable height (for instructions, refer to 'Boom Folding/Unfolding' instructions (in this chapter).
2 Rotate the Three-way Red Handle ball valve to draw from the Rinse tank.
3 Check the 'Agitator Valve' is open.
4 Open each boom section end valve to flush chemicals from boom lines - depending on chemicals used, it may be necessary to collect the rinsate for safe disposal.

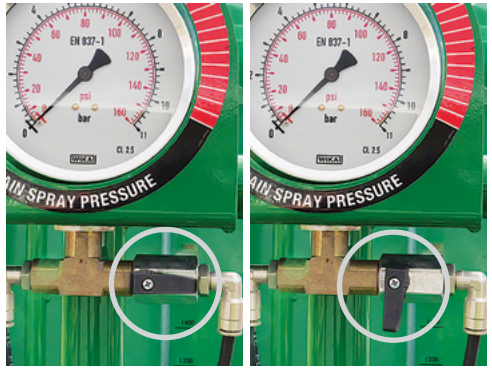
Open each boom section valve to quickly flush chemical from the boom line.

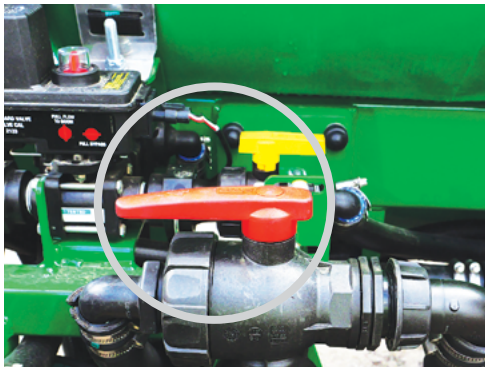


Close each boom section valve after flushing chemical from the boom line to continue flushing nozzles.

5 Start the Product Pump & switch On all Boom Sections, then the Boom Master switch to start flushing the boom plumbing.
6 After flushing the lines, close each boom section end valve and continue to flush the nozzles.
7 If fitted, open close optional Fenceline nozzles to flush any chemicals.
8 Open & close the spray pressure gauge drain valve (located below the pressure gauge at the front of the sprayer) to flush out chemical from the gauge & lines.

Open the spray pressure gauge drain valve (shown left) to flush out chemical, then close the valve (shown right).





Turn the Three-way Red Handle ball valve (top of the suction filter) to draw from the Main tank (arrow pointing forwards).

9 On completion of the boom rinse:
- Switch Off the Boom Master
- Switch off the Boom Sections
- Stop the Product Pump.

10 Return the Three-way Red Handle ball valve to draw from the Main tank.

Open the Tank drain ball valve to safely & completely drain the Main 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 an external Fill Pump & 'Clean Fill Inlet' of the sprayer.

To Basic Rinse the Spray System:

1 Safely park the Prairie Special & unfold the boom.

2 Open the Tank drain ball valve to safely & completely drain the Main Tank.

Unhook the 'Sump Hose Drain Valve', open the valve & lower it, to completely drain the Main Tank sump.

Open the 'Sump Hose Drain Valve', & lower it to completely drain the Main Tank sump.

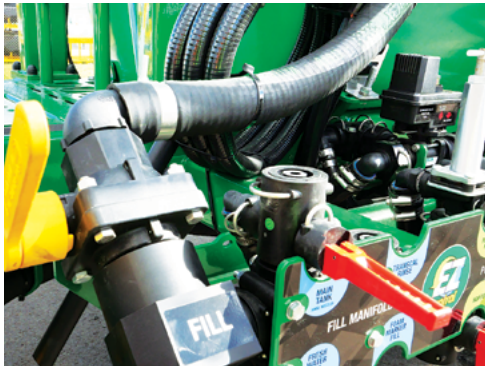
3 Unhook the 'Sump Hose Drain Valve', open the valve & lower it, to completely drain the Main Tank sump.

4 Connect a 2" suction hose to the 2" camlock coupling of the 'Clean Fill Inlet'. Connect the other end of the suction hose connected to a clean water source.

5 Half open the '2" Clean Fill Valve' (on Fill Manifold) & open the ball valve on the suction hose.

6 Open the 'Main Tank Rinse Nozzles' valve (on Fill Manifold) to rinse the Main tank.

Open the 'Main Tank Rinse Nozzles' valve to rinse the Main tank.



After rinsate is drained from the tank, close the 'Main Tank Drain' valve.

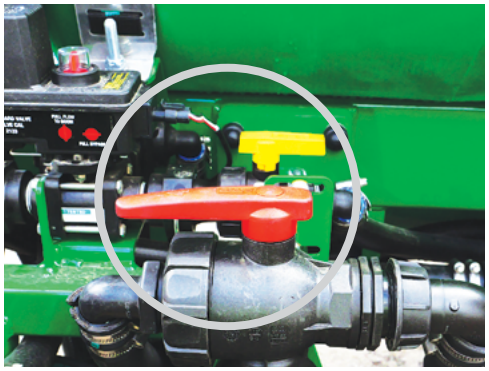
7 Start the external fill pump at low idle to rinse the Main tank. Increase speed of the external fill pump as required.

8 After chemical is flushed from the Main tank, stop the external fill pump and after rinsate is drained from the tank, close the:
- 'Main Tank Rinse Nozzles' valve
- 'Main Tank Drain' valve
- "Sump Hose Drain Valve'.

9 Fully open the 2" Clean Fill Valve' & start the external fill pump to add enough clean water to the Main tank to fully flush the pump, boom plumbing & nozzles.

Fully open the '2" Clean Fill Valve' & start the external fill pump to add clean water to the Main tank.

6 Ready to Spray – **Operation**



Check the Three-way Red Handle ball valve is set to draw from the Main tank & and Bypass valve is On.

10 Stop the external fill pump, then close the 2" Clean Fill Valve' & suction hose ball valve.

11 Check the Three-way Red Handle ball valve (top of the suction filter) is set to draw liquid from the Main tank (arrow pointing forwards) & bypass valve is On.

12 Check the agitator valve is open and Start the Product pump and allow fresh water to circulate, then turn the 'Bypass' valve to Off position.

Check the 'Agitator' valve is open and start the pump to circulate fresh water, then turn the 'Bypass' valve Off.

With the 'Bypass' valve Off, close all manifold valves to flush fresh water through the 'Pressure Relief Valve'.

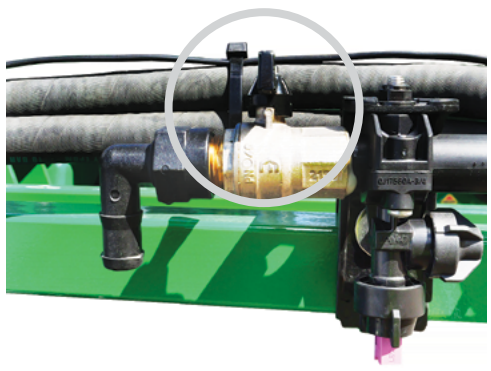
13 Close all manifold valves so that the 'Pressure Relief Valve' activates & flushes fresh water through the 'Pressure Relief Valve back to the Main tank.

14 Re-open the 'Agitator Valve' and 'Venturi Valve', then operate Chemical Mixing Hopper with a quantity of fresh water in order to flush venturi & hopper system with a quantity of fresh water.

15 Turn the 'Bypass Valve' to On position.

16 Open each boom section end valve to flush chemicals from boom lines - depending on chemicals used, it may be necessary to collect the rinsate for safe disposal.

Open each boom section end valve to quickly flush chemical from the boom line.



After flushing each boom section, close the end valve and allow fresh water to flush the nozzles.

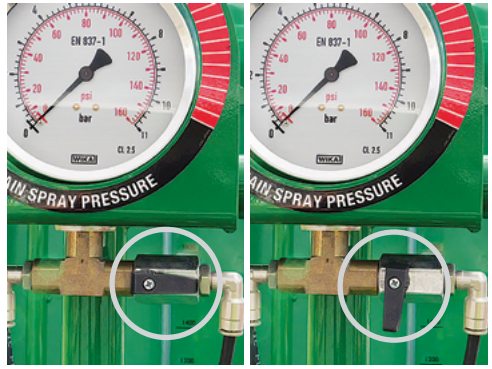
17 Switch On all Boom Sections, then the Boom Master to start flushing the boom plumbing lines.

18 After flushing boom section lines, close each boom section end valve and continue flushing the boom nozzles.

19 If fitted, open & close optional Fenceline nozzles to purge chemicals.

20 Open & close the spray pressure gauge drain valve (located below the pressure gauge at the front of the sprayer) to flush chemicals from the gauge & lines.

Open the spray pressure gauge drain valve (shown left) to flush out chemical, then close the valve (shown right).



21 On completion of the boom rinse:
- Switch Off the Boom Master
- Switch Off the Boom Sections
- Stop the Product Pump.

22 Open the 'Main Tank Drain' valve and completely drain the tank. Close the valve when completely empty.

23 Unhook the 'Sump Hose Drain Valve', open the valve & lower it, to completely drain the Main Tank sump. When empty, close the valve & re-hook the hose into position

24 Clean the suction & pressure filters.

25 Shut-down the Prairie Special and store as required.

⚠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.

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 2" clean water inlet and uses an appropriate cleaner/decontaminant is added to clean & neutralise chemicals used.

Information specific to your circumstances, the spraying equipment being used and the chemicals being applied should be provided by your agronomist or chemical supplier.

The procedure requires a minimum of 1000 litres of clean water in the Main Tank and the Rinse Tank must be filled before proceeding.

Always wear the recommended personal protective equipment and use caution while working with chemicals.

Lower Chemical Mixing Hopper & open the lid to add an appropriate amount of decomtaminating agent.

To Totally Rinse & Decontaminate the Spray System:

1 Complete the 'Basic Rinse' as preiously instructed.

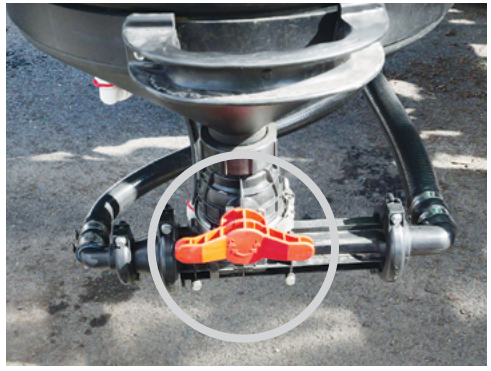
2 Fill the Main tank with approximately 1000 litres of clean water and fill the Rinse tank.

3 Lower the Chemical Mixing Hopper, add the appropriate amount of decontaminating agent and turn on the agitation jet to mix the agent, then fill the hopper to the top.

4 Once the hopper is full, stop the agitation jet and allow the liquid to sit in the hopper for several minutes to ensure the decontaminating agent fully neutralises any chemicals.

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.



Open the 'Transfer' valve (at the base of the hopper) to transfer chemical mixture to the Main tank.

5 After decontaminating the hopper, transfer the hopper contents into the Main tank and allow decontaminating agent to circulate through the tank, pump, agitator and plumbing system.

6 Turn the 'Bypass' valve to Off position, then close all manifold valves so the 'Pressure Relief Valve' activates & flushes decontaminating liquid through the 'Pressure Relief Valve back to the Main tank.

7 Re-open the 'Agitator Valve' and return the 'Bypass Valve' to On position.

8 Switch On all Boom Sections, then the Boom Master to start decontaminating the boom and nozzles.

9 If fitted, open & close optional Fenceline nozzles to purge chemicals.

Open the Tank drain ball valve to safely & completely drain the Main Tank.

10 Open & close the spray pressure gauge drain valve (located below the pressure gauge at the front of the sprayer) to flush chemicals from the gauge & lines.

11 On completion of the boom rinse:
- Switch Off the Boom Master
- Switch off the Boom Sections
- Stop the Product Pump.

12 Open the 'Main Tank Drain' valve and completely drain the tank. Close the valve when completely empty.

13 Unhook the 'Sump Hose Drain Valve', open the valve & lower it, to completely drain the Main Tank sump. When empty, close the valve & re-hook the hose into position

14 Clean the suction & pressure filters as per 'Suction Filter Cleaning' & 'Pressure Filter Cleaning' instructions in this chapter.

15 Proceed to flush the sprayer with clean water again (refer previous 'Basic Rinse' instructions) to remove all decontaminating agent to leave all plumbing thoroughly clean.

Flush the Spray System with Clean Water

After the ‘Total Rinse & Decontamination’ procedure is completed, follow the ‘Basic Rinse’ procedure (steps 4 to 25) to completely flush the Spray System with clean water and remove any remaining rinsate & decontaminating agent.

Unscrew and remove the end caps from each filter and allow liquid to drain out.

Pressure Filter Cleaning

Use PPE (Personal Protective Equipment). For more information refer to Chapter 2 Safety - Essential Risk Management.

It is recommended to remove & clean both Pressure Filters regularly - before each tank fill.

Frequency of cleaning will depend on the quality of water and chemicals used.

The Pressure Filters receive liquid from either the Main Tank or the Rinse Tank via the product pump.

Loosen filter bowls slowly. Be aware some residual liquids may dribble out.

To Remove & Clean the Pressure Filters:

1 Ensure the Product Pump is Off.

2 Rotate the ‘Three-way Red Handle ball valve (top of the suction filter)’ to Off position to isolate liquid coming from the Main Tank.

3 Unscrew and remove the end caps from each filter and allow the liquid to drain.

4 Loosen the filter bowls slowly.

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 Refit and tighten the end caps of each filter.

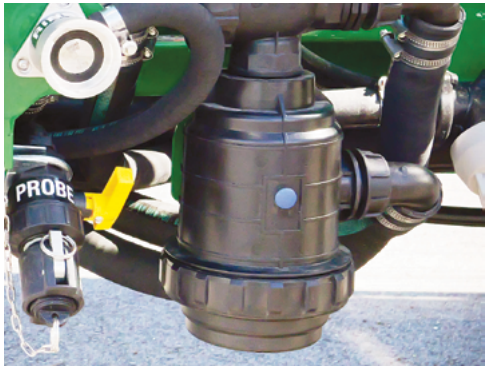
8 Fully tighten the filter bowl.

9 Rotate the ‘Three-way Red Handle’ ball valve (top of the suction filter)’ to the positon required.

⚠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.



Suction Filter located right hand side of the Pressure Manifold.

Suction Filter 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 Main Tank or the Rinse Tank. All liquid to be sprayed or flushed through the system passes through this filter.

Rotate the 'Three-way Red Handle' ball valve (top of filter)' to Off position to close-off any liquid from the Main Tank.

To Remove & Clean the Suction Filter:

1 Ensure the Product Pump is Off.

2 Rotate the 'Three-way Red Handle' ball valve (top of the suction filter)' to Off position to isolate liquid coming from the Main 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 Unscrew the filter bowl collar, then remove the collar & filter bowl.

Be aware some residual chemical will dribble out.

Be careful not to damage the O-Rings.

6 After removing the filter collar & 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.

9 Rotate the 'Three-way Red Handle' ball valve (top of the suction filter)' to the positon required.

⚠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.

To empty the Rinse Tank, open the drain valve on the LHS of the sprayer and allow the water to drain out.

Drain the Rinse Tank

If the Rinse tank needs to be emptied to remove the sprayer from the tractor or for end of season storage or for cleaning, open the Rinse tank drain valve on the left hand side of the sprayer.

Close the drain valve after draining the tank.

After the Rinse Tank is empty, close the drain valve.

End of Day

At the end of each spraying day, follow the Basic Rinse or Total Rinse & Decontamination procedures outlined earlier in this chapter.

If the sprayer is to be disconnected, follow instructions provided.

Rotate the jack down, then & wind the handle to raise the hitch until weight is taken off the tractor.

To Disconnect the Sprayer from the Tractor:

1 Ensure the Main, Rinse & Hand Wash tanks are empty.

2 Rotate the jack down, then wind the handle to raise the hitch until weight is taken off the tractor.

3 Remove safetly, pin then drawbar pin.

4 Detach safety chains from the tractor.

5 Disconnect all connectors between the sprayer & tractor - hydraulic hoses, electric controls, tail lights, foam marker lines, etc.

6 If fitted, remove the PTO shaft from the tractor.

7 Protect hydraulic hoses and electrical connections with covers supplied.

At end of season, thoroughly clean & apply desired protectants to the sprayer for storage.

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 clean & apply desired protectants to the sprayer for storage.

3 Thoroughly examine the Prairie Special to determine if there is any damage.

4 Park the Prairie Special where it will not be affected by frosts, and preferably out of direct sunlight.

5 Ensure all tanks are empty before disconnecting the sprayer fron the tractor.

6 If necessary, remove Prairie Special switches & control from the tractor cabin and store them in a safe & secure location.

⚠CAUTION

If the sprayer is left attached to the tractor when parking the sprayer, make sure the tractor park brake is applied, the engine turned off and the sprayer is securely hitched to the tractor.

⚠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.

NOTE

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

⚠CAUTION

It is recommended a small quantity of anti freeze be added to the Main tank and circulated through the sprayer to minimise the chance of freezing.

Make sure any ice has thawed before using sprayer.

Ensure all safety precautions are observed when transporting the sprayer.

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.

Transcal volumetric measuring system option.

Transcal Fill Option

The Transcal volumetric measuring system is designed to provide a measuring facility without the need for an auxiliary pump and flowmeter.

When used in conjunction with the venturi chemical probe or micromatic fitting, required chemical volume can be transferred directly from the chemical container to the Transcal tank.

Chemical is then transferred to the main spray tank via venturi suction by opening a valve.

The system can be used with most types of chemical containers (including the envirodrum closed transfer system).

To Operate Transcal

1 Remove the Camlock plug and connect the chemical probe line or the Micromatic coupler to the Camlock fitting.

2 Ensure that the yellow T-handle on the Transcal station is aligned to 'FILL'.

3 Add approximately 500 litres of clean water to the Main tank of the sprayer.

4 OPEN the 'Agitator' and 'Venturi' valves of the Pressure Manifold.

5 Turn the 'Bypass' valve to OFF & CLOSE the 'Hopper' valve on the Pressure Manifold.

⚠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.

NOTE

The Transcal system requires a vacuum to operate. Any air leaks in the tank lid, hoses or cam lever seals will affect the performance or cause total failure to operate.

NOTE

The calibration markings on the Transcal tank should be used as a guide only.

6 OPEN the chemical probe valve at the Transcal station.

7 Operate the pump at the lowest speed necessary to generate 530 kPa (85 psi) delivery pressure (as displayed on the manifold pressure gauge).

Do not run faster than 540 RPM. The higher the pump delivery pressure, the greater the venturi suction and the quicker the probe will transfer the chemical. The delivery pressure should not exceed 660 kPa 110 PSI as determined by the pressure relief valve setting.

⚠WARNING

Do not fill Transcal tank past the 45 litre mark

10 Place the probe in the chemical drum and open the valve on the chemical probe or connect the Micromatic fitting to the outlet on the envirodrum and push the handle down so that it locks into position and opens the valve on the envirodrum.

11 The chemical should now be transferring into the Transcal tank.

12 When the required amount of chemical has been transferred, CLOSE the valve on the chemical probe.

Remove the probe from the chemical drum, then OPEN the valve on the chemical probe again.

This will drain residual chemical from hose.

If chemical has been transferred from an envirodrum, push the handle on the Micromatic coupling DOWN slightly and then UP. This will make the handle lift up and close the valve on the envirodrum.

This should be done during successive fills into the Transcal tank.

Transcal Tank Overfill

In the event of over-filling of the Transcal tank, a small piece of supplied black 25mm (1”) hose can be fitted to the ball valve on the bottom of the Transcal to drain away any excess chemical.

To Drain Away Excess Chemical:

1 Turn the Transcal t-handle on the Transcal station to OFF.

2 Close the venturi valve on the EZ Control Fill station.

⚠CAUTION

Ensure that the appropriate protective clothing is worn, as per the chemical label.

3 With the Transcal T-handle on the Transcal station to OFF (wear appropriate safety clothing), undo the Camlock fittings on the ball valve at the bottom of the Transcal station and remove the black 25 mm hose (behind the Transcal station cover & accessed from underneath).

4 Attach the short length of black drain hose to the Camlock connector.

5 Place an appropriate container under the drain hose.

6 Turn the T-handle on the Transcal station to ‘EMPTY’.

7 After draining the required amount of chemical, remove the drain hose, replace the vacuum supply hose and resume operating the Transcal.

Raw chemical should be returned to its original container.

Transfering Chemical to the Main Tank

After required amount of chemical is in the Transcal tank, transfer it to the Main tank of the sprayer.

To Transfer Chemical to Main Tank:

1 Ensure that the venturi valve on the pressure delivery station is ON.

2 The Transcal tank needs to be vented when emptying. Remove the chemical probe from the container and open the valve on the chemical probe, or open the Micromatic fitting.

3 Turn the 3 way ball valve on the Transcal to 'EMPTY'.

4 The chemical should now transfer into the main spray tank.

When finished:

1 The Transcal tank and probe or Micromatic coupler should be thoroughly rinsed (refer 'Rinsing' instructions in this chapter).

2 Turn the Transcal station T-handle OFF.

3 Turn the Probe valve OFF.

4 Turn the Venturi valve OFF.

5 Turn the Bypass valve ON.

6 Check the Agitator valve is ON.

7 Disconnect the probe or envirodrum line and replace the cam plug in the cam lever fitting.

⚠WARNING

Do not level the Transcal tank while under vacuum.

⚠WARNING

Do not use the Transcal tank to store chemicals when spraying.

Transfer Chemical Without Measuring

Chemical can be transferred from the chemical container into the main spray tank (bypassing the Transcal tank) without chemical being measured (ie, by emptying full containers). This reduces time taken to transfer the chemical.

To Transfer Chemical Without Measuring:

1 Release the cam lever fitting from the rear of the Transcal station and connect either the probe or the envirodrum line.

2 Place the Probe into the chemical drum & OPEN the chemical probe valve or connect to the Envirodrum & engage the Micromatic handle.

3 Turn ON the Venturi valve of the Pressure Manifold & perate the pump at the lowest speed necessary to generate 530 kPa (85 psi) delivery pressure (as displayed on the manifold pressure gauge)

4 The chemical will now transfer from the chemical drum into the main sprayer, bypassing the Transcal.

5 When the required amount of chemical has been transferred, close the ball valve on the chemical probe and remove it from the chemical drum or release the Micromatic fitting.

