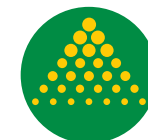




G4 Crop Cruiser Series 2

OPERATOR'S MANUAL MY24

GA8701900 REV 01
NOV 2024
FROM SERIAL NO 203890



GOLDACRES



For further information about any of the products shown please visit www.goldacres.com.au

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Under: Parts & Service > Owner-Operator Manuals:











<u>Model</u>	<u>Year</u>	<u>Revision</u>	<u>Part Number</u>
G4 Crop Cruiser Series 2	2024	01	GA8701900

Under: Parts & Service > Parts Manuals:

<u>Model</u>	<u>Year</u>	<u>Revision</u>	<u>Part Number</u>
G4 Crop Cruiser Series 2	2024	00	GA8701930





	1 - Important Information – Foreword	5
	2 - Safety – Critical Risk Management	11
	3 - Cabin – Your Sprayer at a Glance	27
	4 - Setting Up – Preparation for Use	57
	5 - Calibration – Set & Check Application Rates	99
	6 - Operation – Ready to Spray	115
	7 - Boom Settings – Service	159
	8 - Lubrication & Maintenance – Service	173
	9 - Trouble Shooting – Fast Tracking Solutions	215
	10 - Integrated Systems – Appendix	231



1 - Important Information – Foreword	5
Welcome	6
About this Manual	7
How to Use/Read this Manual	7
Decal/Symbol Instructions	7
Operator Responsibilities	7
Identification & Parts Ordering	8
Wheels & Tyres	8
Vehicle Mass	8
Sprayer Dimensions	9
Sprayer Orientation	10
Paint Codes	10
Axle Driveline Options	10



Welcome

Congratulations on your Selection of the Goldacres G4 Series 2 Crop Cruiser.

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

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

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

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

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

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

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

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

Roger Richards
General Manager

About this Manual

This manual provides instructions for some items requiring assembly on delivery, setting up instructions, calibration procedures, pre-operation requirements, operating instructions and maintenance requirements to achieve the best performance of this G4 Crop Cruiser Series 2.

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

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

How to Use/Read this Manual

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

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

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

Decal/Symbol Instructions

Danger, Warning, Caution & Note symbols & decals are used throughout this manual and on your G4 Crop Cruiser Series 2 instructing you of risks, procedures & operator safety.

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

 DANGER

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

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

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


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

 WARNING

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

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

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

 CAUTION

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

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

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

NOTE

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

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

The Note symbol is not hazard related.

Operator Responsibilities

All operators of the G4 Series 2 Crop Cruiser 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 this Crop Cruiser must **read all Operator Manuals** for this machine including but not limited to:

- This G4 Crop Cruiser Series 2 Operators Manual
- Delivery & Warranty Registration Manual
- G4 Crop Cruiser Series 2 Parts Manual (available online only).
- Raven Rate Control Module Operation Manual
- Other Manuals as required,

and fully understand:

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

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



It is important to use the serial number plate identification details for maintenance & parts ordering.



The serial number plate is located on the left hand side chassis in front of the cabin access ladder.

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 front left hand chassis in front of 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	Tyre Description	Rating	kPa/PSI
480/80R46	480/80 R46, HR45, High load	165A8/159D	240/35
380/90R46	380/90 R46, AusFlex, High load	173D	240/35
520/85R42	520/85R42 (20.8 X 42), HR45 X-Load	169A8/169D	288/42
460/85R38	460/85R38 (18.4R38) HR45 R1WTL	155A8/152D	240/35

G4 Crop Cruiser Series 2 tyre options.

Wheels & Tyres

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

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

- Tyre size,
- Rim type,
- Tyre status (driven or free rolling),
- Load,
- Speed,
- Haul length and
- Load Index.

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

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

Vehicle Mass

It is important to understand Vehicle Mass will vary according to sprayer specifications, options fitted and usage.

Refer to instructions provided under 'Chemical & Water Densities' later in this chapter.

Tare Vehicle Mass:

11,020kg (4WD fitted with 36m boom)

Gross Vehicle Mass (GVM):

15,500kg (4WD fitted with 36m boom).

Maximum allowable GVM: 15,750kg.

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

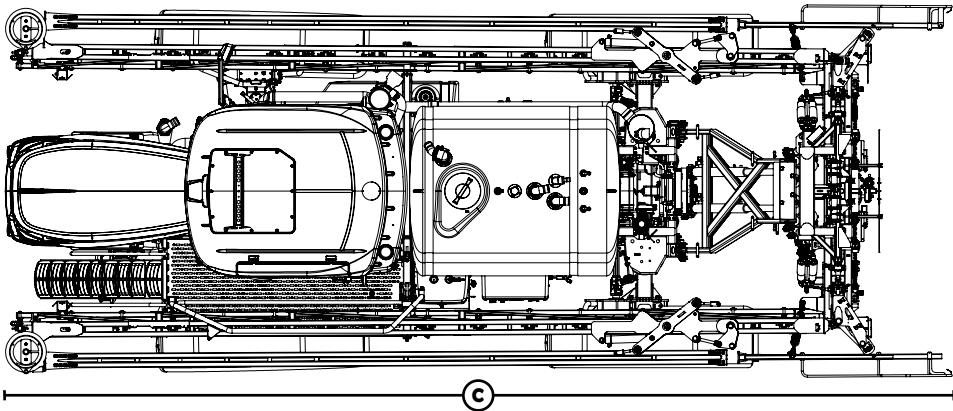
If a tyre is replaced with a different brand or size, please contact the supplier for correct air pressures to suit the load carrying capacity of this machine.

NOTE

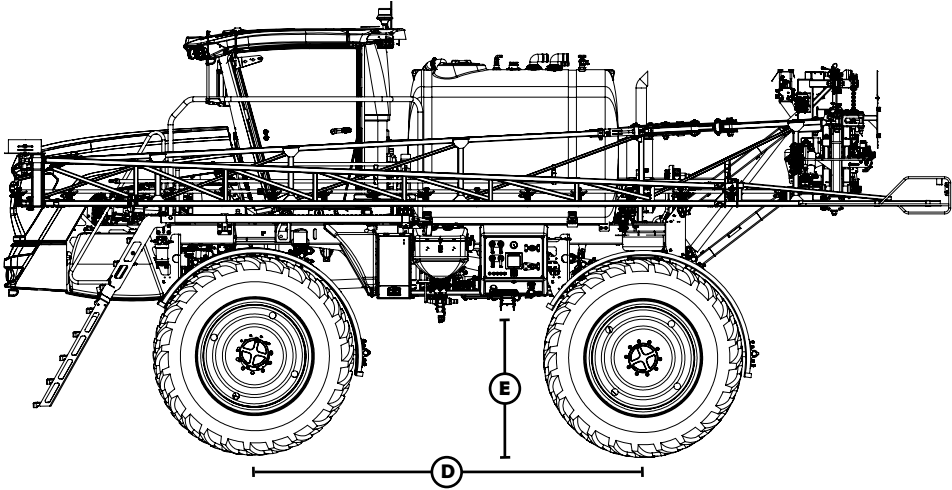
Converting Kilopascals (Kpa) to Pounds per Square Inch (PSI):

PSI = Kpa x 0.145

Eg. 282 Kpa x 0.145 = 40.9 PSI



	A		B		C	D	E
Boom Size	Height		Width		Length	Wheel-base	Ground Clearance
	Airbags Inflated	Airbags Deflated	Tyres Outside	Folded Boom			
24m	4.15m	4.05m	3.5m	3.4m	8.615m	3.8m	1.46m
28m	4.15m	4.05m	3.5m	3.4m	8.615m	3.8m	1.46m
30m	4.15m	4.05m	3.5m	3.4m	8.615m	3.8m	1.46m
36m	4.15m	4.05m	3.5m	3.4m	9.315m	3.8m	1.46m



Sprayer Dimensions

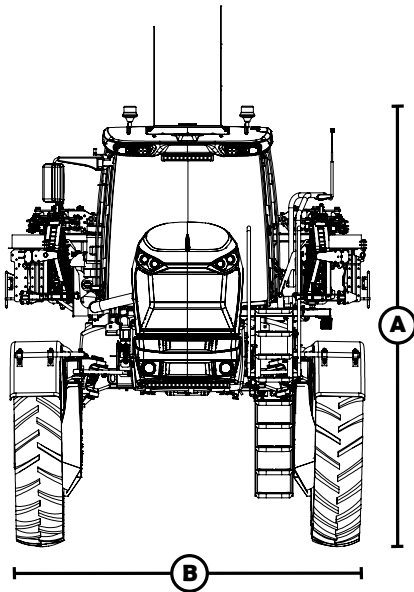
The following G4 Crop Cruiser Series 2 dimensions are provided as a guide only.

Variations in 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.**

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.



NOTE

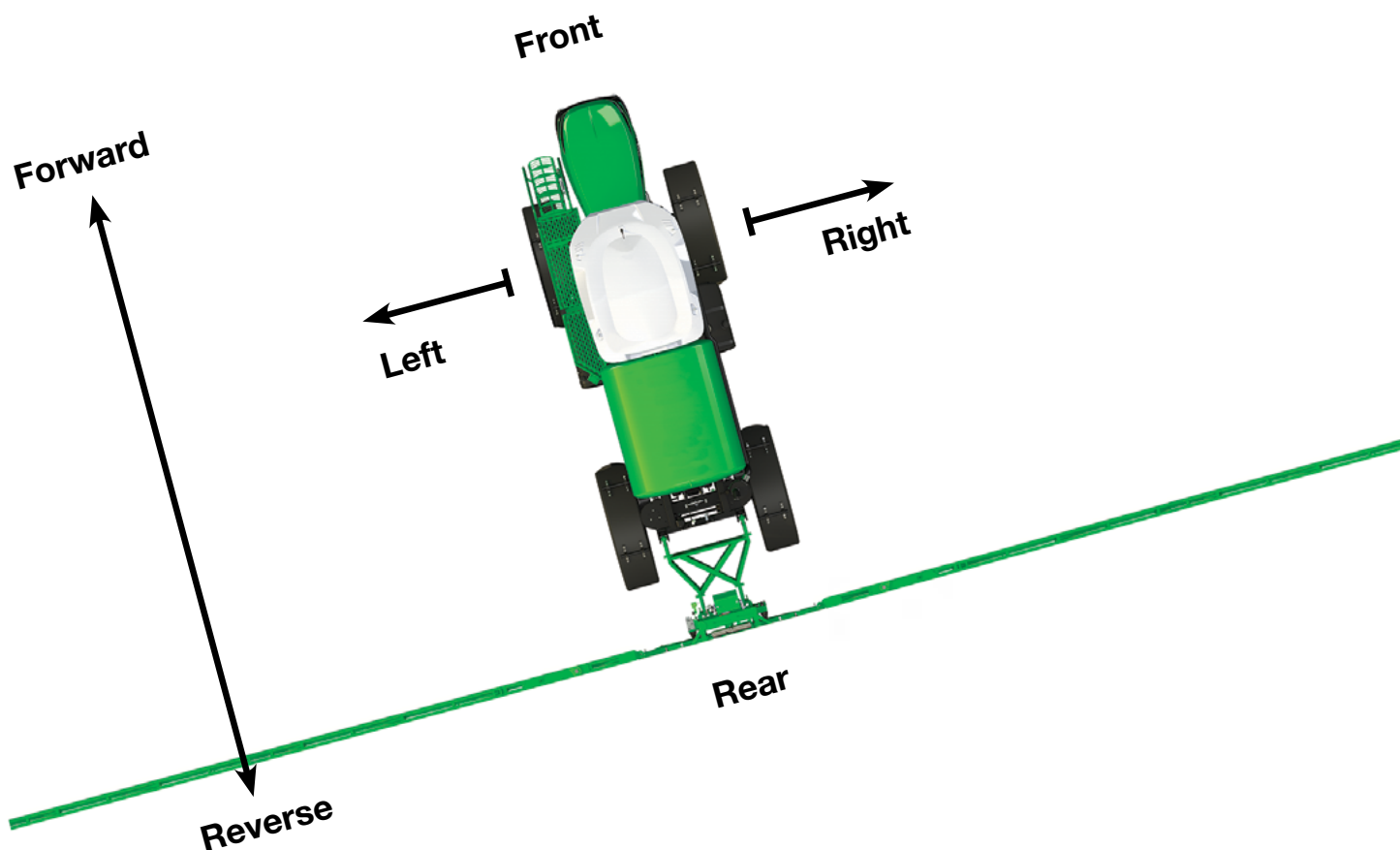
Sprayer dimension are based on 480/80 R46 tyres fitted with airbags deflated.
Be aware dimensions given have no aerials fitted.

NOTE

The Crop Cruiser sprayer is approximately 4.15m in height and with aerials on the roof, can be much 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

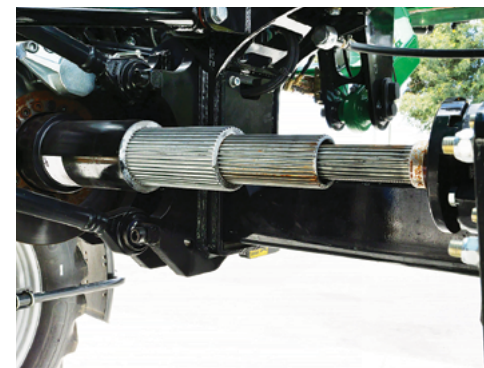
Throughout this manual instructions are given with reference to the front, rear, left and right of the sprayer including moving forward and reversing.

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
 Steel (Green): G13 Emerald Green
 Steel (Black): N61 Black



4WD Adjustable Axle Track (3-4m) option.

Axle Driveline Options

Three Axle Drive Line options are available for the G4 Crop Cruiser:

- 2 Wheel Drive (2WD) Fixed 2m Track
- 2 Wheel Drive (2WD) Fixed 3m Track
- 4 Wheel Drive (4WD) Fixed 3m Track
- 2 Wheel Drive (2WD) 2-3m Adjustable

Fitted with standard 480 wide wheel & tyres, the axle track setting (for each Axle Driveline option) is 2970mm on the ground. This keeps overall vehicle width to under 3500mm to comply with Australian road regulations.

Wheel track manufacturing tolerance is ± 25 mm.

If the 2-3m adjustable axle option is fitted, the wheel track can be adjusted and set from 2000mm to 3000mm.

Refer to 'Chapter 6 'Operation' for instructions to adjust & set adjustable wheel tracks.

NOTE

Tyres wider than 480mm will increase total machine width to over 3500mm.

2 - Safety – Essential Risk Management	11
1 Operator Safety	12
2 Chemical Safety	13
3 Maintenance Safety	15
4 Transport Safety	19
5 Operating Safety	20
6 In-field Safety	23



Crop Cruiser G4 Series 2.

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

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

1 Operator Safety

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

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

Training & Certification

Operational training for your sprayer will be given by your dealer or at the point of sale.

If required, please ask for this training again.

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

Not Okay to Operate!

Do not operate this sprayer if you are:

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

First Aid

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

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

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

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



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

Personal Protective Equipment (PPE)

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

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

PPE must be appropriate to both chemicals and sprayer.

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

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

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

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

Poisons Information Centres - Call 131 126 (AU)



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

Minimum PPE

Minimum Personal Protective Equipment requires:

- Coveralls
- Elbow length rubber gloves
- Approved respirator & face shield
- Safety glasses & gloves with high pressure fluids.

Passengers

Your sprayer is equipped with one training seat with a seatbelt. To minimize the risk of injury in the event of an accident, the operator and anyone in the training seat must wear the seat belts at all times.

Any other passengers (not recommended) will not be protected by the roll-over protection system and must not be on the machine.

Do not stand on or carry passengers on the steps or platform when the machine is in motion or when the booms are being folded or unfolded.

Avoid Excessive Noise Exposure

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

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



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

Machine Alterations

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

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

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

2 Chemical Safety

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

Safe Chemical Usage

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

Risks of chemical entering the body include:

- Orally** - Drinking, splashing into mouth, eating/drinking with dirty hands
 - Never attempt to clean parts or nozzles by blowing with your mouth
 - Never attempt to siphon chemicals or substances by sucking.
- Inhalation** - Inhaling chemical vapours &/or spray droplets as Airborne Particles
 - Always stand well clear of equipment during operation
 - Any spray drift is dangerous and may be hazardous to humans & other animals.



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

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

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

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

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

Keep Operator Areas Clean

Use disposable gloves or triple rinse multiple-use gloves.

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

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

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.



Crop Cruiser G4 Series 2.



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

The following conditions are generally unsuitable for spraying:

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

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

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

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

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

Spray Application Risk Assessment

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

Weather Conditions?

Yes / No

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

Physical risks and the work environment

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

Disposal of Chemicals & Containers

Flush all chemicals from the sprayer immediately after use.

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

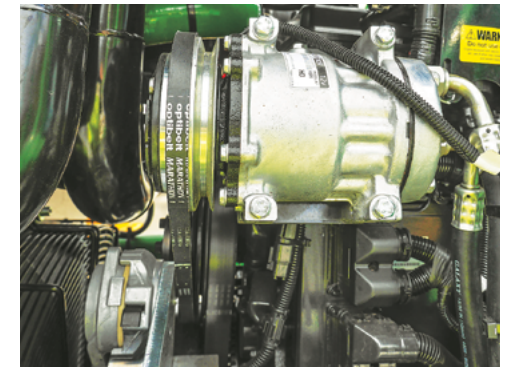
Do not use food or beverage containers because someone may consume the contents by mistake.

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

For information on correct disposal of unwanted farm chemicals, visit ChemClear.org.au 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 oil, fuel, coolant, brake fluid & batteries.

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.

Always use recommended Personal Protective Equipment (PPE) such as safety glasses & gloves for any hydraulic maintenance.

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, fans, plate edges and brackets as they may cause cut, stab or puncture injuries.

Entanglement Hazards:

- Keep loose clothing, hair, fingers and other items away from rotating components such as drive belts, rotating shafts, fans & alternators.
- Keep clear of variable spring & cable gaps which may catch onto items when moving or operating.

Electrical Hazards:

- Be wary of bare electrical terminals & exposed or damaged wires to avoid risks of electrocution injury or death.
- Take care when working with electrical items & electricity as improper use may cause a short, fire or unexpected movement.

Crush Hazards:

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

**Pinch Hazards:**

- Keep fingers and hands away from potential pinch points when operating moving components such as booms, access ladders, doors, catches, bonnets or other components.

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 any contact of the entire exhaust system of the machine when at operating temperature
- 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.
- Avoid contact with radiators, heat exchangers & heatsinks as they may be hot when in use. Allow such items to cool before doing maintenance.

Injection Injury

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

Striking Hazards

- 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.
- Moving items such as ladders, booms, steering & suspension componentry may move unexpectedly. Exercise caution when undertaking inspections or maintenance near these items.

Fluids or Air Under Pressure

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

Always use appropriate Personal Protective Equipment (PPE) to protect from injury.

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

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

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

Such equipment poses two major risks:

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

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

Pumps, Pressure Lines & Valves

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

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

To avoid risks of injury, it is important to:

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

Coolant filling instructions
Caution Ensure coolant has reached ambient temperature before opening coolant reservoir.

1. Before filling, ensure heater hose taps are open.
2. Turn key on, but leave engine off.
3. Turn heater on header tank at 13 l/min.
4. Turn engine on and run for 5 mins.
5. Top up tank as required to end of the fill point inlet tube.

Total system volume 39L

GA8701934

Battery Isolator

 **STOP ENGINE BEFORE SWITCHING TO "OFF" POSITION**

GA8701126

 **WARNING**
Check wheel nuts

GA870107

Cooling System

At operating temperature, liquid in the cooling system is under pressure. Only remove the radiator cap when the engine is turned off and the engine has cooled down.


Loosen the radiator cap slowly to relieve the pressure before removing the cap completely. Coolant should be added only when the engine is cool and turned off.

Stored Energy Hazard

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

 **CAUTION**

When adding engine coolant following filling instructions:

- Be sure the engine has cooled down (not hot).
- Before adding coolant, ensure the engine Off.

Failure to follow instructions can result in injury.

Batteries

The sprayer is supplied with sealed, non-serviceable batteries.

The battery electrolyte contains sulfuric acid which is an highly dangerous liquid. Batteries therefore should be handled with the greatest degree of care. Sulfuric acid can cause blindness, burn skin and dissolve clothing.

Batteries also produce flammable hydrogen gas (especially when charging), so keep them isolated from any source of sparks or flames.

An operator should minimise hazards by:

- Wearing the correct Personal Protective Equipment (PPE)
- Avoid spilling or dripping electrolyte
- Place the battery into a plastic collection tray ready for disposal if its case is found to be damaged.

Emergency Procedure

If an electrolyte gets in your eyes, flush your eyes with clean water for at least 15 minutes, then get immediate medical assistance.

Also thoroughly wash all other affected areas on your body with water & remove all clothing. If you swallow any electrolyte seek medical attention immediately.

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 and engage the park brake.
- Empty the spray tank where possible.
- Chock all wheels that remain on the ground.
- Securely lift the sprayer using a jack and support the machine on work stands.
- Do not work under the machine when supported solely by a jack.
- Do not support the machine using materials that may crumble.

Changing Wheels & Tyres

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

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

Tyre Maintenance

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

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

Always use a tyre inflation gauge. Be pro-active and continually check the condition of your tyres during operations. Do not weld, heat or modify a tyre rim.



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

Main tank overflow

GA8701211



Diesel only
DIESEL TANK FILL POINT

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.

Always close the paralift cylinder taps when performing maintenance on or underneath the sprayer.

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

If work is required underneath any part of the sprayer, ensure the machine or part is solidly supported & paralift cylinder taps are closed.

If it necessary to move underneath the sprayer, take care to not strike yourself on low or moving components, eg, steering.

Slippery Surfaces

The surface of the sprayer platform has raised portions 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 & other moving components such as fans, drive belts, can cause serious injury or even death if entanglement occurs.

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

Never operate a machine if covers, shrouds, or guards have been 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 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.

Sprayer Lighting

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

Refuelling

Wear appropriate Personal Protective Equipment (PPE) when refuelling.

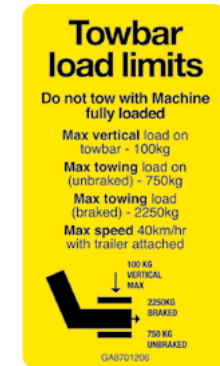
Handle fuel with extreme caution. Avoid any skin contact and immediately wash off any fuel if contact is made.

Do not refuel the machine while smoking or near open flames or sparks.

Always stop the engine before refueling.

To prevent fires always keep the machine clean of grease, debris and dirt.

Do not use electronic devices when re-fuelling.



Exhaust Fumes

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

If it is necessary to run the 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

The machine is fitted with a reverse warning beeper and a reversing screen (camera) when the machine is put into reverse.

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

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 self-propelled 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 self-propelled sprayers driven on public roads have requirements for flashing lights.

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

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

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

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

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

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

Always use safety chains when towing a trailed vehicle.

Towing the Sprayer

A disabled sprayer must not be towed unless the engine is running (as the steering and brakes require engine power to operate).

Before towing, front & rear tail shafts should be disconnected due to the risk of damage to the transmission.

While towing do not travel at a speed greater than 10 Km/h.

An operator must be in the cabin to steer and brake the sprayer under tow.

The park brake must be manually released if engine is not able to run. Refer to Chapter 8, Service & Maintenance for instructions.



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

Transporting the Sprayer

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

Use chains to secure the machine via the tie down attachment point located under the front and rear axles.

Loading & Unloading

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

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

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

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

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



5 Operating Safety

Ladders & Steps

Ladders present a number of risks to an operator such as the first step will vary in height with air suspension. Therefore use ladders & steps cautiously and 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.

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.

Always use correct plugs and connectors. If an electrical device or accessory is supplied with a three-pronged, earthed plug, ensure it is used 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.

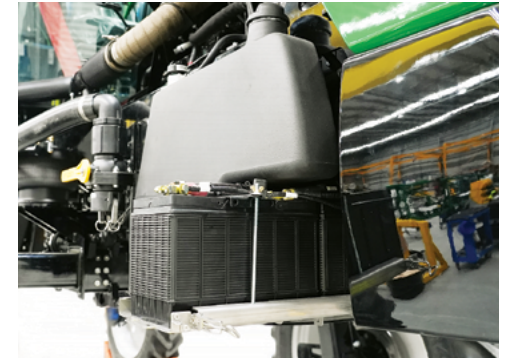
Use caution around any bare terminals & wires which may be damaged.

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.



Battery Safety

Lead acid batteries generate flammable and explosive gases. Keep sparks and flames away from batteries. Failure to do so may cause injury or death can occur.

When disconnecting the battery, do not ground out the (red) positive side of the battery as electrocution or shock can occur.

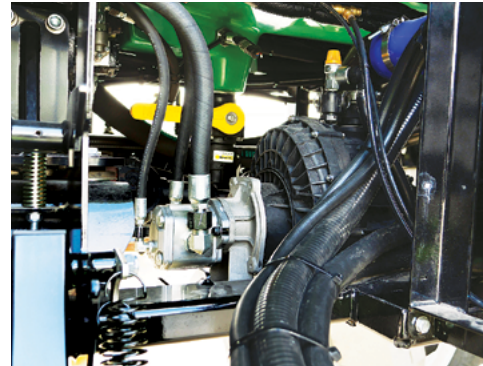
Wear appropriate Personal Protective Equipment (PPE) to protect yourself from injury such as safety goggles or a face shield when inspecting or cleaning lead acid batteries.

If acid enters an eye, immediately flood the eye with running water for at least 15 minutes. See a doctor as soon as possible.

If acid contacts the skin, wash the affected area immediately with plenty of water.

Smoking or naked flames should never be present in battery area.

Be aware that poor connections to a battery may spark and be an ignition source for a fire.



Battery Jumper Lead Tips

If it is necessary to use jumper leads, it is important to follow the correct procedure.

Improper jumper cable connections can cause an explosion resulting in personal injury.

Ensure the donor battery is the same voltage as the Goldacre 12V system if a battery is flat.

If vehicles are involved, make sure the vehicles are in either Neutral or Park, with the handbrake on and/or have the wheels chocked. Ensure the vehicles are not touching.

Then follow this procedure:

- 1 Select the clamp of the red positive (+ive) jumper lead and attach it to the positive terminal on the dead battery.
- 2 Select the other end of the red positive (+ive) clamp and secure it to the positive terminal on the good battery.
- 3 Select one end of the black negative (-ive) jumper lead and attach it to the negative terminal on the good battery.

- 4 Select the other end of the black negative (-ive) clamp and connect it to a spot of clean, unpainted metal part of the dead vehicle but not near the battery.
- 5 Disconnect the jumper leads in the reverse order of connection.
Remove the black negative (-ive) lead from the grounding point, then from the donor vehicle.