6 When finished, the probe or Micromatic coupler should be thoroughly rinsed (see 'Rinsing' section).

7 Turn the venturi valve OFF.

8 Turn the bypass valve ON.

9 Ensure that the agitator valve is ON. The sprayer agitator should be maintained until spraying begins.

10 Disconnect the Probe or Envirodrum from the sprayer and re-attach the black suction hose to the rear of Transcal station.

Transcal Rinse Procedures

To Rinse the Chemical Probe Line:

1 Fill a suitable container with fresh water (plus applicable decontaminating agent).

A minimum of 50 litres of fresh water is required for sufficient cleaning.

2 Remove the cam lever plug and connect the chemical probe line to the cam lever socket at the Transcal station.

3 OPEN the Chemical Probe valve.

4 Place the probe into the container with fresh water and OPEN the probe valve

5 Turn the yellow T-handle on the Transcal station to 'EMPTY'.

6 Operate the Transcal venturi around 530 kPa (85 psi).

7 The fresh water should now transfer to the Transcal tank and then into the Main tank - cleaning lines from the chemical probe to the Transcal tank and Main spray tank.

When finished:

- Turn OFF chemical probe valve OFF.
- Turn OFF the yellow T-handle.
- Turn OFF the 'Venturi' valve.
- Ensure the 'Agitator' valve is ON.

Disconnect the line from the Transcal tank to the probe from the Camlock fitting & refit the Camlock plug.

To Rinse the Micromatic Line:

1 Connect the Micromatic coupler to the Micromatic rinsing socket.

2 Connect the envirodrum suction line to the Camlock socket on the sprayer.

3 OPEN the Chemical Probe valve

4 Open the 'Envirorum Coupling Rinse' valve on the external water delivery station so that the fresh water cleans both the Micromatic coupler and the line to the Transcal tank.

5 Turn the venturi ON at 85 PSI.

6 The fresh water will now rinse through the Micromatic fittings to the Transcal tank and then into the main spray tank.

7 When there has been sufficient cleaning with fresh water (at least 5 minutes of cleaning), close the Envirodrum Coupling Rinse valve.

When finished:

- Turn OFF chemical probe valve OFF.
- Turn OFF the yellow T-handle.
- Turn OFF the 'Venturi' valve.
- Ensure the 'Agitator' valve is ON.

To Rinse the Transcal Tank:

1 Keep both the sprayer pump and Transcal venturi system operating at 530 kPa (85 psi).

2 Ensure that the tank is vented by turning the yellow T-handle on the Transcal station to 'EMPTY'.

3 Turn ON the 'Transcal Flush' valve (on the external water delivery station).

4 The tank & sight tube should be rinsed and rinsate transferred to the Main tank.

5 Rinse the Transcal tank for as long as recommended on the chemical label or at least two minutes.

6 CLOSE the 'Transcal Flush' valve after the tank is sufficiently rinsed and rinsate has been transferred to the Main tank.

To Vent the Transcal Tank:

1 Turn OFF the venturi.

2 OPEN probe ball valve.

3 OPEN Transcal ball valve to empty the Transcal tank.

4 Vent for 30 seconds then close.

Foam Marker Option

Follow the operating instructions below.

To Operate the Foam Marker:

1 Open the water valve 6 turns and open the concentrate valve in quarter turn intervals up to 2 turns until the correct foam consistency is reached.

2 Then, open the water valve to a total of 12 turns and open the concentrate valve up to a total of 4 turns.

3 Allow up to 5 minutes for each needle adjustment to take effect.

To successfully use the Exacta foam marking system, it is essential to observe the following points:

1 Make sure that initially all ball valves on the external water delivery station are turned OFF.

2 If filling of the main spray tank is not required at the same time, turn the red handle on the fill ball valve OFF.

3 Connect the fresh water fill hose to the quick-fill coupling.

4 Operate the fresh water pumping system (make sure pressure does not exceed 200 kPa (120 psi).

5 Take the lid off the foam marker water tank.

6 OPEN the 'foam marker fill' valve. Fill the Exacta foam water tank with only clean soft water.

7 Continue to bottom-fill the foam tank until the desired amount has been transferred.

8 When the desired amount of water has been transferred to the foam tank, turn the 'foam marker fill' valve OFF.

9 Re-fit the lid to the foam marker water tank.

10 Turn the fresh water pumping system off.

NOTE

This information applies to the Exacta foam marker system supplied with MY17 machines. For information on the MY19 fitted Salvarini foam marker system, see supplementary documentation.

11 Fill the concentrate tank with only Goldacres foam concentrate.

12 All adjustments of the control valve should be within plus or minus ½ a turn or similar.

13 Always allow sufficient time for the altered foam to come out of the accumulator.

14 If the foam is too runny, close the water valve slightly, if the foam is stiff and has air holes, open the water valve slightly. Loose foam is desirable when spraying in crops where the foam needs to sit on top of the crop in order to be visible.

Tight foam is desirable when the foam needs to be visible for an extended period of time and when the spraying conditions are relatively hot and windy.

15 Regularly inspect the foam marker lines, to ensure they are free of foreign matter.

16 Periodically remove and clean the water filter. The foam marker filter is located underneath the foam marker tank. To remove the filter, ensure the appropriate protective clothing is being worn.

Close the foam tank ball valve, loosen the brass screen, remove the filter and clean.

17 Periodically check the condition of the one-way valve in the compressor/diverter unit.

Bleeding the concentrate line when the foam concentrate tank empties:

If the foam concentrate tank empties, it will take a few minutes for the concentrate to feed through the lines to the compressor/diverter unit.

To reduce this time, the concentrate can be bled to minimize water wastage.

1 Close the concentrate needle valve ½ turn at a time and record the number of turns until the needle valve is closed.

2 Open the needle valve several turns more than the previous setting.

3 When the concentrate comes through, fully close the concentrate needle valve, then re-open the valve to the setting recorded from step 1.

⚠WARNING

Ensure that the foam marker water tank lid is screwed on loosely to prevent pressure build up in the tank

⚠WARNING

Ensure that the foam marker water tank lid is screwed on loosely to prevent pressure build up in the tank

NOTE

If either the water tank or the foam concentrate tank empties, it's possible that flow from the other tank (foam water or foam concentrate) can siphon into the empty tank. To prevent this, as soon as either the foam water tank or foam concentrate tank empties, shut the ball valve at the bottom of both tanks.

NOTE

Re-fill the tanks prior to the next spraying operation.
Regularly check valves.

3000 litre Prairie Special fitted with 24m Delta boom & Rowcrop 3 point linkage hitch option.

Goldacres Delta Boom Paralift system

Delta Boom Functions

The Delta Boom Centre Section comprises two components - the Paralift and Boom Centre Section held together by four Delta links. The Delta links allow the boom to be suspended in while providing both Roll & Yaw suspension.

Roll suspension acts when the boom pitches up & down at boom ends.

Yaw suspension acts when the boom moves fore & aft at boom ends. It allows the sprayer chassis to move left & right without movement being transferred to the boom

Without Yaw suspension, excessive stresses would be exerted on the boom sections & centre section, especially with cornering or steering corrections and uneven ground.

⚠CAUTION

When folding the boom, always ensure the sprayer chassis is laterally level.

If the chassis is sloping laterally, sprayer stability and boom folding can be compromised.

The Paralift moves with the sprayer but the Boom Centre Section remains level as it moves on its delta links.

Boom Yaw is dampened by a combination of springs and dampers. If the springs are not tensioned correctly the boom will be able to yaw excessively and the springs may be damaged.

Hydraulic Raise & Lower

The Paralift function raises and lowers boom to maintain consistent boom height above the target.

Two hydraulic cylinders are used the lift the boom while also acting as a component in the vertical suspension system.

Each hydraulic cylinder is connected to an individual nitrogen charged accumulator which smooths out the boom ride.

A boom limit height switch allows the operator to adjust the ride height of the boom.

The Paralift is also used to raise the boom for folding & lowering the boom onto boom rests when folded in.

Hydraulic Fold

Hydraulic fold allows boom opening and closing to be controlled in the cabin.

Hydraulic phasing cylinders are used to ensure both sides of the boom are synchronised and open and close together so weight distribution is the same on both sides.

As hydraulic fluid enters one hydraulic cylinder, it acts upon the first ram and causes it to move. This motion results in an amount of fluid entering the second hydraulic cylinder which causes it to move an equivalent distance.

Each cylinder has a flow restrictor to control the hydraulic fluid flow rate. This slows down fluid transfer rate allowing the boom to open & close slowly - protecting it from damage.

If the phasing cylinders do not fold together, information on re-phasing the rams can be found in Chapter 11 ‘Troubleshooting’.

Boom Balance

The Delta boom suspension system balances the boom to adopt the same plane as the sprayer chassis.

If one side of the boom is heavier than the other, the boom will tend to hang lower on its heavy side. Therefore both sides must be in balance for the boom ends to be level.

If the boom is not level, a counterweight can be used & placed strategically to compensate for the other end and balance the boom.

Different sized counterweights can be used and/or moved to help balance a boom correctly.

Boom Cables

Boom cables are a critical part of the Delta boom and it is important to ensure that boom cables are correctly adjusted prior to operation.

Loose cables cause outer boom sections to hang out of alignment or to ‘break away’ too easily placing unnecessary stress on boom compoonents which will damage & shorten the their operating life.

Boom Settings & Adjustments

Boom Settings & Adjustments include:

1 Smiling Forward Setting.
2 Tilt Angle Settings.
3 Yaw Tension.
4 Tilt Arm Guide Adjustment.
5 3-Way Tip Breakaway.
6 Boom Folding Alignment.
7 Boom Cable Settings.
8 Stainles Steel Protection Plates.
9 Boom Centre Levelling.
9 Boom Spray Height.

NOTE

It is recommended all relevant adjuster nuts and threads be lubricated prior to making adjustments.

On level ground, engage tractor park brake, chock wheels & place boom in working position before making adjustments.

Before Making Boom Adjustments:

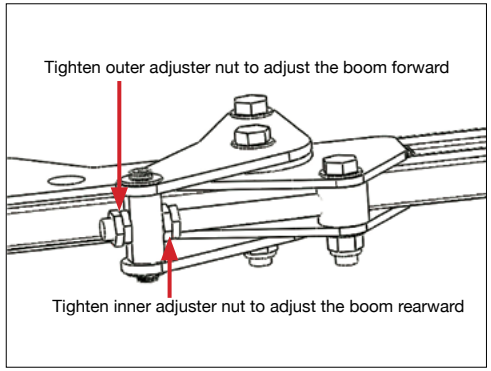
- Park the sprayer on a flat level surface with the tractor park brake engaged & wheels chocked.
- Place the boom in its working (unfolded) position.

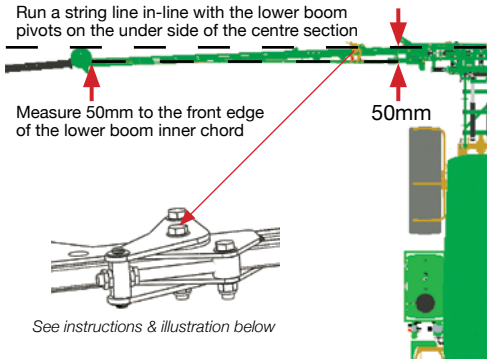
Adjuster bolt used to adjust the 1st boom section forward.

'Smiling Forward' view on a 24m boom.

1 Smiling Forward Setting

Wings of the Delta booms comprise two sections and a breakaway end. The 1st & 2nd sections are adjusted forward at the inner section pivot points.





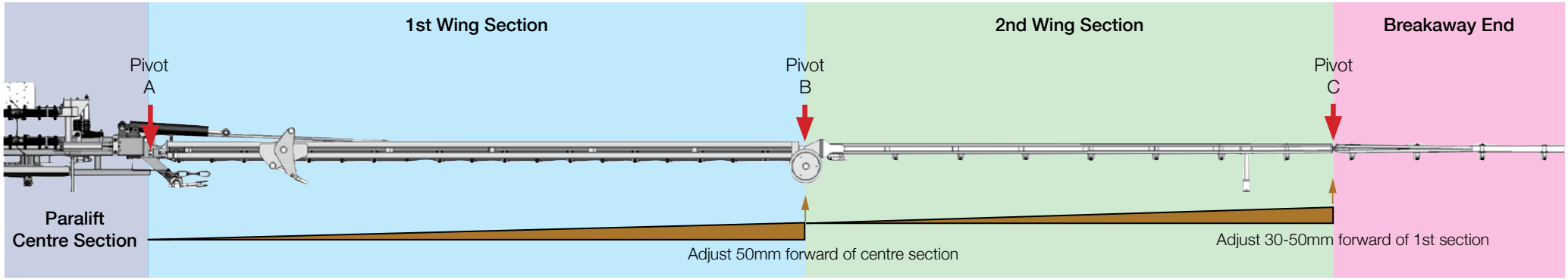
Adjust both 1st boom wing sections forward 50mm.

To Adjust the 1st Wing Sections:

1 Follow the 'Before Making Boom Adjustments' instruction on this page.
2 The 1st wing section adjustment should bring outer end of this 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.
4 To adjust the boom forward, loosen the inner adjuster nut, then tighten the outer adjuster nut.

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.



24 metre Boom: Plan view of right hand side boom wing & the 'Smiling Forward' adjustment points (Pivot A & B).

To adjust the boom rearward, loosen the outer adjuster nut, then tighten the inner adjuster nut.

5 When the 1st boom section 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 2nd Wing Sections:

1 Using a string line is recommended for achieving correct measurements, the 2nd boom sections must be 30-50mm forward of the inner boom sections.

2 Cable adjusters and boom stopper bolts are used to align the outer booms:

- To adjust the outer boom forward, loosen the lock nut and wind-in the boom stopper bolt.

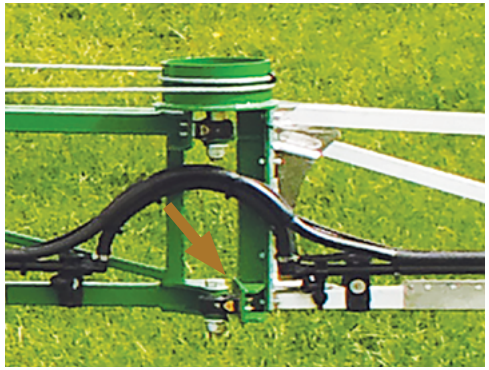
  At the same time, the turnbuckle (connected to the cable damper springs at the front of the boom) must be shortened and the rear pivot connection must be shortened to maintain cable tension.

- To adjust the outer boom rearward, loosen the lock nut and wind-out the boom stopper bolt.

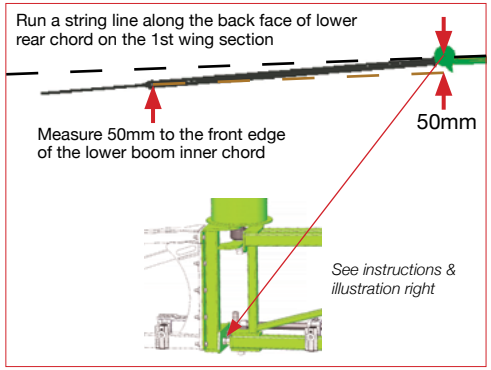
  At the same time, the turnbuckle (connected to the cable damper springs at the front of the boom) must be shortened and rear swivel connection lengthened to maintain cable tension.

After correct alignment has been achieved on both left & right 2nd wing sections, check each cable spring tension is still retains a 3mm gap between coils. If necessary, adjust spring tension by adjusting the turnbuckle tensioners.

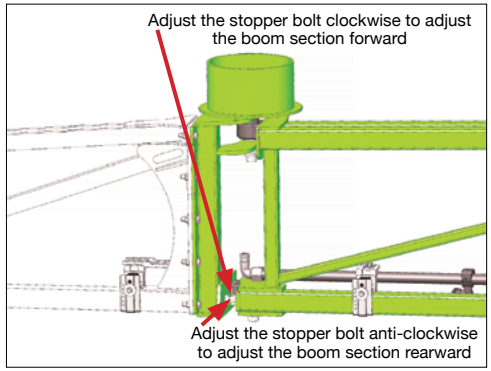
A stopper bolt is used to adjust the 2nd boom section forward.



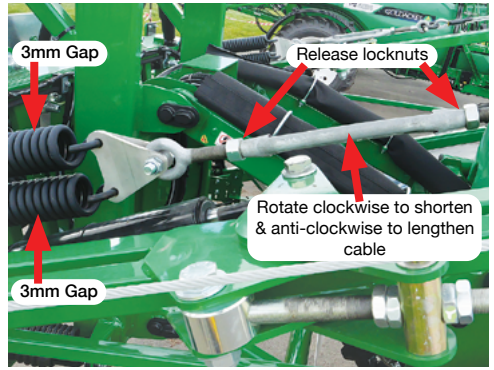
Adjust both 2nd boom wing sections forward 50mm.

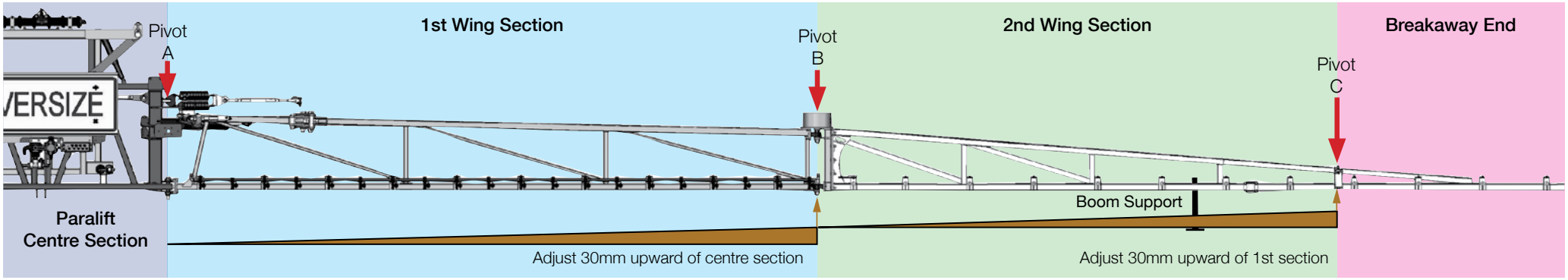


Release the locknut, then adjust the stopper bolt as required to move the 2nd section forward.



Reset cable spring tensions by adjusting the turnbuckle tensioner until there is a 3mm gap between coils.





24 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

The wings of the Delta boom 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 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 to the same height as the centre section or slightly increasing in height from the centre section (to allow for boom stretch).

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 1st Section of RH Wing:

The height of the outer booms in the working position are adjusted by adding or removing shims at the cable drum (Pivot B).

The cable drum mounts are assembled in manufacturing with 6-7 shims at the upper and lower bearing blocks.

If the outer boom hangs lower than the inner boom, remove shims from the upper mount until the booms are level. If the outer boom is too high remove shims from the lower bearing block.

Boom cables may need to be loosened to enable easier removal of the shims.

1 Follow the 'Before Making Boom Adjustments' instruction at the beginning of this chapter.

2 The 1st wing section adjustment brings the outer end of this section 30mm upward of the centre section.

The adjustment is made on the adjustable tilt rod (or optional tilt cylinger if fitted).

Use a horizontal string line and measure the upward incline of the first boom section.

3 If adjustment is required, lower the boom outer wings onto supports.

4 With both left & right booms safely supported, loosen the locknut on the tilt rod adjustment (or optional hydraulic tilt cylinder if fitted). Loosen the locknut, then rotate the cylinder rod using a 1½" spanner:

- Clockwise (inwards) to raise the end of the wing section, or
- Anti-clockwise (outwards) to lower the end of the wing section.

5 Use the hydraulics to raise the boom and remove the supports, then re-check the outer end of the section is 30mm upward of the centre section.

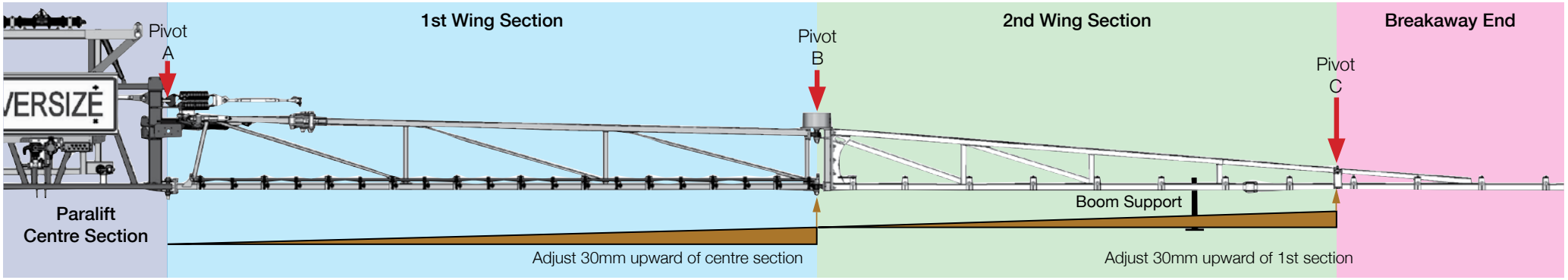
If correct, tighten the locknut.

If further adjustment is required, repeat steps 3-5 until 30mm upward tilt is achieved.

To Adjust 1st Section of LH Wing:

Repeat above procedure for the LH wing.

The 1st section tilt angle of the RH wing is adjusted manually on the RH wing tilt rod or optional wing tilt cylinder.



24 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 2nd Section of RH Wing:

The height of the outer booms in the working position are adjusted by adding or removing shims at the cable drum (Pivot B).

The cable drum mounts are assembled in manufacturing with 6-7 shims at the upper and lower bearing blocks.

If the outer boom hangs lower than the inner boom, remove shims from the upper mount until the booms are level. If the outer boom is too high remove shims from the lower bearing block.

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 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 Raise the boom section and 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.

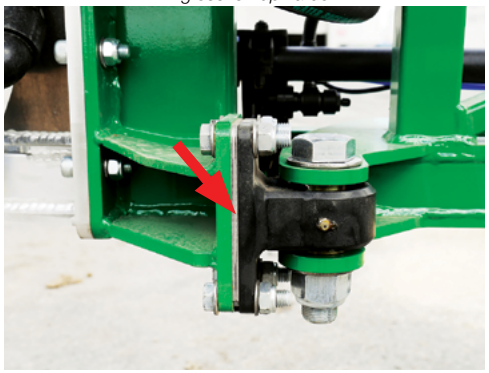
For 18-24m booms: 1 shim added = 5-15 mm change at boom section end.

To Adjust 2nd Section of LH Wing:

Repeat the above procedure for 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.



Springs & dampers (on each side of boom centre section) used to align & control Yaw movement.

3 Yaw Adjustment

The standard fitted boom is set-up parallel to the rear of the sprayer chassis and Boom Yaw is set & dampened by a combination of springs and dampers.

If the springs are not tensioned correctly the boom will be able to yaw excessively and springs may be damaged.

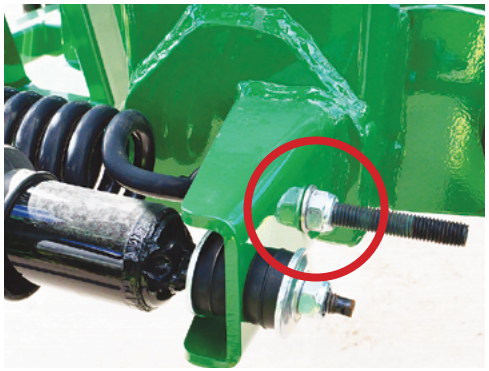
If a spring is damaged, both opposing springs must be replaced at the same time.

To Check & Adjust Yaw Alignment:

1 Measure the length of each damper cylinder (on each side of centre section) - from the front attachment point to rear bolt attachment.

Both should measure the same.

2 Tension the springs to re-set the Yaw tension.



Spring tension adjustment (located each side in the boom centre section) used for Yaw tension.

To Adjust Yaw Tension:

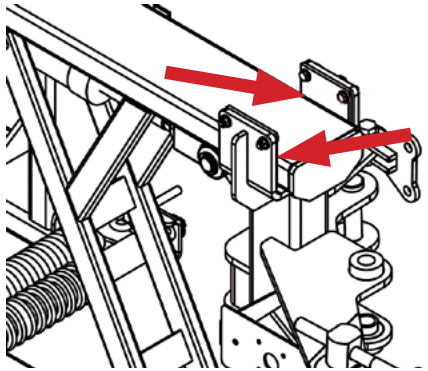
1 Follow the 'Before Making Boom Adjustments' instruction at the beginning of this chapter.

2 Boom yaw is controlled by a pair of springs & dampers located each side in the boom centre section.

3 Adjust Yaw tension by tighting or loosening the springs.

4 Check Yaw tension is the same on both sides of the boom by moving the boom ends by hand.

Check Yaw tension by hand on standard booms.

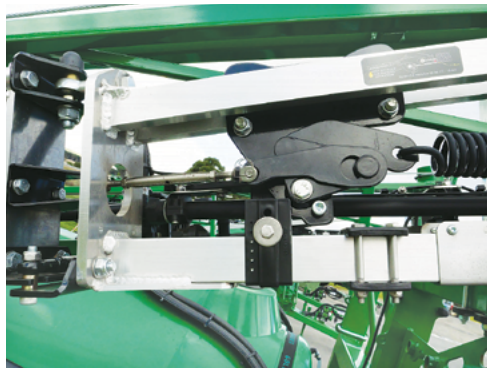


4 Tilt Arm Guides

The tilt arm guide arms are fitted with wear strips.

It is important that these strips are maintained and that the gap between them and the tilt arm is kept between 0-0.5mm either side.

This ensures the tilt arm cannot twist and prolongs its operating life.



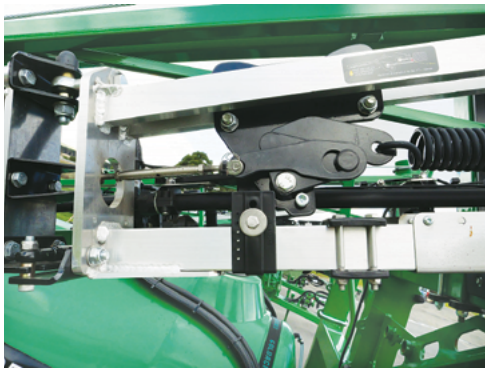
Three Way Tip Breakaway mechanism of the Delta boom.

5 3-Way Tip Breakaway

Each boom wing tip or end incorporates a 3-Way Tip Breakaway mechanism to allow wing tips to break-away:

- Forwards,
- Rearwards and/or
- Upwards
  - minimising potential damage to the boom if striking an obstacle.

It is important the breakaway mechanism is properly adjusted for correct operation - just tightening the spring will not properly facilitate break-away functions).



3-Way wing Tip Breakaway mechanism.

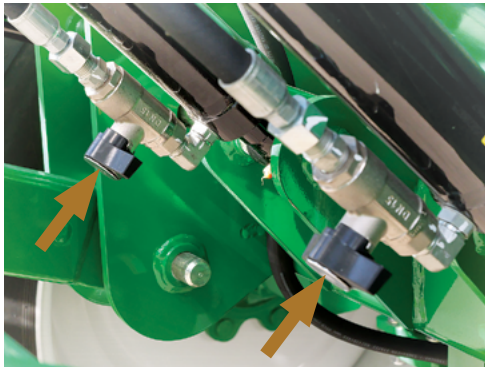
To Adjust 3-Way Tip Breakaways:

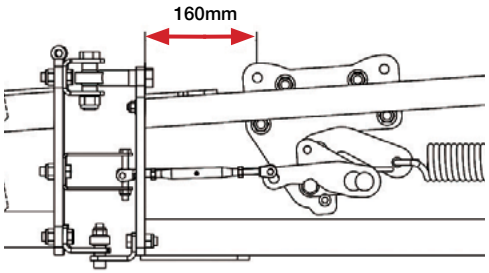
1 Follow the 'Before Making Boom Adjustments' instruction in this chapter.

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.

Close the ball valve on each lift cylinder for safety.





Distance from centre of closest retaining bolt of the boom end plate must be 160mm.

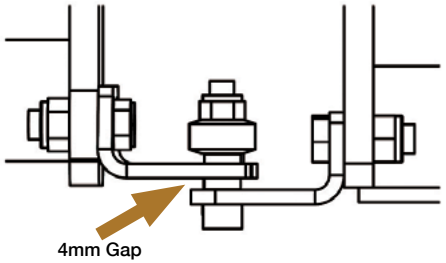
4 The breakaway mechanism mounting plate must be a specific distance from the boom section end plate.

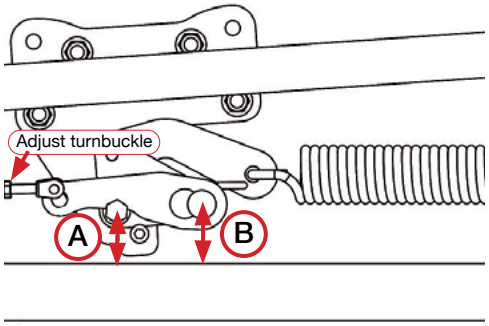
Measure from the centre of the closest mounting plate retaining bolt to the boom section end plate.

This must measure 160mm *(as shown above)*. If not, adjust the mounting plate positon to 160mm.

5 Bottom mounting plates of the boom section must have a 4mm gap between them. Loosen retaining bolts & adjust sliding plates to the 4mm gap.

Adjust the boom section bottom mounting plates to 4mm gap between them.





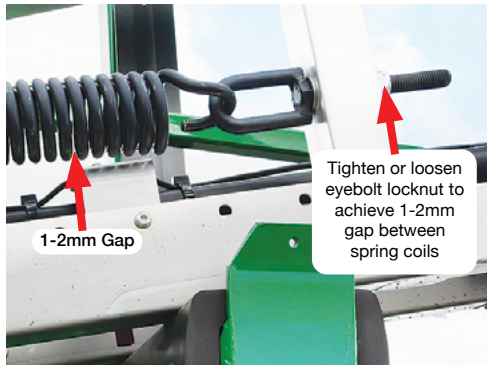
Adjust turnbuckle so Pivot Bolt 'A' & Pivot Bolt 'B' centre to base RHS measurement difference is 17-18mm.

6 The wing tip turnbuckle determines the initial breakaway force required when an object is struck:

- Measure from top of the base RHS to the centre of the Pivot Bolt 'A'.
- Measure from top of the base RHS to the centre of Pivot Point 'B'.
- Subtract measurement 'A' from 'B'. The differnce must be 17-18mm.

If this is less than 17mm, shorten the turnbuckle. If it is greater than 18 mm the turnbuckle must be lengthened.

Rearward & Upward Breakaway.



Tighten or loosen the spring eyebolt locknut to achieve 1-2mm gap between spring coils.

7 The spring tension must be adjusted to a 1-2 mm gap between its coils which applies appropriate resistance for the tip breakaway function.

Adjust spring tension by tightening or loosening the locknut on the spring eyebolt.

Spring tension can be checked by hooking a spring scale onto the boom tip, pulling and measuring the force required for the boom tip to breadaway. It should be about 5 kg force to breakaway.

8 Repeat steps 4-7 for each end of the boom.

Forward & Upward Breakaway.

Regularly lubricate the 3-Way Breakaway mechanism.

Breakaway Mechanism Care

Regularly check both breakaway mechanisms & adjust as required because springs stretch over time & lose tension.

Worn springs should be replaced if there is insufficient tension on the spring to fully return the tip to working position.

Regularly lubricate breakaway mechanisms with oil to ensure smooth & long lasting operation.

Upward Breakaway.

3000 litre Prairie special with 3 point linkage hitch & 24m boom

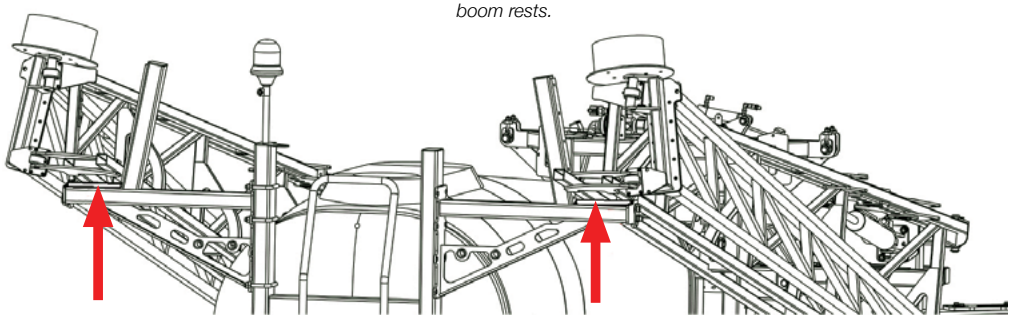
6 Boom Folding Alignment

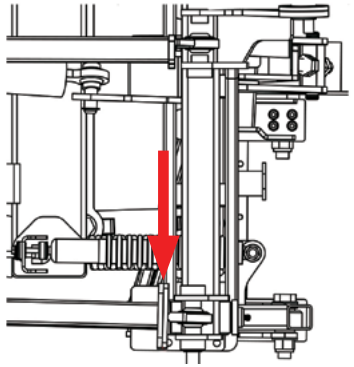
When the boom is folded to transport position, the full weight of the boom must be supported by the inside boom sections. The outside aluminium boom section may sit on the boom rest but must not support any weight.

When the booms are folded up into transport position, the outside boom must saddle onto the inside boom. If not in-alignment, the outer boom will not saddle correctly and will not be supported in transport.

A support saddle bolted to the outside boom, when folded couples onto the inside boom. This saddle must slide onto the inside boom freely to prevent damaging booms.

When folded into transport position, the full weight of the boom must be supported by the inner boom sections resting on the boom rests.





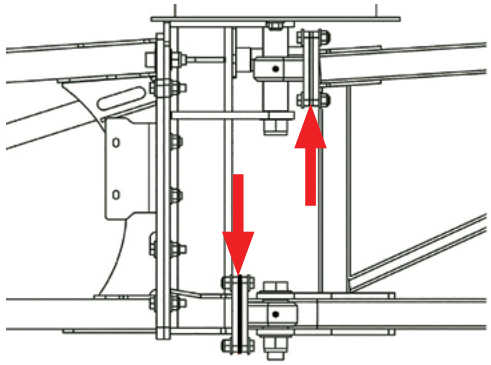
'Diagram A' - Add or subtract shims to the lower pivot point to raise or lower the boom as required.

To Align Inner Booms

If the boom is level in working position but when folded, one side is lower than the other, shims can be added at the lower boom point *(see Diagram A above)*.

Adding shims will raise the boom in folded position. Removing shims will lower the boom in folded position.

If the boom is not level in the working position, the most likely cause is an out-of-balance boom *(refer previous instructions)*



Add or subtract shims to both upper & lower cable drum pivot points to raise or lower support saddles as required.

To Align Outer Booms

With booms folded to transport position, the outside boom sections must saddle onto the inside boom.

Each saddle must slide onto the inside boom freely to prevent damage to the booms.

If an outside boom is not saddled correctly, it will not be supported in transport.

If an outside boom hangs too low when folding, shims must be added to cable drum pivots:

- To raise the outside boom, add shims to both upper & lower pivots to adjust the angle of the pivot axis & the outer boom to fold higher.

  An additional 1mm shim at both upper & lower pivots will raise fold hieght by about 15mm.

- To lower the outside boom, remove shims from both upper & lower pivots to adjust the angle of the pivot axis & the outer boom to lower higher.

  Removal of a 1mm shim at both upper & lower pivots will lower fold hieght by about 15mm.

Turnbuckle cable adjuster used to tension each boom cable.

7 Boom Cable Settings

Boom cables are critical to boom function & cables must be correctly adjusted prior to operation in both:

- Working position &
- Folded position.

Loose boom cables will result in unnecessary stress on the boom, lift & chassis and shorten working life.

Cable tension must be checked & adjusted for:

- Working position cable tension &
- Folded cable tension.

When completed, retighten the locknuts of the cable swivel point adjuster.

Working Position Cable Tension

The cable swivel point adjuster is used to tension the cable and to keep the outer boom aligned in working position.

If a cable is too loose, damage may occur because outer boom sections may hang out-of-alignment or break-away too easily.

To Adjust Working Cable Tension:

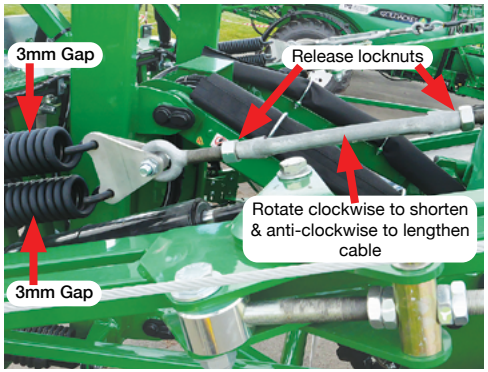
1 Follow the 'Before Making Boom Adjustments' instruction at the beginning of this chapter.

2 Undo the locknuts of the cable swivel point adjuster.

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 swivel point adjuster.



Reset cable spring tensions by adjusting the turnbuckle tensioner until there is a 3mm gap between coils.

6 After correct alignment has been achieved on both left & right 2nd wing sections, check each cable spring tension still retains a 3mm gap between coils.

If necessary, adjust spring tension by adjusting the turnbuckle tensioners

Folded Cable Tension

After making adjustment to working postion cable tension, re-check boom folding for alignment and cable tension.

Fold the boom to re-check boom alignment in the folded position.

Ensure inside boom & outside boom protector plates are correctly for folding & resting on transport boom rests.

8 Stainless Steel Protection Plates

Stainless steel protection plates protect the boom when being folded & when resting in transport position.

It is important to ensure both outer boom rest and inner boom rest protection plates are correctly positioned.

Ensure outside boom saddles slide over inside boom proctection plates for support in folded position.

Loosen the bolt & nut clamping the top centre level support (on the centre section side the boom is low).

9 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 eye 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.

Adjust the Boom Limit Height Setting (located on LHS of the boom centre section) to set minimum boom height.

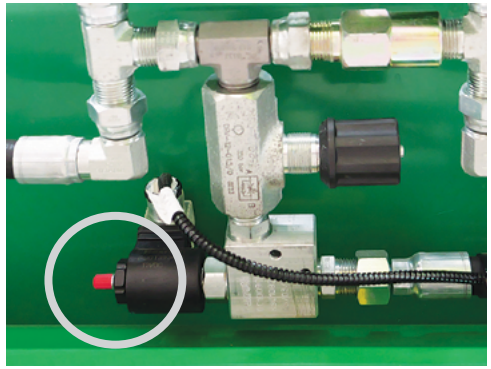
10 Boom Limit Height Setting

The Boom Limit Height Setting allows the operator to set the desired minimum boom height for each operation.

An electric sensor switch incorporated in the Paralift hydraulic circuit automatically controls return to a minimum boom height. The boom will not go lower than this setting.

In the event of an hydraulic dysfunction, the boom can be lowered below the Boom Spray Height Setting by turning the red button on the end of the switch sensor.

Boom Limit Height Setting switch sensor located under the rear of the chassis - use the red button to overide the minimum height setting if hydraulic dysfunction occurs.



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.

⚠CAUTION

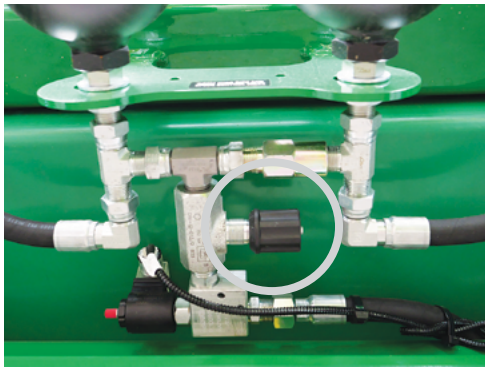
If an outer boom arm contacts the boom stop too early and too much tension is placed on the cable, then the hydraulic cylinder may fail to bring both arms all the way in or damage the boom arm and cable.

⚠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.



Hydraulic Speed Valve located under the rear of the chassis near the gas accumulators

11 Speed Control Valve

The Hydraulic Speed Control Valve (located under the rear chassis near the gas accumulators) is used to control the speed of lowering the boom only.

The valve is factory preset and mostly needs no adjustment.

However, if boom lowering speed requires adjustment:

- Turn the valve anti-clockwise to increase speed
- Turn the valve clockwise to decrease speed.

NOTE

Booms must not be folded, or unfolded, while the sprayer is moving. When the boom is between fully open and fully closed , there can be large stresses placed on many boom components.

If the sprayer is moving and hits a bump, severe damage to the boom can occur.

NOTE

Booms must be folded continuously without stopping and starting during it folding sequences.

Take care not to fold/unfold booms too fast, as damage can be caused.

⚠ DANGER

Always check for power lines while folding and unfolding the boom, as contact with lines can be fatal.

Regularly do the routine checks on the Prairie Special while stationary.

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 diaphragm pump oil level (if fitted).

- 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.

Check hydraulic & spray operating pressures.

Running Checks

The following should be routinely done while the Prairie Special is in operation:

- Check all light functions
- 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

Inspect sprayer axle & wheel magnets.

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’.

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.

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 wheel retaining nuts frequently - wheel nuts should be checked to ensure 320 ft/lb is maintained
- Check tightness of axle retaining bolts frequently - on both sides of the sprayer.

Check pump oil level.

2 Fluids & Lubrication

Check:

- Pump oil level
- For hydraulic system leaks.

Grease:

- Tilt arm pivot pins
- Cable drum pivot bearings
- PTO shaft (if fitted) universal joints.

Check the tank restraining straps - front (shown above).

3 Tank Retaining Straps

- Check tank retaining straps & bolts to ensure they are not loose. Tighten if loose.

Check pump & other mounting bolts.

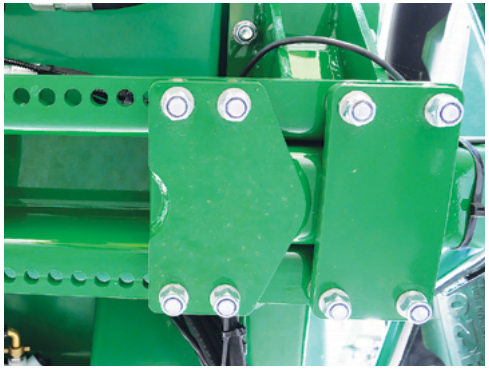
4 Pump Mounting Bolts

- Check pump mounting & other mounting bolts to ensure they are not loose.

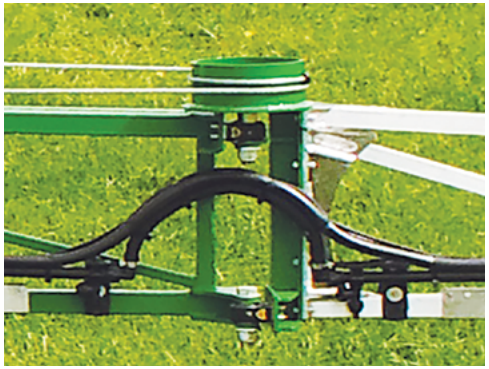
5 Lights

- Check lights on the sprayer for correct function.

During the first 8 hours of operation, check axle retaining bolts & nuts frequently - until plates are fully imbedded.



Grease the cable drum pivot bearings



Check the tank restraining straps & bolts - rear (shown below).

⚠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'.