Hydraulic Safety

Hydraulic systems used on the Crop Cruiser include hydraulic cylinders, motors, pumps, manifolds, accumulators and oil coolers.

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.

Always use appropriate Personal Protective Equipment (PPE) to protect yourself from injury.

Connecting Hoses

Hydraulic systems are colour coded for rate & use to aid in correct identification of hoses.

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

Engines

Be aware of warning labels on your engine which highlight operating risks.

Risks include:

- Materials expelled from the engine
- Burns from hot engines & exhausts
- Fire while filling an engine with fuel or flammable material contacting a hot exhaust
- Entanglement in belt-drive components and moving parts.
- Carbon monoxide & carbon dioxide poisoning & suffocation from operating an engine in an enclosed space.

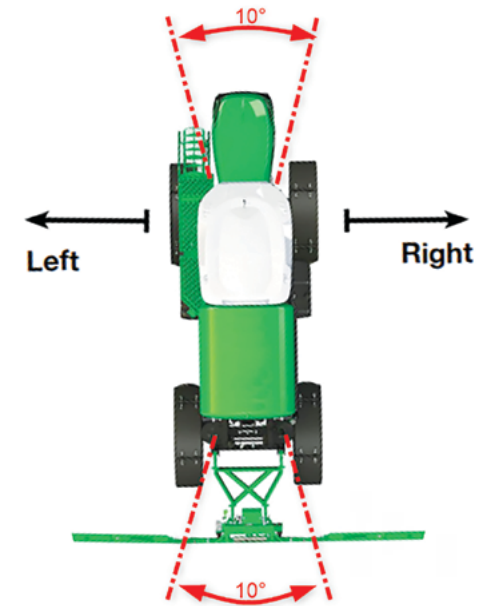
To minimise risk:

- Keep clear of all moving parts
- Do not touch hot exhaust and engine components.
- Do not refuel engines near naked flames or ignition sources. Be especially vigilant when refuelling the engine.

**CAUTION
HOT EXHAUST**



When towing from a bog, attach rated straps only to designated chain points on the Crop Cruiser chassis.



When towing a Crop Cruiser from a bog, always pull directly forward or directly backwards within 10° of centre.

- Always clear away flammable materials (such as dry grass) that might come into contact with the engine's exhaust
- Do not continue to operate the engine if it is not running properly
- Do not wear loose clothing when operating equipment.
- Keep hands well away from moving parts.
- Do not operate the engine in an enclosed area.

Be aware of the risk of fire due when flammable materials are present.

Keep firefighting equipment nearby if necessary.

Always follow the engine manufacturer's instructions.

Working with Fans

Cooling fans for the engine and oil systems simply move air to cool liquid.

It is vital all supplied guards remain in place and are replaced if damaged or fatigued.

Be mindful the air inlet side is often the most dangerous side because the suction created by fans can quickly and unexpectedly pull in hands, hair or objects such as loose clothing or tools.

On the downwind side of a fan, the most common danger is loose objects being propelled at high speed.

Serious injury or death may occur if the warnings below are not followed:

- Keep body parts and loose objects away from rotating fans
- Never try to adjust or clean the fan while it is engaged and operating
- Never allow untrained personnel or children near the fans while in operation
- Always ensure fans are stopped completely before repairing, cleaning or inspecting fans.

Bogged Sprayer

The Goldacres mechanical drive system delivers efficient, positive power to the ground for superior traction.

If your sprayer becomes bogged and the wheels subsequently locked, **never engage first gear and maximise engine revs.**

Locked wheels, in a bogged situation, transmitting full power WILL DAMAGE the driveline.

Goldacres strongly recommends a bogged sprayer be addressed prudently **using the assistance of a tow vehicle.**

However, when towing a Crop Cruiser/Super Cruiser from a bog using another vehicle, high horsepower tractors can exert extreme stresses on sprayer axles & drive line.

Therefore, adhere to the following guidelines to minimise any risk of damage:

- 1 The Crop Cruiser must be towed either directly forwards or directly rearwards.

- 2 Use only rated recovery straps attached to designated chain points (front or rear) on the Crop Cruiser chassis (shown above left).
- 3 If the Crop Cruiser is 4WD, disengage the centre diff lock.
- 4 The towing vehicle **must pull directly forward or directly backwards within 10° of centre.** Never pull a Crop Cruiser sideways.
- 5 Front wheels of the Crop Cruiser must remain in **forward direction.** Never turn full lock when pull force is applied to the Crop Cruiser.

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



Boom Safety

Safety risks to avoid with booms include:

- Boom height control systems, if fitted may cause a boom to move unexpectedly. Keep clear at all times
- Boom breakaway sections can be activated & move without notice and can cause injury to anyone nearby. Keep clear at all times
- Boom breakaway hinges & control mechanisms are potential pinch, shearing & entanglement injury areas. Keep well clear
- Moving booms cover a large area with potential for striking. Avoid the boom path
- Beware of the potential of hydraulic failure or damaged hydraulics as booms or boom sections may move in an uncontrolled manner. Keep clear.

Operating Procedure

- 1 Before leaving the sprayer the engine must be shut off, the transmission placed in neutral and the park brake engaged.
- 2 **Never engage the Park Brake while the sprayer is moving.** Damage to the transmission may result.
- 3 When leaving the machine always isolate the batteries by turning the isolator key off and removing the key.
- 4 A supply of fresh water should be maintained on the sprayer at all times.
- 5 Water tanks are not designed for use with diesel fuel or any other flammable liquid.
- 6 Do not use this machine in ambient temperatures exceeding 40 degrees Celsius.
- 7 Ensure that all bolts are tightened and secured before operation.
- 8 Seat belts must be worn when moving or operating the sprayer.
- 9 Cabin doors must be closed when moving or operating the sprayer.

<p>⚠ WARNING</p> <ul style="list-style-type: none"> • Do not stand on the access platform when the sprayer is in motion or boom in operation. • Do not enter main product tank or climb on main product tank. • The diaphragm pump speed must be between 400 & 540 RPM or 4200 RPM for centrifugal pump, do not run pump dry. • Do not lift sprayer with jack unless the main product tank is empty. • Always support the sprayer with a suitable stand if removing the wheels. • Induction Hopper must be raised and locked into position when sprayer is moving. Do not store chemicals in induction hopper. • Use relevant safety protection clothing and equipment (PPE) when handling chemicals. Refer to chemical manufacturers label for requirements. • If operated incorrectly this machine could cause serious injury or death. Read the operators manual for all safety procedures. • Check wheel nuts daily. • Not intend for use with flammable liquids. 	<p>DANGER</p> <p>KEEP CLEAR OF OVERHEAD POWERLINES, CONTACT CAN CAUSE DEATH. CHECK THE HEIGHT OF THE SPRAYER BEFORE TRAVELLING UNDER OBSTACLES.</p> <p>⚠ Whenever you see this symbol it means</p> <p>Warning be alert your safety may be involved. The information below explains these and other items requiring your attention. Read the important information below before operating the sprayer. If in doubt consult operator's manual.</p>	<p>⚠ CAUTION</p> <ul style="list-style-type: none"> • Do not fold booms whilst the sprayer is moving. Ensure booms are in spraying position or lowered on boom rests before moving. Always raise booms off boom rests before unfolding. • Keep bystanders clear when opening booms. • The water contained in the rinse water tank is not suitable for drinking. • Before working under the boom, close the hydraulic taps at the bottom of the lift cylinders and place stands under the boom wings. • Flush chemicals from the sprayer after use. • To avoid boom damage. Speed must be reduced when directional changes are made. • Drain the air tanks daily. • High pressure in hydraulics, pneumatic and plumbing systems, all systems should be properly maintained and care taken when working around these systems. • Drain the air tanks daily. <p>GA8701850</p>
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6 In-field Safety

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

Sloping or Uneven Ground

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

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

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

When operating the sprayer:

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

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

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

Hazard identification

Power Lines

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

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

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

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

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



Take notice of warning signs for overhead power lines.



Be aware of unsafe & safe distances from power lines.



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

See your local authority for further information.

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

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

Large booms

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

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

Potential Risks

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

Control measures

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

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

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

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

Chemical & Water Densities

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

1 Litre water = 1 Kg.

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

For example: Liquid nitrogen has a density of 1.28 kg/L. It will therefore significantly increase vehicle load if the tank were to be filled completely, ie, 4000 litres of water weighs 4000kg. 4000 litres of liquid nitrogen weighs 5120kg. 4000kg of liquid nitrogen is only 3125 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 transport speed of 50 km/h and with boom open, a maximum speed of 30 km/h. Maximum speeds can only be used if terrain & conditions are suitable.

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

High speed turning will place severe stress on the wheels & axles and can cause vehicle instability. Avoid high speed turning at all times.



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

Maximum speed when cornering or turning at a steering angle of 30° or greater 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 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 Cruiser

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 cabin roof beacons & antennae.

Drive the Cruiser onto the truck, then:

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



Crop Cruiser G4 Series 2.

2 Unloading

Before unloading:

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

Drive the Cruiser off the truck, then:

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

3 - Cabin – Your Sprayer at a Glance**27**

Know Your Cabin	28
Folding Ladder	30
Entering the Cabin	30
Exiting the Cabin	30
Cabin Seats	31
Steering Column	32
Multifunction Lever	33
Ignition Switch	34
Foot Brake & Accelerator	34
Quick Start Guide	34
Pressure Gauges	35
Sunvisors - Front & Rear	35
UHF Two Way Radio	35
Cup Holder	35
Overhead Console	36
Light Switches	38
Map Lights	39
Egress Lighting	39
AM/FM Radio/CD Player	39
UHF Two Way Radio	39
Air Conditioning Controls	39
Cabin Corner Panel	41
Carbon Filtration System	41

Armrest Control Console	42
A) G-Hub Touch Screen	42
B) Boom Folding/Unfolding	42
C) Joystick Controller	43
D) Transmission Shifter	45
G) Mobile Phone Holder	45
H) Mode Switch Panel	45
I) Storage Trays	46
Electrical Compartment	46
G-Hub Interface	46
Home Screen	46
External Screen	46
G-Hub Controller	47
Engine-Drivetrain Touch Buttons & Information	48
Spraying System Touch Buttons & Information	49
Menu Touch Buttons	50
Engine & Drivetrain Touch Buttons	50
Spraying System Touch Buttons	51
Back-Up/Restore USB	54

Know Your Cabin

Learn all of the Cabin controls for safe and efficient sprayer operation.

Cabin controls are identified (right) with a reference page shown for further information and operating instructions.

Front Sunvisor Guides
- refer P. 35

Pressure Gauges
- refer P. 35

Multifunction Lever:

- Horn
- Windscreen Wiper
- Windscreen Washer
- Right Turn Indicator
- Left Turn Indicator
- High/Low Beam
- Headlight Flasher

- refer P. 33

Steering Column
- refer P. 32

Foot Rest
- refer P. 34

Foot Brake & Accelerator
- refer P. 34

Overhead Console
- refer P. 36

UHF Two Way Radio
- refer P. 35

Rear Vision Mirror (RHS) -
refer P. 36

Controller Screen - Optional

Cup Holder
- refer P. 35

Ignition Switch / Rear Corner Console
- refer P. 34 & 36

Armrest Control Console -
refer P. 42

Joystick Controller
- refer P. 43

G-Hub Touch Screen
- refer P. 42 & 47

Operator's Seat
- refer P. 30



Cabin photo - information on each item (shown above) is given on the following pages using the item heading).



Cabin photo - information on each item (shown above) is given on the following pages using the item heading).

Your Sprayer at a Glance - **Cabin**



The folding stairway & walkway platform provide cabin access.



Use the stairway & walkway platform to enter the cabin. Understand its Warning decal before operating.



Use the cabin's external lockable door handle to open the cabin door.



Squeeze the door handle lever to open the cabin door latch, then push the door handle to open the door.

Folding Ladder

Entrance to the cabin is via a folding ladder which is pneumatically:

- Raised for transport & spraying. It is lifted up to its transport position only when the ignition key is on and the park brake is released.
- Lowered into position when parking. It is lowered into park position only when the park brake is applied &/or the ignition key is turned off.

The operator must take extra care applying & releasing the park brake to ensure no person is standing on or near the folding ladder.

In emergency, the ladder can be lowered by:

- Applying the park brake
- Turning off the ignition
- Removing the air supply hose from the air cylinder or
- Disconnecting the solenoid electrical connector.

! WARNING
Keep clear folding ladder

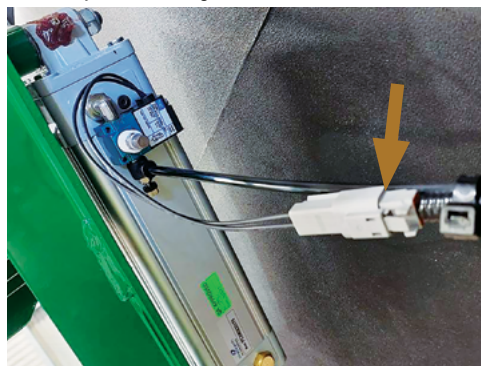
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Entering the Cabin

To enter the cabin:

- 1 Carefully climb up the lowered ladder - retaining three points of contact with the steps and rails at all times. Understand the implications of the Warning decal (located on the step) before operating the sprayer.
- 2 Walk along the walkway platform, past the cabin door.
- 3 Unlock the door (if locked) & open the door to enter the cabin.

During emergency or maintenance the ladder can be lowered by disconnecting the solenoid electrical connector.



- 4 Close the door after entering by firmly pulling the door handle inwards.

The steps and walkway platform must be kept clean from mud & other substances that may cause a person to slip and incur injury.

Always wear appropriate footwear and clothing to ensure easy, safe movement in and out of the cabin.

NOTE

The cabin door will open wider if the left hand boom rest is in its outer position.

! 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.

! CAUTION

Care must be taken climbing the ladder:

- Always face the ladder and
- Retain three points of contact with steps & rails at all times when ascending or descending the ladder.

Failure to follow these instructions may cause injury.

Exiting the Cabin

To exit the cabin:

- 1 Squeeze the door handle lever to release the cabin door latch.
- 2 Use the door handle to push the door open and exit the cabin
- 3 Once out of the cabin, close the cabin door and walk along the walkway platform to the ladder stairs.
- 4 Carefully climb down the lowered ladder - retaining three points of contact with the steps and rails at all times.

Always lock the cabin door if finished & leaving the sprayer.

! CAUTION

To prevent injury to individual operators, all seat settings for position, weight, height and comfort must be adjusted and checked for each operator before driving. All adjustments must be made while the vehicle is stationary. Failure to follow these instructions may result in injury.

Cabin Seats

The cabin is equipped with an Operator's seat and a fold-up Training seat.

Operator's Seat

The Operator's Seat has its own air compressor - operating as soon as the ignition is On. Adjustments are shown right.

To make adjustments:

1 Fore/Aft Adjustment Lever

First release the Fore/Aft Locking lever (2). Then lift the Fore/Aft Adjustment lever (1) & slide the seat back or forth to the position desired. Finally, lock the seat into position with the Fore/Aft Locking lever (2).

2 Fore/Aft Locking Lever

Releasing the lever enables Seat Fore/Aft Adjustment (1) and engaging the lever locks the seat to its desired position.

3 Seat Height & Weight Adjustment

Weight Adjustment

The seat must be adjusted for the driver's weight by briefly pulling the actuator lever of the automatic weight height adjuster with the vehicle at a standstill and the driver sitting on the seat. The driver must sit absolutely still during adjustment.

To avoid injury to individual operators, all seat settings for the operator's weight & comfort must be checked and adjusted for each operator before driving.

Height adjustment

With ignition key On, seat height is set pneumatically & is continuously adjustable.

Adjust seat height by pulling or pushing the adjustment lever fully up or down.

Lift the lever to raise the seat (air is pumped into the airbag suspension).

Push the lever down to lower the seat (air is release from the air bag).

If the adjustment reaches the top or bottom endstop, the height is adjusted automatically in order to guarantee a minimum spring travel.

To avoid mechanism damage, do not operate adjustment lever/compressor for more than 1 minute at a time.

4 Absorber Lever

The Absorber Lever setting of the seat can be varied to suit the on & off-road driving conditions. The cushioning effect can be individually adjusted for this purpose.

Turn the lever to the desired position & release: 1- Soft 2- Medium 3- Hard.

5 Lap Seat Belt

Clip the Lap Seat Belt into position whenever seated in the cabin.

6 Seat Tilt Lever

Lift the Seat Tilt Lever to tilt the back of the seat forward or rearward to suit, then release the lever to lock it into position.

7 Armrest Height Adjustment

Both armrests can be folded up if required & armrest height individually adjusted.

To adjust armrest height, remove the round cap, then loosen the hexagon nut (13 mm) and adjust the armrest to the desired height (5 steps). Tighten the nut (25Nm) & replace the cap into the nut.

8 Lumbar Adjustment Knob (behind seat)

By rotating the Lumbar Adjustment Knob left or right, both the height & curvature of the backrest cushion can be adjusted to increase operator's seating comfort.

9 Armrest Inclination Adjustment

Each Armrest Inclination can be altered by turning its adjustment knob.

Rotating the knob outward, lifts the front part of the armrest. Rotating the knob inwards, lowers the front of the armrest.



Location of the Operator Seat settings (refer to numbered information & headings on this page for instruction).
All position, weight, height & comfort adjustments must be made before driving.

10 Seat Pan Angle Adjustment

Pull the Seat Pan Angle Adjustment Lever upwards and exert pressure on the front or rear part of the seat pan to move the seat pan into its desired position, then release the lever to lock its position.

11 Seat Cushion Depth Adjustment

The Seat Cushion Depth can be adjusted. To adjust the seat cushion depth, pull the right handle upwards, then by moving the seat cushion backwards or forwards the desired cushion position can be reached. Release the lever on completion.



The cabin is equipped with an Operator's seat (left) and a fold-up Training seat (right - folded up).

Training Seat

The Training Seat is fitted with a lap seat belt which must be worn at all times when operating with a trainee or passenger present.

A storage area/fridge option facility is directly underneath the training seat. It is easily accessed by lifting up the training seat, then lifting the storage area lid.

The Training Seat with the lap seat belt (shown left) and underneath, a storage area/fridge option facility (shown right).



Steering Column

The Steering Column provides three adjustments to quickly & easily position the steering wheel for the operator.

1 Foot Lever - Fore/Aft Column Adjustment

This adjustment allows the steering column to be quickly moved forward or rearward as required.

To make adjustment:

- While sitting in the operator's seat, hold the steering wheel with both hands, press the foot lever downwards (left hand side column base) with your foot to release the column lock.
- With the foot lever pressed down, move the steering column with your hands **forward or rearward as desired**.
- Release the foot lever to lock the steering column in the desired position.

Use the Foot Lever Fore/Aft Column Adjustment to quickly & easily move the steering wheel away for exiting and entering the operator seat.



Steering Column/Steering Wheel Adjustment points (refer to numbered information & headings on this page for instruction).

2 Tilt Lever Adjustment

This adjustment further refines the closeness and angle of the steering wheel for operator comfort & steering efficiency.

To make adjustment:

- While seated in the operator's seat with the Foot Lever Fore/Aft Adjustment completed, hold the steering wheel with your right hand and use your left hand to lift the Tilt Lever upwards to release the tilt adjustment lock.

- With the Tilt Lever held up, move the upper steering column & steering wheel to the desired position.
- Release the Tilt Lever to lock the upper steering column in the desired position.

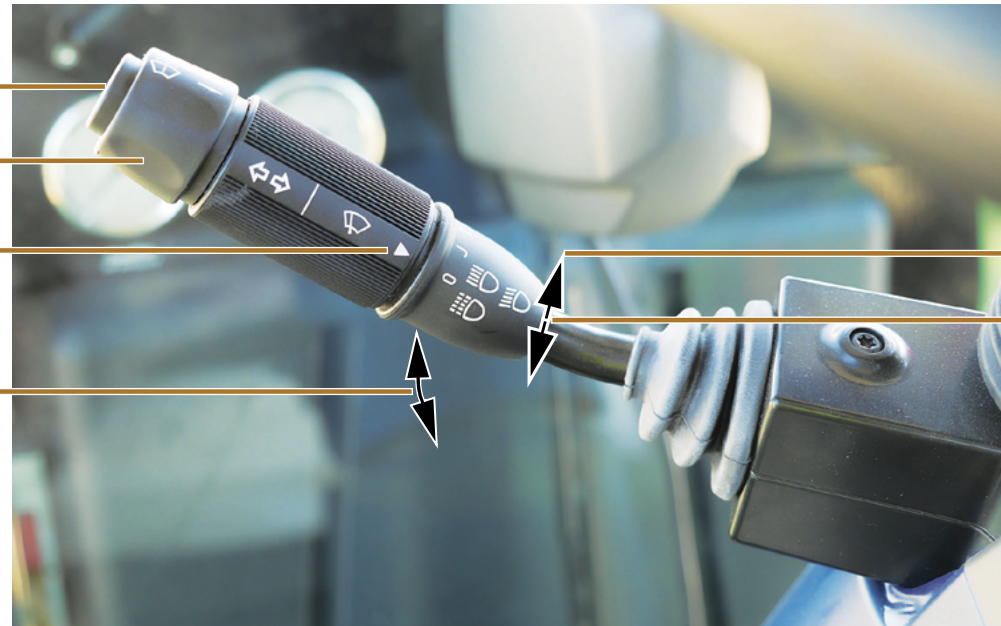
3 Steering Wheel Height Adjustment

This adjustment allows the height of the steering wheel to be raised or lowered to suit the operator.

To make adjustment:

- While seated in the operator's seat, hold the steering wheel with one hand and with other hand, grasp the steering wheel Centre Cap & rotate it 90 degrees anti-clockwise (quarter turn) to unlock the height adjustment.
- Now lift or lower the steering wheel to the desired height.
- Grasp the steering wheel Centre Cap again & rotate it 90 degrees clockwise (quarter turn) to lock the desired steering wheel height.

- 1 Horn
- 2 Windscreen Washer
- 3 Windscreen Wiper
- 4 Turning Indicators



6 Headlight Flasher

5 Headlight High/Low Beam

Multifunction Lever

The Multifunction Lever is located on the left hand side of the steering column below the steering wheel.

This lever has seven functions:

- 1 Horn
- 2 Windscreen Washer
- 3 Windscreen Wiper
- 4 Turning Indicators
- 5 Headlight High/Low Beam
- 6 Headlight Flasher

1 Horn

The Horn button is located on the outer end of the Multifunction Lever.

Use a left hand fingertip to press the Horn button inwards (toward the steering column) to sound the Horn.

Stop pressing the button to stop the horn sounding.

The Multifunction Lever (located on the left hand side of the steering column below the steering wheel) controls seven functions as shown. Refer to numbered information & headings on this page for instruction.

2 Windscreen Washer

The Windscreen Washer control is located next to the Horn button close to the end of the Multifunction Lever.

Use the left thumb and fingers to grasp the Windscreen Washer button and push the button inwards (toward the steering column) to activate water through the windscreen washers.

To stop water flowing through the windscreen washers, release the button.

3 Windscreen Wiper

The Windscreen Wiper rotating barrel switch is located next to the windscreen washer button.

Use the left thumb and fingers to rotate the barrel switch (top forward) to the desired setting (aligning the arrow with):

J - Intermittent wiper function

I - Constant wiper function.

Rotate the barrel switch in the opposite direction (top rearward) to return the wiper function to:

J - Intermittent wiper function or

O - Wiper function Off.

4 Turning Indicators

Pull the Multifunction Lever counter-clockwise around the steering column to activate the Left Turning Indicator.

Push the Multifunction Lever clockwise around the steering column to activate the Right Turning Indicator.

Return the Multifunction Lever to neutral off position after turning.

5 Headlight High/Low Beam

The headlights must first be turned On at the Overhead Console headlight switch (see page 37 for instructions).

In the centre position (horizontally) the headlights will be on high beam.

Using the left hand, the Multifunction Lever downward to move to low beam.

Move the Multifunction lever upwards back to high beam as required.

6 Headlight Flasher

Use left hand to lift the Multifunction Lever fully upwards/intermittently to flash the headlights On/Off for a warning.

The flasher function works with or without the overhead console light switch On.

Your Sprayer at a Glance - **Cabin**



The Ignition Switch has 3 functions: Stop, On/Accessories (lightning symbol) & Engine Start (rotating arrow symbol).

Ignition Switch

The Ignition Switch, located on the right hand side rear corner console of the cabin, is used to start and stop the engine and all electrical functions of the Sprayer.

The Ignition Switch has three functions:

- Stop/Off (top position)
- On/Accessories (lightning symbol)
Insert the key and rotate the key clockwise to the On/Accessories (lightning symbol) position to energise all cabin functions.
- Engine Start
The transmission must be in neutral to start the engine.

NOTE

Before starting the engine:

- All fluid levels must be checked.
- Ensure the battery isolator switch is engaged - to provide power to the sprayer systems.
- Ensure the transmission in neutral. Otherwise the engine will not start.



The Ignition Switch is located on the right hand side, rear corner console of the cabin.

To Start the Engine:

- 1 Rotate the key to the Engine Start (On) position ((lightning symbol).
- 2 Wait to hear the reverse beeper sound.
- 3 Rotate the key further to the Engine Start position (rotating arrow emblem) to crank & start the engine.
- 4 Release the key when the engine starts.
The key automatically returns to the On/Accessories position.

To Stop the Engine:

To stop the engine, rotate the ignition key counter clockwise to its vertical Stop/Off position.



The Foot Brake (left) & Accelerator (right) located on the floor on the right hand side of the steering column.

Foot Brake & Accelerator

The Foot Brake & Accelerator are located on the floor of the cabin at the right hand side of the steering column. On the left hand side of the steering column is a fixed Foot Rest.

The Foot Brake & Accelerator are used to:

- Drive
- Stop

The Foot Rest located on the floor on the left hand side of the steering column.



The plastic coated Quick Start Guide attached to the right hand safety door rail of the cabin

Quick Start Guide

A plastic coated Quick Start Guide is attached to the right hand safety door rail of the cabin for a quick reference for the Starting, Driving and Shut Down procedures of the sprayer.

The guide diagrammatically presents the steps for:

- Start Up
- Drive
- Shut Down.



The RapidFire air pressure and Hydraulic Oil pressure gauges in the console in front of the steering column.

Pressure Gauges

Three pressure gauges are located in the console at front of the steering wheel for current operating information:

- 1 Rapid Fire Air Pressure - operating air pressure of the Rapid Fire system.
- 2 Hydraulic Oil Pressure - operating oil pressure of the closed centre pump.
- 3 Spray Pressure - operating liquid pressure of the sprayline.

The Sprayline pressure gauge in the console in front of the steering column.



The Front Sunvisor shown in a lowered position.

Sunvisors - Front & Rear

The sprayer is fitted with Sunvisors at the front and the rear of the cabin to reduce sunglare when required.

To lower the Front Sunvisor, use your hand and pull the bottom rail of the sunvisor down to the level required.

To raise the sunvisor, pull down on the cord at the top right hand side of the sunvisor. The spring-loaded sunvisor automatically returns to its rolled-up position.

Pull downwards on the cord on the right hand side of the Front Sunvisor to roll it up.



The Rear Sunvisor shown in a lowered position.

To lower the Rear Sunvisor, turn to the rear of the cabin and use your hand and pull the bottom rail of the sunvisor down to the level required.

To raise the sunvisor, pull down on the cord at the top right hand side of the sunvisor (facing the sunvisor). The spring-loaded sunvisor automatically returns to its rolled-up position.

Pull downwards on the cord on the right hand side of the Rear Sunvisor to roll it up.



The hand piece of the Two Way Radio located in the right hand rear corner of the cabin.

UHF Two Way Radio

A UHF Two Way Radio is located in the Overhead Console of the cabin. The hand piece is located in the right hand rear corner of the cabin.

Operating instructions for UHF two way radio are provided in the UHF Two Way Radio manual supplied with this manual.

Cup Holder

A convenient fold-up/fold-down cupholder is located in the rear right hand corner of the cabin.



Overhead Console

The cabin ceiling and Overhead Console (shown right) conveniently locates air vents, speakers, mirror adjustment knob, light switches, air conditioning controls & vents, AM/FM radio/CD player, UHF two way radio and storage area.

Windscreen Air Vent

Adjust the Windscreen Air Vent to direct the airflow onto to the desire area of the windscreen.

Adjustable Air Vent

Two Adustable Air Vents located in the Overhead Console (above and each side of the operator) allows operators to adjust the airflow to suit their needs.

Mirror Adjustment Knob

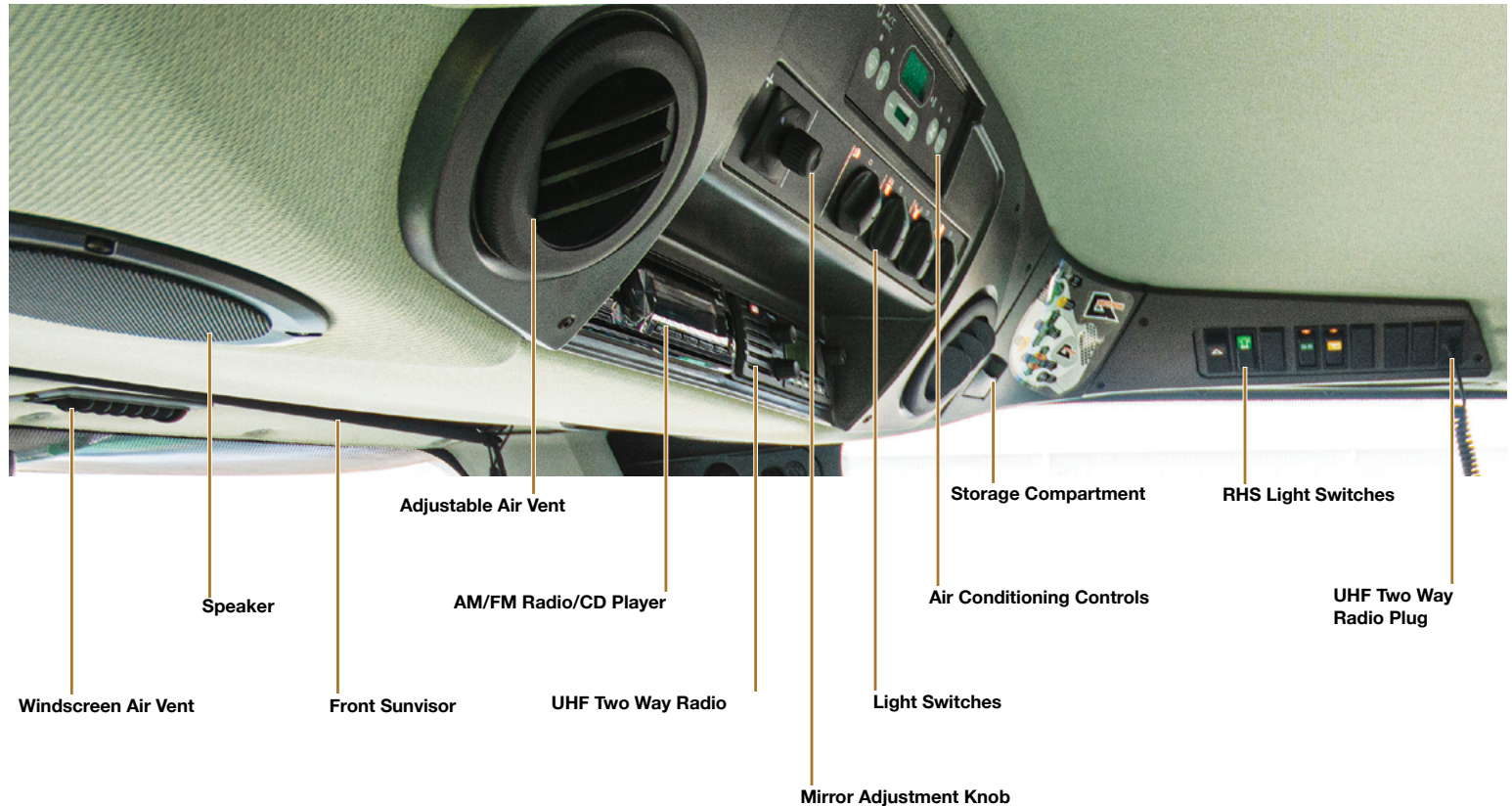
The Mirror Adjustment Knob allows the operator to personally adjust the rear vision mirrors from inside the cabin.

To adjust the left hand side mirror:

- 1 Rotate the Mirror Adjustment Knob anti-clockwise to the left hand mirror position.
- 2 Push or pull the knob up or down (vertically), then, left or right (sideways) to adjust the mirror to the desired position.

To adjust the right hand side mirror:

- 1 Rotate the Mirror Adjustment Knob clockwise to the right hand mirror position.
- 2 Push or pull the knob up or down (vertically), then, left or right (sideways) to adjust the mirror to the desired position.



Overhead Console photo - information on each item (shown above) is given on the following pages using the item heading).

The left hand mirror.

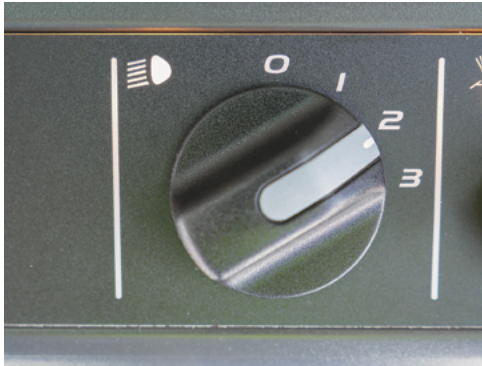


The Mirror Adjustment Knob.

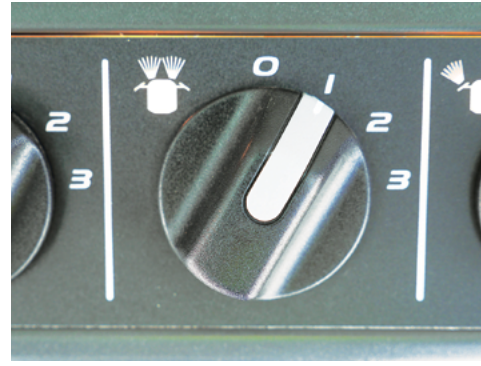


The right hand mirror.

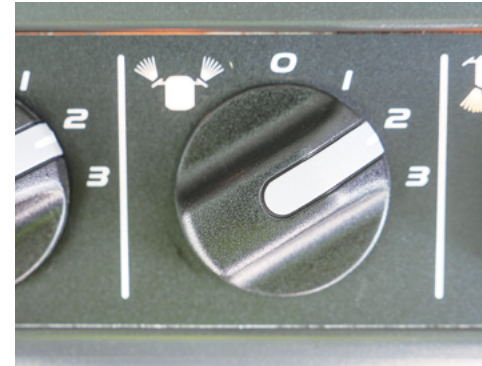




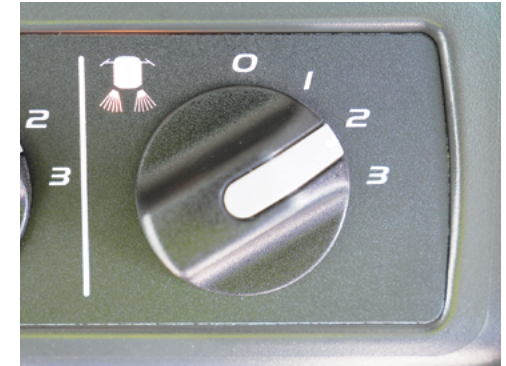
The Headlights Switch.



The Inner Front Work Lights Switch.



The Outer Front Work Lights Switch.



The Rear Work Lights Switch.

Front Light Switches

Four exterior light switches, on the Overhead Panel in front of the operator are used for:

- 1 Headlights
- 2 Inner Front Work Lights
- 3 Outer Front Work Lights
- 4 Rear Work Lights.

To operate the lights, rotate each switch to the position (0, 1, 2 or 3) for the lights required.

The Headlight Switch must be On (Position 1, 2 or 3) for the other three switches to work.

1 Headlights Switch

The Headlights Switch controls the Headlights, Interior Cabin Lights, Tail Lights & Outer Boom Marker Lights:

- Position 0 is Off.
- Position 1 is Interior Cabin Lights, Tail and Park Lights & Outer Boom Marker Lights On.
- Position 2 or 3 is Headlights, Interior Cabin Lights, Tail and Park Lights & Outer Boom Marker Lights On.

2 Inner Front Work Lights Switch

The Inner Front Work Lights Switch controls the Inner Front Work Lights.

- Position 0 is Off
- Position 1, 2 or 3 is Inner Front Work Lights On.

An Interior Cabin Light (located in RH rear corner ceiling) automatically illuminates when either Park lights or Headlights are switched On.

The Interior Light (located in RH rear corner ceiling) automatically illuminates when either Park lights or Headlights are switched On.



3 Outer Front Work Lights Switch

The Outer Front Work Lights Switch controls the Outer Front Work Lights:

- Position 0 is Off
- Position 1, 2 or 3 is Outer Front Work Lights On.

4 Rear Work Lights Switch

The Rear Work Lights Switch controls the Rear Work Lights & Night Pro LED Boom Lights:

- Position 0 is Off
- Position 1, 2 or 3 is Rear Work Lights & Night Pro LED Boom Lights On.

NOTE

To switch between High and Low beam Headlights, use the Multi-Function Lever located on the left hand side of the steering column.
The Headlights Switch must be first turned On.

NOTE

The Headlights Switch must be turned On for all Front & Rear work lights to function.
All lights can be turned Off by returning the Headlights Switch to 0 (Off).



The Storage Compartment located in the right hand side corner of the Overhead Console.

Storage Compartment

A Storage Compartment located in the right hand side corner of the Overhead Console provides convenient storage for documents and other smaller items.

To access the compartment, lift the latch at the bottom of the door and lift the door upwards.

Close the Storage Compartment door before operating.

The Storage Compartment is heated or cooled by the climate control and can be used to cool or warm items if required.



Hazard Lights Switch

Rotating Beacon Lights Switch

Auxiliary Chassis Lights Switch
- For customer light connection

Auxiliary Boom Lights Switch
- For customer light connection

Overhead light switch panel photo - information on each item (shown above) is given on this page using the item heading).

Light Switches

The Light Switches (rocker switches) located on the right hand side of the cabin in the Overhead Console (shown above) include:

- 1 Hazard Light Switch
- 2 Rotating Beacons Light Switch
- 3 Auxiliary Chassis Lights Switch
- 4 Auxiliary Boom Lights Switch.

1 Hazard Lights Switch

The Hazard Lights Switch controls the hazard lights function.

To engage the hazard lights, push the rocker switch upwards.

To disengage the hazard lights, push the rocker switch downwards

2 Rotating Beacon Lights Switch

The Rotating Beacon Lights Switch controls the rotating beacon lights on the top of the cabin.

To engage the Rotating Beacon lights, push the rocker switch upwards.

To disengage the Rotating Beacon lights, push the rocker switch downwards.

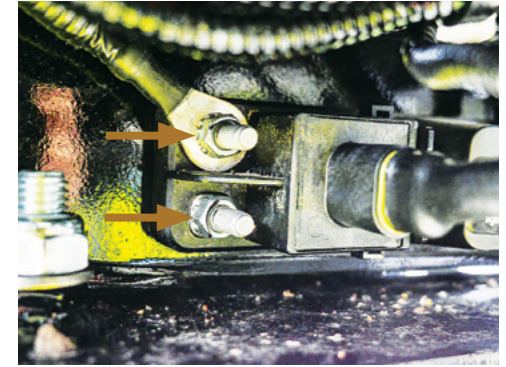
3 Auxiliary Chassis Lights Switch

The Auxiliary Chassis Lights Switch controls customer fitted lights.

The Auxiliary connection point for customer fitted lights is located on the front chassis rail under the front of the engine.

To engage the Auxiliary Chassis lights, push the rocker switch upwards.

To disengage the Auxiliary Chassis lights, push the rocker switch downwards.



The Auxiliary connection point for customer fitted lights is located on the front chassis rail under the front of the engine.

4 Auxiliary Boom Lights Switch

The Auxiliary Boom Lights Switch controls customer fitted lights.

The Auxiliary Power Connectors are externally located within the boom centre section. Boom lights can be fitted as desired.

To engage the Auxiliary Boom lights, push the in-cab rocker switch upwards.

To disengage the Auxiliary Boom lights, push the rocker switch downwards.

Auxiliary power connector located on a cable on the boom centre section (RHS shown [2 connectors - left & right side]).





Two Egress lights on the front corners of the cabin provide exit safety in dark conditions.

Map Lights

There are 2 map lights in the front right ceiling which can be operated together or individually (shown bottom right).

The front map light is fixed. The Outer rocker switch is used to switch the light On & Off.

The rear directional map light can be adjusted as desired. The Outer rocker switch is used to switch the directional light On & Off.

Egress Lighting

The Cruiser is fitted with Egress lighting (shown above) to assist in exiting the machine safely when parking in dark conditions.

The G-Hub Controller keeps these outside work lights on for 30 seconds after the engine is stopped & the ignition key removed.

NOTE

Map Lights only operate when the ignition key is On (in the "Accessories" or "Run" position).



The AM/FM Radio/CD Player located in the Overhead Console above & in front of the operator in the cabin.

AM/FM Radio/CD Player

The entertainment radio, located in the Overhead Panel in front of the operator comprises an AM/FM radio tuner and single CD player. A Bluetooth compatible phone system is also installed in the unit.

Operating instructions for AM/FM Radio/CD Player are provided in the Entertainment AM/FM Radio/CD Player manual supplied with this manual.

Use the Outer rocker switch to switch the front map light On & Off.



The UHF Two Way Radio located in the Overhead Console above & in front of the operator in the cabin.

UHF Two Way Radio

The UHF Two Way Radio, located in the Overhead Console of the cabin, has the hand piece located in the right hand rear corner of the cabin.

The operating instructions for the UHF Two Way Radio are provided in the UHF Two Way Radio manual supplied with this manual.

Use the Inner rocker switch to switch the directional map light On & Off.



The Air Conditioner Panel (see next page for details).

Air Conditioning Controls

The touch buttons of the automatic air conditioning panel (located above the light switches on the Overhead Console), are used to choose & regulate airflow, temperature & humidity within the cabin.

Operating modes of the air conditioner include:

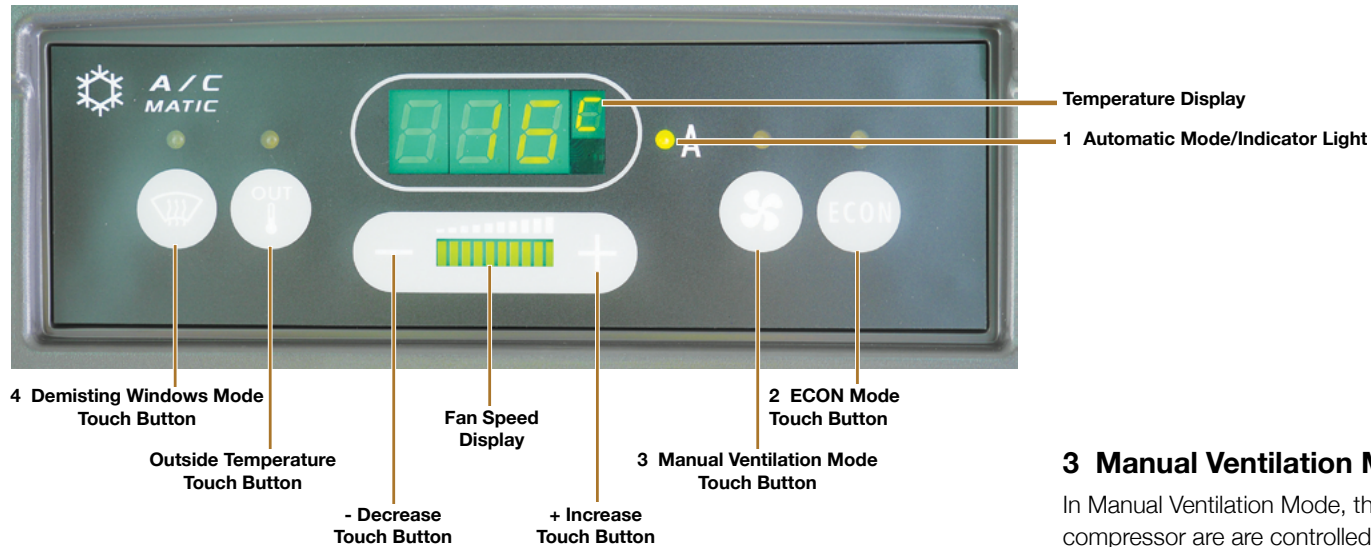
- 1 Automatic Mode - fully automatic operation (ideal for high outside temperatures).
- 2 Manual Ventilation Mode - Automatic Mode with manual fan speed control.
- 3 ECON Mode - Automatic Mode without the cooling function.
- 4 Demisting Windows Mode - Continuous operation at maximum fan speed.

To activate the air conditioner

Switch the Ignition On & start the engine.

Once ignition is On, a software version is displayed for 3 seconds, then a self-testing procedure takes a maximum of 20 seconds, to complete, then the control touch buttons on the Air Conditioner Control Panel are enabled for use.

On activation, the air conditioning mode displayed will be the same as last used.



Control touch buttons & Displays of the Air Conditioner Panel (information on each item (shown above) is given on this page).

1 Automatic Mode/Indicator Light

In Automatic Mode the air conditioner heater, compressor & ventilation operation is fully automatic to achieve and maintain the pre-set, constant cab temperature. The Automatic Mode is ideal for high outside temperatures.

To Activate the Automatic Mode:

Press the following touch buttons to switch off:

- 2 ECON Mode
- 3 Manual Ventilation Mode
- 4 Demisting Windows Mode

Indicator lights of Modes 2, 3 & 4 go Off and the Automatic Mode light (A) illuminates. Automatic Mode is now active.

NOTE

When outside temperatures go below 10°C, the Automatic Mode shuts down the air conditioner compressor.

2 ECON Mode

In ECON mode, the air compressor is shut Off while the heater & ventilation (depending on settings) are controlled automatically. This mode is used when cooling is not required.

To Activate the ECON Mode:

- Press the ECON Mode touch button. The ECON Mode Indicator light illuminates and the Automatic Mode Indicator (A) is Off. The ECON Mode is now active.

3 Manual Ventilation Mode

In Manual Ventilation Mode, the heater and compressor are controlled automatically (depending on settings) while the fan speed is manually controlled.

This Mode offers opportunity of setting slower or faster fan speeds with slower temperature adaptation in case of large deviations between cab and outside temperatures.

To Activate the Manual Ventilation Mode:

- Press the 'Manual Ventilation Mode' touch button and its Indicator light illuminates. The Manual Ventilation Mode is now active.
Current fan speed is shown on the Fan Speed Display. One bar represents 10% speed increment between 0 & 100%.

To Reduce the Fan Speed:

- Press the '- Decrease' touch button once for each 10% speed decrease.

To Increase the Fan Speed:

- Press the '+ Increase' touch button once for each 10% speed increase

Changed settings are activated after 5 seconds.

4 Demisting Windows Mode

The Demisting Windows Mode is used for demisting cabin windows. The compressor switches to run constantly with maximum fan speed. The heater operates at pre-set value.

To Activate the Demisting Windows Mode:

- Press the 'Demisting Windows Mode' touch button and its Indicator light illuminates. The Demisting Windows Mode is now active and the fan operates at maximum speed.

To Alter the Fan Speed:

- Refer to previous Fan Speed instructions under "3 Manual Ventilation Mode".



Fully adjustable cabin overhead air flow vents for operator comfort.

Setting Cab Temperature

The Temperature Display shows the currently set temperature.

To Decrease the Temperature setting:

- Press the ‘- Decrease’ touch button.

To Increase the Temperature setting:

- Press ‘+ Increase’ touch button

Temperature will be adjusted in 1°C or 2°F increments per touch button press, depending on Display Unit selected (Refer to “Changing Temperature Display” instructions next).

In Automatic Mode the air conditioner adjusts the cab temperature to its set value. During the Setting Cab Temperature procedure, the fan speed may rise quickly so that the cab temperature reaches the pre-set set point more quickly, for example, on a very hot day. When the cabin temperature approaches its set value, the fan speed will reduce again.

Changing Temperature Display

The Temperature Display can be changed between degrees Celcius & degrees Farenheit.

To Change the Temperature Units:

- Press the ‘- Decrease’ touch button & ‘+ Increase’ touch button simultaneously for up to 3 seconds to switch between units.

Repeating the above step will cycle between the two units.

Displaying Outside Temperature

To display the Outside Temperature:

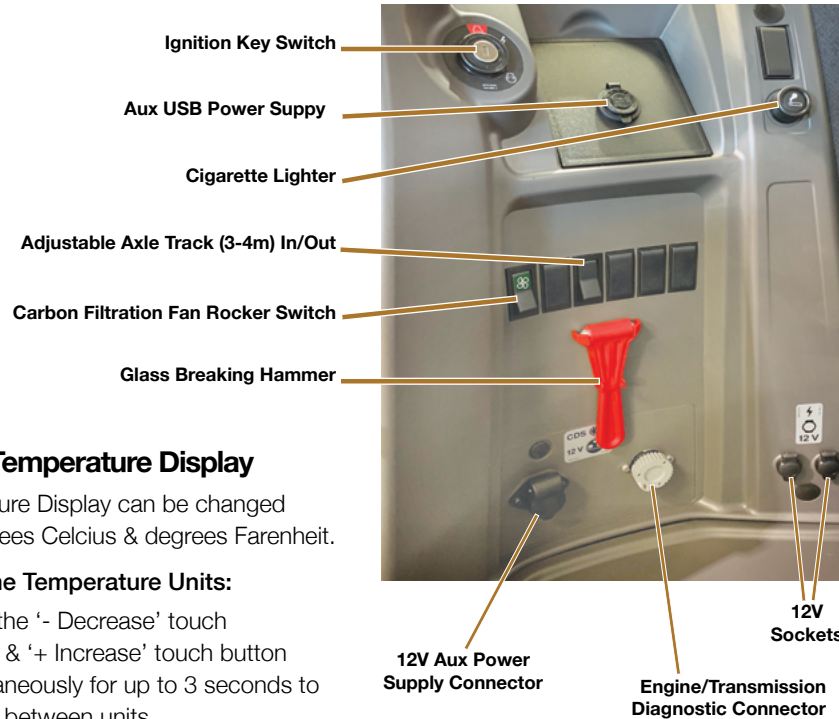
Press the ‘Outside Temperature’ touch button and its Indicator lights illuminates. The display now shows the outside temperature.

Adjusting Air Flow Vents

Air conditioner air flow is distributed inside the cabin through fully adjustable airflow vents.

Each vent can be adjusted directionally or turned On or Off to suit the individual needs of

For example, to heat the leg area, close all upper vents and direct air flow of the lower vents to the floor area.



Press the Carbon Filtration Fan Rocker Switch to activate the Carbon Filtration System Fan before spraying.

Carbon Filtration System

A fan forced Carbon Filtration System in conjunction with a fully sealed cabin creates a pressurised operator environment preventing contaminated air from entering the cabin.

The Carbon Filtration System removes dust, pollen, fumes and other potentially harmful pollutants from the air.

The Carbon Filtration fan (independent of the air conditioner fan) must be switched On separately for spraying operations.

To Activate the Carbon Filtration System Fan:

- Press the Carbon Filtration Fan Rocker Switch, located on the right hand side Rear Corner Console (see above).

Carbon Filter Maintenance

Carbon filters require periodic maintenance. See Chapter 8 ‘Lubrication & Maintenance’ for more information.

Cabin Corner Panel

The Cabin Corner Console (shown above) is located in the right hand rear corner of the cabin and incorporates the following:

- Ignition Key Switch
- Aux USB Power Supply
- Cigarette Lighter
- Adjustable Axle Track (3-4m) In/Out
- Carbon Filtration Fan Rocker Switch
- Glass Breaking Hammer (Emergency use only)
- 12V Aux Power Supply Connector
- Engine/Transmission Diagnostic Connector
- 12V Sockets.

CAUTION

Both cabin doors (entrance door & emergency escape door) must be completely closed and the Carbon Filtration System must be running to protect the operator from contaminated air.



Armrest Control Console photo - information on each item (shown above) is given on the following pages using the item letter & title).

Armrest Control Console

The Armrest Control Console (shown above) incorporates the following controls:

- A) G-Hub Touch Screen
- B) Boom Folding/Unfolding
- C) Joystick Controls
- D) Transmission Shifter
- E) Back-Up/Restore USB
- F) Dual USB Power Outlet
- G) Mobile Phone Holder
- H) Mode Function Switches
- I) Storage Trays

A) G-Hub Touch Screen

The G-Hub Touch Screen is Goldacres advanced Control System known as the G-Hub. It is a fully integrated electronic control system developed by Goldacres.

The G-Hub system comprises:

- In-Cabin Touch Control Screen
- External Control Screen with separate control pad,
- PLC (programmable logic controller),
- I/O modules,
- Sensors and
- Switches

to control & monitor all critical machine functions.

The fully integrated G-Hub system operates with all leading steering and mapping providers using the ISOBUS protocol.

On-board diagnostics allow an operator to quickly pinpoint any problems that might arise without the need of a laptop, specialised service tools or internet connections to minimise cost & downtimes.