Maintenance Schedule - First 50 Hours

Chassis	50 Hours
Tow Eye Bolts	Check
Pull Mounting bolts	Check
Tank Retaining Straps	Check

Pumps	50 Hours
Pump - Zeta 140 & Zeta 170	Check
Pump - Oil	Check
Pump - Speed RPM	Check
Pump PTO Shaft (inside safety cover)	Grease

Booms	50 Hours
Boom Alignment	Check
Boom Level	Check
Breakaway Hinge Mechanism	Lubricate
Boom Plumbing	Inspect
3D Breakaway Adjusment	Check
Boom Lower Limit	Check
Cable Adjuster pivots	Grease (25 hrs)
Boom Lifting Cylinders	Grease
Paralift Arm Rose Ends	Grease
Aluminium Outer Boom Bolts	Check
3D Breakaway adjusment	Check

Hydraulics	50 Hours
Hydraulic Hose Leaks	Inspect
Hydraulic Cylinders Leaks	Inspect
Hydraulic Manifold Leaks	Inspect

Wheels & Axles	50 Hours
Tyre Pressures	Check
Wheel Nuts	Check
Axle Retaining Bolts	Check
Wheel bearings	Grease

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
Pull						
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 (Mechanical)	x	x	Grease	Grease	Grease	Grease
Chassis						
Ladder Bolts	x	x	Inspect	Inspect	Inspect	Inspect
H-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
Pump - Zeta 140 & Zeta 170						
Pump - Oil	Inspect	Inspect	Replace	Replace	Replace	Replace
Pump - Diaphragms	Inspect	Inspect	Inspect	Inspect	Inspect	Replace
Pump - Check Valves	Inspect	Inspect	Inspect	Inspect	Inspect	Replace
Pump - Seals	Inspect	Inspect	Inspect	Inspect	Inspect	Replace
Pump - Drive Motor Shaft	x	x	Lubricate	Lubricate	Lubricate	Lubricate

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 1Year
Tyre Pressures	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Wheel Nuts	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Wheel Bearings	Inspect	Grease (25 hrs)	Grease	Grease	Grease	Clean & Re-grease
Wheel Bearing Sideways Movement	x	Inspect	Inspect	Inspect	Inspect	Inspect
Axle Retaining Bolts	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Axle Bearing Cap Bolts	x	Inspect	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

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
Paralift Arm Rose Ends	x	Grease	Grease	Grease	Grease	Grease
Paralift Cylinders	x	Grease	Grease	Grease	Grease	Grease
Delta Links on Centre Section	x	Grease	Grease	Grease	Grease	Grease
Boom lower limit	x	Inspect	Inspect	Inspect	Inspect	Inspect
Fold Cylinder Adjuster Threads	x	Inspect	Inspect	Inspect	Inspect	Inspect
Tilt Cylinder Bearing	x	Inspect	Inspect	Inspect	Inspect	Inspect
Cable Adjuster Pivots	x	Grease (25 hrs)	Grease (25 hrs)	Grease (25 hrs)	Grease (25 hrs)	Grease (25 hrs)
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	x	Inspect	Inspect	Inspect	Inspect	Inspect
Aluminium Outer Boom Bolts	x	Inspect	Inspect	Inspect	Inspect	Inspect

Service Parts

Filters		
Part Number	**Description**	**Quantity Required**
GA5077394	Filter Screen, 80 Mesh, SS & Polypropylene	1
GA5077395	Filter Screen, 100 Mesh, SS & Polypropylene	1
GA5076780	Filter Screen 50 mesh, 1½" Suction	1

Lubricants			
Product:	**Part Number**	**Description**	**Volume Required**
Pump, Zeta 170	GA5012457	Oil, SAE 15W40 - 20L Drum	2.68L
Grease Nipples	GA5078604	Grease, General Purpose, SKF, 400g	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
- In storage, 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 pressure manifold.

Service Instructions

Maintenance & Service instructions follow.

Pressure Relief Valve

The Pressure Relief Valve setting determines maximum available spray delivery pressure & provides relief if pressure exceeds its pre-set value.

Altering or adjusting the valve will affect the pressure at which the relief valve comes into operation. The factory pre-set pressure is 690 kPa (110 psi) & mostly requires little alteration.

To Check or Alter Pressure Relief Setting:

1 Stop the pump and loosen the valve lock nut, then unscrew the valve counter clockwise until it is right out.

2 Close all control manifold ball valves so that all flow passes through the relief valve.

3 Close the bypass valve (yellow handle).

4 Run the pump at maximum operating speed (540 RPM) and slowly turn the relief valve clockwise until desire pressure is achieved.

5 Tighten the valve lock nut to maintain the setting.

If the relief setting is too low, excessive flow through bypass back to the Main tank will occur and limit maximum spraying pressures.

If set too high, it may cause damage to system componest from excessive pressure.

Chock opposite wheel of the sprayer before raising the other wheel off the ground.

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.

⚠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.

5 Use a rated jack to lift the sprayer.

6 Remove wheel as per instructions.

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.

⚠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.

Recommended wheel nut torque tension is 320 ft/lb.

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:

- 70 Series = 8 to 12 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 preload specified in step 19.

Tighten or loosen the axle nut to achieve the 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 proceddure 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.

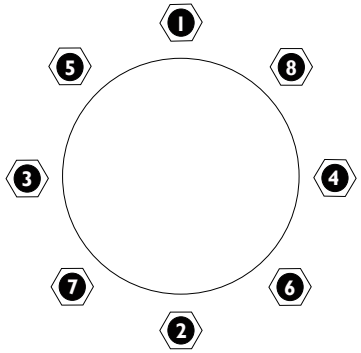
Empty the spray tank if possible before lifting the machine.

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.

Regularly check tyre pressure and wheel nut tension.



Follow this tightening sequence to ensure even wheel nut torque distribution (320 ft/lb).

Tyre Size	Load Index	Model (L)	Recommended Pressure @ (kPa/PSI)
14.9 x 24		2500	138 / 20
420/85R34		3000	200 / 29
540/65R x 28		2500 3000	138 / 20 165 / 24
380/90R x 46		2500	138 / 20
380/90R x 46		3000	138 / 20

See Chapter 1, 'Important Information' for full details of tyre options & recommended tyre pressures for the Prairie Special.

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.

10 Remove all wheel nuts & remove wheel from sprayer.

Be careful the wheel does not fall on anyone or cause bodily harm.

It us recommended to use a forklift and slings for safety when changing wheels.

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.

It us recommended to use a forklift and slings for safety when changing wheels.

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 after emptying the first tank load.

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.

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 done at approx 50 hours. Wheel nut tension specification on the Prairie Special wheels is 320 ft/lb.

⚠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

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.

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.

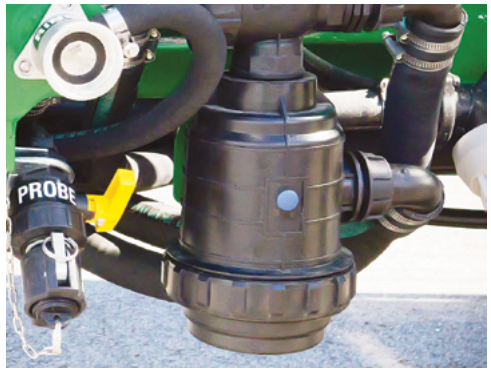
Always safely unfold & lower the boom before attempting to unscrew and service filters.

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 Filter located right hand side of the Pressure Manifold.

Rotate the 'Three-way Red Handle' ball valve (top of filter)' to Off position to close-off any liquid from the Main Tank.

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:

To Remove & Clean Suction Filter:

1 Ensure the Product Pump is Off.

2 Rotate the 'Three-way Red Handle' ball valve (top of the suction filter)' to Off position to isolate liquid coming from the Main 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 Unscrew the filter bowl collar, then remove the collar & filter bowl.

Be aware some residual chemical will dribble out.

Be careful not to damage the O-Rings.

6 After removing the filter collar & 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.

9 Rotate the 'Three-way Red Handle' ball valve (top of the suction filter)' to the positon required.

⚠CAUTION

Read and heed the chemical label warnings regarding PPE before cleaning any filter.

Unscrew and remove the end caps from each filter and allow liquid to drain out.

Loosen filter bowls slowly. Be aware some residual liquids may dribble out.

Thoroughly clean & corrosion protect the Prairie Special for storage for long trouble free operation.

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.

To Remove & Clean the Pressure Filters:

1 Ensure the Product Pump is Off.

2 Rotate the 'Three-way Red Handle ball valve (top of the suction filter)' to Off position to isolate liquid coming from the Main Tank.

3 Unscrew and remove the end caps from each filter and allow the liquid to drain.

4 Loosen the filter bowls slowly.

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 Refit and tighten the end caps of each filter.

8 Fully tighten the filter bowl.

9 Rotate the 'Three-way Red Handle' ball valve (top of the suction filter)' to the positon 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.

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 Quick Fill frame mounting bolts.

11 Wheel nuts.

12 Axle 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.

End boom section lubrication points.

Boom Lubrication

Refer to 'Grease Points' shown on the following pages.

Grease Points

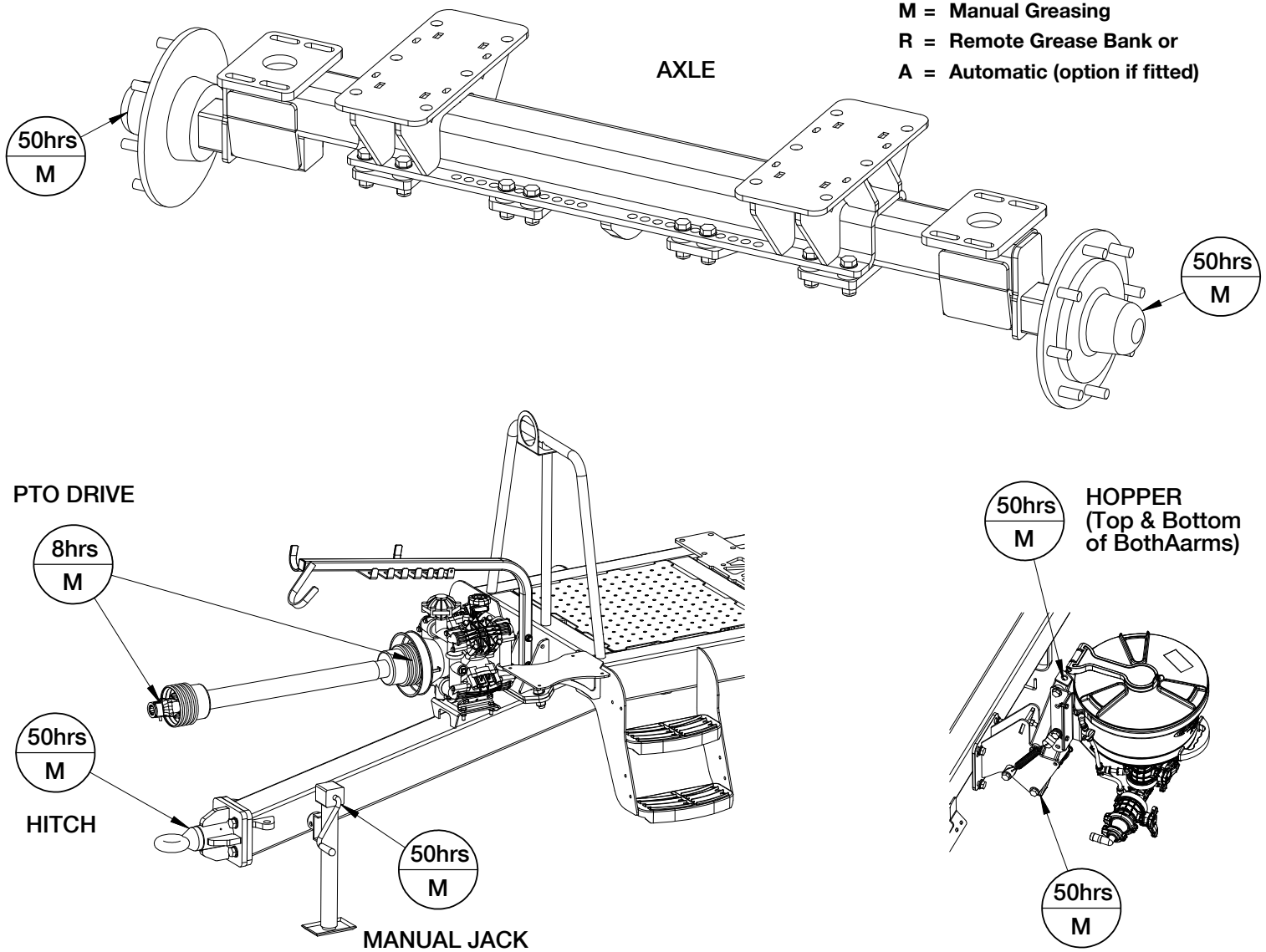
The location & greasing schedules of the Prairie Special grease nipples are shown in the following pages & illustrations:

1 Chassis Grease Points
2 Paralift Grease Points
3 Boom Centre Grease Points
4 Wing Section Grease Points

Boom grease points.

1 Chassis & Hopper Grease Points

Lubrication Legend:
M = Manual Greasing
R = Remote Grease Bank or
A = Automatic (option if fitted)

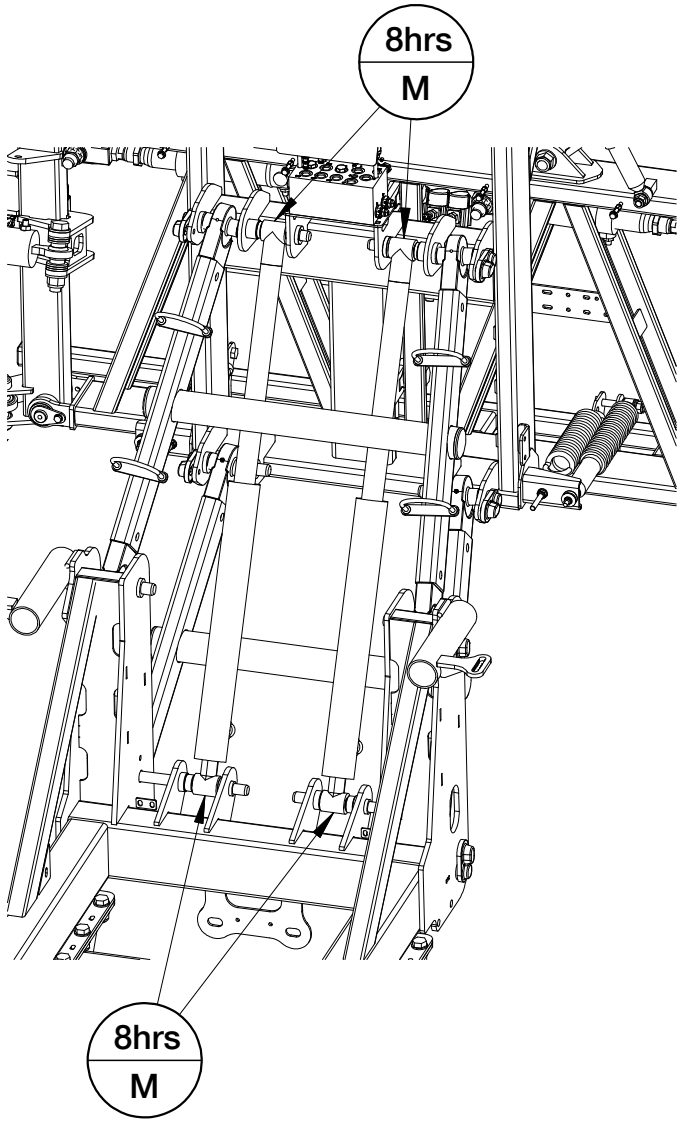


LUBRICATION SCHEDULE - PRAIRIE SPECIAL 3000 litre

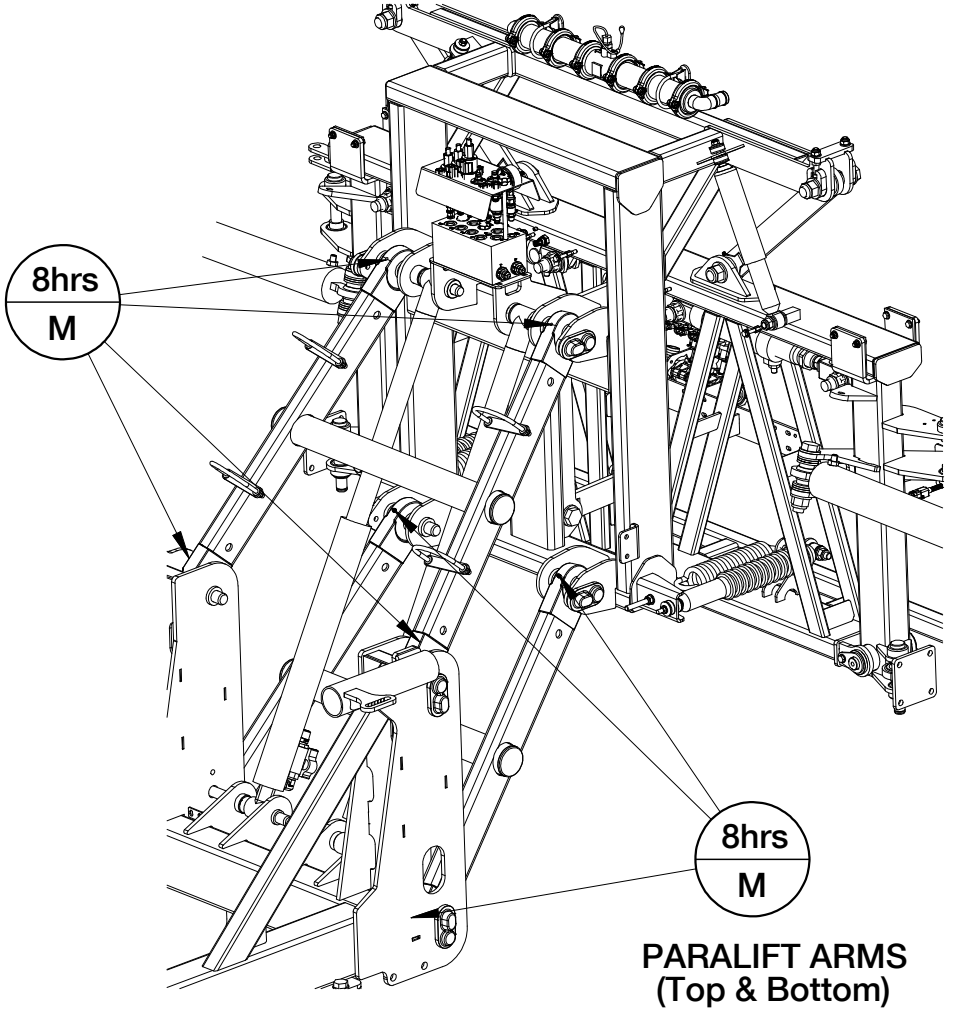
2 Paralift Grease Points

Lubrication Legend:

M = Manual Greasing
R = Remote Grease Bank or
A = Automatic (option if fitted)



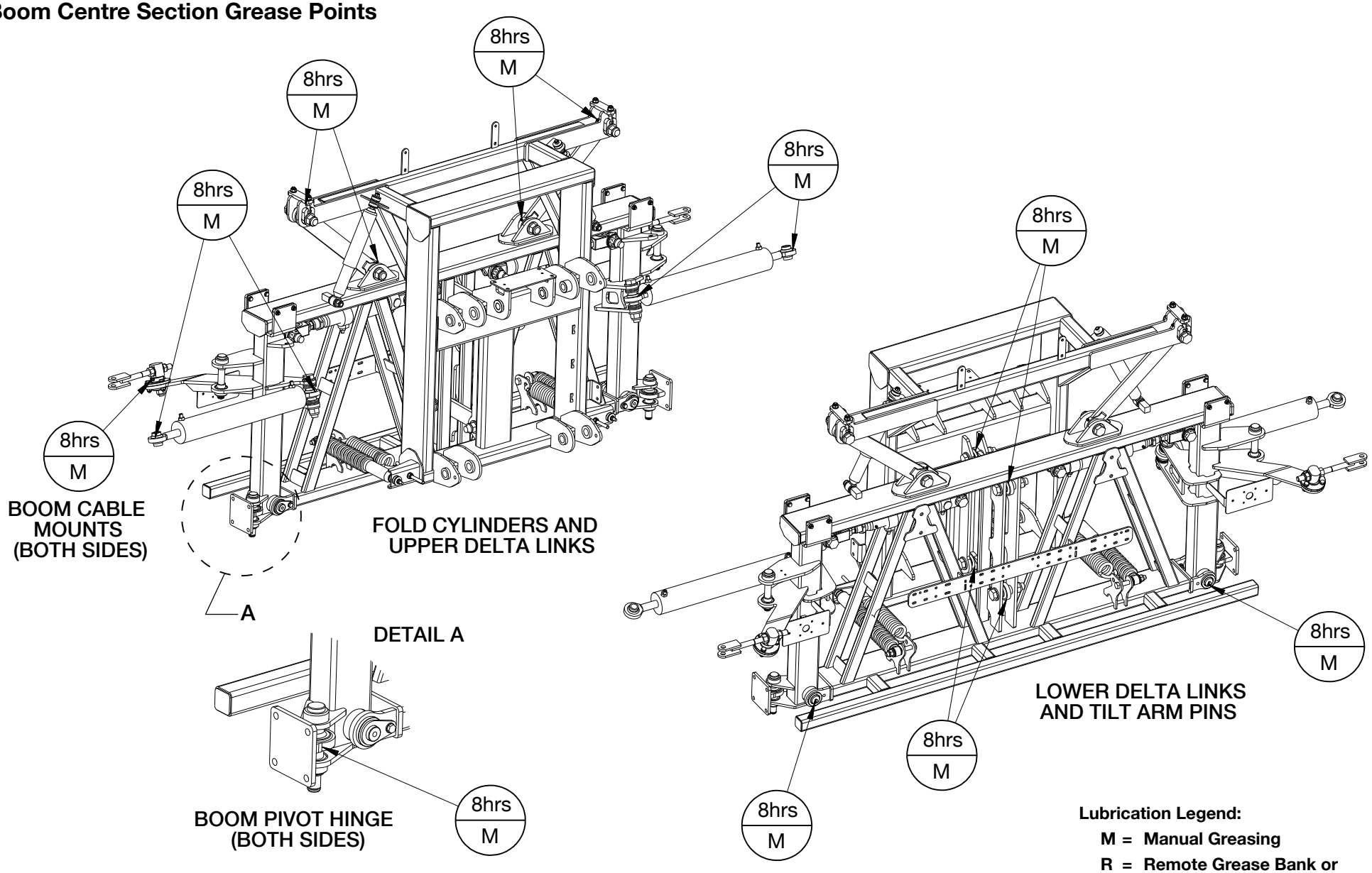
LIFT CYLINDERS



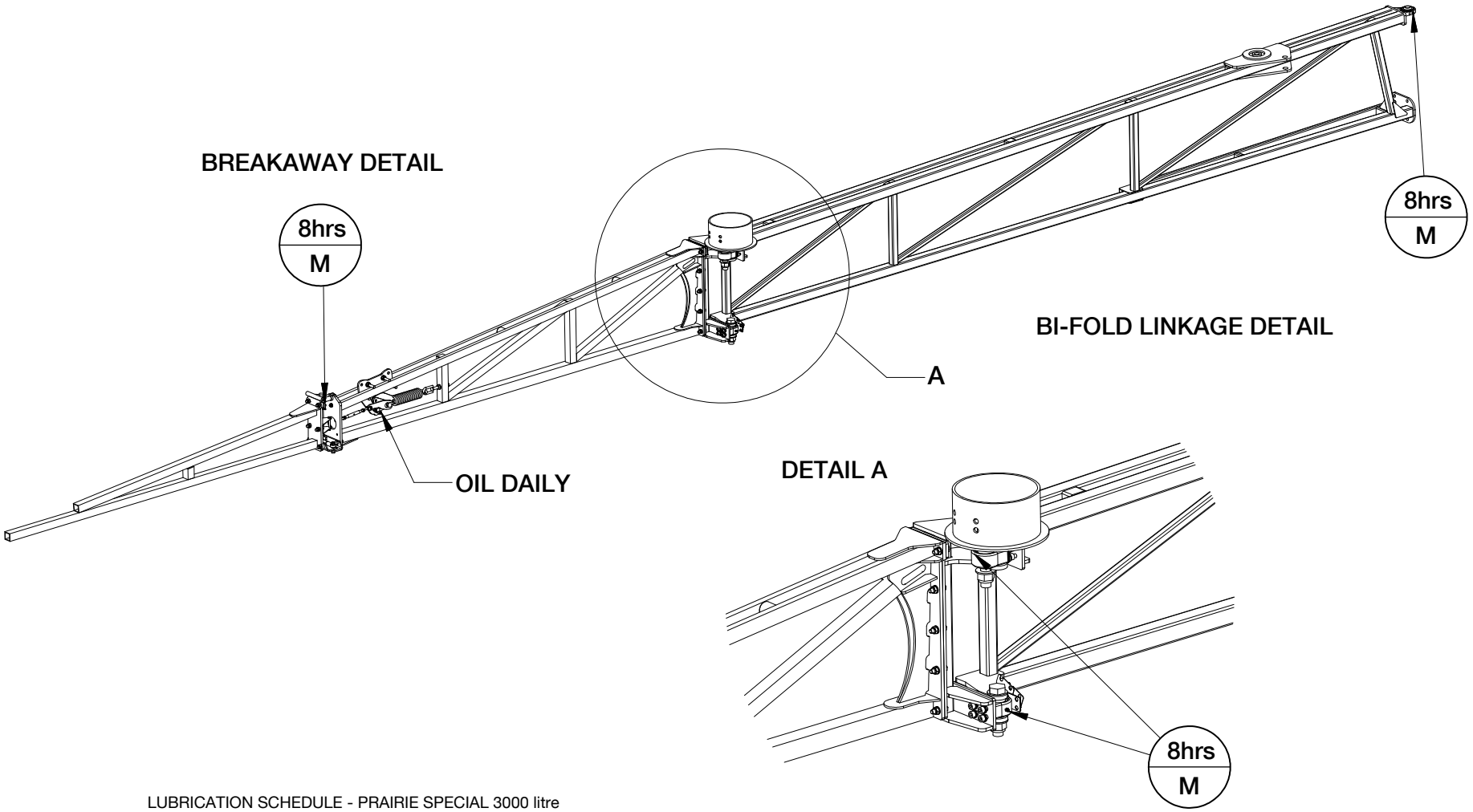
PARALIFT ARMS
(Top & Bottom)

LUBRICATION SCHEDULE - PRAIRIE SPECIAL 3000 litre

3 Boom Centre Section Grease Points



4 Wing Section Grease Points



LUBRICATION SCHEDULE - PRAIRIE SPECIAL 3000 litre

Lubrication Legend:

M = Manual Greasing
R = Remote Grease Bank or
A = Automatic (option if fitted)

Ground Drive ‘SPEED CAL’ Calibration

Ground Drive ‘SPEED CAL’ is the rolling circumference of the sprayer’s sensor wheel. Accurate ‘SPEED CAL’ value requires measuring the circumference of the wheel as it rolls across the ground.

It is recommended ‘SPEED CAL’ calibration procedure is done after all sprayer systems installation is completed. This calibration is critical to the Controller’s spraying accuracy.

Calibration should be done with similar soil conditions to intended spraying conditions because rolling wheel circumference varies with changing soil conditions & sprayer loading, eg, soft soil versus hard-packed soil or full tank versus near empty tank.

To Calibrate Ground Drive ‘SPEED CAL’:

1 Half fill the spray tank with water to provide an average wheel diameter between full & empty loading

2 Place a chalk mark or tape on the tyre with the speed sensor.

3 Mark the spot on the ground directly below the chalk mark or tape.

4 Drive the machine straight ahead, counting 10 full revolutions of the speed sensor wheel on soils typical of those to be encountered for spraying.

5 Stop at exactly at 10 full revolutions - the chalk mark or tape perpendicular to the ground at the bottom of the tyre (as it was at the start).

6 Measure the distance (cm) from the ground starting mark to the stopping mark. Round off fractions of a cm.

7 Write down the measured distance, then convert this to decimeters for the speed ‘Speed Cal’ value (1 metre = 10 decimeters).

8 Calculate the ‘Speed Cal’ value to be used for presetting the Controller.

For example: Distance measured 32m = 3200cm divide by 10 = 320 decimeters.

Refer to “Chapter 4 Setting Up” to enter the speed calibration value in cm.

Wheel speed sensor & magnets are fitted to the right hand side sprayer wheel.

Wheel Speed Sensor

A wheel speed sensor & magnets are fitted to the right hand side wheel of the sprayer to measure wheel rotation & calculate travel speed.

One north & south pole magnet is required to pass the sensor to give a pulse reading.

Four magnets (2 x North pole [red] & 2 South pole [black]) are fitted to the sensor wheel.

The sensor must be mounted between 12mm & 19mm from the face of the magnet to receive a reading & magnets must pass directly through the centre of the sensor face.

The speed calibration figure on the Contoller indicates a measurement of the circumference of the wheel as it rolls across the ground.

The wheel speed sensor detects when the wheel completes one revolution and the distance the wheel travels is used to calculate the Speed reading in km/hr.

If a ground speed display reading is incorrect, then calibration & sensor condition must be checked (refer to Chapter 9 ‘Troubleshooting’).

NOTE

It is recommended to record & maintain tyre pressure and to check ‘SPEED’ CAL at beginning of each season and make changes necessary to the preset value in the Controller because of varying seasonal & soil conditions, tyre wear, etc.

NOTE

For the Racen SCS 450 Controller with 4 wheel magnets (2 red and 2 black) - use the measured distance converted to decimeters for the speed CAL entry (1 metre = 10 decimeters).

NOTE

Large tyres & very low speed applications may require additional magnets to ensure accurate speed readings. Any even number of magnets may be used as long as they alternate in color & are equally spaced. After calculating the ‘SPEED CAL’ value, the number must be adjusted according to the actual number of magnets used.

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 & online.

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
	Restricted Flow	Blocked suction or pressure filters.

Spray Pump - Diaphragm cont.

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.

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

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)

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
The drawbar of the sprayer has become noisy and loose	Worn, or missing, plastic insert in towing eye	Replace plastic insert

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/power harness.
		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.

Flow Control Valve Override

To Override the Flow Control Valve:

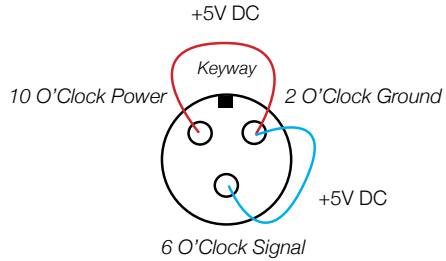
1 Remove electric motor from three way fast close valve, and manually rotate valve until desired spraying pressure is achieved.

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.



Voltage Readings:

2 o'clock - 6 O'clock (+5V DC)

10 o'clock - 2 O'clock (+5V DC).

Cable connector test points.

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.

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.

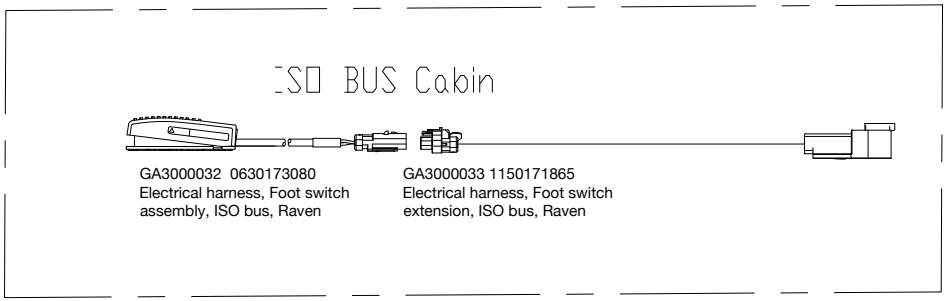
Universal Terminal (Raven CR7)

PROBLEM	ACTION
1 Rate reads "0."	• Verify SPEED is registering accurately. If SPEED is zero, refer to the VT display troubleshooting procedure in the Raven ISOBUS Product Control Installation & Operation Manual. • Verify TOTAL VOLUME is registering flow. If not, refer to problem 6.
2 Rate inaccurate or unstable.	• 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. • In MAN (manual) operation, verify that RATE display holds constant. If not, refer to problem 7. • Confirm that boom section status shown on the display is not changing. • In MAN (manual) operation, check low end and high end pressure range. If pressure cannot be adjusted manually, refer to problem 6.
3 Cannot verify rate in manual operation or in auto.	• Check cabling to motorized control valve for breaks. • Check connections in cabling for cleanliness. • 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. • Verify that valve is turning, if not, replace control valve.
4 Sprayer pressure is correct but RATE is low.	• Verify that nozzle strainer screens or check nozzles are not plugged. • Verify that pressure at each boom is the same. • Verify all nozzles are of proper and same orifice size. See Chapter 5, Calculating the Calibration Values.
5 Total volume does not register.	• 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 & Operation Manual for details. • 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. • Replace flow meter transducer/encoder.
6 Total volume registers flow inaccurately.	• Verify that arrow on flow meter is pointing in direction of flow.
7 Motorised control valve rotates more than 1/4 turn.	• Replace motorised control valve.
8 Water inside cover of motorized control valve.	• Replace isolation flange assembly and coupler shaft. • Replace entire motorized control valve if PC board or motor is corroded and will not run.
9 Boom valve(s) will not operate.	• Check cable for wires with breaks. • Check connectors for cleanliness. • Check BOOM switch and MASTER switch for operation. • Replace boom valves.
10 System does not enable in 'Liquid Applicator' or 'NH3 Applicator' mode.	• 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 & Operation Manual for details.
11 Boost pump pressure (AccuFlow HP systems) does not increase or reach target pressure.	• Refer to AccuFlow and AccuFlow HP Installation and Operation manual for boost pump troubleshooting procedures. • Verify that the pressure cal is calibrated correctly and the correct and the correct target pressure is entered. • The low limit pressure is not set correctly for operating conditions. The low limit will shut down the system if the limit is reached.

Standard Three Way Solenoid Electric Control.

Optional In-cab Raven SCS 450 Controller.

OPTIONAL FOOT SWITCH SUIT RCM



Optional Foot Switch schematic.

Control Systems

The Prairie Special 2500 & 3000 litre models are fitted standard with Three Way Solenoid Electric Controls.

The Optional Raven PC1 ISO Bus system operates with all leading spray controllers, steering & mapping providers using the ISO Bus protocol.

Each tractor & sprayer will vary according to its size and options fitted.

Illustrations & pictures used in this manual are representive 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’.

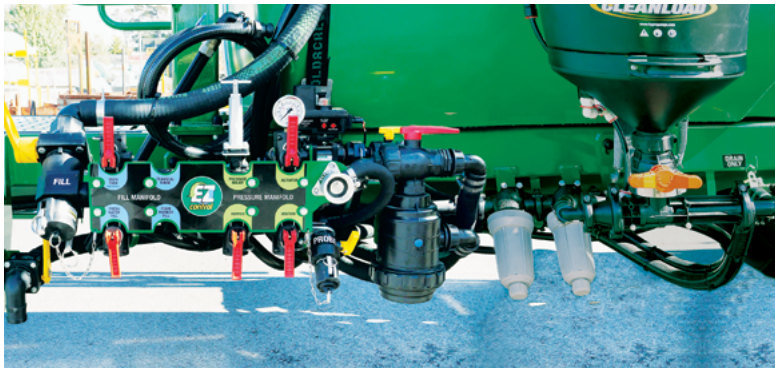
This chapter includes infomation in the liquid applicaiton system, fuses, schematic drawings and layouts of systems & options used with the Prairie Special as follows:

- Liquid Application System
- Fuses
- Standard 3-Way Solenoid Controls
- Cabin Hydraulic Electrical Harness
- Raven PC1 ISO BUS & Options
- Hydraulic Schematics
- Boom Plumbing Assembly - 24m 5 Section
- Plumbing Schematic for Diaphragm Pump - 2500L
- Plumbing Schematic for Diaphragm Pump - 3000L.

Optional In-Cabin Raven CR7 Controller.

Optional Raven PC1 ISO BUS Control Centre located on the sprayer chassis.

Optional Master On/Off Foot Switch.



EZ Control Filling & Cleaning Centre.

Liquid Application System

The Liquid Application System comprises liquid & chemical:

- EZ Control Filling & Cleaning Centre
- Spraying system

EZ Contol Filling & Cleaning Centre

Filling & Cleaning functions of the Prairie Special are primarily controlled at the EZ Control Filling & Cleaning Centre on the left hand side of the sprayer.

Refer to chapter 6 ‘Operation - Ready to Spray’ for operating details.

Spraying System

Optimum droplet sizing, pressure, nozzle flow rate and spray uniformity across the boom width are all critical to accurate chemical application.

All Spraying application functions of the Prairie Special are controlled and monitored through the intergrated SCS 450 or ISO BUS control options. Refer to chapter 6 ‘Operation - Ready to Spray’ for operation details.

Primary components include:

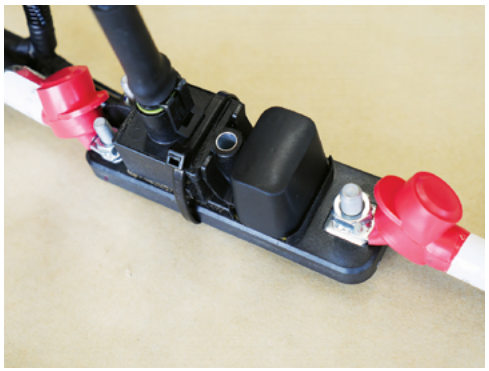
- Spray pump, filters & valves
- Spray pump & liquid controls
- Boom sections
- Speed control.

Hydraulically driven diaphragm pump.

Spray Pumps

The Prairie Special is optioned with diaphragm spray pumps:

- Zeta 140 l/min diaphragm pump on 2500L models
- Zeta 140 l/min or 170 l/min diaphragm pump on 3000L models.



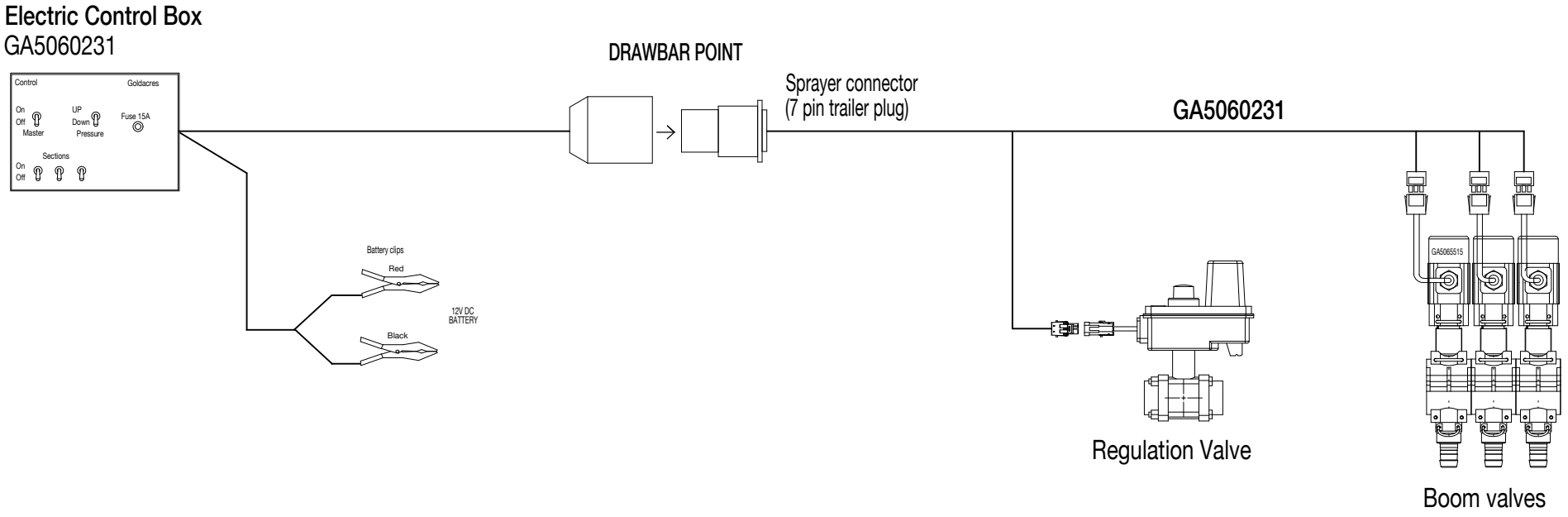
The main power fuse of the Prairie Special electrical system is fitted near the tractor battery.

Fuses

The main power fuse protecting the Prairie Special electrical system is fitted near the tractor battery.

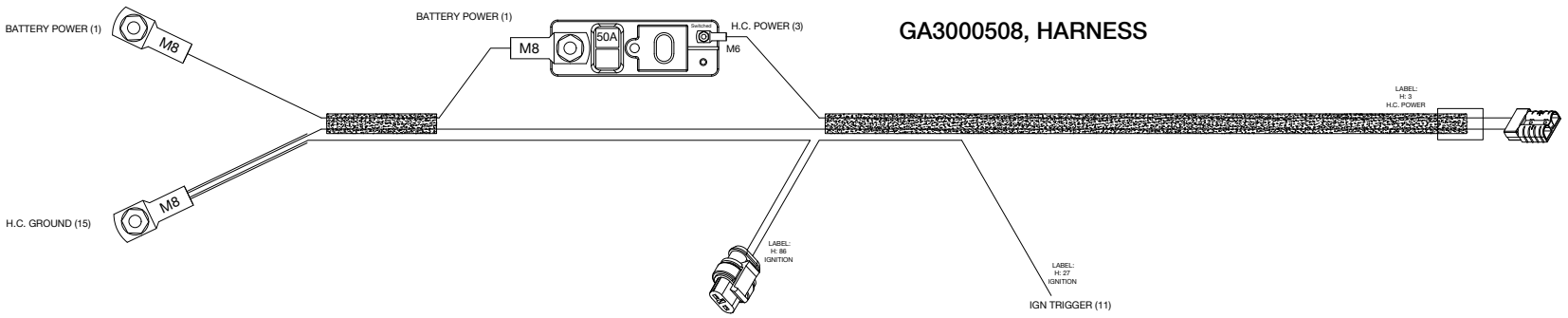
The main fuse of the electrical system with cover removed.