Refer to G-Hub Touch Screen & Chapter 6 'Operation' for more information).



Always check for power lines while folding and unfolding the boom, as getting too close or any contact with power lines can be fatal.



Boom Rest, Boom Fold & Boom Bi-fold rocker switches used for folding & unfolding the boom.

B) Boom Folding/Unfolding

The Boom Folding/Unfolding panel comprises three rocker switches which control the folding and unfolding of the boom (shown above).

Unfolding the Boom

The Boom Unfolding Procedure is manually controlled by using the Boom Unfolding Switches & a Joystick Button. Refer to Chapter 6 'Operation', 'Unfolding the Boom' for instructions.

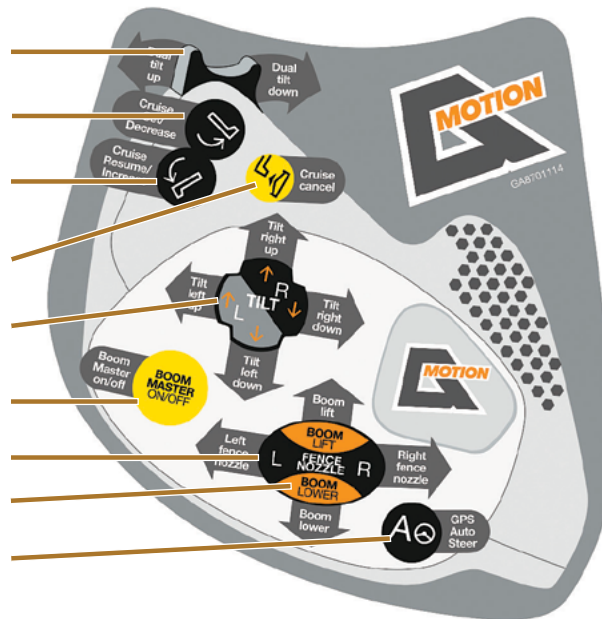
Automatic Boom Folding

To fold the boom automatically, the calibration values must first be entered into the G-hub Controller for tilt left, tilt right & boom lift. Refer to Chapter 6 'Operation', 'Automatic Boom Folding' for instructions.

Manual Boom Folding

The boom can be folded manually, but only when the calibration values in the G-hub controller are set to zero for tilt left, tilt right & boom lift. Refer to Chapter 6 'Operation', 'Manual Boom Folding' for instructions.

- 1 Dual Tilt Up/Down
- 2 Cruise Set/Decrease
- 3 Cruise Resume/Increase
- 4 Cruise Cancel
- 5 Boom Tilt - Left Up/Down & Right Up/Down
- 6 Boom Master On/Off
- 7 Fenceline Nozzle L/R On/Off
- 8 Boom Lift/Lower
- 9 GPS - Autosteer On/Off



Joystick Controller Push Buttons - information on each item (shown above) is given on the following pages.

C) Joystick Controller

The Joystick Controller incorporates 8 function push buttons shown above and fore/Aft movement of the Joystick is used in 3 modes of Cruise Control.

Refer to Chapter 6 'Operation' for details.

One Rocker Switch and 8 Push Buttons are used on the Joystick:

- 1 Dual Tilt Up/Down (rocker switch)
- 2 Cruise Set/Decrease
- 3 Cruise Resume/Increase
- 4 Cruise Cancel
- 5 Boom Tilt - Left Up/Down & Right Up/Down
- 6 Boom Master On/Off
- 7 Fenceline Nozzle Left/Right - On/Off
- 8 Boom Lift/Lower
- 9 GPS - Autosteer On/Off.

Refer to Chapter 6 'Operation' for instructions.



Dual Tilt rocker switch on the Joystick used to tilt boom wings up for folding.

1 Dual Tilt Up/Down

The Dual Tilt Up/Down rocker switch, located on the front of the Joystick, is used to raise or lower both right & left boom wings simultaneously.

Both boom wings pivot on the centre section and both left & right boom wings are raised or lowered together - the outer end of the wings move the furthest.

Refer to Chapter 6 'Operation' for instructions.



The lower Cruise Set/Decrease push button used to set the current ground speed for Cruise Control.

2 Cruise Set/Decrease

The Cruise Set/Decrease push button is used to set the current ground speed as Cruise Control Speed and to decrease the set ground speed.

See Chapter 6 'Operation' for instructions.

3 Cruise Resume/Increase

The Cruise Resume/Increase push button is used to resume the previously set current ground speed as the Cruise Control and increase the set ground speed.

Refer to Chapter 6 'Operation' for instructions.

The upper Cruise Set/Increase push button used to resume current ground speed for Cruise Control.



Your Sprayer at a Glance - **Cabin**



The Cruise Cancel push button on the side of the Joystick used to cancel the cruise control function.



The L & R Arrow Boom Tilt push button used to tilt boom ends up & down.



The Boom Master push button used to start & stop the boom spraying.



The Boom Lift & Boom Lower push button used to raise & lower the boom height as required.

4 Cruise Cancel

The yellow Cruise Cancel push button is used to cancel the active Cruise Control. Applying the Foot Brake also cancels the Cruise Control.

The Cruise Master switch is used to cycle the Cruise Control between On [active] and Off [inactive].

Refer to Chapter 6 'Operation' for instructions.

5 Boom Tilt - L Up/Down & R Up/Down

The Boom Tilt - L Up/Down & R Up/Down push button is used to individually lift or lower the angle the boom from left to right or right to left to more closely follow ground contour.

The boom wings pivot on the centre section and the left or right boom wing is raised or lowered - the outer end of the wing moves the furthest.

Refer to Chapter 6 'Operation' for instructions.

6 Boom Master On/Off

The yellow Boom Master On/Off push button is used to cycle the boom spraying On & Off, as required.

Refer to Chapter 6 'Operation' for instructions.

7 Fence Nozzle L/R

The Fenceline Nozzle L/R push button is used to switch the left & right side fenceline nozzles On & Off.

Refer to Chapter 6 'Operation' for instructions.

8 Boom Lift/Lower

The Boom Lift/Lower push button is used to raise or lower the vertical height of the boom.

Refer to Chapter 6 'Operation' for instructions.

9 GPS Autosteer On/Off

Auto steer is retrofitted by the dealer/customer according to their requirements.

The black Autosteer push button is used to cycle the GPS autosteer On & Off as required.

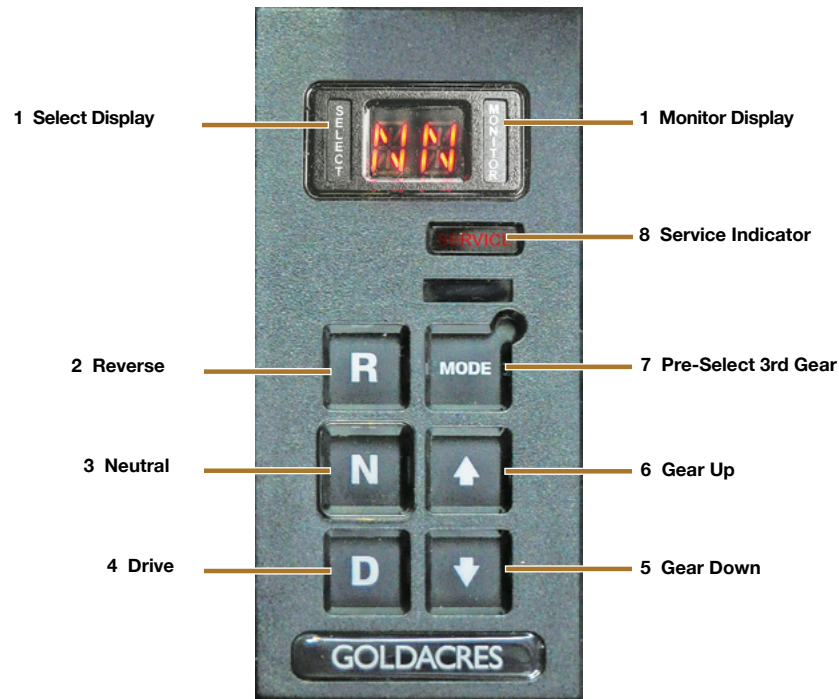
Refer to Chapter 6 'Operation' for instructions.

The Fenceline Nozzle push button is used to switch the Left & Right fenceline nozzles On & Off.



The Autosteer push button is used to engage & disengage the Autosteer.





Transmission Shifter photo - refer to Chapter 6 'Operation' for instructions.

D) Transmission Shifter

The Transmission Shifter panel (shown above) contains 6 push button Gear Selectors, Illuminated Displays and a Service Indicator light as follows:

- 1 Select & Monitor Displays
- 2 Reverse Gear
- 3 Neutral
- 4 Drive

- 5 Gear Down
- 6 Gear Up
- 7 Pre-Select 3rd Gear
- 8 Service Indicator Light.

Refer to Chapter 6 'Operation' for instructions.



The Back-Up/Restore USB is provided to back-up & restore system settings & data.

E) Back-Up/Restore USB

The Back-Up/Restore USB is provided to back-up & restore system settings & data of the G-Hub Controller only. Refer to the end of this chapter for more information.

F) Dual USB Power Outlet 5W

A dual USB outlet is provide in the Armrest Control Console to enable charging of a phones, tablets or other USB devices.

G) Mobile Phone Holder

A convenient Mobile Phone Holder is provided in the Armrest Control Console.

The dual USB outlet enables charging of phones or other USB devices.



Mobile Phone Holder located in the Armrest Control Console.

H) Mode Switch Panel

The Mode Switch panel located on the Armrest Control Console contains 3 or 4 rocker switches (shown below - left to right):

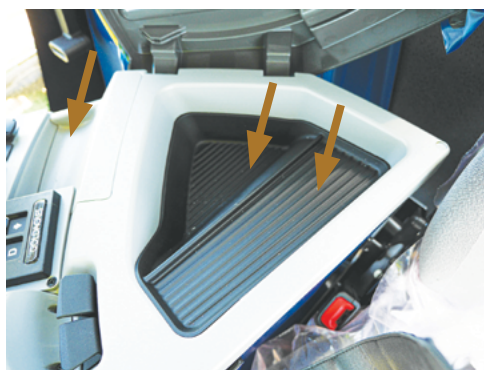
- 1 Spray Mode/ Road Mode
- 2 Cruise Master On/Off (also used as a mode switch for 'Headland Assist' settings - refer Chapter 4 'Setting Up' under 'Headland Assist').
- 3 Differential Lock On/Off (4WD option only)
- 4 Park Brake On/Off.

Refer to Chapter 6 'Operation' for instructions.

The Mode Switch panel (The Differential Lock Switch is optional for 4WD models only).



Your Sprayer at a Glance - Cabin



Storage trays provided at the rear & underneath the right hand side Armrest.



Electrical compartment located below the Armrest Control Console.

I) Storage Trays

Storage trays are provided at the rear and underneath the right hand side Armrest.

One storage tray is located to the right side of the Transmission Shifter.

Other trays are located under the rear of the Armrest. Lift up the top of the Armrest to access the storage trays (as shown above).

Electrical Compartment

The Electrical Compartment is located at the right hand side of the operator's seat below the Armrest Control Console.

The compartment contains two main fuse boxes and various fuses, relays to activate the machine circuitry and the connectors for GPS steering systems.

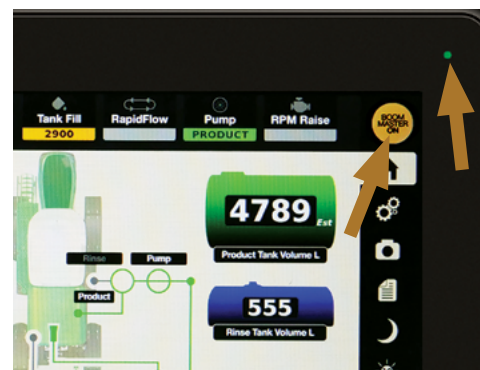
Fuses are designed in the system to protect the system against electrical faults and incorrect connections. If a fault or incorrect connection occurs, a fuse will blow and disconnect the related circuit.

If a fuse has blown, identify the corresponding components in the circuit and investigate the cause before reconnecting with a new fuse.

See Chapter 10 'Integrated Systems', 'Cabin Electrical Compartment' for further information.

CAUTION

When a fuse is replaced it is important that the fuse is replaced with another fuse of the same rating. Do NOT use a higher rated fuse in an attempt to correct an electrical fault. Failure to follow these instructions may cause damage to the machine which cannot be covered by warranty.



Green light indicator & the Boom Master Switch touch button

G-Hub Interface

Software upgrade has improved functionality and G-Hub Home screen operator interface.

Home Screen

Functional changes to the G-Hub Home screen include:

- Green light on the top right corner of the G-Hub displays:
 - Green = Connected & OK
 - Red = Display not connected
- External Buzzer sounds, momentarily, when the PLC is turned On with the key & is running OK
- Boom Master Switch - the Boom Master indicator has been changed to a Touch Button switch allowing the Boom to be turned On & Off on the G-Hub Home screen.

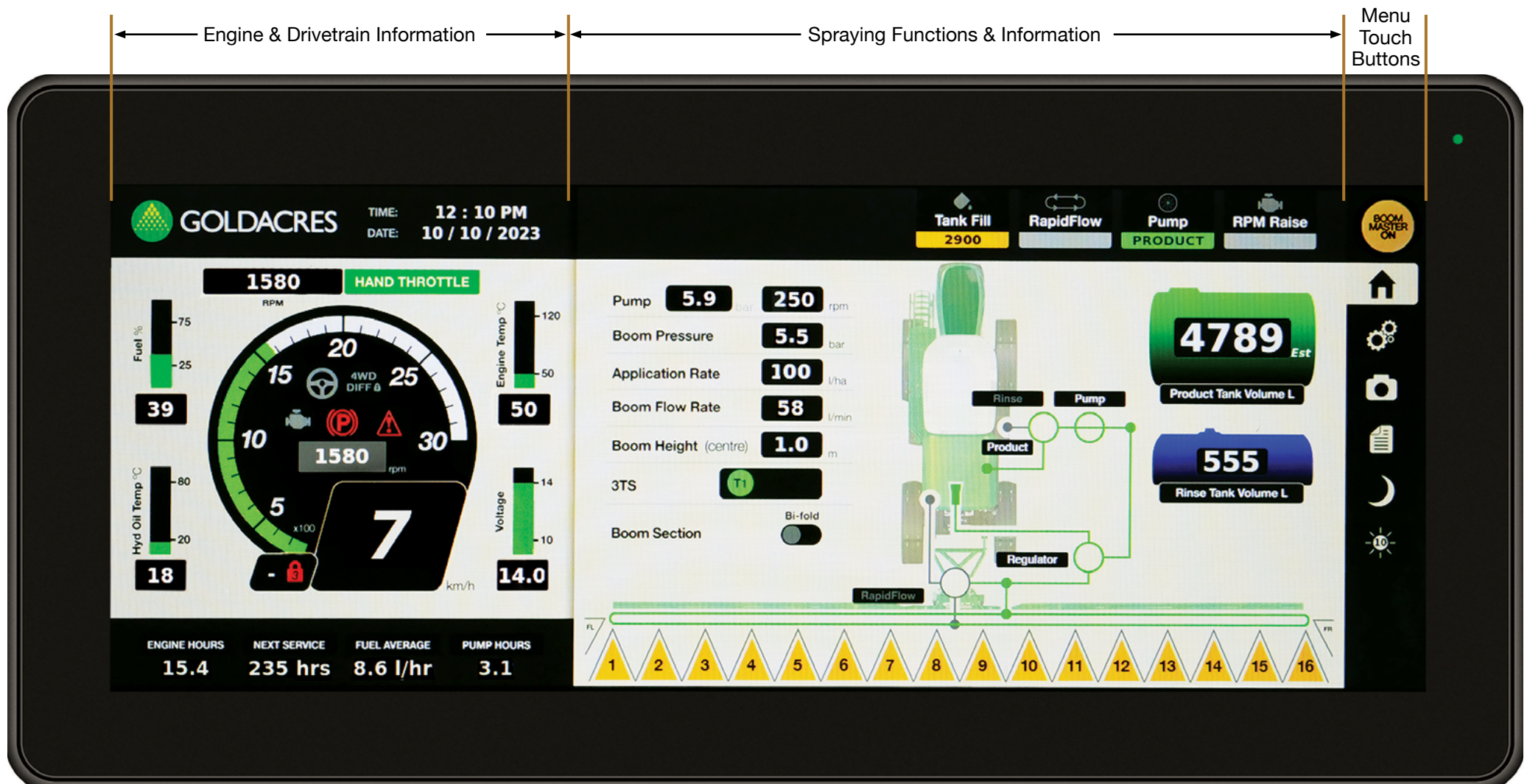


External display screen with Green light indicator.

External Screen

The External display screen includes a Green light on the top right corner of display:

- Green = Connected & OK
- Red = Display not connected.



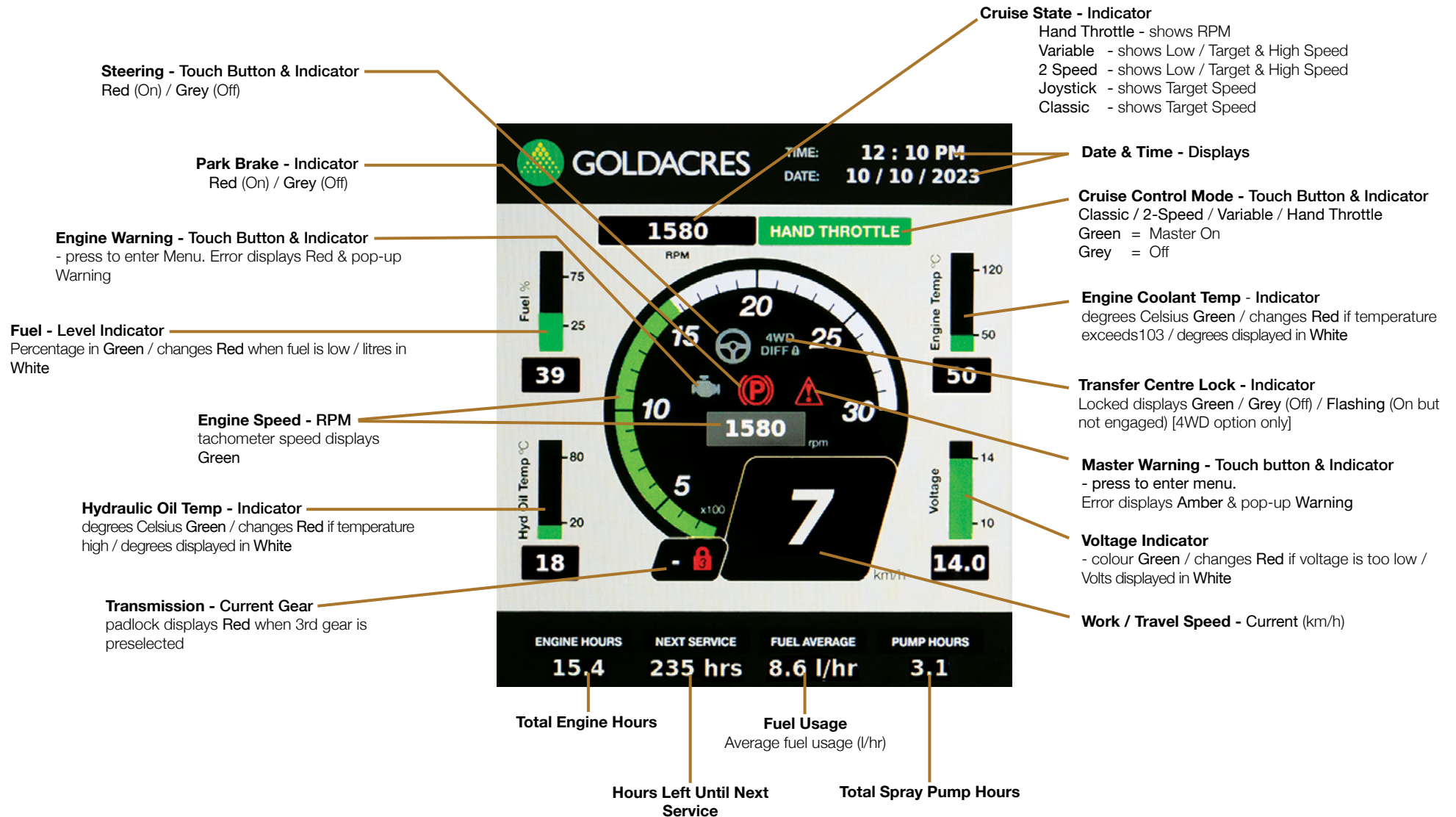
G-Hub Controller

Goldacres G-Hub Controller with touch button controls (*Home screen shown above*) is a fully integrated electronic control system facilitating easy in-cab controls & monitoring of critical machine & spraying functions (see Chapter 6 'Operation' for instructions), as well as an External G-Hub Control Screen for filling & cleaning functions (Refer to Chapter 6 'Operation', 'Filling the Sprayer').

The G-Hub Controller integrated system is designed to operate seamlessly with leading steering and mapping providers using the ISOBUS protocol.

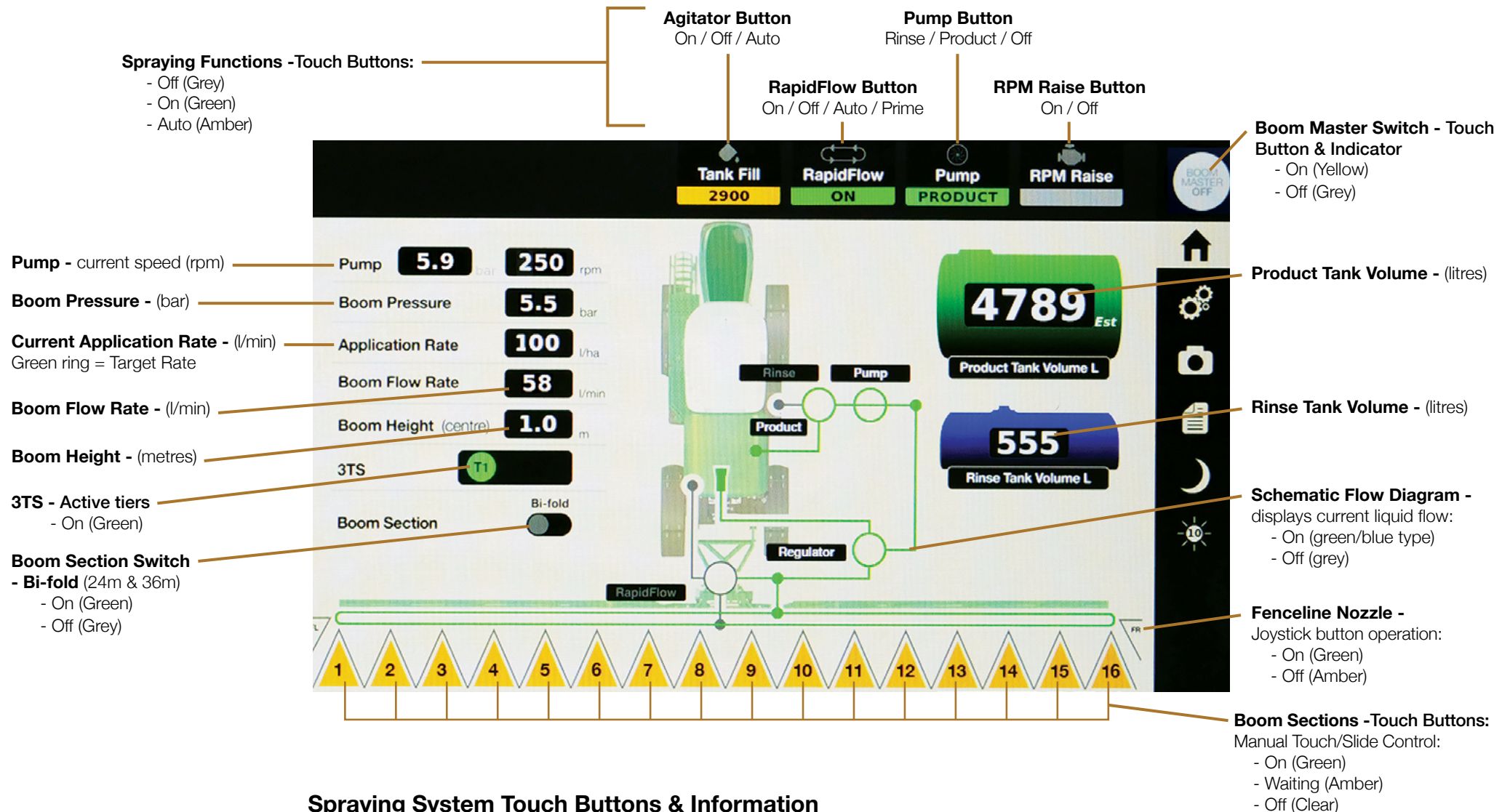
On-board diagnostics allow the operator to quickly pinpoint problems without the need for laptops, specialised service tools or internet connection (Refer to Chapter 9 'Trouble Shooting' for more information).

Your Sprayer at a Glance - Cabin



Engine-Drivetrain Touch Buttons & Information

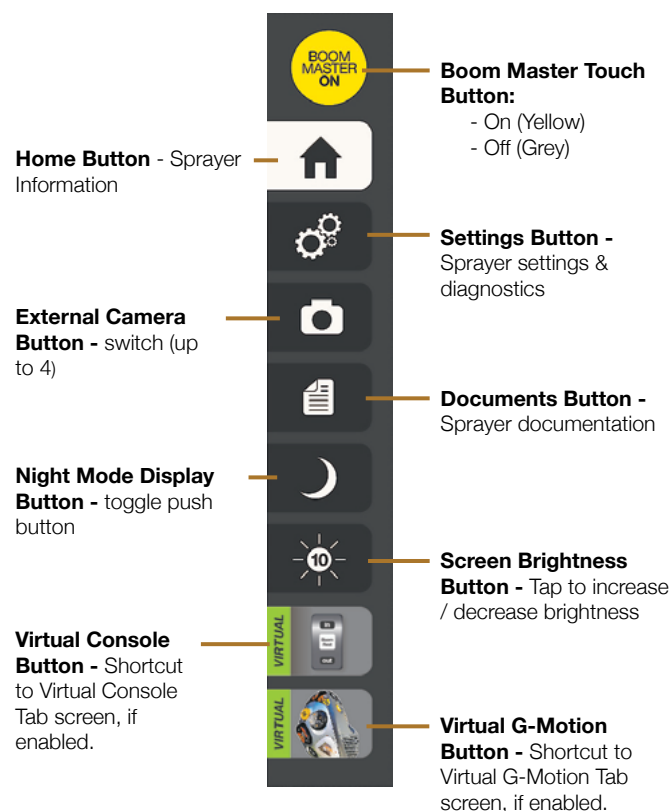
The Engine-Drivetrain touch buttons & Information (on the Home screen shown above) displays information of the engine, transmission, servicing, cruise control & system warnings, as well as touch buttons to access Cruise control setting & the Warning menu of the G-Hub Controller.



Spraying System Touch Buttons & Information

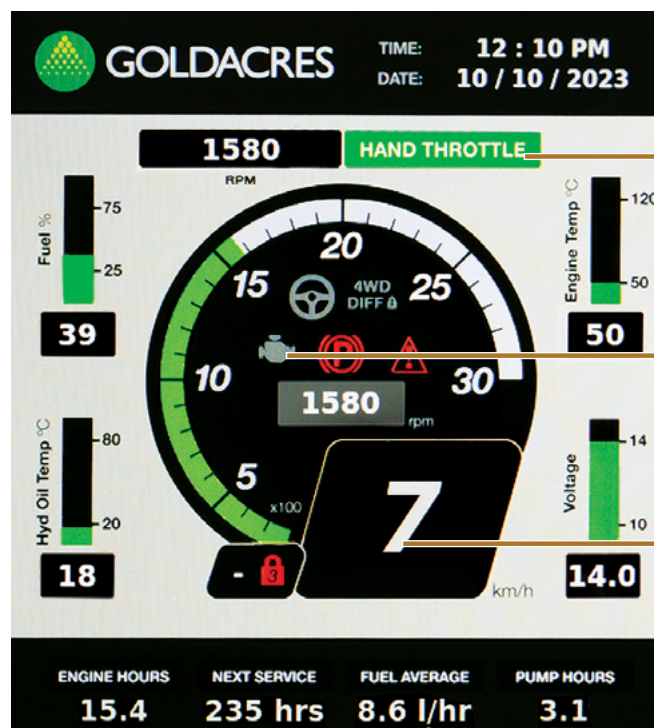
The Spraying System touch buttons & Information (on the Home screen shown above) illustrate the touch buttons for spraying functions and display information of the G-Hub Controller spraying system.

Your Sprayer at a Glance - **Cabin**



Menu Touch Buttons

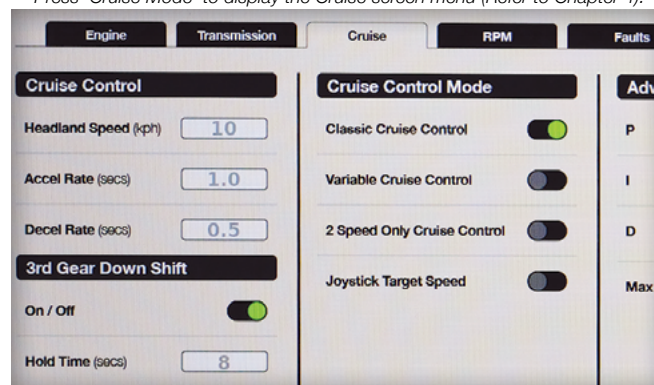
The Menu touch buttons on the Home screen (shown above) provide touch buttons to access the G-Hub Controller settings, cameras, documents, display lighting and other functions according to the configuration and settings of the Cruiser.



Engine & Drivetrain Touch Buttons

The Engine & Drivetrain touch button Areas (shown above) are short cut buttons providing quick access to both 'Cruise Control' settings & Engine Warning 'GA Default Codes'

Press 'Cruise Mode' to display the Cruise screen menu (Refer to Chapter 4).



Cruise Mode Touch Button -

- Displays the 'Cruise Control Mode selection panel

- **Engine/Warning Touch Button -**

Engine/Warning Touch Button
Displays the Engine 'GA Default Code' screen

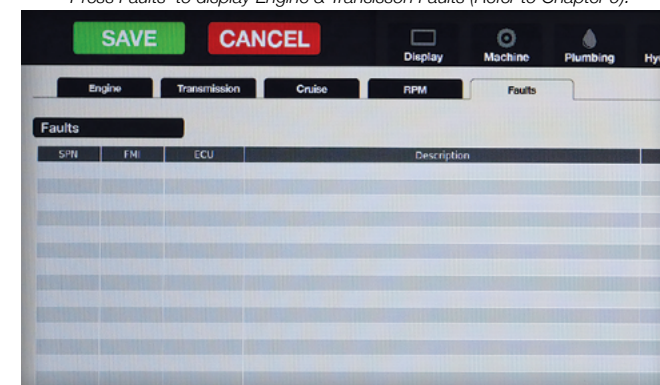
— **Selected Cruise Mode -**

Displays the current Cruise Mode selection, gear & current speed in km/hr

Press the 'Cruise Mode' touch button (see *above centre*) & the Cruise Control Mode selection screen appears (see *below centre*). Refer to Chapter 4, 'Setting Up', 'B Cruise Tab' for instructions.

Press the Engine/Warning touch button (see *above left*) & the GA Faults screen appears (see *below*). Refer to Chapter 9,

Press Faults' to display Engine & Transissson Faults (Refer to Chapter 9).





Spraying System Touch Buttons

The Spraying System touch buttons (shown above) provide 7 functions along the top the screen:

- Tank Fill
- Rapid Flow
- Pump
- RPM Raise.

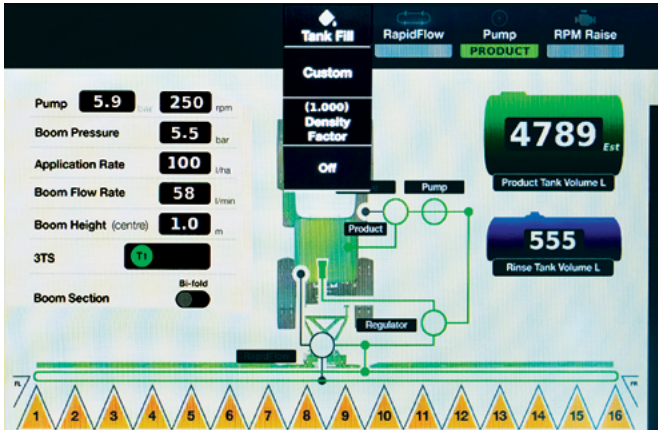
All touch buttons show Grey when Off, Amber in Auto and Green when On

Up to sixteen On/Off Boom touch buttons along the base of the screen (depending on boom size with one touch button for each boom section) show Amber when Off and Green when On (active).

The FL & FR Fenceline symbols are display only.

The Boom Section touch buttons & Fenceline indicators display:

- Green when On
- Amber when Waiting
- Clear when Off.



Tank Fill Touch Button

Press the Tank Fill touch button and drop a down menu of three touch buttons (shown above) appears:

- **Custom** - allows the operator to set the Product Tank fill volume (litres) before filling.

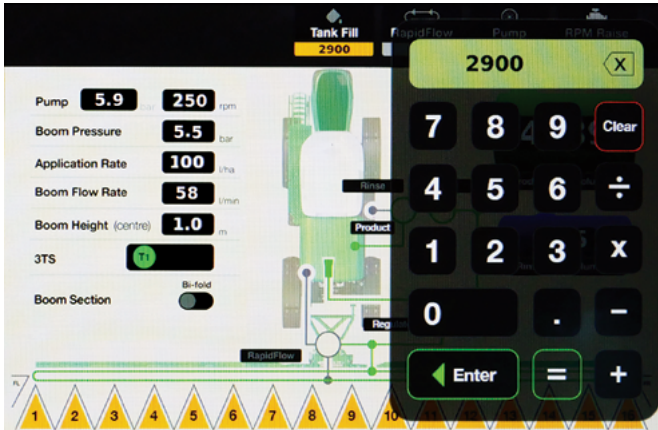
1 Press the 'Custom' touch button and a keypad appears.

2 Press the touch buttons to enter the amount of Fill liquid required for the Product Tank, then press Enter.

The screen returns to the 'Tank Fill' touch button (Orange). The 'Desired Fill' is now set for use on the External Display.

- **Density factor (1.000)** - allows the operator to change the density factor according to chemicals being used.

The Density Factor can also be set using the External G-Hub Controller at the Quick Filling Station (refer to



the the External G-Hub Controller & Filling instructions in Chapter 6 "Operation".

To Set the Density Factor on the G-Hub Controller in the cabin:

1 Press the 'Density Factor' touch button and a keypad appears (shown above).

2 Press the keypad touch buttons to enter the Density Factor required, then press Enter.

The screen returns to the 'Tank Fill'

Your Sprayer at a Glance - Cabin



RapidFlow Touch Button

Press the RapidFlow touch button and a drop down menu with four touch buttons (shown above) appears:

- **On**
Press the 'On' touch button & the screen returns with the 'RapidFlow' touch button displaying 'On' (Green)
- **Off**
Press the 'Off' touch button & the screen returns with the 'RapidFlow' touch button displaying 'Off' (Grey)
- **Auto**
Press the 'Auto' touch button & the screen returns with the 'RapidFlow' touch button displaying 'Auto' (Amber)
- **Prime**
Press the 'Prime' touch button & the screen returns with the 'RapidFlow' key displaying 'Prime' (Amber)
Priming the boom lines begins with a count down timer. When boom priming is completed, the 'RapidFlow' key displays 'Auto' (Amber).



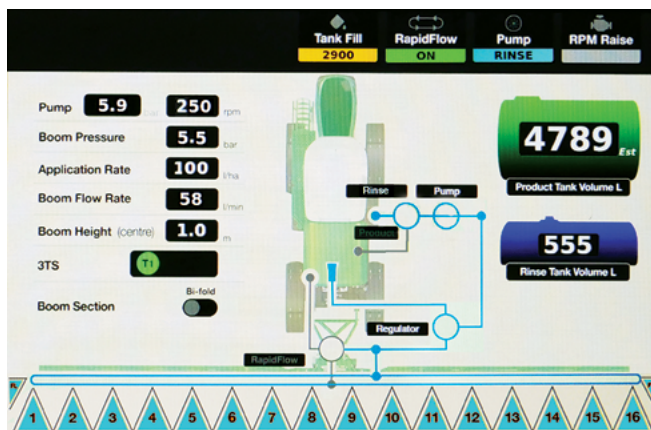
Pump Touch Button

The Pump touch button provides selection of the Rinse tank or Product tank as the water source.

Press the Pump touch button and a drop down menu with three touch buttons (shown above) appears.

Press the touch button required:

- **Rinse**
Press the 'Rinse' touch button & the screen returns with the 'Pump' touch button displaying 'Rinse' (Blue) [shown below]

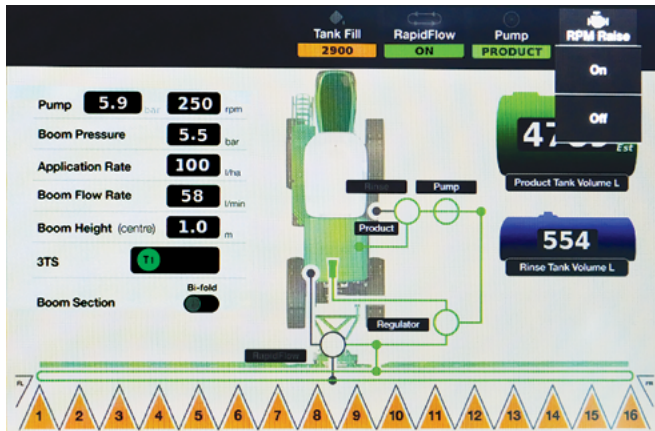


Product

Press the 'Product' touch button & the screen returns with the 'Pump' touch button displaying 'Product' (Green) [shown above].

Off

Press the 'Off' touch button & the screen returns with the 'Pump' touch button displaying 'Off' (Grey)



RPM Raise Touch Button

The RPM Raise touch button allows engine speed to be raised while stationary (Park Brake must be On) for filling & mixing functions.

Press the RPM Raise touch button and a drop down menu with two touch buttons (shown above) appears.

Press the touch button required:

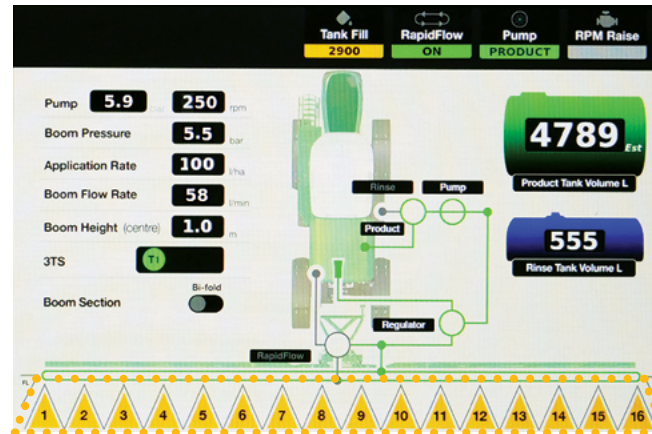
- **On**

Press the 'On' touch button & the screen returns with the 'RPM Raise' touch button displaying 'On' (Green)

The engine will increase to the preset RPM Raise speed

- **Off**

Press the 'Off' touch button & the screen returns with the 'RPM Raise' touch button displaying 'Off' (Grey).



The engine will reduce to normal idle speed.

Boom Section Touch Buttons

Boom Section touch buttons along the bottom of the screen (outlined above with orange dots) can be used to switch selected boom sections On & Off.

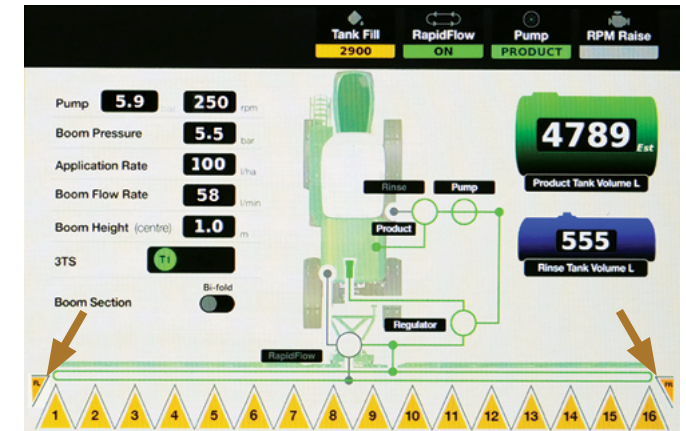
Press a Boom Section touch button to cycle the section On or Off as required:

- **Boom Sections**

Press each touch button as required to activate or deactivate boom sections as required.

Section touch buttons display:

- Amber while waiting for the Spray Controller
- Green when On



- Clear when Off.

Fenceline Nozzle Indicators

The Fenceline Nozzle symbols (FL & FR) on the left & right ends of the boom, show whether the fenceline nozzles are On or Off.

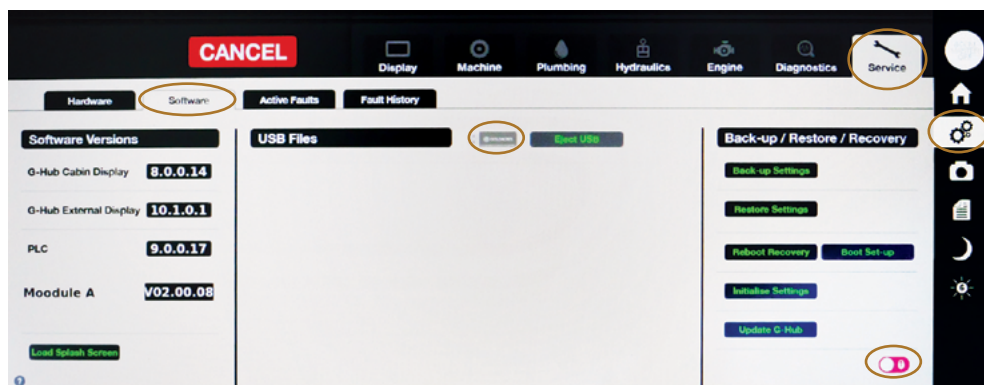
- Fenceline Nozzle touch buttons display:
 - Amber with liquid circulating and waiting for the Boom Master to be activated or deactivate
 - Green when On
 - Clear when Off.

Switching the Fenceline Nozzles 'On' or 'Off' is controlled with

Press the L/R ends of the Fence Nozzle push button on the Joystick to nozzles spraying. Press again to Stop nozzles spraying.



Your Sprayer at a Glance - Cabin



Press the 'Settings' touch button, then the 'Service' touch button, then the 'Software' touch button to display the 'USB Files' screen menu. Press the red 'Lock' touch button to unlock the screen.

Back-Up/Restore USB

The Back-Up/Restore USB facility is used to back-up system data onto a USB stick and to restore system data from the USB stick.

To Back-Up System Settings & Data to a USB Memory Stick:

- 1 Turn the ignition key On.
- 2 Press the 'Settings' touch button on the G-Hub Main screen to open the Display screen, then press the 'Service Tab' touch button to open the Service screen.
- 3 Press the Software tab and the Software screen opens with the Goldacres USB memory stick displaying GREY in the USB Files menu.

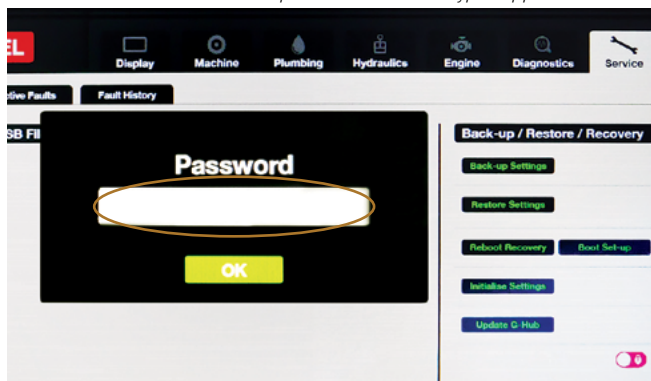
- 4 The Software screen is locked for protection from uninformed or accidental alteration.

The screen must be unlocked before any setting or alterations can be made.

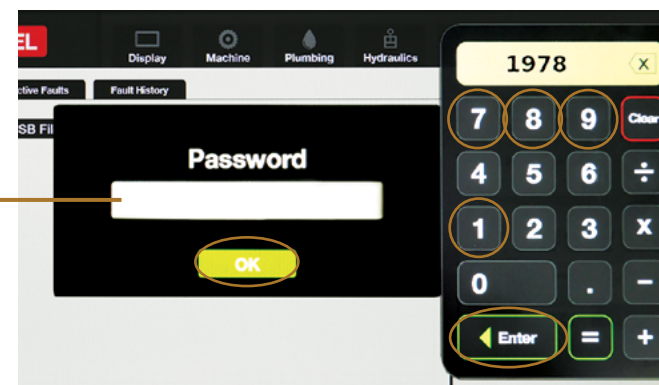
To Unlock the Software Tab Screen:

- a) Press the red 'Unlock to change' touch button at the bottom RHS of the screen. The 'Unlock to change' touch button changes to green and a password request appears.
- b) Press the password space and a numerical keypad appears.

Press the 'Password' space & a numerical keypad appears.



Unlock Password/PIN
1978



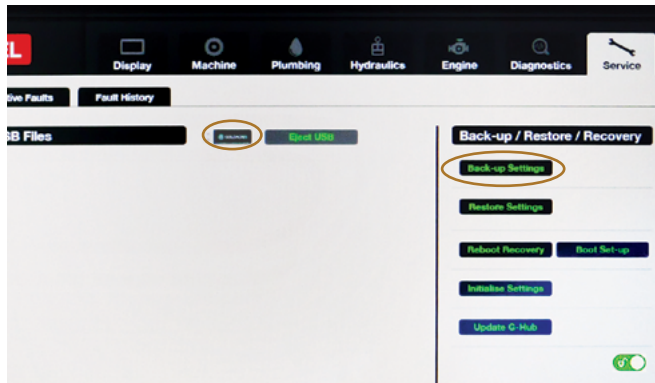
Press the touch buttons '1978' to enter the password, then press 'Enter'.

- c) Press the numerical touch buttons to enter the password '1978', then press the 'Enter' touch button. The screen returns to the 'Password' with '*****' displayed.
- d) Press the 'OK' touch button and the screen returns to the Software Screen.

- 5 Remove the cap from the Back-Up/Restore USB fitting on the console and Insert a USB Memory Stick into the fitting & wait for the the Goldacres USB memory stick to display BLACK in the USB Files menu.

Remove the cap & insert a USB memory stick into the Back-Up/Restore USB fitting on the console.





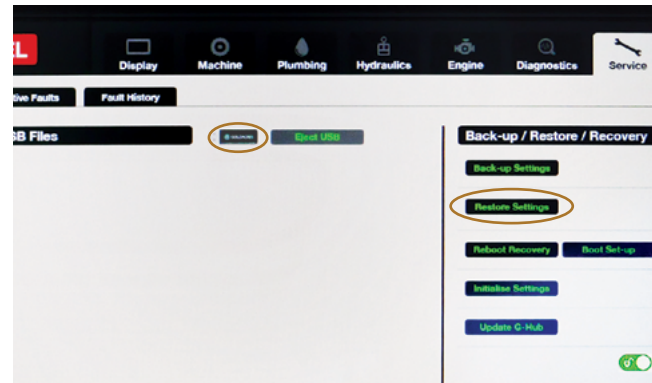
Wait for the Goldacres USB memory stick to display BLACK in the USB Files menu, then press the 'Back-up Settings' touch button to back-up system settings & data.

- 6 Press the 'Back-up Settings' touch button & the screen changes to 'G-HUB Backing up... DO NOT SWITCH OFF MACHINE'.
- 7 When Back-Up is completed, press the 'Eject USB' touch button, then safely remove the USB Memory Stick.
- 8 Refit the cap to USB fitting on the console.

NOTE

DO NOT press the 'Back-up Settings' touch button or 'Restore Settings' touch button **BEFORE** the USB Memory Stick is installed & recognised. Otherwise the G-Hub Controller system will stall & require re-booting.

The screen 'G-HUB Backing up... DO NOT SWITCH OFF MACHINE'.



Wait for the Goldacres USB memory stick to display BLACK in the USB Files menu, then press the 'Restore Settings' touch button to restore system settings & data.

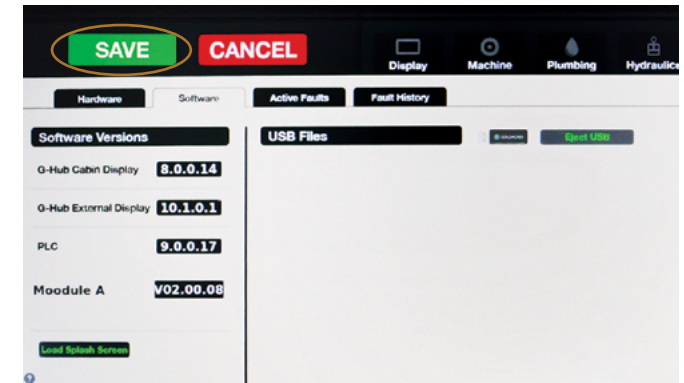
To Restore System Settings & Data from the USB Stick:

- 1 Follow steps 1 to 5 'To Back-Up System Settings & Data to a USB Memory Stick'.
- 2 Press the 'Restore Settings' touch button & the screen changes to 'G-HUB Restoring... DO NOT SWITCH OFF MACHINE'.
- 3 When Restoring is completed, press the 'Eject USB' touch button, then safely remove the USB Memory Stick.
- 4 Refit the cap to USB fitting on the console.

Reboot Recovery & Boot Set-up - Used to reboot the display to configure internal hardware settings. For service use only.

Initialise Settings - Used to reset GHub settings to default values. If used, the GHub setting must be re-entered before operating.

The screen 'G-HUB Restoring... DO NOT SWITCH OFF MACHINE'.



Press the 'SAVE' touch button to save the settings before leaving the 'Software' screen.

Press the 'SAVE' touch button to save the settings before leaving the 'Software' screen.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change is made in the G-Hub system. If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain. The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.



Crop Cruiser G4 Series 2.

4 - Setting Up – Preparation for Use 57

Autosteer Installation	58
Accessing the Electrical Compartment	58
Autosteer Connectors	59
Goldacres Autosteer System	59
Installing Trimble Autosteer	63
Installing John Deere Autosteer	65
Pre-Set the Raven Control Module (RCM)	67
Pre-Set the G-Hub Controller	75
1 Display	76
2 Machine	77
A Setup	77
B Boom Automation	79
C Steering Diagnostics	80
D Steering Calibration	81

3 Plumbing	83
A Boom Sections	83
B Control Valves	84
C Tank Levels	86
D Tank Calibration	88
4 Hydraulics	89
5 Engine	90
A Engine	90
B Transmission	91
C Cruise	91
D RPM	95
Check Boom Settings	96
Pre-Set the AutoBoom XRT (Option)	97
Alternate Screen Mounting	97
G-Hub Controller Screen	97
GPS Screen	98



Lift up the the right hand rear latch of the armrest control console.



Lift & raise the front of the armrest control console to its highest position.



The right hand door latch opened with the holding pin & latch holding the door ajar.



Locking latches of the electrical compartment cover lifted up to release the locks.

Autosteer Installation

The Crop Cruiser is equipped to be fitted with 3rd party GPS Autosteer systems.

Inbuilt Autosteer connectors are located in the Electrical Compartment located below the armrest control console, as well as within the roof space & top of the cabin.

Instructions here provide basic explanation for accessing, locating and connecting relevant connectors for Trimble & John Deere steering systems.

Other systems may be used but details are not provided here.

Refer to installation instructions in this chapter for your chosen steering system.

NOTE

While it is recommended to gain full access to the electrical compartment via the right hand cabin door, it should be noted that more limited access to the electrical compartment can be made from within the cabin.

Accessing the Electrical Compartment

It is recommended to open the right hand cabin door and use a step ladder or a raised platform to gain full access to the electrical compartment.

To access the electrical compartment:

- 1 Start the engine and fully open the boom to its working position, then turn the front wheels hard left to create space for a ladder or platform to access the electrical compartment. Stop the engine.

The right hand door latch in locked position.



- 2 While inside the cabin, lift up the right hand rear latch of the armrest control console to release the lock that holds the console in its resting position.
- 3 Lift & raise the front of the armrest control console upwards to its highest position.
- 4 Release the latch of the right hand door.

CAUTION

When accessing the electrical compartment using a ladder from the outside, do not touch the engine exhaust pipe (along the base of the cabin door) as it may be very hot. Failure to follow this instructions may result in injury.

The right hand cabin door fully opened.



- 5 Unhook the door latch from the holding pin, then fully open the right hand door.
- 6 Place the ladder or platform into position to safely access the electrical compartment.
- 7 Lift up the two latches locking the cover of the electrical compartment.
- 8 Lift & remove the cover from the compartment.

NOTE

Blue protective wrap covers many in-cab surfaces of a new Crop Cruiser. The blue protective wrap can be carefully removed when desired.