3-Way Solenoid Control Option

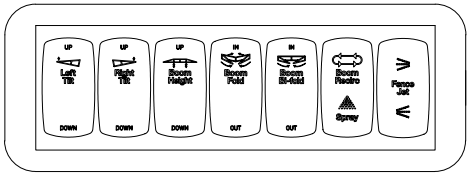


DRG NO: GA7500032

Cabin Hydraulic Electrical Harness Option



GA4903721, SWITCH BOX SUIT BASIC 3PL SPECIAL



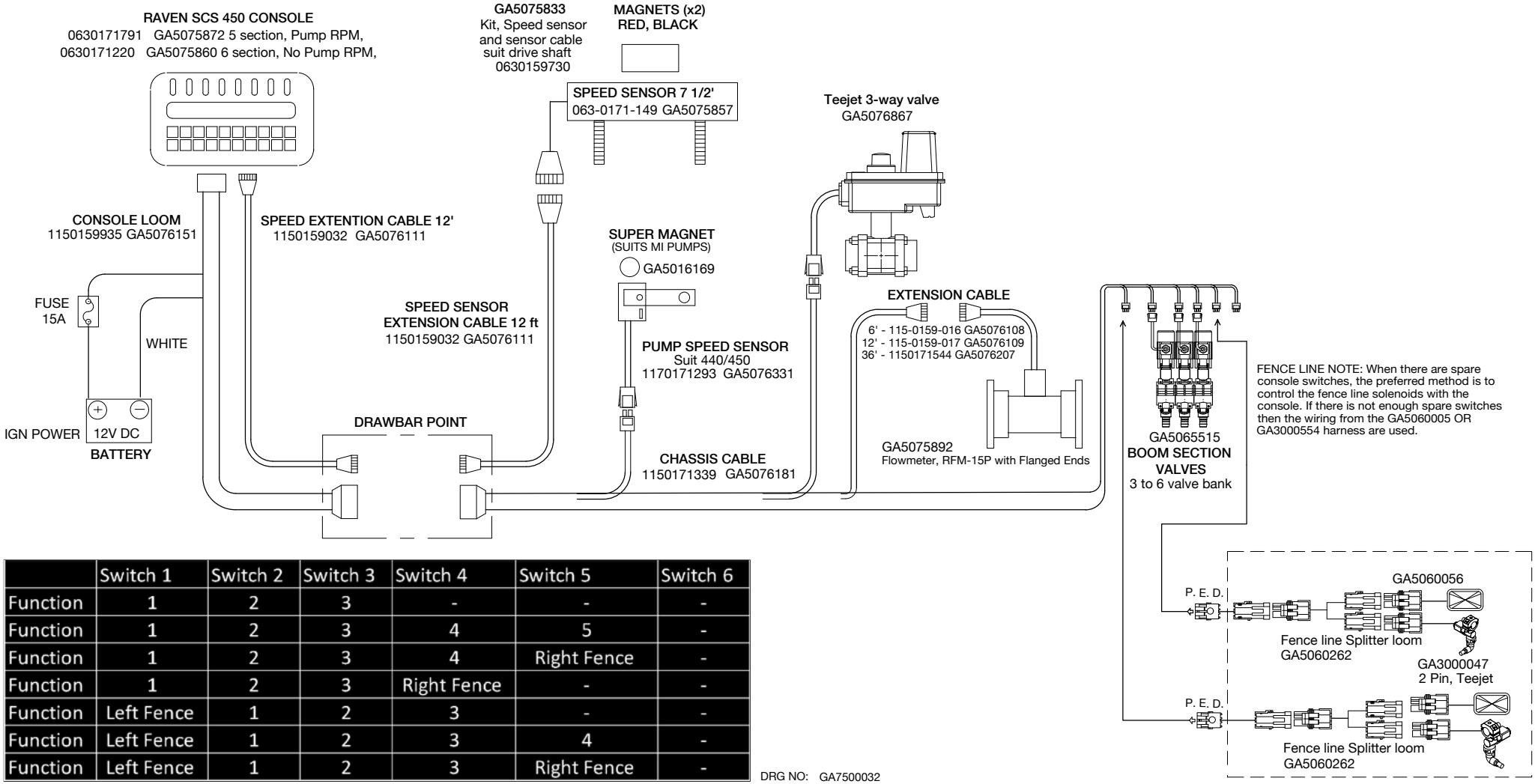
GA3000505, HARNESS

GA3000505-1, HARNESS

DRG NO: GA7500032

Raven SCS 450 Option

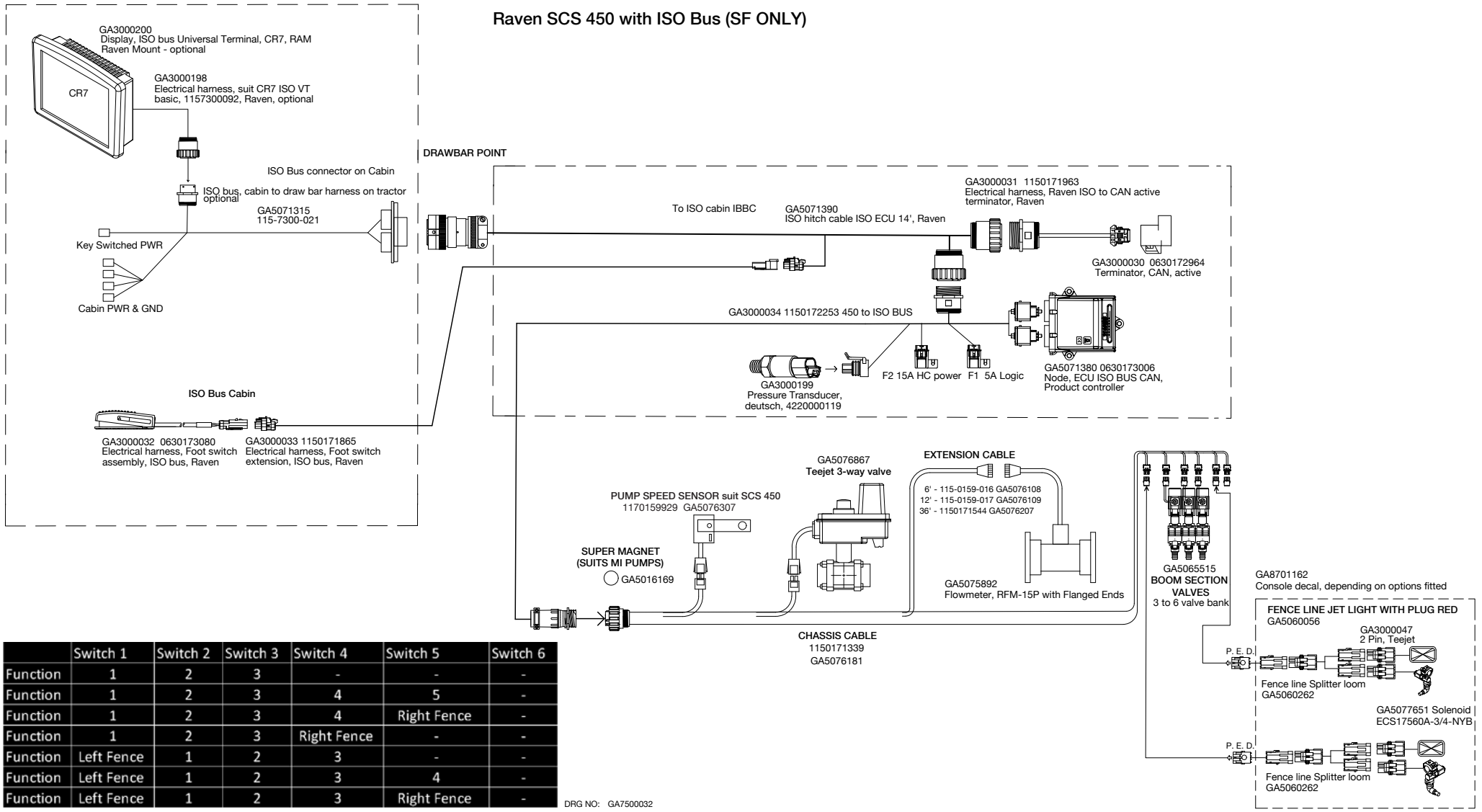
Raven SCS 450 (SF ONLY)



	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6
Function	1	2	3	-	-	-
Function	1	2	3	4	5	-
Function	1	2	3	4	Right Fence	-
Function	1	2	3	Right Fence	-	-
Function	Left Fence	1	2	3	-	-
Function	Left Fence	1	2	3	4	-
Function	Left Fence	1	2	3	Right Fence	-

DRG NO: GA7500032

Raven PC1 ISO BUS Option

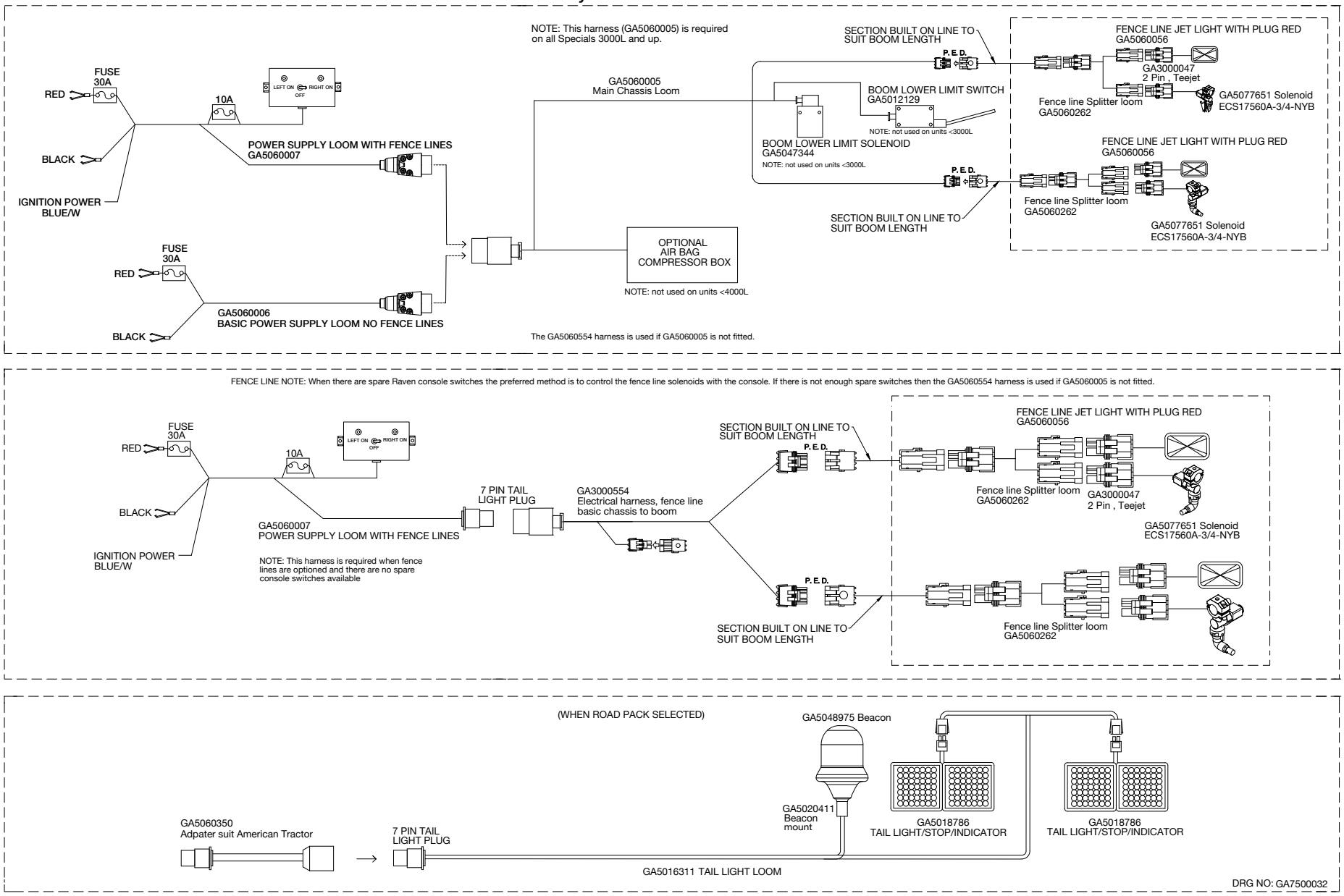


	Switch 1	Switch 2	Switch 3	Switch 4	Switch 5	Switch 6
Function	1	2	3	-	-	-
Function	1	2	3	4	5	-
Function	1	2	3	4	Right Fence	-
Function	1	2	3	Right Fence	-	-
Function	Left Fence	1	2	3	-	-
Function	Left Fence	1	2	3	4	-
Function	Left Fence	1	2	3	Right Fence	-

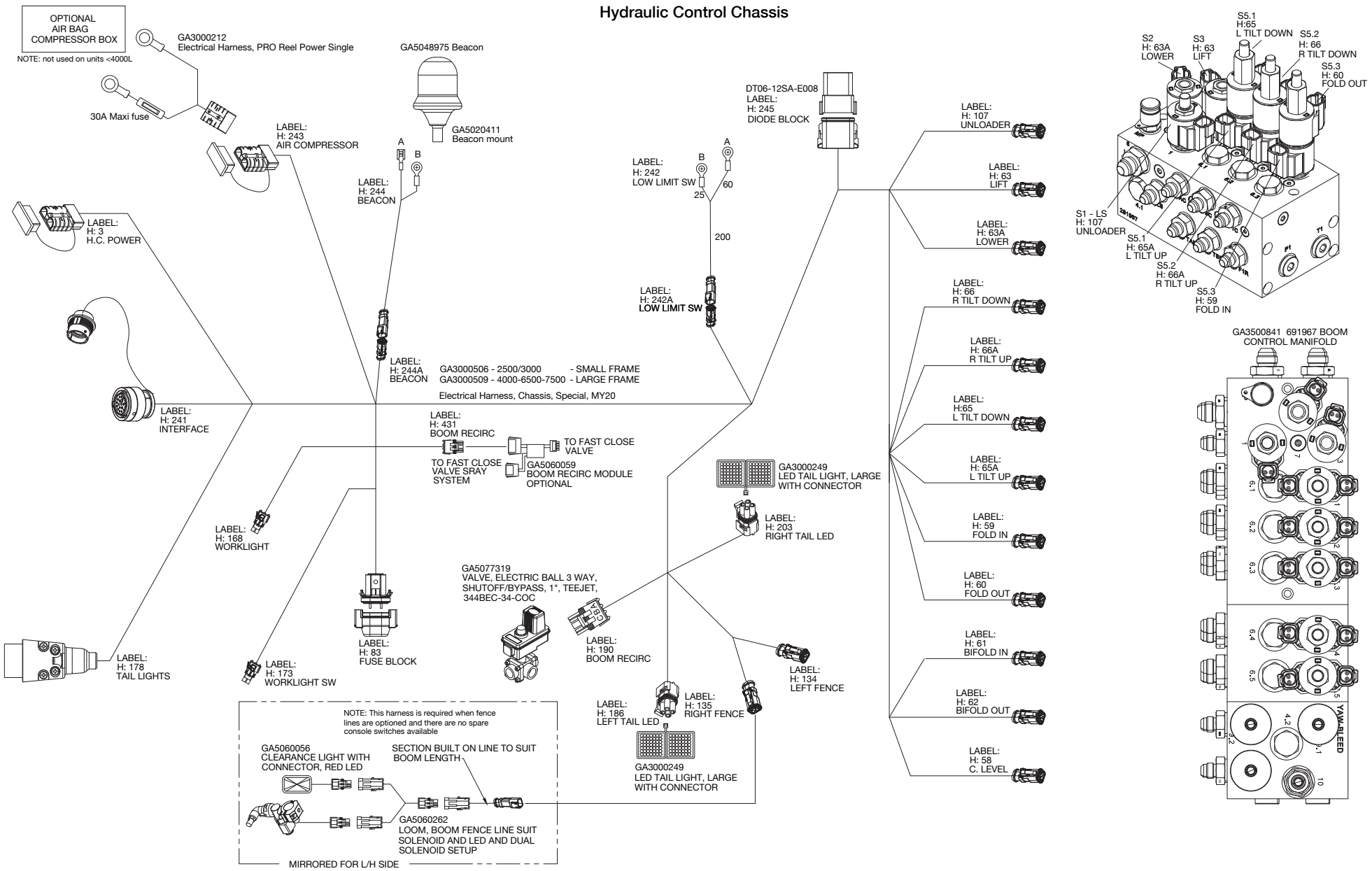
DRG NO: GA7500032

Non Hydraulic Chassis Options

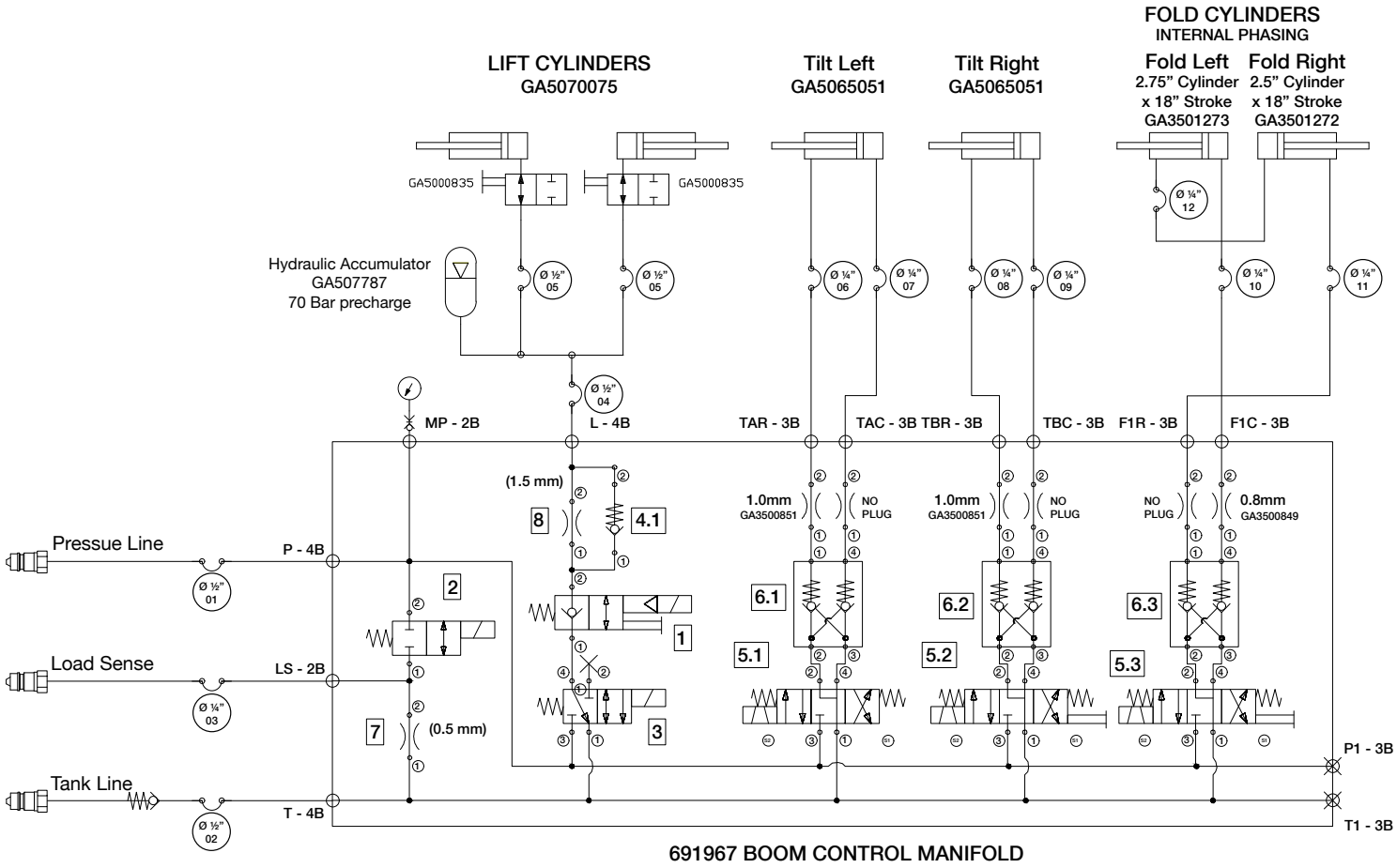
Non Hydraulic Chassis

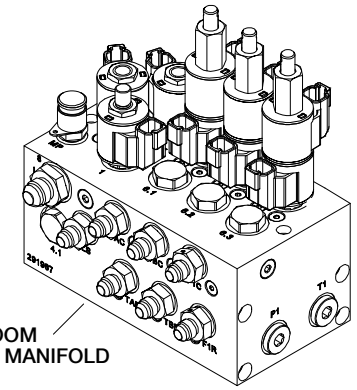


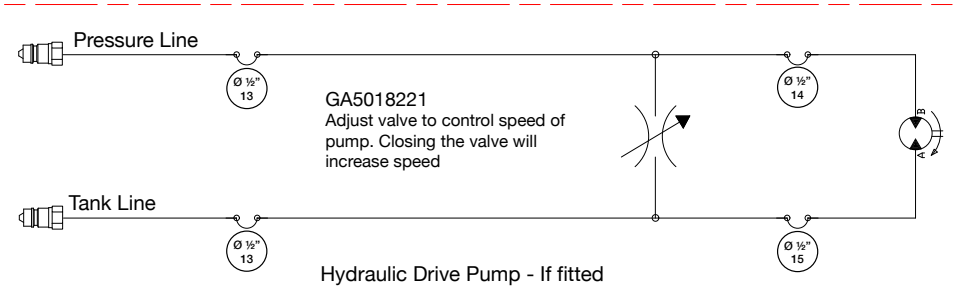
Hydraulic Control Chassis Options



Boom Hydraulic Option - 2500L Electric over Hydraulics





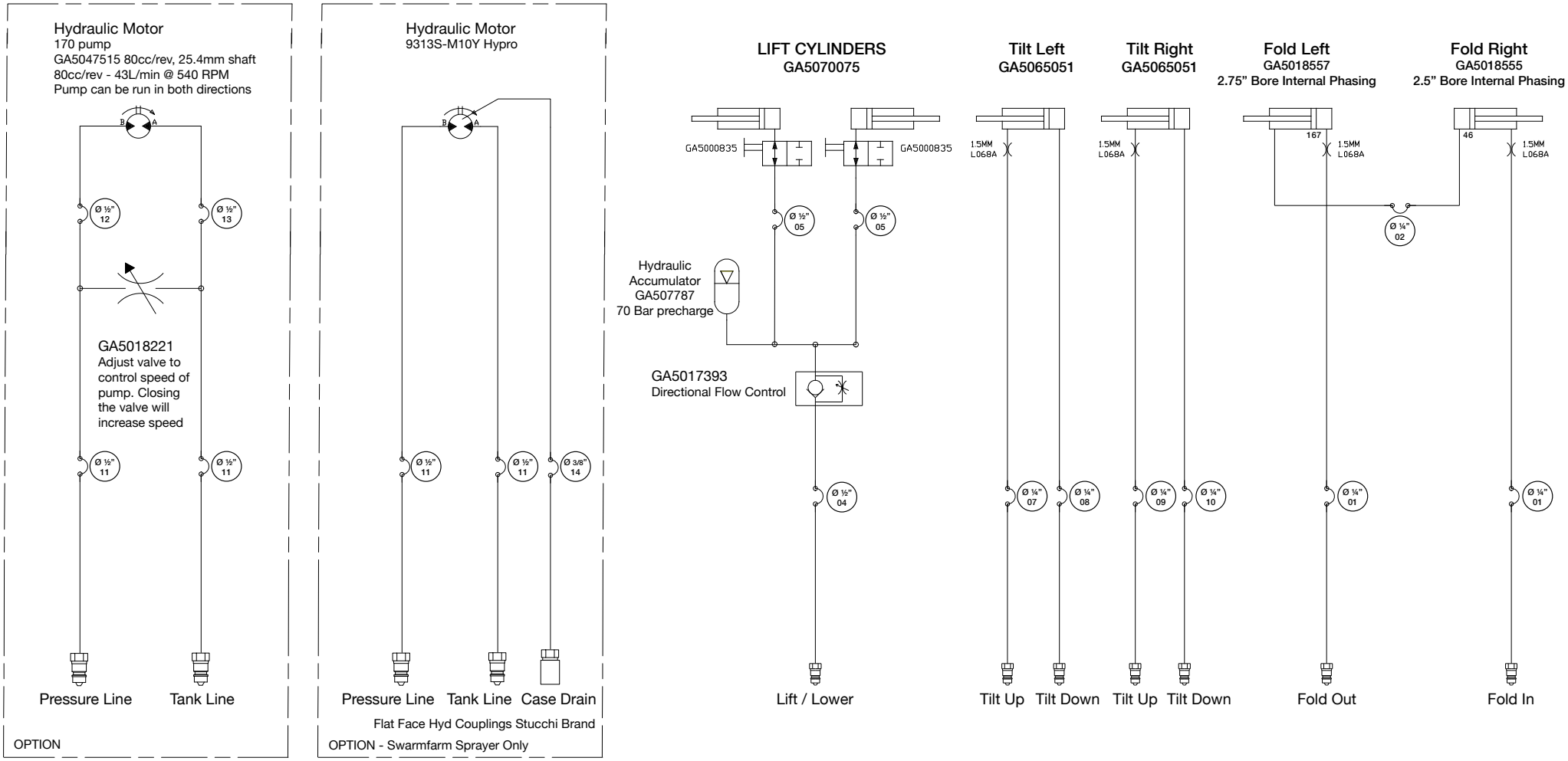


Hydraulic Motor
170 & 260 pump
GA5047515 80cc/rev, 25.4mm shaft
300 & 320 pump
GA5020210 80cc/rev, 25mm shaft
80cc/rev - 43L/min @ 540 RPM
Pump can be run in both directions