An opened electrical compartment (cover removed).



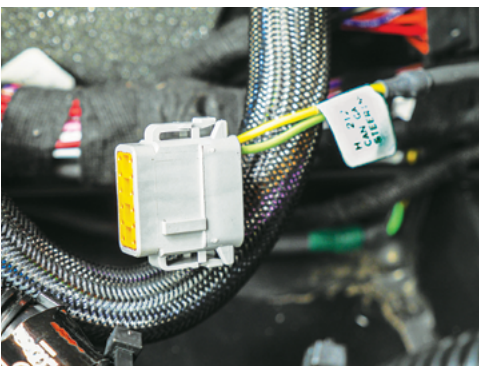


Mounting plate for a Trimble autosteer module at the back of the electrical compartment.

Autosteer Connectors

Inside the electrical compartment, the following Autosteer connectors are available for fitting and connecting your chosen Autosteer system:

- 1 A mounting plate is located at the back of the electrical compartment for fixing a Trimble autosteer module.
- 2 Steering CAN connector used for both Trimble & John Deere autosteer systems.



Steering CAN connector.

- 3 The Goldacres Standard ISO Cabin Harness fitted to the GPS IN connector is used for both Trimble & John Deere autosteer receivers.
- 4 SMARTRAX connector (Isobus & power) is used for John Deere autosteer systems.



SMARTRAX connector - ISO BUS connection point.



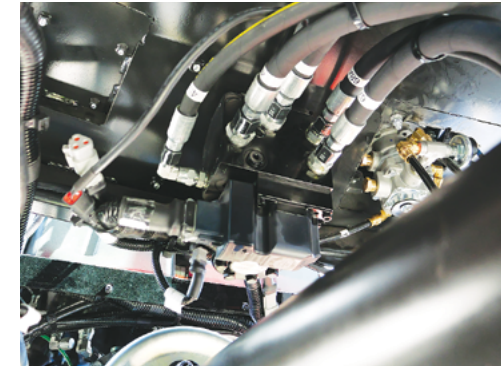
Danfoss autosteer unit.

Goldacres Autosteer System

Goldacres high performance Danfoss OSPE steering unit with PVED CLS control valve is a fully integrated GPS steering ready solution.

The control valve is compliant with all current legislation and safety standards, and removes the need for a customer to add any extra hydraulic valves to the machine.

While providing a fully integrated solution the steering will function correctly if no GPS system is installed.



Autosteer unit fitted under the cab.

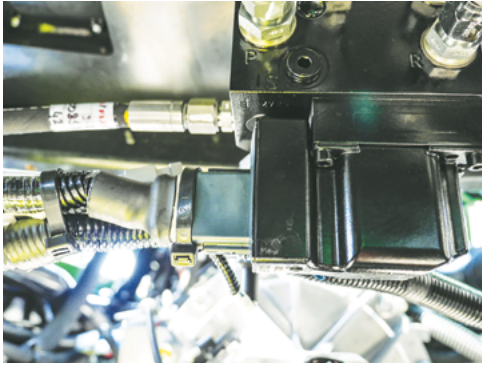
The steering system runs on a dedicated CAN bus network (separate from the ISO BUS) and includes a CAN SASA sensor to measure the current steering wheel angle and speed for steering break out control, as well as, an analogue wheel angle sensor (WAS) to report the angle of the front wheels.

All CAN addresses are setup to utilise the default GPS steering controller source address of '28'.

NOTE

For safety reasons, when the Crop Cruiser is used in Road Mode, the unit shuts down the autosteering function.

Preparation for Use – **Setting Up**



Cable connection of the autosteer unit under the cab.



Fitted Danfoss autosteer components.

Machine Steering is controlled via the manual steering wheel via the steering orbital or via CAN commands sent via the steering system to the CLS valve over the CAN bus network.

The safety information, like vehicle speed and MMI information is sent from the G-Hub Controller display located in the cabin.

The valve is also electrically locked out when the field road mode switch is in the 'Road' position to prevent accidental activation.

Maximum engage speed & maximum turn angle setting limits are controlled by the GPS steering system.

The valve can be directly controlled by any steering system that can steer this valve on other model machines. The wheel angle can be read from the Danfoss valve on the steering CAN bus network.

The steering valve is pre-tuned at the factory with the finer adjustments to be made in the field.

Individual Autosteer systems are fitted by the Goldacres dealer.

Refer to the Goldacres Steering System information and Autosteer Electrical Layout drawing provided.



Labelled electrical terminals inside the Electrical Compartment.

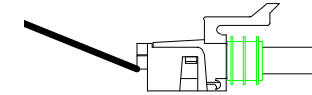
Switched & Un-switched Power Terminals

Inside the cabin electrical compartment are electrical terminals provided for the easy connection of optional Autosteer controllers and equipment.

Inside the compartment you will see these power studs clearly labelled.

Ensure all connected equipment is suitably fused.

GPS RESUME APTIV P/N 12015791			
CAV	CIR	COLOR	FUNCTION
A	168	BRN	ISO/STEER RESUME



LABEL:
H: 24
GPS RESUME

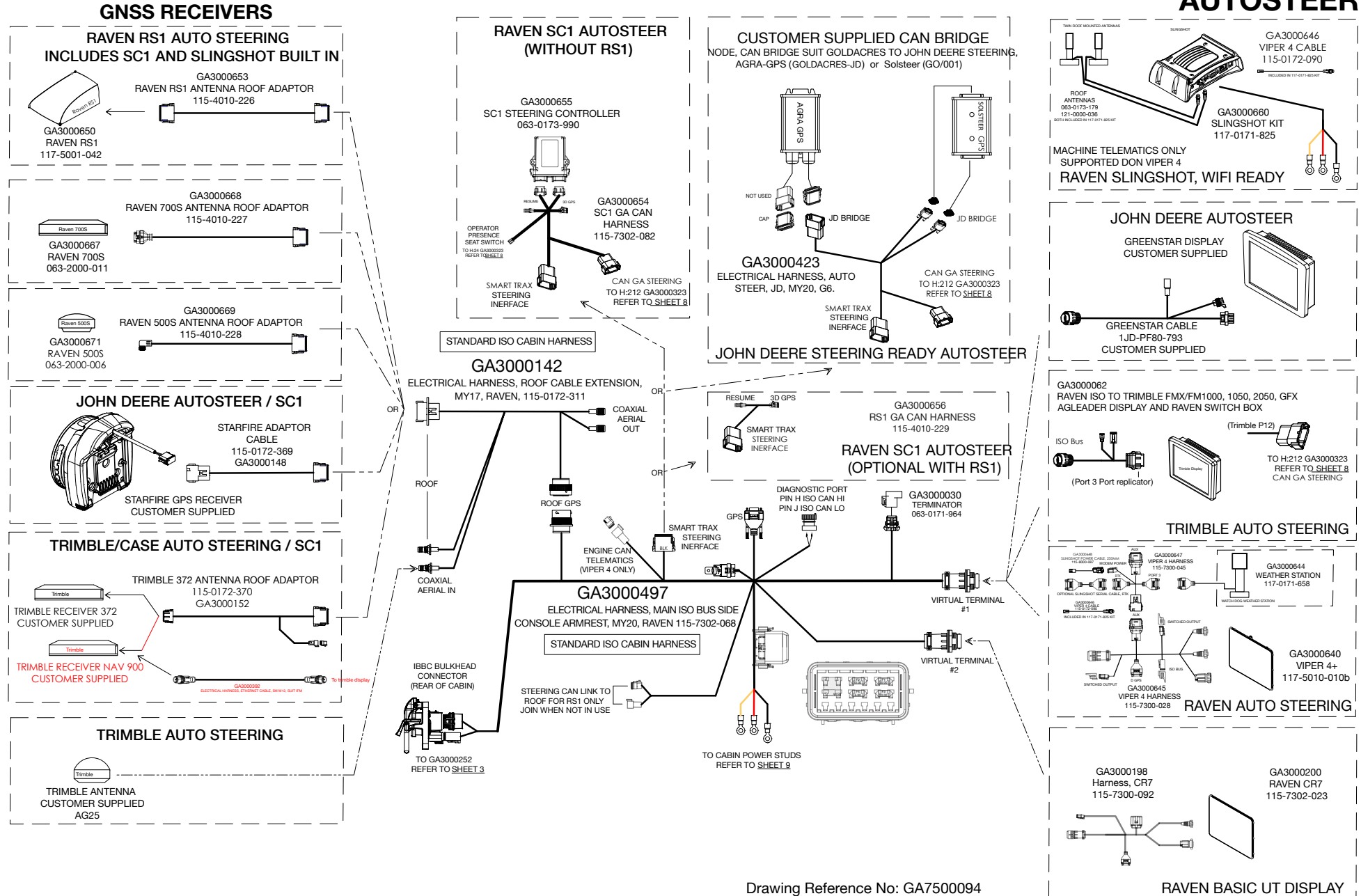
Mating connector PN 12010996.

GPS Remote Switch Momentary +12V

The G-Hub Controller is set to send a CAN command for the resume switch and a hard wire has also been included if required.

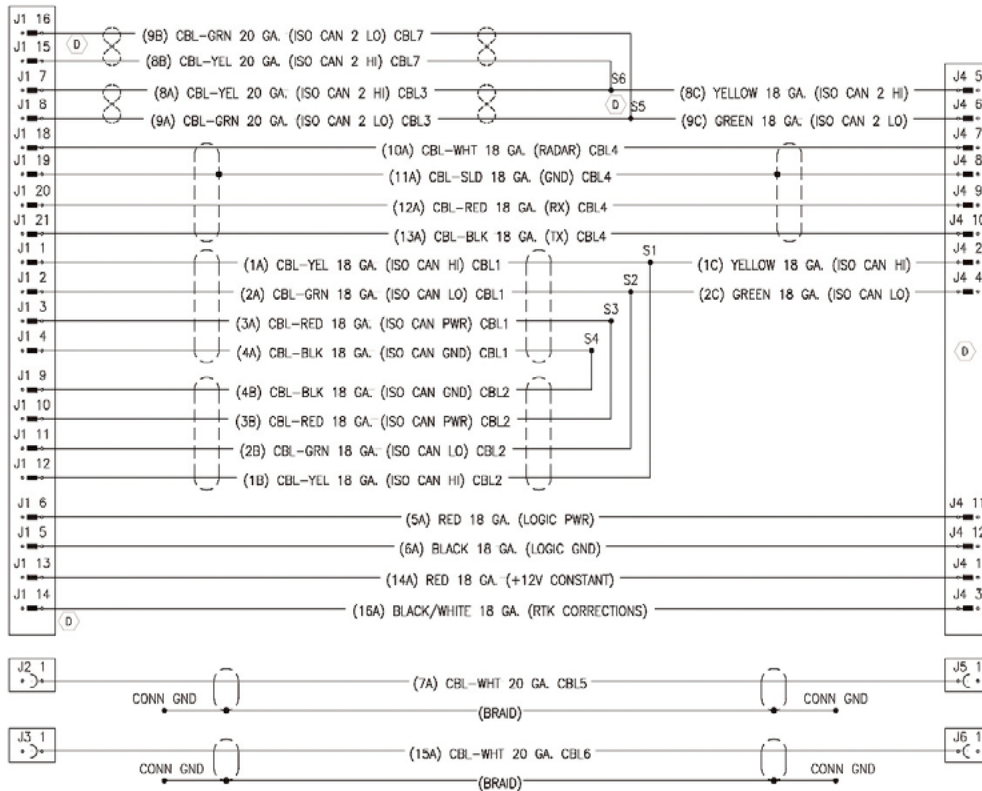
It is used for the connection of the G-Motion GPS momentary switch from the joystick mounted on the Armrest Control Console.

When this single pin connector is connected to the GA3000323 cabin harness, it will provide a momentary 12 volt signal when the steering touch button is pressed.



Drawing Reference No: GA7500094

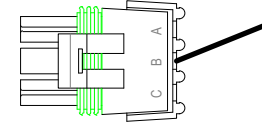
Preparation for Use – Setting Up



Wiring pin out for GPS receiver connection points.

MASTER GPS SWITCH APTIV P/N 12015793			
CAV	CIR	COLOR	FUNCTION
A	259	ORG	MASTER PWR
B	192	ORG/BLK	ROAD MODE
C	191	ORG/RED	SPRAY MODE

LABEL:
H: 23
MASTER GPS



Mating connector PN 12010973.

GPS Remote ON/OFF Switch

The GPS Remote On/Off Switch is provided for to connect to a customer's auto steer system cable with a 3 pin male weather pack plug.

The switch is labelled Road mode/spray mode and is located near the GPS momentary switch on harness GA3000323.

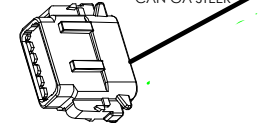
The switch will cut power to the steering orbital when in 'Road' mode making the steering system safe on road.

To make use of this touch button circuit for Autosteer systems it should be connected.

It is wired so the supply for the switch is fed through one connector as the return so it can be used as either a switched earth or a switched positive.

CAN GA STEERING DUETSCH P/N DTM06-12SA			
CAV	CIR	COLOR	FUNCTION
1	304	YEL	CAN HI GA STEERING
12	305	GRN	CAN LO GA STEERING

LABEL:
H:212
CAN GA STEER



Mating connector DTM04-12PA.

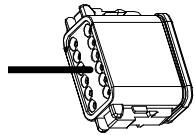
Steering CAN bus Network Connection

The Steering CAN bus Network Connection is provided for connecting to the steering CAN bus network.

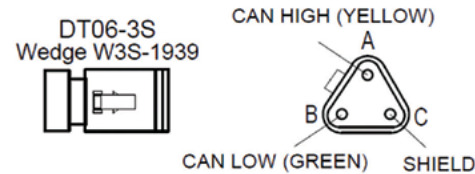
This enables the steering system to send CAN steering commands to the orbital.

The connection is located on the cabin harness GA3000323.

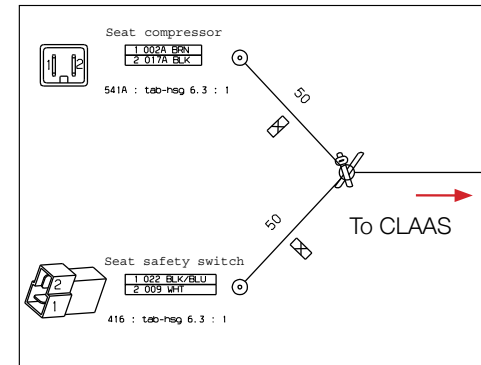
SMART TRAX			
CAV	CIR	COLOR	FUNCTION
1	13	ORG	LOGIC POWER
2	4	RED	BATT POWER
3	15	BLK	LOGIC GROUND
11	105	GRN	ISO CAN LO
12	104	YEL	ISO CAN HI



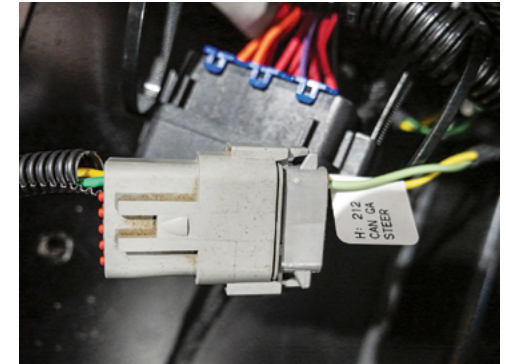
Mating connector DT04-12PB.



Mating connector DT04-3P



Safety switch harness from back of CLAAS seat.



Goldacres connecting cable CAN connector fitted to the Steering CAN connector in the electrical compartment.

ISO Bus CAN Network Connection

The ISO Bus CAN Network Connection is provided to connect the steering CAN bus network.

It enables the steering system to send CAN steering commands to the orbital.

The connection is located on the Raven ISO bus harness PN 115-7302-068 (GA3000497).

It is labelled J6 or "Smartrax" in the back right side of the electrical compartment.

J1939 Engine CAN bus Network Connection

The J1939 Engine CAN bus Network Connection is provide to connect the engine and transmission CAN bus network.

It can be used to get engine data such as engine hours for use in remote telematics.

It is located on the J1939 'Backbone' harness near the right hand side of the electrical compartment.

Mating connector DT04-3P.



Seat Safety Switch

The Seat Safety Switch or operator presence switch causes the Autosteer system to turn off when the operator leaves their seat as a safety feature.

The switch is connected to Autosteer systems to detect the presence of an operator on the seat. For safety, it is recommended this sensor be connected.

The connector is located on the lower rear, right hand side of the electrical compartment.

Safety switch harness connector.



Installing Trimble Autosteer

The Trimble Autosteer system requires installation of three components:

- Autosteer Module,
- GPS Antenna and
- Display console.

To Install the Autosteer Module:

- 1 Obtain the optional Goldacres connecting cable for a Trimble autosteer module.
- 2 Connect the Bridge connectors of the Goldacres connecting cable and the Trimble autosteer module.
- 3 Connect the Goldacres connecting cable CAN connector to the Steering CAN connector in the electrical compartment.

Preparation for Use – **Setting Up**



Remove the screws from the antenna connectors cover.



To Install the GPS Antenna:

The GPS Antenna connectors are located within the roof space on the left hand side of the cabin and the antenna platform is located on the top of the cabin roof.

To access & fit antenna connectors:

- 1 Remove two screws from the front & rear of antenna connectors cover above the cabin door.
- 2 Remove the cover to access the antenna connectors.

- 3 Fit & screw the COAXIAL Cable A fitting to the front COAXIAL A connector.
- 4 Feed the other end of the COAXIAL Cable through the eave of roof to the magnet plate on top of the cabin.
- 6 Fit the end connector of the COAXIAL Cable to the Trimble Antenna.
- 7 Place the Trimble Antenna onto the magnetic plate and adjust the COAXIAL Cable to move any excess cable back into the roof space.
- 8 On completion of fitting the antenna, refit the cover & screws above the left hand cabin door.

The cover removed showing the antenna connectors.



The Trimble antenna on the cabin roof magnetic plate.



To Fit the Trimble Autosteer Console:

- 1 Obtain the optional Goldacres Raven ISO to Trimble connecting cable.
- 2 Fit the Raven ISO to Trimble cable connector to the Terminal ISO connector located on the rail in right hand side of the cabin.
- 3 Fit the Trimble Autosteer Console to the ball mount on the rail at the right hand side of the cabin.
- 4 Fit the other end of the Raven ISO to

Ball mount fitted on the rail ready for the Autosteer Console.



The electrical compartment cover refitted & locked into position.

Trimble cable connector to the connector on the back of the Autosteer Console

- 6 On completion of the Autosteer installation, refit the cover of the Electrical Compartment and fold down the latches to lock the cover into position.
- 7 Close & lock the right hand cabin door and lower the armrest control console into its working position.



Optional Goldacres connecting cable (Part No. GA3000423) for a Solsteer GPS Module.

Installing John Deere Autosteer

The John Deere Autosteer system requires installation of three components:

- Solsteer GPS Module or Agra GPS Bridge,
- Starfire GPS Receiver and
- Display console & harness.

To install the Autosteer Module:

- 1 Obtain the optional Goldacres JD connecting cable (Part No. GA3000423) for a Solsteer GPS Module.
- 2 Connect the Bridge connectors of the Goldacres connecting cable & GPS Module.

Connect the bridge connectors of the connecting cable & the GPS Module in the electrical compartment.



Steering CAN connector in the electrical compartment.

- 3 Connect the Goldacres JD connecting cable CAN connector to the Steering CAN connector in the electrical compartment.
- 4 Connect the Goldacres JD connecting cable SMARTRAX connector to the SMARTRAX connector in the electrical compartment.



SMARTRAX connector in the electrical compartment.



Remove the screws from the antenna connectors cover.

To Install the GPS Antenna:

The GPS Antenna connectors are located within the roof space on the left hand side of the cabin and the antenna platform is located on the top of the cabin roof.

To access & fit antenna connectors:

- 1 Remove two screws from the front & rear of antenna connectors cover above the cabin door.
- 2 Remove the cover to access the antenna connectors.



The cover removed showing the antenna connectors.



Optional Goldacres connecting cable (Part No. GA3000148) for the Starfire Receiver.

- 4 Obtain the optional Goldacres connecting cable (Part No. GA3000148) for a Starfire Receiver.
- 3 Fit the connecting cable (GA3000148) to the front connector in the cabin roof.
- 4 Feed the other end of the Starfire adaptor cable through the front roof space to the mounting plate on top of the cabin.



The Starfire adaptor cable fitted to the front connector.

Preparation for Use – **Setting Up**



Fit the Starfire adaptor cable & Starfire Receiver cable connectors.



Fit & connect the Starfire Receiver onto the roof mounting.



Fit & connect the John Deere Console.



The electrical compartment cover refitted & locked into position.

- 6 Fit the other end connector of the Starfire adaptor cable to the Starfire Receiver connector.
- 7 Fasten the Starfire Receiver mount onto the roof and fit the receiver cable.

- 8 Fit the Starfire Receiver onto the roof mount and connect the cable connector.
- 9 On completion of fitting the Starfire Receiver, refit the antenna cover & screws above the left hand cabin door.

To Fit the John Deere Autosteer Console:

- 2 Fit the Greenstar cable connector to the virtual terminal ISO connector located on the rail in right hand side of the cabin.
- 3 Fit the John Deere Autosteer Console to the ball mount on the rail at the right hand side of the cabin.
- 4 Fit the other end of the Greenstar cable connector to the connector on the back of the Autosteer Console

- 6 On completion of the Autosteer installation, refit the cover of the Electrical Compartment and fold down the latches to lock the cover into position.
- 7 Close & lock the right hand cabin door and lower the armrest control console into its working position.

Fasten the Starfire Receiver mount onto the cabin roof.

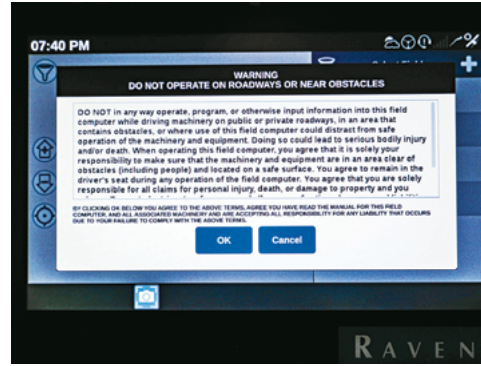


Ball mount fitted on the rail ready for the Autosteer Console.

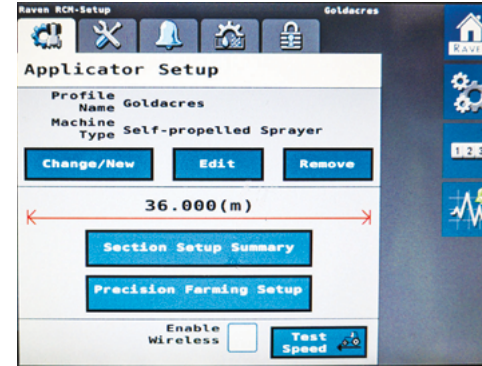




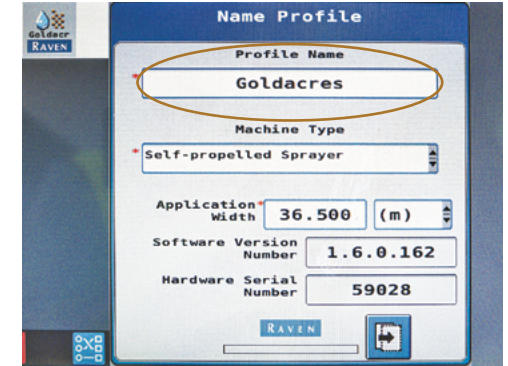
Optional Raven Control screen (CR7) fitted in the cabin.



Opening Warning screen of the optional Raven CR7.



Press the 'Edit' touch button.



Select & press 'Self-Propelled Sprayer'

Pre-Set the Raven Control Module (RCM)

The Raven Control Module (RCM) (Spray Rate Controller) is pre-set and tested for spraying applications prior to delivery.

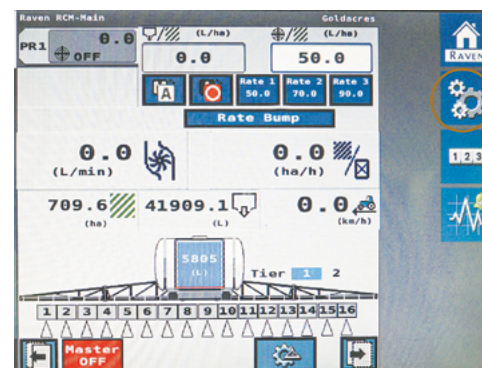
However, it is recommended that all settings and operation be checked and tested for the accuracy prior to spraying applications.

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

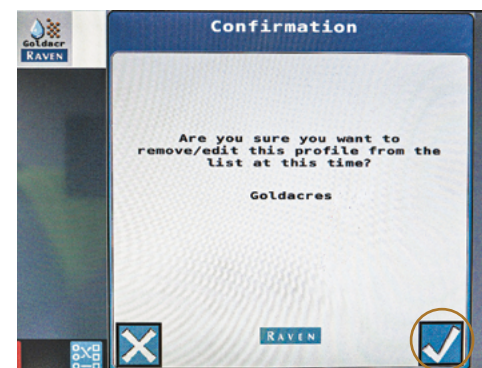
To Pre-Set the RCM:

- 1 Start the engine.
- 2 "WARNING DO NOT OPERATE ON ROADWAYS OR NEAR OBSTACLES" appears on the optional Raven CR7 screen.
Press the OK touch button and the home screen appears.
- 3 Press the 'Set-Up' touch button on the home screen, and the 'Applicator Setup' screen appears.

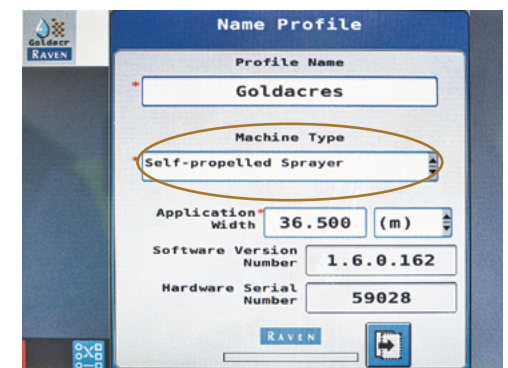
Press the Set-Up touch button on the home screen.



Press the 'Tick' (Next) touch button.



Press the 'Machine Type' touch button.



- 4 Press the 'Edit' touch button or 'Change/New' touch button and a 'Confirmation' screen appears.
- 5 Press the 'Tick' (Next) touch button and the 'Name Profile' screen appears.