Drawing No: GA7500047

2500L Hydraulic Hoses - Electric Over Hydraulic							
Hose No	**Hose Dia**	**Hose Length**	**End 1 (& orientation if reqd)**		**End 2 (& orientation if reqd)**		**Description**
01	1/2”	8000mm	GA3500411	T2050-0808 (90 Deg)	GA3500399	T2020-0808 (Straight)	PRESSURE - MANIFOLD TO PULL
02	1/2”	8000mm	GA3500426	T2270-0808 (45Deg)	GA3500399	T2020-0808 (Straight)	TANK - MANIFOLD TO PULL
03	1/4”	8000mm	GA3500397	T2020-0404 (Straight)	GA3500397	T2020-0404 (Straight)	LS - MANIFOLD TO PULL
04	1/2”	2570mm	GA3500399	T2020-0808 (Straight)	GA3500399	T2020-0808 (Straight)	MANIFOLD TO ACCUMULATOR TEE
05	1/2”	1300mm (x2)	GA3500399	T2020-0808 (Straight)	GA3500411	T2050-0808 (90 Deg)	ACCUMULATOR TEE TO LIFT CYLINDERS
06	1/4”	1140mm	GA3500399	T2020-0404 (Straight)	GA3500408	T2050-0808 (90 Deg)	TAR - MANIFOLD TO LEFT TILT CYLINDER ROD
07	1/4”	945mm	GA3500411	T2020-0404 (Straight)	GA3500425	T2270-0404 (45Deg)	TAC - MANIFOLD TO LEFT TILT CYLINDER
08	1/4”	1315mm	GA3500397	T2020-0404 (Straight)		T2050-0808 (90 Deg)	TBR - MANIFOLD TO RIGHT TILT CYLINDER ROD
09	1/4”	945mm	GA3500397	T2020-0404 (Straight)	GA3500425	T2270-0404 (45Deg)	TBC - MANIFOLD TO RIGHT TILT CYLINDER
10	1/4”	1505mm	GA3500397	T2020-0404 (Straight)	GA3500408	T2050-0404 (90Deg)	F1C - MANIFOLD TO LEFT FOLD CYLINDER
11	1/4”	1850mm	GA3500397	T2020-0404 (Straight)	GA3500408	T2050-0404 (90Deg)	F1R - MANIFOLD TO RIGHT FOLD CYLINDER ROD
12	1/4”	3080mm	GA3500397	T2050-0404 (90Deg)	GA3500408	T2050-0404 (90Deg)	LEFT FOLD CYLINDER ROD TO RIGHT FOLD CYLINDER
13	1/2”	3990mm (x2)	GA3500426	T2050-0404 (90Deg)	GA3500399	T2020-0808 (Straight)	PRESSURE / TANK TO SPRAY PUMP ADJUST VALVE
14	1/2”	540mm	GA3500399	T2020-0808 (Straight)	GA3500399	T2020-0808 (Straight)	SPRAY PUMP ADJUST VALVE TO PUMP MOTOR
15	1/2”	560mm	GA3500399	T2020-0808 (Straight)	GA3500399	T2020-0808 (Straight)	SPRAY PUMP ADJUST VALVE TO PUMP MOTOR

Boom Hydraulic Option - 2500L with Tractor Remotes



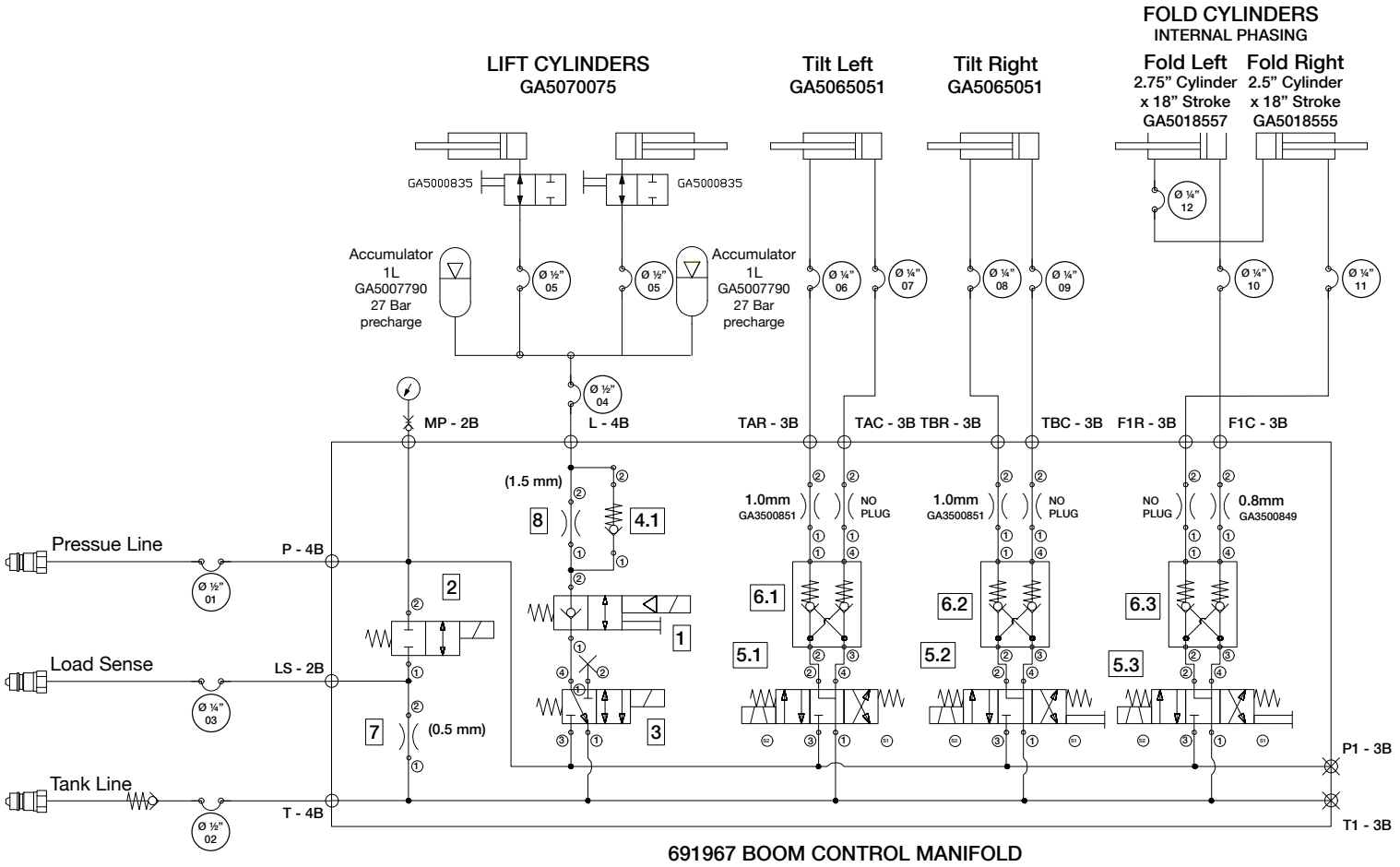
Hydraulic Drive Pump If Fitted

Drawing No: GA7500047

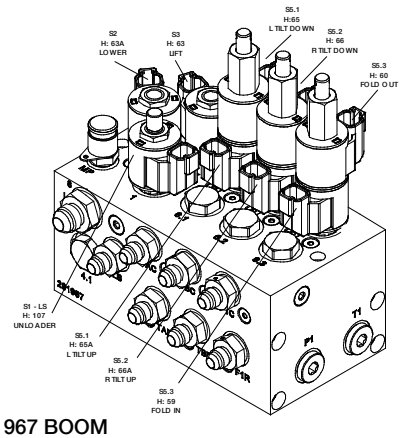
2500L Hydraulic Hoses - Tractor Remotes

Hose No.	Hose Length	End 1 (& orientation if reqd)	End 2 (& orientation if reqd)	Description
Tilt to suit 2500L Special				
01	10500mm (2R)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to R Fold cylinders
02	10500mm (1R)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to L Fold cylinders
03	3080mm	90Deg (T205-0404)	90Deg (T205-0404)	Fold cylinder to fold cylinder
04	7000mm	Straight (T202-0808)	Straight (T202-0808) *fitted on line	Tractor to Accumulator
05	1300mm(1B+1R)	90Deg (T205-0404)	Straight (T202-0404)	Accumulator to Right lift cylinder
06	1220mm(2B+1R)	90Deg (T205-0404)	Straight (T202-0404)	Accumulator to Left lift cylinder
Tilt to suit 2500L Special				
07	9000mm (1Y)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to Left Tilt cylinders
08	9000mm (2Y)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to Left Tilt cylinders
09	9000mm (1Blue)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to Right Tilt cylinders
10	9000mm (2Blue)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to Right Tilt cylinders
Hydraulic Driven Spray Pump ZETA 170				
11	4000mm ( ) x2	90 Deg (T226-0808)	Straight (T201-0808)	Spray Pump
12	340mm ( )	45 deg (T227-0808)	Straight (T201-0808)	Spray Pump
13	420mm ( )	Straight (T202-0808)	Straight (T201-0808)	Spray Pump
Hydraulic Driven Spray Pump ZETA 140				
11	4000mm ( ) x2	90 Deg (T205-0808)	Straight (T201-0808) *fitted on line	Spray Pump
12	340mm ( )	90 Deg (T205-0808)	Straight (T202-0808)	Spray Pump
13	420mm ( )	90 Deg (T226-0808)	Straight (T202-0808)	Spray Pump
Hydraulic Driven Spray Pump Hypro 9313S-M10Y used for SwarmFarm Sprayer				
11	3500mm ( ) x2	90 Deg (T205-0808)		Spray Pump Pressure and Return
14	3500mm ( )	90 Deg (T205-0606)		Spray Pump Case Drain

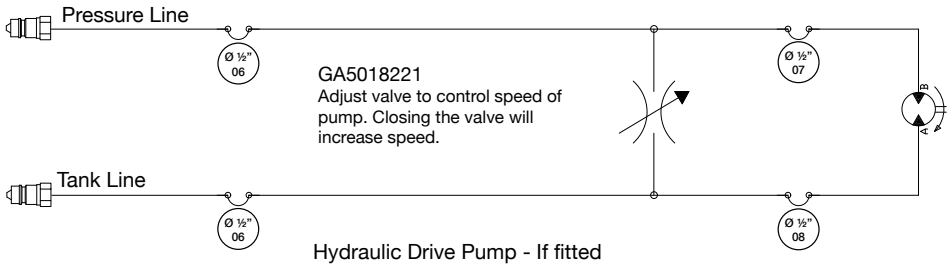
Boom Hydraulic Option - 3000L Electric over Hydraulic



691967 BOOM CONTROL MANIFOLD



691967 BOOM CONTROL MANIFOLD

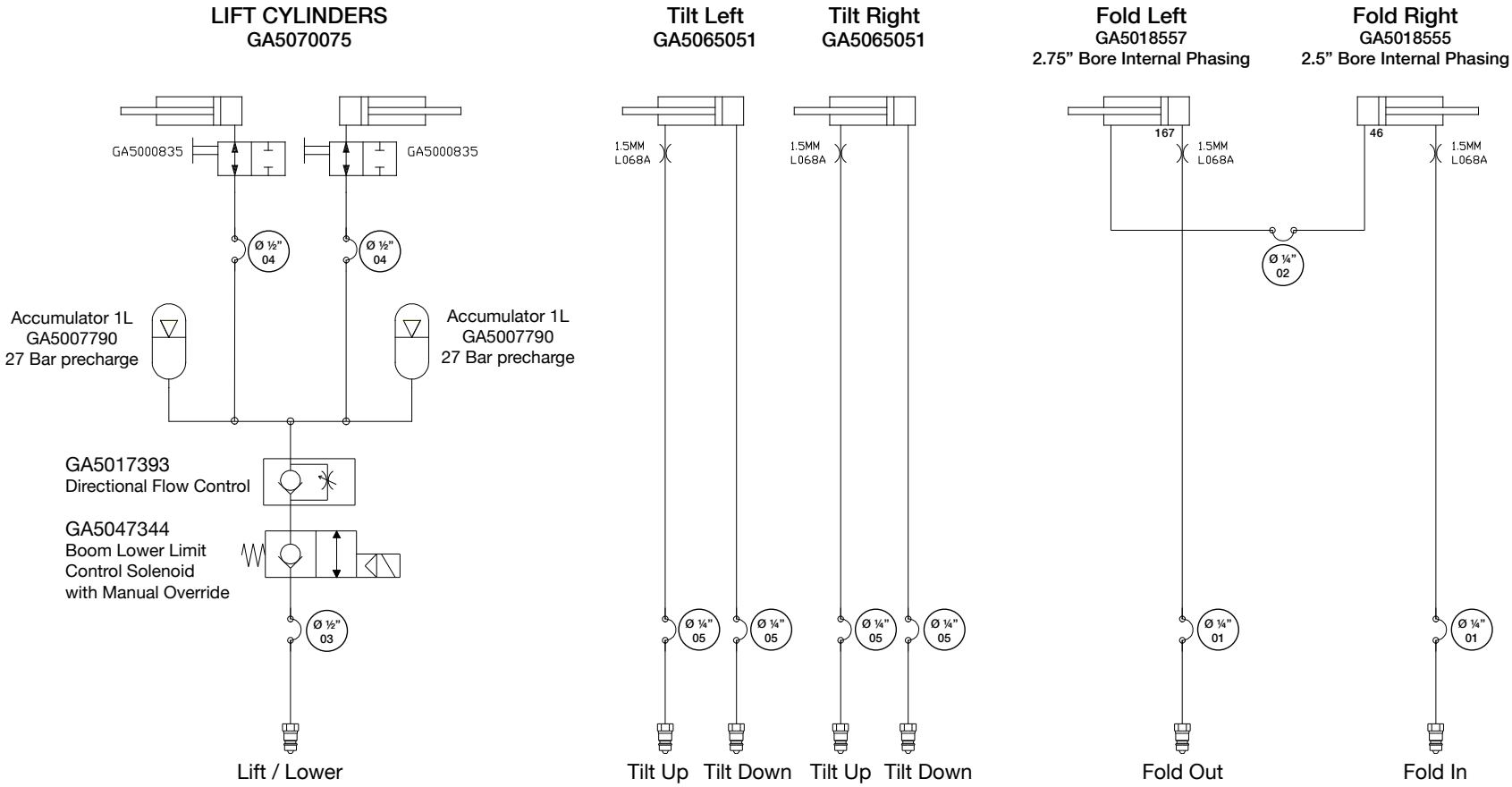


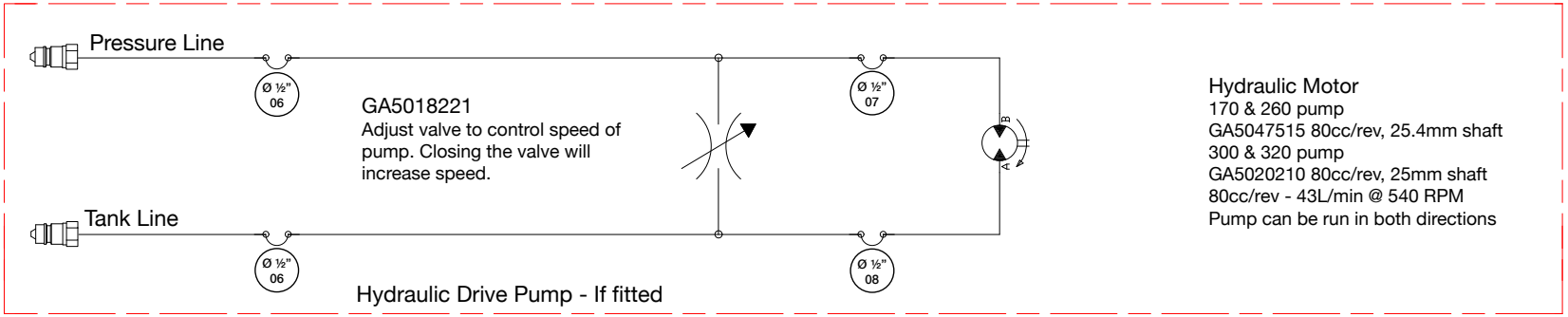
Hydraulic Motor
170 & 260 pump
GA5047515 80cc/rev, 25.4mm shaft
300 & 320 pump
GA5020210 80cc/rev, 25mm shaft
80cc/rev - 43L/min @ 540 RPM
Pump can be run in both directions

Drawing No: GA7500047

3000L Hydraulic Hoses - Electric Over Hydraulic							
Hose No	**Hose Dia**	**Hose Length**	**End 1 (& orientation if reqd)**		**End 2 (& orientation if reqd)**		**Description**
01	1/2”	8000mm	GA3500411	T2050-0808 (90 Deg)	GA3500399	T2020-0808 (Straight)	PRESSURE - MANIFOLD TO PULL
02	1/2”	8000mm	GA3500426	T2270-0808 (45Deg)	GA3500399	T2020-0808 (Straight)	TANK - MANIFOLD TO PULL
03	1/4”	8000mm	GA3500397	T2020-0404 (Straight)	GA3500397	T2020-0404 (Straight)	LS - MANIFOLD TO PULL
04	1/2”	2570mm	GA3500399	T2020-0808 (Straight)	GA3500399	T2020-0808 (Straight)	MANIFOLD TO ACCUMULATOR TEE
05	1/2”	1300mm (x2)	GA3500399	T2020-0808 (Straight)	GA3500411	T2050-0808 (90 Deg)	ACCUMULATOR TEE TO LIFT CYLINDERS
06	1/4”	1140mm	GA3500399	T2020-0404 (Straight)	GA3500408	T2050-0808 (90 Deg)	TAR - MANIFOLD TO LEFT TILT CYLINDER ROD
07	1/4”	945mm	GA3500411	T2020-0404 (Straight)	GA3500425	T2270-0404 (45Deg)	TAC - MANIFOLD TO LEFT TILT CYLINDER
08	1/4”	1315mm	GA3500397	T2020-0404 (Straight)		T2050-0808 (90 Deg)	TBR - MANIFOLD TO RIGHT TILT CYLINDER ROD
09	1/4”	945mm	GA3500397	T2020-0404 (Straight)	GA3500425	T2270-0404 (45Deg)	TBC - MANIFOLD TO RIGHT TILT CYLINDER
10	1/4”	1505mm	GA3500397	T2020-0404 (Straight)	GA3500408	T2050-0404 (90Deg)	F1C - MANIFOLD TO LEFT FOLD CYLINDER
11	1/4”	1850mm	GA3500397	T2020-0404 (Straight)	GA3500408	T2050-0404 (90Deg)	F1R - MANIFOLD TO RIGHT FOLD CYLINDER ROD
12	1/4”	3080mm	GA3500397	T2050-0404 (90Deg)	GA3500408	T2050-0404 (90Deg)	LEFT FOLD CYLINDER ROD TO RIGHT FOLD CYLINDER
13	1/2”	3990mm (x2)	GA3500426	T2050-0404 (90Deg)	GA3500399	T2020-0808 (Straight)	PRESSURE / TANK TO SPRAY PUMP ADJUST VALVE
14	1/2”	540mm	GA3500399	T2020-0808 (Straight)	GA3500399	T2020-0808 (Straight)	SPRAY PUMP ADJUST VALVE TO PUMP MOTOR
15	1/2”	560mm	GA3500399	T2020-0808 (Straight)	GA3500399	T2020-0808 (Straight)	SPRAY PUMP ADJUST VALVE TO PUMP MOTOR