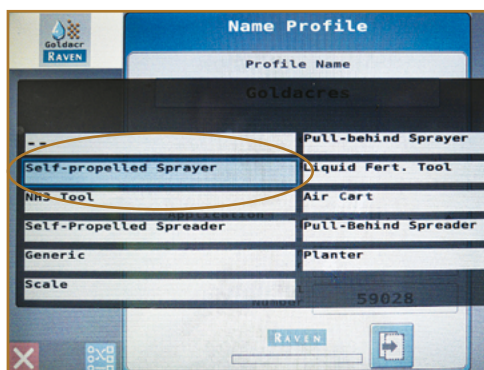
- 6 Press the 'Profile Name' touch button and an alphabetical keypad appears.

Press the touch buttons to create a profile name. eg. 'Goldacres', then press the Next touch button.

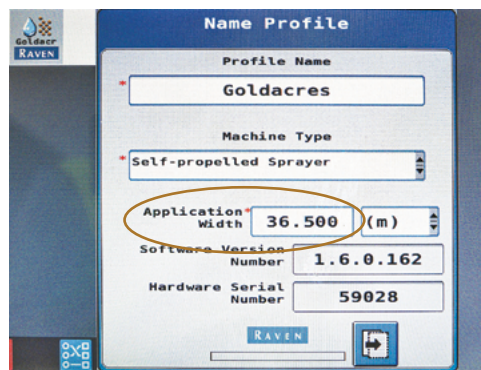
The screen returns to the Name Profile screen with "Goldacres" displayed.

- 7 Press the 'Machine Type' touch button and a machine type menu appears.

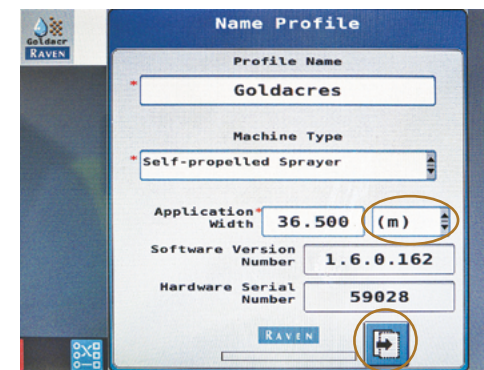
Preparation for Use – Setting Up



Select & press 'Self-propelled Sprayer'



Press the 'Application Width' touch button.



Press 'Units' touch button.

- 8 Select & press 'Self-propelled Sprayer' and the screen returns to the Name Profile screen with selection 'Self-propelled Sprayer' displayed.

- 9 Press the 'Application Width' touch button and a numerical keypad appears.

It is important that the 'Application Width' of the machine is entered correctly.

Determine how the boom is plumbed.

Booms may be plumbed with either:

- Centreline (rowcrop) plumbing - A single nozzle at the boom centre or
- Broadacre plumbing - Two nozzles either side of the boom centre.

A single nozzle plumbed to the centre of the boom - referred to as centreline or row crop plumbing.



Two nozzles plumbed either side of the centre of the boom - referred to as broadacre plumbing.



Each has a different spray application width, for example, on a 36m boom:

- Centreline plumbing has 73 nozzles x 500mm = 36.5m application width.
- Broadacre plumbing has 72 nozzles x 500mm = 36m application width.

To calculate Application Width, count the number of nozzles on the boom line, then multiply by the nozzle spacing.

Press the touch buttons to enter the boom width. eg. '36.5' metres, then press the 'Next' touch button.

The screen returns to the Name Profile screen with '36.500' displayed.

- 10 Press the 'Units' touch button and a units menu appears.

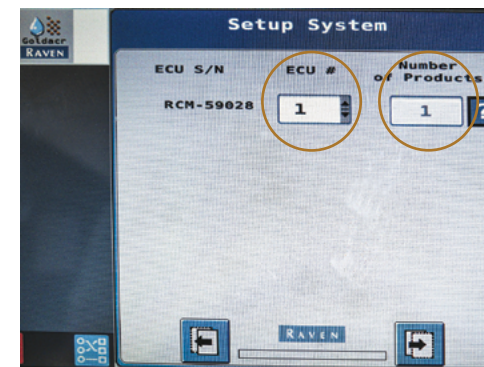
Select & press 'm' (metres) and the screen returns to the Name Profile screen with selection 'm' displayed.

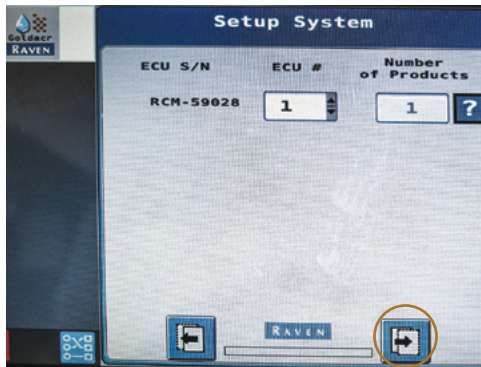
- 11 Press the 'Next' touch button and a 'Setup System' screen appears.

- 12 Press the 'ECU #' touch button and a drop down menu appears.

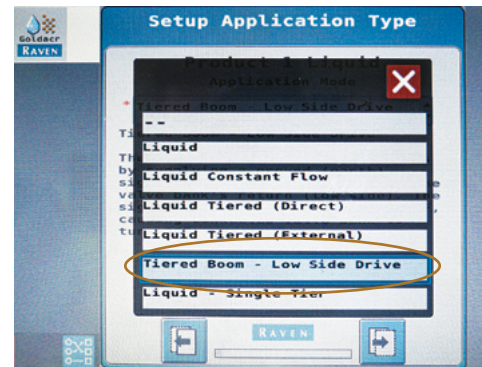
Select & press the appropriate 'ECU #' and the number 1 appears in the Setup System screen.

Press the 'ECU #' touch button, then, press 'Number of Products' touch button.

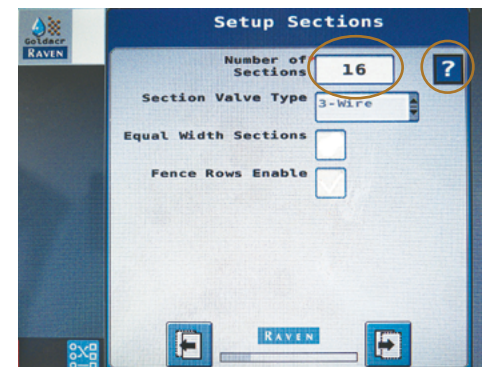




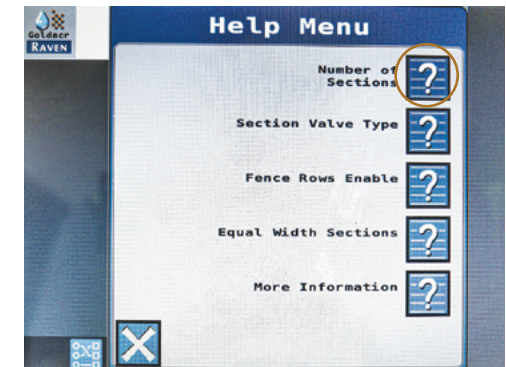
Press the 'Next' touch button.



Select & press 'Tiered Boom - Low Side Drive'.



Press the 'Number of Sections' touch button. Leave the 'Equal Widths Sections' blank. Press the Help Menu '?' touch button.



Select & press the Help Menu '?' touch button required. To exit press the 'X' touch button.

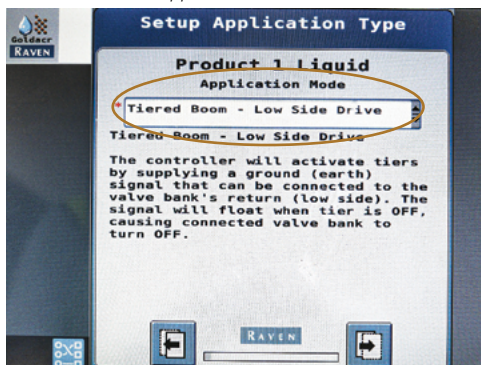
- 13 Press the 'Number of Products' touch button and a drop down menu appears.
Select & press the appropriate '1' product and '1' appears in the Setup System screen.
- 14 Press the 'Next' touch button and a 'Setup Application Type' screen appears.
- 15 Press the 'Application Mode' touch button and a drop down menu appears.

- 16 Select & press the 'Tiered Boom - Low Side Drive' mode, and 'Tiered Boom - Low Side Drive' appears in the Setup Application Type screen.
- 17 Press the 'Next' touch button and a 'Setup Sections' screen appears.
- 18 Press the 'Number of Sections' touch button and a drop down menu appears.

- 19 Select & press '16', then '16' appears in the Setup Sections screen.
- 20 Leave the 'Equal Width Sections' box unchecked (blank) as Goldacre booms are plumbed with varying section widths.
- 21 Leave the 'Fence Rows Enable' box unchecked (blank) as the Fence Rows are enabled in the Goldacre G-Hub.
- 22 If more information is needed, press the Help Menu '?' touch button and a Help menu appears.

- 23 Select & press the appropriate Help Menu '?' touch button for more information on settings. Another screen appears with more information.
To exit the Help screen, press the 'X' touch button & the screen returns to the Setup Section.
- 24 Press the 'Next' touch button and a 'Setup Section Width' screen appears.

Press the 'Application Mode' touch button.



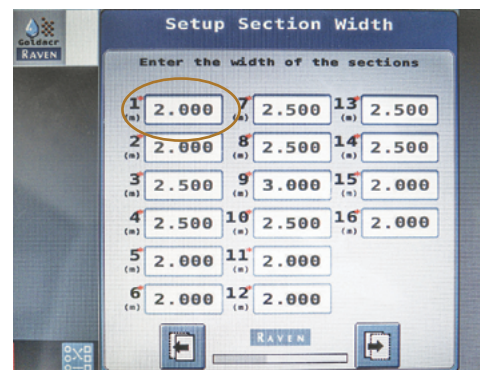
NOTE

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.

Preparation for Use – **Setting Up**

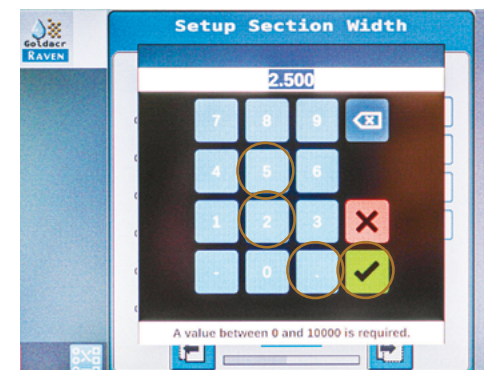
Section Details of a 36m Boom with Centreline Plumbing			
Section Number (L to R)	Nozzle Spacing (m)	No Nozzles in Section	Section Width (m)
1	0.5	4	2.0
2	0.5	4	2.0
3	0.5	5	2.5
4	0.5	5	2.5
5	0.5	4	2.0
6	0.5	5	2.5
7	0.5	5	2.5
8	0.5	4	2.0
9	0.5	5	2.5
10	0.5	5	2.5
11	0.5	5	2.5
12	0.5	4	2.0
13	0.5	5	2.5
14	0.5	5	2.5
15	0.5	4	2.0
16	0.5	4	2.0
Total No of nozzles:		73	

Section Details of a 36m Boom with Broadcast Plumbing			
Section Number (L to R)	Nozzle Spacing (m)	No Nozzles in Section	Section Width (m)
1	0.5	4	2.0
2	0.5	4	2.0
3	0.5	5	2.5
4	0.5	5	2.5
5	0.5	4	2.0
6	0.5	5	2.5
7	0.5	5	2.5
8	0.5	4	2.0
9	0.5	4	2.0
10	0.5	5	2.5
11	0.5	5	2.5
12	0.5	4	2.0
13	0.5	5	2.5
14	0.5	5	2.5
15	0.5	4	2.0
16	0.5	<u>4</u>	<u>2.0</u>
Total No of nozzles:		72	



Individually press each 'Section' touch button from 1st to 16th & set each width in metres.

25 Individually press each 'Section Width' touch button and a numerical keypad appears.



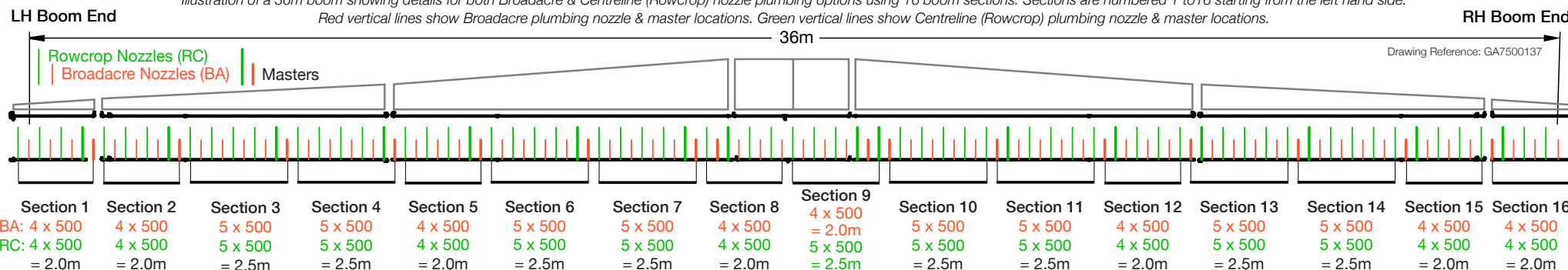
Press touch buttons to enter the section width, then press the 'Tick' touch button.

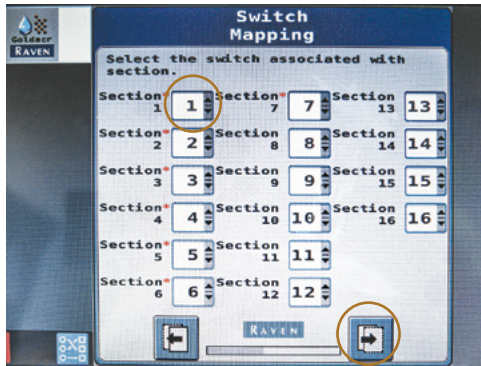
26 Press the touch buttons to enter a section width. eg. '2.0, 2.5 or 3.0' metres as required, then press the 'Tick' touch button.

The screen returns to the Setup Section Widescreen with '2.0, 2.5 or 3.0' respectively displayed.

Repeat for each section as required.

Illustration of a 36m boom showing details for both Broadcast & Centreline (Rowcrop) nozzle plumbing options using 16 boom sections. Sections are numbered 1 to 16 starting from the left hand side. Red vertical lines show Broadcast plumbing nozzle & master locations. Green vertical lines show Centreline (Rowcrop) plumbing nozzle & master locations.





Individually press each 'Section' touch button from 1st to 16th to set the individual switches.

27 Press the Next touch button and a 'Switch Mapping' screen appears.

28 Individually press each 'Section' (1-16) touch button and a numerical list appears.

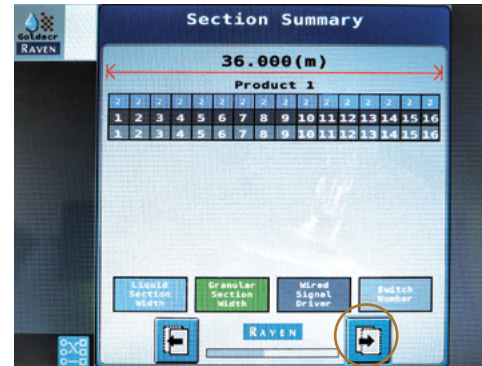
Select & press the switch number. eg. '1' and the screen returns to the Switch Mapping screen with '1' displayed.

Repeat for each section.

29 On completion press the Next touch button and a 'Section Summary' screen appears.



Select & press the switch number required.



Review the information on the Section Summary screen. Press the 'Next' touch button.

30 Review the information on the Section Summary screen.

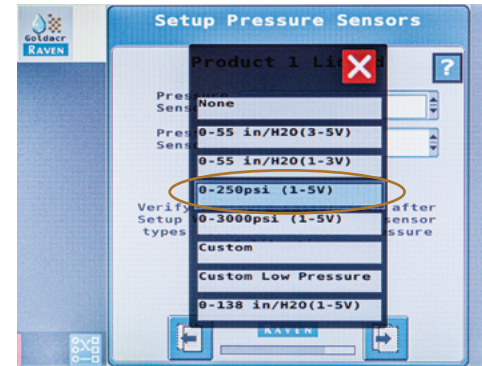
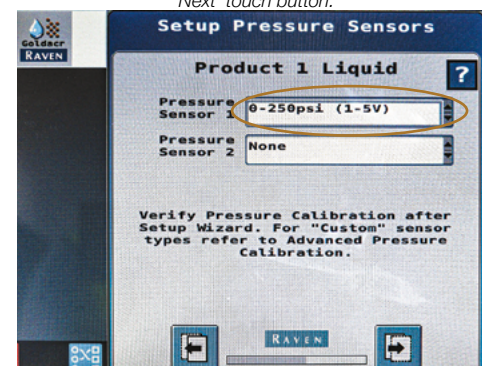
If any change is required, press the 'Back' touch button to the screen(s) required to make the change(s).

31 Press the 'Next' touch button and a 'Setup Pressure Sensors' screen appears.

32 Press the 'Pressure Sensor 1' touch button and a Pressure Sensors menu appears.

33 Select & press the '0-250psi (1-5v)' pressure sensor setting and the screen returns to the Setup Pressure Sensors screen with '0-250psi (1-5v)' displayed.

Press the 'Pressure Sensor 1' touch button. Press the 'Next' touch button.

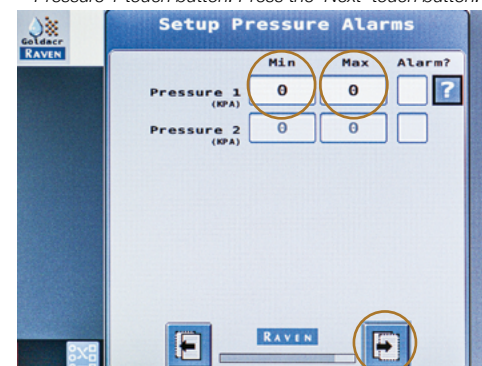


Select & press the '0-250psi (1-5v)' touch button pressure sensor setting.

34 Press the 'Next' touch button and a 'Setup Pressure Alarms' screen appears.

35 Press the 'Min' touch button and a 'Set Pressure Alarms' keypad appears.

Press the 'Min' Pressure 1 touch button. Press the 'Max' Pressure 1 touch button. Press the 'Next' touch button.



Press the touch buttons to set minimum pressure value eg. '100', then press the 'Tick' touch button.

36 Press the touch buttons to set the minimum pressure value eg. '100', then press the 'Tick' touch button.

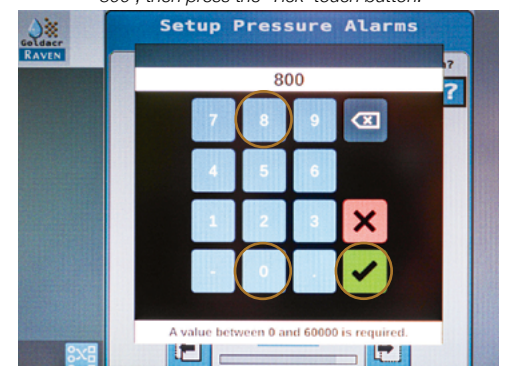
The 'Setup Pressure Alarms' screen returns with the value eg. '100' showing in the 'Min' display.

37 Press the 'Max' touch button and a 'Set Pressure Alarms' keypad appears.

Press the touch buttons to set the minimum pressure value eg. '800', then press the 'Tick' touch button.

The 'Setup Pressure Alarms' screen returns with the value eg. '800' showing in the 'Max' display.

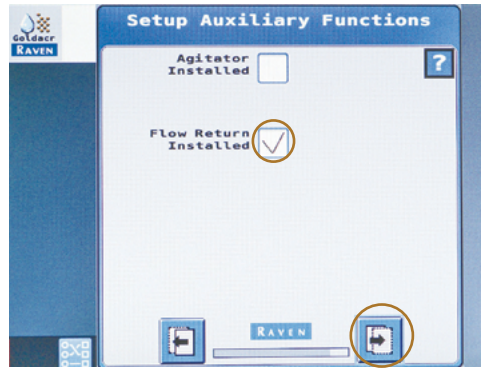
Press the touch buttons to set maximum pressure value eg. '800', then press the 'Tick' touch button.



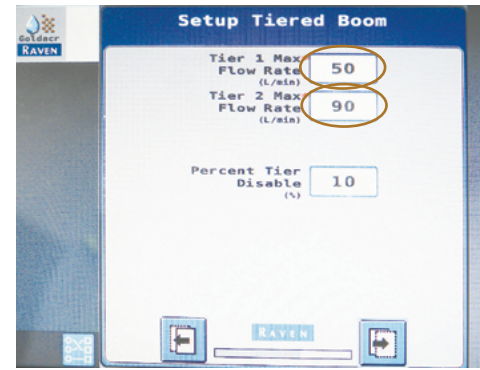
Preparation for Use – Setting Up



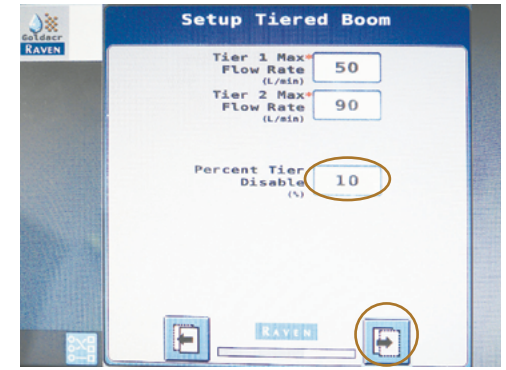
Press the 'Alarm?' touch button to enable the Alarms. Press the Help Menu '?' touch button for Alarm setting notes. Press 'Next'.



Press & 'Tick' the 'Flow Return Installed' box as shown. Press the 'Next' touch button.



Press the 'Tier 1' & 'Tier 2' touch buttons to enter the appropriate Tier Maximum Flow Rates.



Press the 'Percent Tier Disable' touch button and enter 10% as shown, then press the 'Next' touch button.

- 38 Press the 'Alarms' touch button to enable the Alarms.

A 'Tick' appears when Enabled (the checkbox is blank when Disabled).

- 39 Press the Help Menu '?' touch button to read notes on Alarm settings.

- 40 Press the 'Next' touch button and a 'Setup Auxiliary Functions' screen appears.

- 41 In the Setup Auxiliary Function screen:

- Leave the 'Agitator Installed' box blank as agitator is controlled by the G-Hub.
- Press the 'Flow Return Installed' box to select the Flow Return Installed. A "Tick" appears when Selected (the box is blank when unselected).

This stops the 'Warning Pop-Up' when the boom RapidFlow is On (Automatic mode).

If using Manual Mode, an operator may choose to leave this box unchecked to be reminded of switching Off the RapidFlow for spraying.

- 42 Press the 'Next' touch button and a 'Setup Tiered Boom' screen appears.

This screen requires the operator to calculate the maximum flow rates of nozzles fitted to Tier 1 & Tier 2 boom sections.

Refer to Chapter 6 'Calibration' for the information required to determine Maximum Tier Flow Rates & Nozzle Charts.

- 43 Press the 'Tier 1 Max Flow Rate' touch button and a keypad appears. Press the touch buttons to set the minimum pressure value eg '50' (L/min), then press the 'Tick' touch button.

The 'Setup Tiered Boom' screen returns with eg '50' (L/min) displayed in the 'Tier 1 Max Flow Rate' display.

- 44 Press the 'Tier 2 Max Flow Rate' touch button and a keypad appears. Press the touch buttons to set the minimum pressure value eg, '90' (L/min), then press the 'Tick' touch button.

The 'Setup Tiered Boom' screen returns with eg, '90' (L/min) showing in the 'Tier 2 Max Flow Rate' display (example only).

- 45 Press the 'Percent Tier Disable' touch button and a keypad appears. Press the touch buttons to set the value eg, '10' (%), then press the 'Tick' touch button.

The 'Setup Tiered Boom' screen returns with eg, '10' (%) showing in the 'Percent Tier Disable' display.

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

- 46 Press the 'Next' touch button and a 'Setup Control Valve' screen appears.

NOTE

HELP MENU INFORMATION

Minimum Pressure

Enter the minimum desired pressure for the system while applying.

When the pressure sensor is assigned to a liquid product, the alarm is enabled and the minimum pressure threshold has been met, the rate controller will override flow control and attempt to maintain the minimum pressure setting. This condition may result in over-application.

NOTE

HELP MENU INFORMATION

Maximum Pressure

Enter the maximum desired pressure for the system while applying.

When the pressure sensor is assigned to a liquid product, the alarm is enabled and the maximum pressure threshold has been met, the rate controller will override flow control and attempt to maintain the maximum pressure setting. This condition may result in under-application.

NOTE

Valve Response Rate

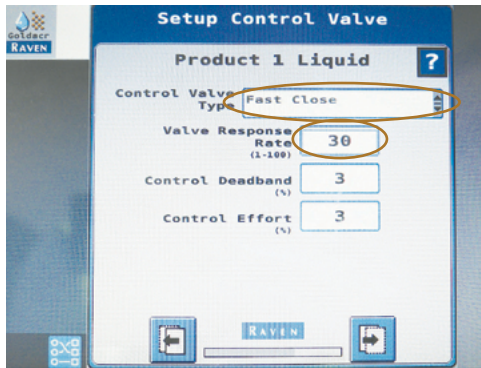
The Response Rate has a range of 1 to 100 and the setting determines how aggressively the target rate is controlled to. Increasing this value will cause the system to respond more quickly. Decreasing it will cause a slower response. If the flow is slow to reach the target value, consider increasing it.

NOTE

Percent Tier Disable

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

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



Press the 'Control Valve Type' & 'Valve Response Rate' touch buttons to set the values as shown.

- 47 Press the 'Control Valve Type' touch button and a menu appears.

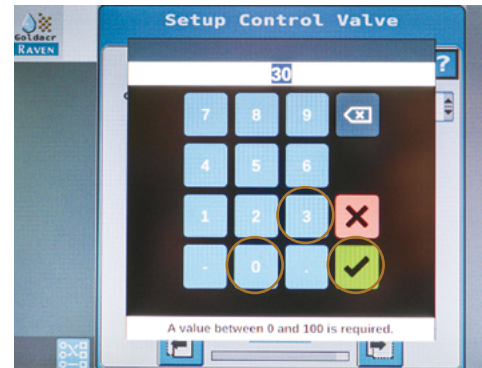
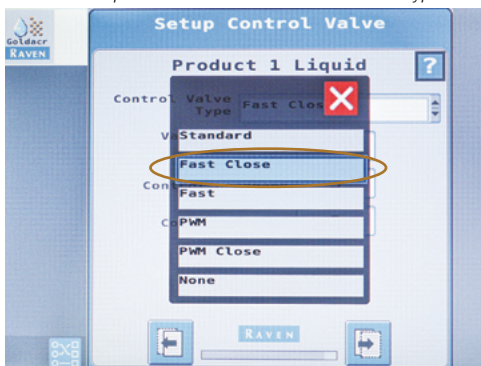
Select & press the 'Fast Close' Control Valve Type and the screen returns to the Setup Control Valve screen with 'Fast Close' displayed.