Boom Hydraulic Option - 3000L with Tractor Remotes

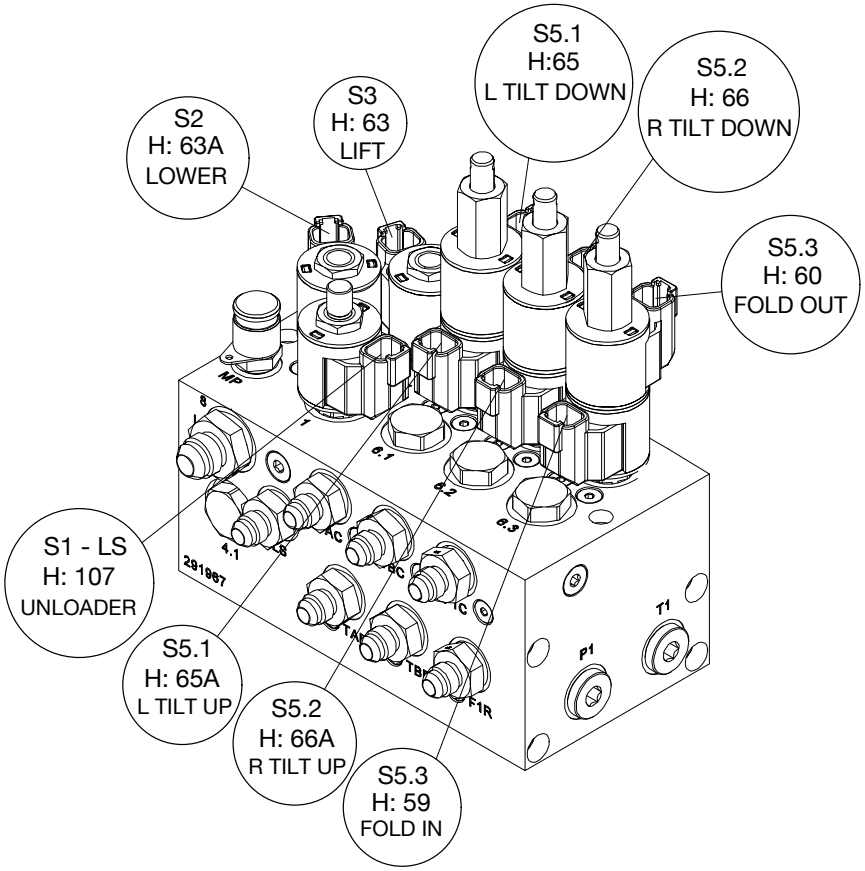


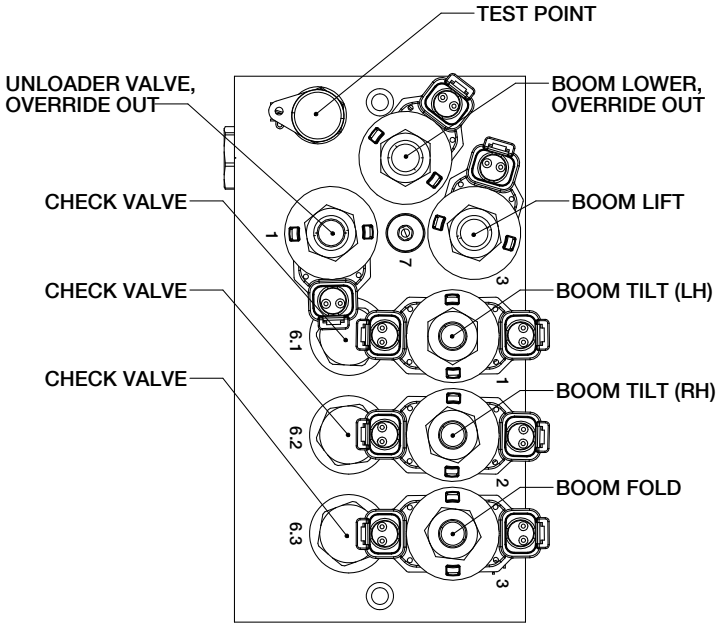


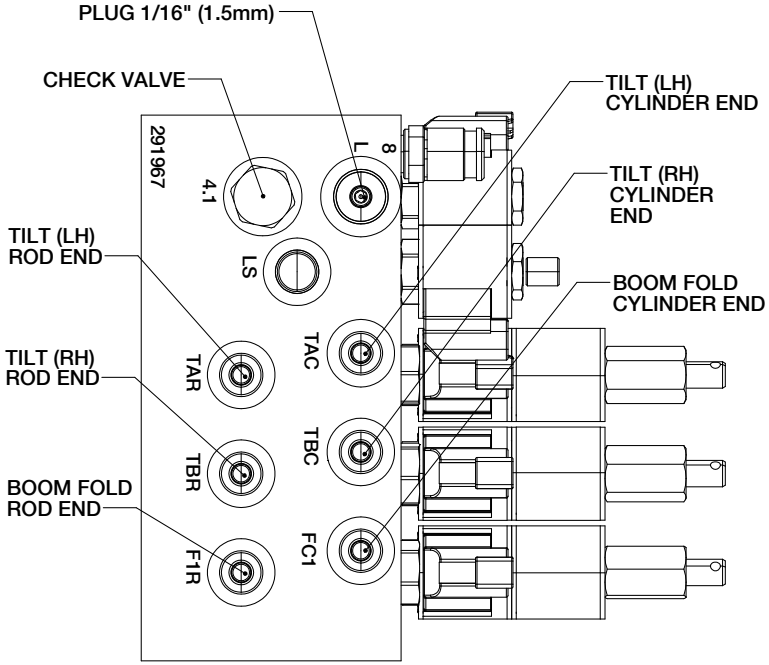
Drawing No: GA7500047

3000L Hydraulic Hoses - Tractor Remotes				
Tilt to suit 2500L Special				
Hose No.	**Hose Length**	**End 1 (& orientation if reqd)**	**End 2 (& orientation if reqd)**	**Description**
01	10500mm (2R)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to R Fold cylinders
02	10500mm (1R)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to L Fold cylinders
03	3080mm	90Deg (T205-0404)	90Deg (T205-0404)	Fold cylinder to fold cylinder
04	7000mm	Straight (T202-0808)	Straight (T202-0808) *fitted on line	Tractor to Accumulator
05	1300mm(1B+1R)	90Deg (T205-0404)	Straight (T202-0404)	Accumulator to Right lift cylinder
06	1220mm(2B+1R)	90Deg (T205-0404)	Straight (T202-0404)	Accumulator to Left lift cylinder
Tilt to suit 2500L Special				
07	9000mm (1Y)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to Left Tilt cylinders
08	9000mm (2Y)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to Left Tilt cylinders
09	9000mm (1Blue)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to Right Tilt cylinders
10	9000mm (2Blue)	90Deg (T205-0404)	Straight (T202-0404) *fitted on line	Tractor to Right Tilt cylinders
Hydraulic Driven Spray Pump ZETA 170				
11	4000mm ( ) x2	90 Deg (T226-0808)	Straight (T201-0808)	Spray Pump
12	340mm ( )	45 deg (T227-0808)	Straight (T201-0808)	Spray Pump
13	420mm ( )	Straight (T202-0808)	Straight (T201-0808)	Spray Pump
Hydraulic Driven Spray Pump ZETA 140				
11	4000mm ( ) x2	90 Deg (T205-0808)	Straight (T201-0808) *fitted on line	Spray Pump
12	340mm ( )	90 Deg (T205-0808)	Straight (T202-0808)	Spray Pump
13	420mm ( )	90 Deg (T226-0808)	Straight (T202-0808)	Spray Pump
Hydraulic Driven Spray Pump Hypro 9313S-M10Y used for SwarmFarm Sprayer				
11	3500mm ( ) x2	90 Deg (T205-0808)		Spray Pump Pressure and Return
14	3500mm ( )	90 Deg (T205-0606)		Spray Pump Case Drain

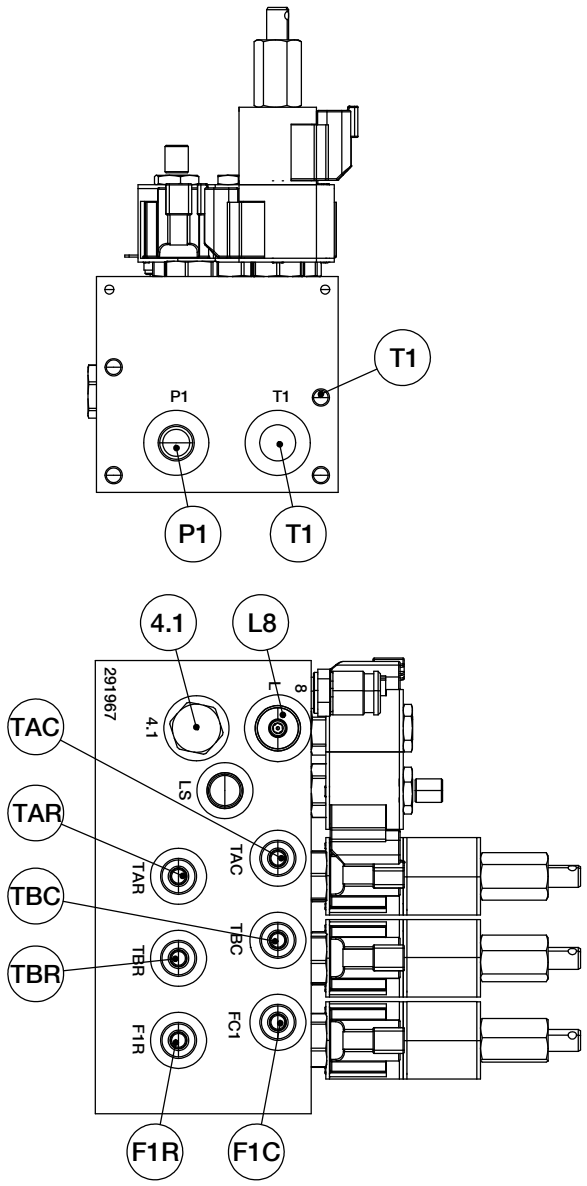
Hydraulic Block

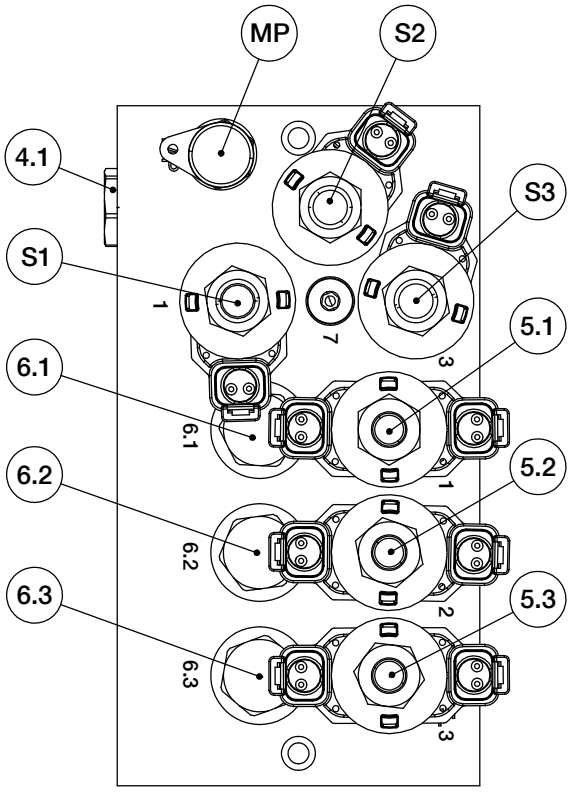






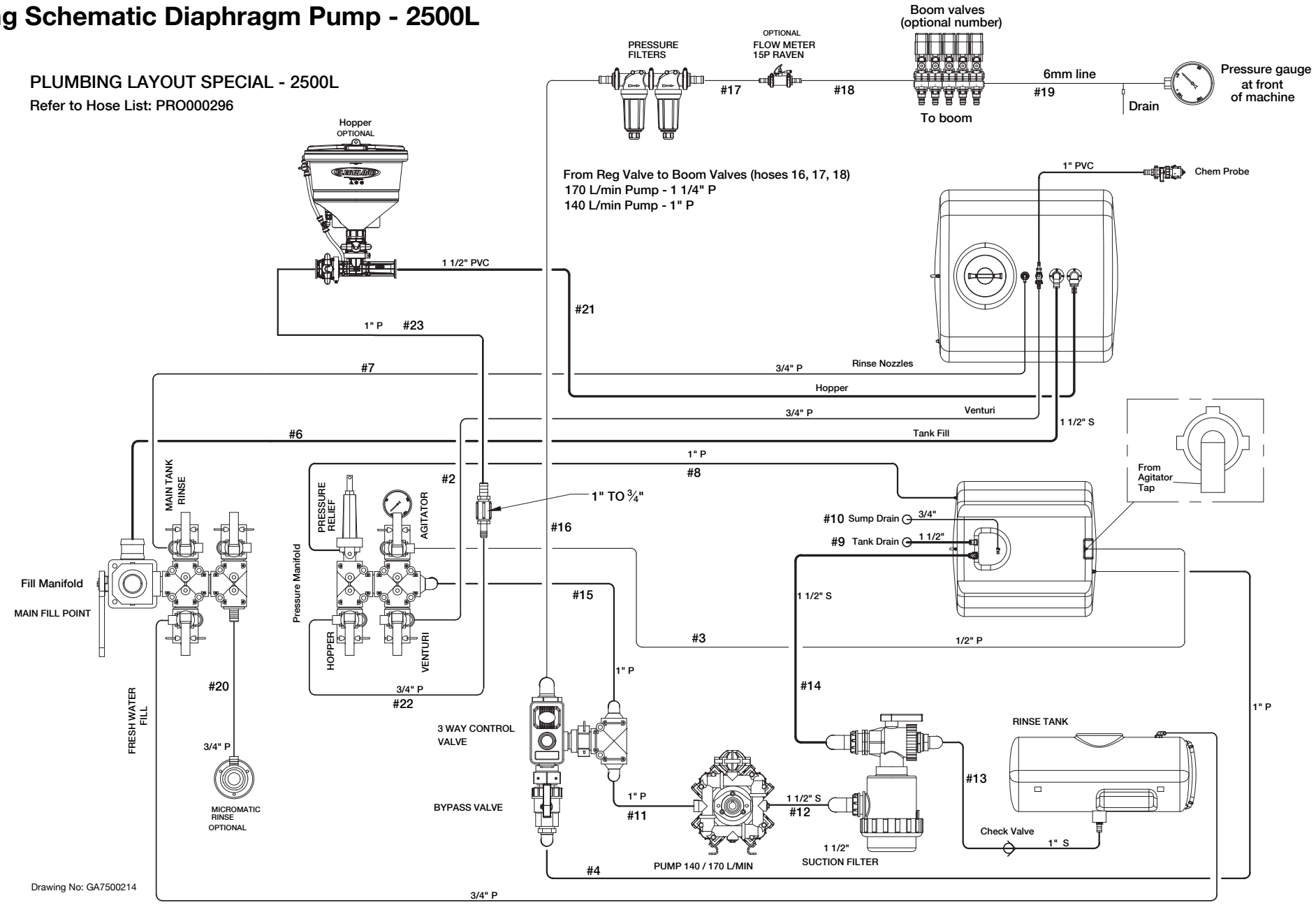
Hydraulic Block Function Table





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)

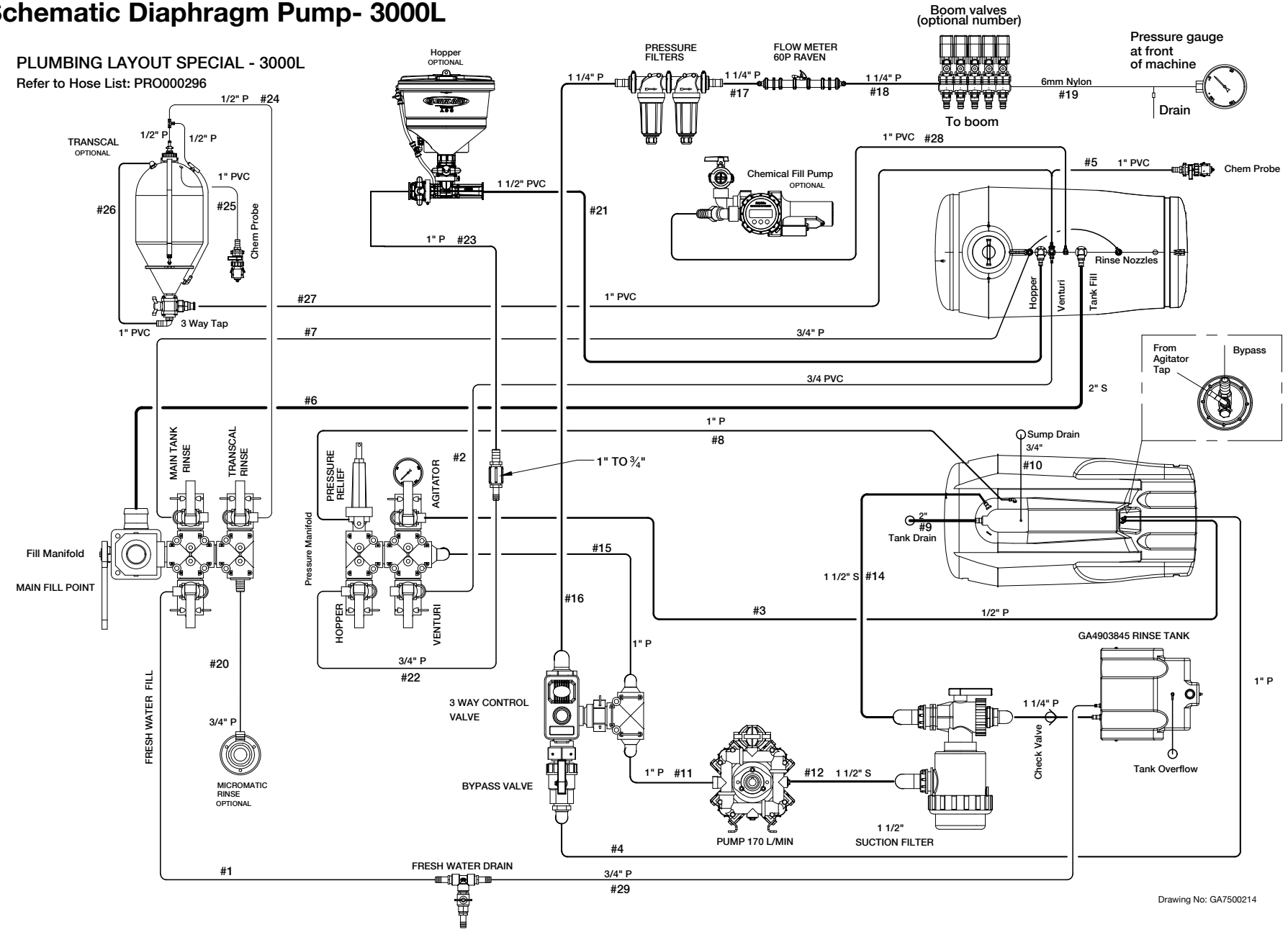
Plumbing Schematic Diaphragm Pump - 2500L



2500L Plumbing Hose List

Hose #	Part No	Hose Description	Length (mm)	Description
1	GA2000216	¾” Pressure	3500	Fresh Water Fill Tap to Fresh Water Rinse Tank
2	GA2000216	¾” Pressure	4800	Venturi Tap to Tank Venturi
3	GA2000211	½” Pressure	3500	Agitator Tap to Tank Agitator
4	GA2000219	1” Pressure	3000	Bypass Valve to Tank Return
5	GA2000220	1” PVC	3500	Chem Probe to Tank Venturi
6	GA2000229	2” Rubber Suction	3300	Main Fill Manifold to Main Tank
7	GA2000216	¾” Pressure	3800	Main Tank Rinse Manifold Tap to Main Tank (Rinse Nozzle)
8	GA2000219	1” Pressure	1500	Pressure Relief Valve to Main Tank
9	GA2000225	1 ½” Pressure		Main Tank Drain
10	GA2000216	¾” Pressure		Main Tank Sump Drain
11	GA2000219	1” Pressure	3000	Pump to 3 Way (Fast close Valve)
12	GA2000226	1 ½” Rubber Suction	3000	Pump to Suction Filter
13	GA2000223	1 ¼” Rubber Suction	3500	Rinse Tank to Suction Filter Tap
14	GA2000219	1 ½” Rubber Suction	2000	Suction Filter to Main Tank
15	GA2000219	1” Pressure	1000	3 Way (Fast close Valve) to Pressure Manifold
16	GA2000219 GA2000223	1” Pressure 1 ¼” Pressure	2000	(Zeta 140) 3 Way Control Valve to Pressure Filters Option (Zeta 170) (Check Pump Size)
17	GA2000219 GA2000223	1” Pressure 1 1/4” Pressure	1500	(Zeta 140) Pressure Filter to Flowmeter Option (Zeta 170) (Check Pump Size)
18	GA2000219 GA2000223	1” Pressure 1 ¼” Pressure	3500	(Zeta 140) Flowmeter to Boom Valves Option (Zeta 170) (Check Pump Size)
19	GA5004383	6mm Nylon (Black)	8000	Boom Valves to Pressure Gauge
20	GA2000216	¾” Pressure		(Option) Macro Rinse
21	GA2000227	1 ½” PVC	6500	(Option) Induction Hopper to Main Tank
22	GA2000216	¾” Pressure	1500	(Option) Hopper Manifold Tap to Reducing Joiner
23	GA2000219	1” Pressure	2500	(Option) Reducing Joiner to Hopper Tap

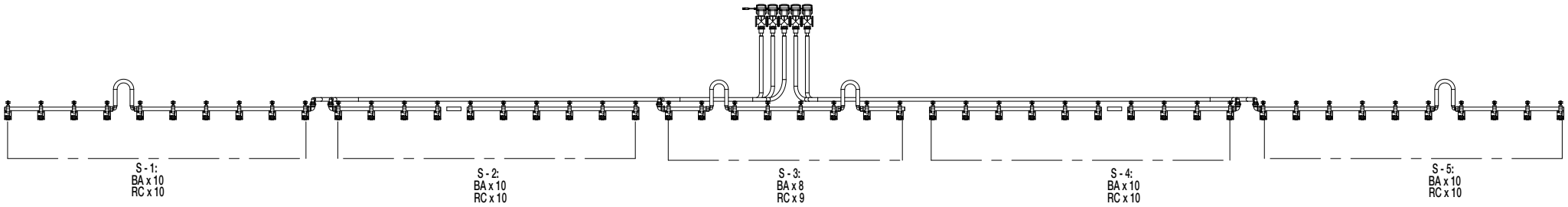
Plumbing Schematic Diaphragm Pump- 3000L



3000L Plumbing Hose List

Hose #	Part No	Hose Description	Length (mm)	Description
1	GA2000216	¾" Pressure	3500	Fresh Water Fill Tap to Fresh Water Rinse Tank
2	GA2000216	¾" Pressure	4500	Venturi Tap to Tank Venturi
3	GA2000211	½" Pressure	3500	Agitator Tap to Tank Agitator
4	GA2000219	1" Pressure	3000	Bypass Valve to Tank Return
5	GA2000220	1" PVC	3500	Chem Probe to Tank Venturi
6	GA2000229	2" Rubber Suction	3800	Main Fill Manifold to Main Tank
7	GA2000216	¾" Pressure	4000	Main Tank Rinse Manifold Tap to Main Tank (Rinse Nozzle)
8	GA2000219	1" Pressure	1500	Pressure Relief Valve to Main Tank
9	GA2000229	2" Rubber Suction	2000	Main Tank Drain
10	GA2000216	¾" Pressure	1200	Main Tank Sump Drain
11	GA2000219	1" Pressure	2500	Pump to 3 Way (Fast close Valve)
12	GA2000226	1 ½" Rubber Suction	3000	Pump to Suction Filter
13	GA2000223	1 ¼" Rubber Suction	2800	Rinse Tank to Suction Filter Tap
14	GA2000219	1 ½" Rubber Suction	2000	Suction Filter to Main Tank
15	GA2000219	1" Pressure	50	3 Way (Fast close Valve) to Pressure Manifold
16	GA2000223	1 1/4" Pressure	1000	3 Way Control Valve to Pressure Filters
17	GA2000223	1 ¼" Pressure	4500	Pressure Filter to Flowmeter
18	GA2000223	1 ¼" Pressure	1000	Flowmeter to Boom Valves
19	GA5004383	6mm Nylon (Black)	8000	Boom Valves to Pressure Gauge
20	GA2000216	¾" Pressure		(Option) Macro Rinse
21	GA2000227	1 ½" PVC	7000	(Option) Induction Hopper to Main Tank
22	GA2000216	¾" Pressure	1000	(Option) Hopper Manifold Tap to Reducing Joiner
23	GA2000219	1" Pressure	3000	(Option) Reducing Joiner to Hopper Tap
24	GA2000211	½" Pressure		(Option) Transcal Rinse Manifold Tap to Transcal Lid
25	GA2000220	1" PVC		(Option) Transcal to Chem Probe
26	GA2000220	1" PVC		(Option) Transcal to 3 Way Tap
27	GA2000220	1" PVC		(Option) Transcal 3 Way Tap to Main Tank
28	GA2000220	1" PVC		(Option) Chemical Fill Pump to Main Tank

Boom Plumbing Assembly - 24m 5 Section



24m 5 Section Boom Plumbing Assembly