- 48 Press the 'Valve Response Rate' touch button and a keypad appears.

Press the touch buttons to set the value to '25', then press the 'Tick' touch button.

The 'Control Valve Type' screen returns with '30' showing in the 'Valve Response Rate' display.

Select & press the 'Fast Close' Control Valve Type.



Press the touch buttons to set the Valve Response Rate value to '30', then press the 'Tick' touch button.

- 49 Press the 'Control Deadband' touch button and a keypad appears. Press the touch buttons to set the value to '3' (%), then press the 'Tick' touch button.

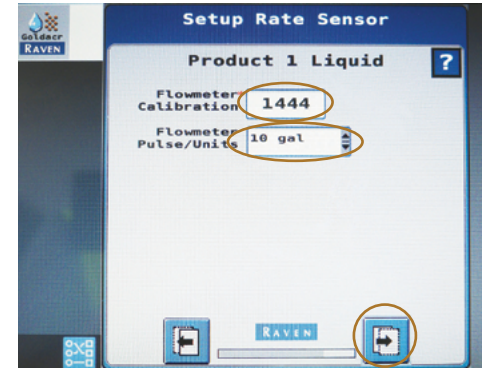
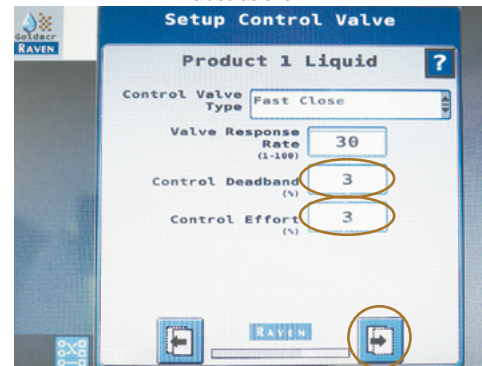
The 'Control Valve Type' screen returns with '3' (%) showing in the 'Valve Response Rate' display.

- 50 Press the 'Control Effort' touch button and a keypad appears.

Press the touch buttons to set the value to '3' (%), then press the 'Tick' touch button.

The 'Control Valve Type' screen returns with '3' (%) showing in the 'Control Effort' display.

Press the Control Deadband & Control Effort and enter the values as shown.



Press the 'Flowmeter Calibration' touch button. Press the 'Flowmeter Pulses/Units' touch button. Press Next.

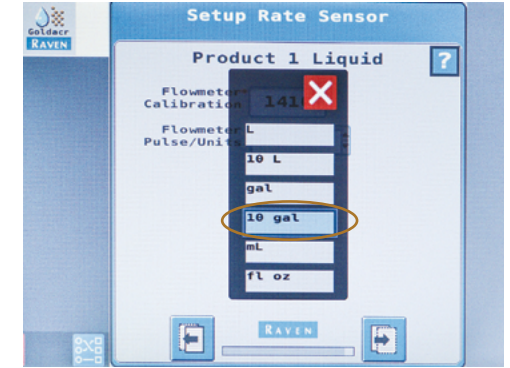
- 51 Press the 'Next' touch button and a 'Setup Rate Sensor' screen appears.

- 52 Press the 'Flowmeter Calibration' touch button and a keypad appears.

Press the touch buttons to enter the flowmeter calibration value (obtained from the flowmeter tag [shown below]) eg, '1444', then press the 'Tick' touch button.

The 'Setup Rate Sensor' screen returns with eg, '1444' showing in the 'Flowmeter Calibration' display.

Check the tag of flowmeter located on the top rear boom centre section.



Select & press the '10 gal' option.

- 53 Press the 'Flowmeter Pulses/Units' touch button and a menu appears. Select & press the '10 gal', then '10 gal' appears in the 'Flowmeter Pulses/Units' display.

- 54 Press the 'Next' touch button and a 'Setup Tank/Bin' screen appears.

NOTE

Control Deadband

Enter the percent of target rate the control valve will control to. For example, if 2% is entered the rate controller will attempt to adjust the flow rate until the actual rate is with 2% of the target rate.

Control Effort

Enter the minimum percentage needed for the control valve to change position.

NOTE

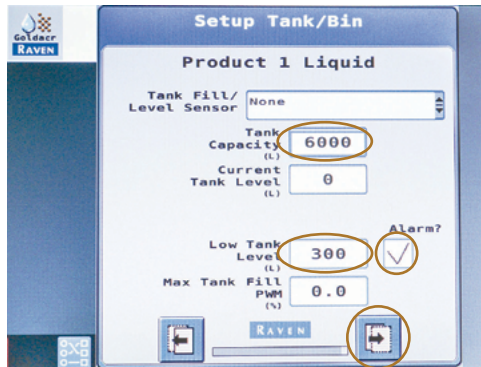
Flowmeter Calibration

Enter the Flowmeter Calibration. Most flowmeter have an attached tag indicating recommended calibration number. Enter this number as initial flowmeter calibration value.

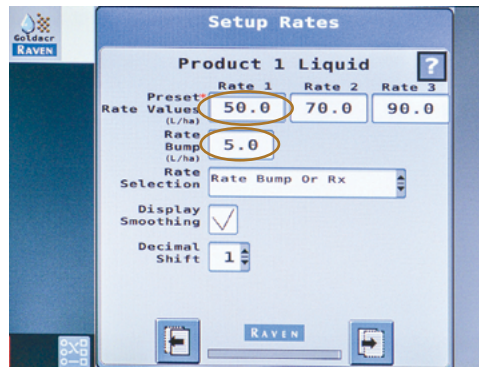
Flowmeter Pulse/Units

Select the flowmeter units from this drop-down. The Flowmeter Pulses/Units is the number of pulses the flowmeter will generate for a given amount product passed through that flowmeter. For example, a flowmeter calibration of 710 Pulses/10gal (37.85 litres) would indicate that for every 710 pulses from the flowmeter, 10 gal (37.85 litres) of product will pass through the flowmeter.

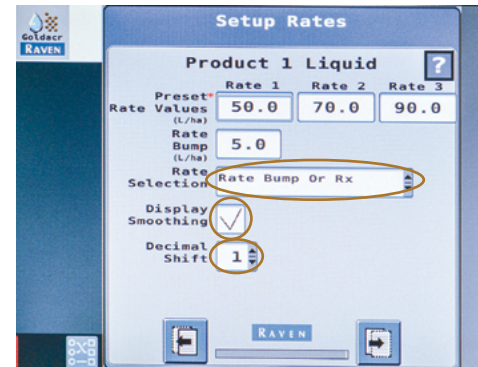
Preparation for Use – Setting Up



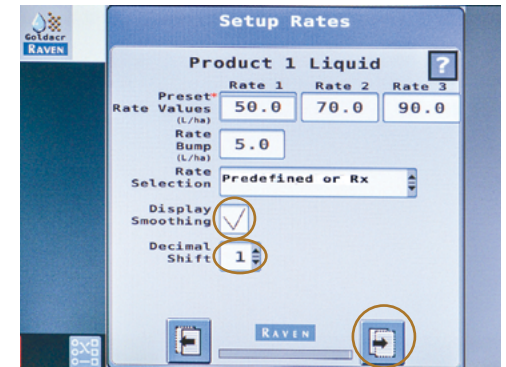
Press the 'Tank Capacity' touch button. Press the 'Low Tank Level' touch button. Enable the Alarm. Press 'Next'.



Press 'Preset Rate Values' touch button and set the rate required, then set the 'Rate Bump' value.



Press 'Rate Selection' touch button & select 'Predefined or Rx' Smoothing'.



Press the 'Enable 'Display Smoothing' checkbox, then. Set the 'Decimal Shift' value. Press the 'Next' touch button.

55 The 'Tank Fill/Level Sensor' should display 'None'.

56 Press the 'Tank Capacity' touch button and a keypad appears. Press the touch buttons to enter the total tank volume in litres eg, '6000', then press the 'Tick' touch button.

The 'Setup Tank/Bin' screen returns with eg, '6000' displayed in 'Tank Capacity'.

Actual tank volume may be more eg, 6200 & may be used if desired.

57 Press the 'Low Tank Level' touch button and a keypad appears. Press the touch buttons to enter the total tank volume in litres '300', then press the 'Tick touch button.

The 'Setup Tank/Bin' screen returns with '300' displayed in the 'Low Tank Level'.

58 Press the 'Low Tank Level Alarm' checkbox to enable the Alarm. A 'Tick' appears when the Alarm is enabled (the checkbox is blank if disabled).

59 Press the 'Next' touch button and a 'Setup Rates' screen appears.

60 Press the 'Preset Rate Values - Rate 1' touch button and a keypad appears. Press the touch buttons to enter the rate required in litres, eg. '50' (L/ha), then press the 'Tick' touch button.

The 'Setup Tank/Bin' screen returns with '50' displayed in 'Tank Capacity'.

61 Repeat for rates required in 'Rate 2' and 'Rate 3'

62 Press the 'Rate Bump' touch button and a keypad appears. Press the touch buttons to enter the rate value, eg '5', then press the 'Tick' touch button.

The 'Setup Rates' screen returns with '5' displayed in 'Rate Bump'.

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.

64 Press the 'Rate Selection' touch button and a menu appears. Select & press 'Predefined or Rx'.

The 'Setup Rates' screen returns with 'Predefined or Rx' displayed.

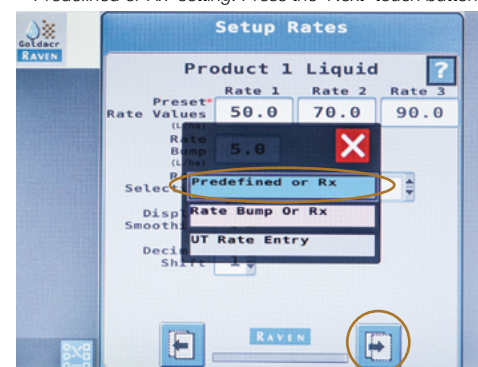
65 Press the 'Display Smoothing' checkbox to enable display smoothing. A 'Tick' appears when the 'Display Smoothing' is enabled (the checkbox is blank if disabled).

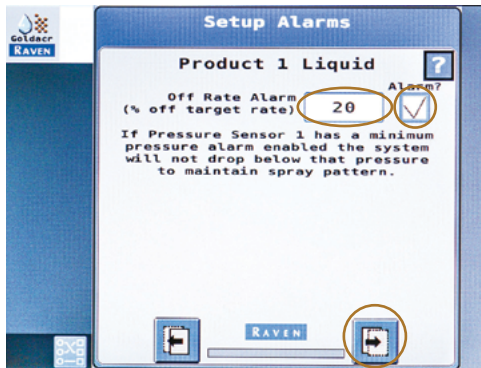
64 Press the 'Decimal Shift' touch button and a menu appears. Select & press '1'.

The 'Setup Rates' screen returns with '1' displayed in decimal shift.

65 Press the 'Next' touch button and a 'Setup Alarms' screen appears.

Press the 'Rate Selection' touch button & select the 'Predefined or Rx' setting. Press the 'Next' touch button.





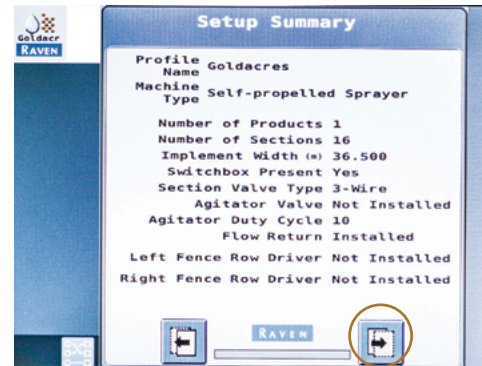
Press the 'Off Rate Alarm' touch button. Enable the 'Alarm?'. Press the 'Next' touch button.

66 Press the 'Off Rate Alarm' touch button and a keypad appears. Press the touch buttons to enter the rate value, eg '20' (%), then press the 'Tick' touch button.

The 'Setup Rates' screen returns with '20' displayed in "Off Rate Alarm".

67 Press the 'Alarm?' checkbox to enable the alarm. A 'Tick' appears when the 'Alarm' is enabled (the checkbox is blank if disabled).

68 Press the 'Next' touch button and a 'Setup Summary' screen appears.



Review the setting summary, then press the 'Next' touch button.

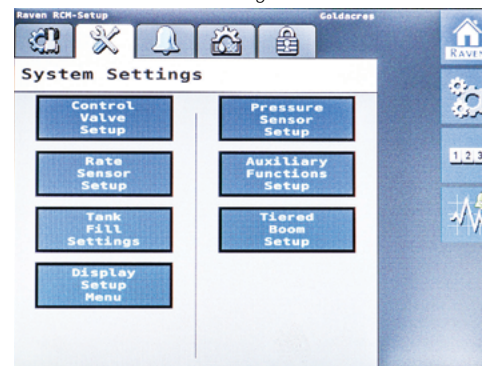
69 Review the Setup Summary page to check all is correct.

This completes the RCM initial setup procedure. After completion of the RCM setup, no further setup in this procedure is necessary unless the boom and its components are physically altered or changed.

70 Press the 'Next' touch button and a 'System Settings' screen appears.

Now that the RCM is preset, any required application rate changes and most system changes are made from this screen.

Use this screen to make further application or system changes.



NOTE

If the number of boom sections and/or section widths are physically altered at anytime, then the Application Width and Section Width inputs need to be changed accordingly.



Goldacres G-Hub Touch Screen illustrating three sections of touch control & data information.

Pre-Set the G-Hub Controller

Goldacres G-Hub Controller is pre-set and tested for spraying applications prior to delivery.

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

Goldacres G-Hub Touch Screen in the cabin with Armrest Control Console and Joystick Controller.

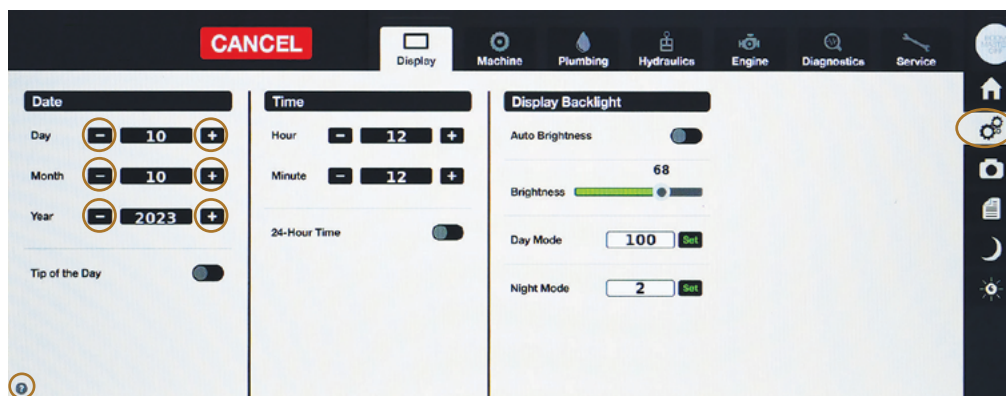


It is the operator's responsibility to correctly operate all controller and sprayer functions at all times.

The Settings touch button in the Menu column on the right hands side of the G-Hub Operating screen gives access to 7 screens for settings, diagnostics and service, namely:

- 1 Display
- 2 Machine
- 3 Plumbing
- 4 Hydraulics
- 5 Engine
- 6 Diagnostics (refer to chapter 8, Lubrication & Maintenance for details)
- 7 Service (refer to chapter 8, Lubrication & Maintenance for details).

Pre-setting the G-Hub uses the first 5 of these screens.



Press the 'Settings' touch button to open the 'Display' tab screen. Press the appropriate touch buttons to set local Date.
Press the Help (?) touch button to display further information.

To Pre-Set the G-Hub:

- 1 Start the engine:
 - Rotate the key to the Engine Start (On) position (lightning symbol).
 - Wait to hear the reverse beeper sound.
 - Rotate the key further to the Engine Start position (rotating arrow emblem) to crank & start the engine.
 - Release the key when the engine starts. The key automatically returns to the On/Accessories position.
- 2 Press the Settings touch button on the G-Hub screen to open the Display screen.

Pressing the Help (?) touch button displays the Help information screen shown below.

Display

- ▶ **Date**
 - Day, Month, Year, use the plus and minus buttons to change the date
- ▶ **Time**
 - Hour, Minute, use the plus and minus buttons to change the time
- ▶ **Display Backlight**
 - Auto brightness, use the inbuilt light sensor to adjust the backlighting automatically
 - Manual brightness adjustment slider
 - Day mode, backlight setting for brightness when display is in day mode
 - Night mode, backlight setting for brightness when display is in night mode
 - Note that the day / night mode is elected from the home screen, moon icon
- ▶ **Tip of the day**
 - Show a small message each day on the 'Start' screen

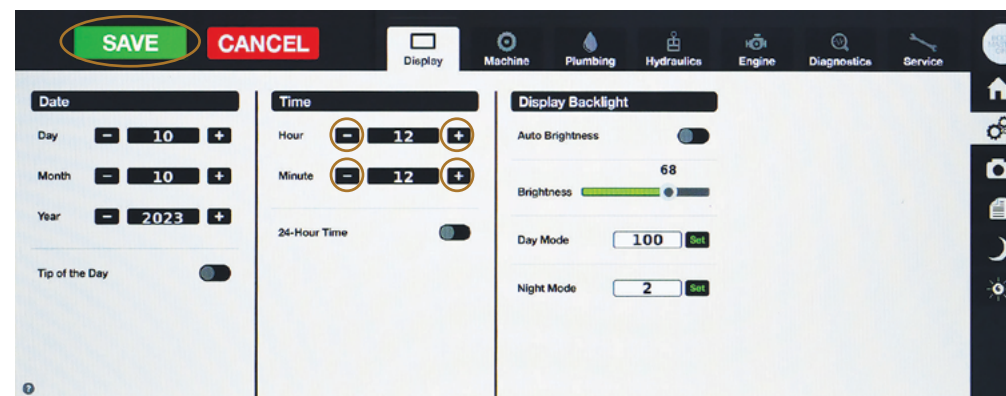
1 Display

The Display screen gives access to set the Date, Time and Display Backlight.

Press the 'Help (?)' touch button to display the Help information screen if required.

To Set the Date:

- i) Press the 'Day' Minus (-) or Plus (+) touch buttons to select the correct day.
- ii) Press the 'Month' Minus (-) or Plus (+) touch buttons to select the month.
- iii) Press the 'Year' Minus (-) or Plus (+) touch buttons to select the year.



Press the appropriate touch buttons to set the 'Time', then adjust the 'Display Backlight' settings to your personal preferences. Press the 'SAVE' touch button to save the settings before leaving the 'Display' screen.

- iv) Press the 'Tip of the Day' touch button to activate or deactivate.
The touch button is Green when activated & Grey when deactivated.

To Set the Time:

- i) Press the 'Hour' Minus (-) or Plus (+) touch buttons to select the hour of the day.
- ii) Press the 'Minutes' Minus (-) or Plus (+) touch buttons to select the time in minutes.
- iii) Press the 24 Hour Time touch button if '24-Hour Time' display to activate or deactivate.
The touch button is Green when activated & Grey when deactivated.

Press the 'SAVE' touch button to save the settings before leaving the Display screen.

To Adjust the Display Backlight:

- i) Press the 'Auto Brightness' touch button to select Auto Brightness 'On' or 'Off'. Green is On & Grey is Off.
- ii) Slide the 'Brightness' touch button slider to manually adjust backlight brightness.
- iii) Press the 'Set' touch button to change the 'Day Mode' setting for daylight operation & a numerical keypad appears.
Press the numerical touch buttons to enter the desired value, then press the 'Enter' touch button. The screen returns with the value displayed.
- iv) Press the 'Set' touch button to change the 'Night Mode' setting for night operation - as per instructions for iii) above.

Press the 'SAVE' touch button to save the settings before leaving the 'Display' screen.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change is made in the G-Hub system.

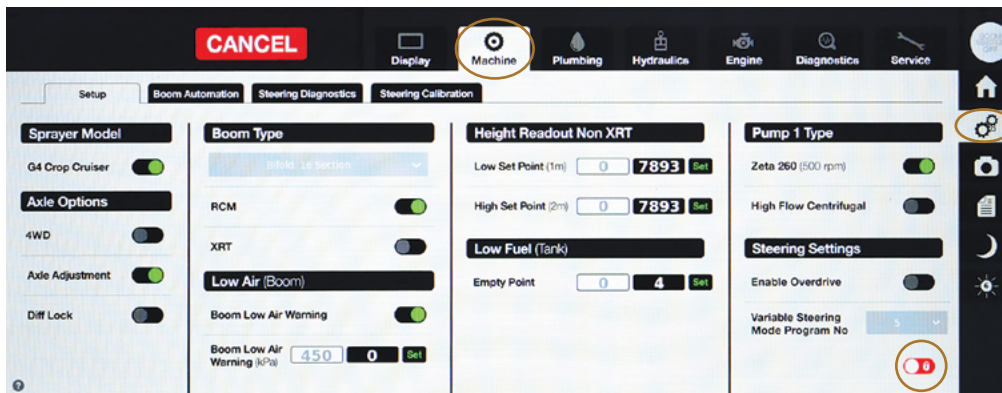
If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain.

The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.

NOTE

The Day Mode/Night Mode is operated on the Home Screen menu using the 'Moon' icon.

Press the 'Help (?)' touch button for further information and a help information screen appears.



Press the 'Settings' touch button to open the 'Display' tab, then press the Machine Tab touch button to open the Machine/Settings' screen. Press the red 'Locked' touch button to unlock the screen.

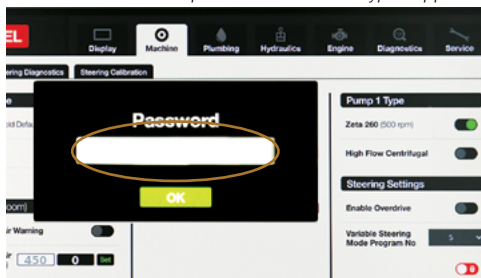
2 Machine

Press the Machine tab touch button & the Machine 'Setup' screen opens displaying:

- Sprayer Model
- Axle Options
- Boom Type
- Low Air
- Height Readout Non XRT
- Low Fuel (Tank)
- Pump 1 Type
- Steering Settings.

The Machine Setup screen is locked for protection from uninformed or accidental alteration and must be unlocked before any changes can be made.

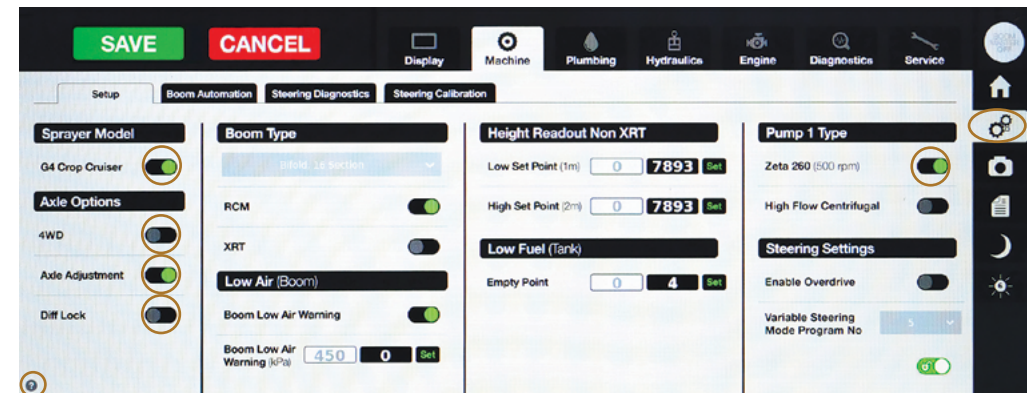
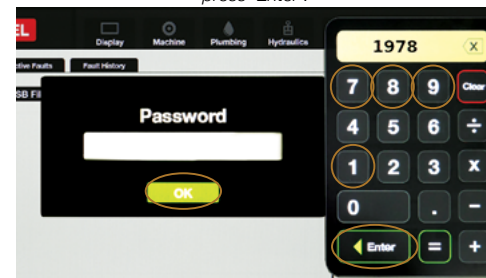
Press the 'Password' space & a numerical keypad appears.



To Unlock the Machine/Setup Screen:

- Press the 'Unlock to change' touch button at the bottom RHS of the screen and a password request appears.
- Press the password space and a numerical keypad appears.
- Press the numerical touch buttons to enter the password '1978', then press the 'Enter' touch button.
The screen returns to the 'Password' with '*****' displayed.
- Press the 'OK' touch button and the screen returns to the Machine/Settings Screen.

Press the touch buttons '1978' to enter the password, then press 'Enter'.



Press appropriate 'Sprayer Model' & 'Axle Options' touch buttons to suit your Crop Cruiser & preferences. Press the Help (?) touch button to display further information if required.

A Setup

To Select the Appropriate Settings for your Cruiser:

Press the 'Help (?)' touch button to display the Help information screen if required.

i) Sprayer Model

Ensure the 'Sprayer Model' G4 is selected, ie, 'G4 Crop Cruiser'. Press the touch button to select, if required.

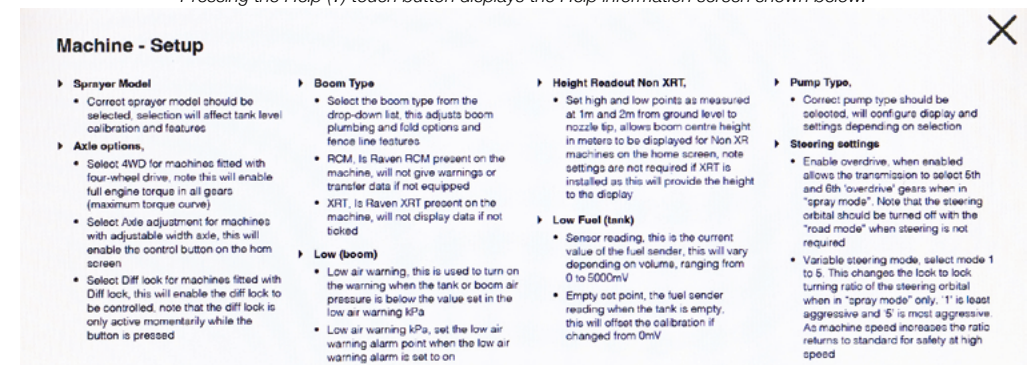
The touch button is Green when selected & Grey when deselected.

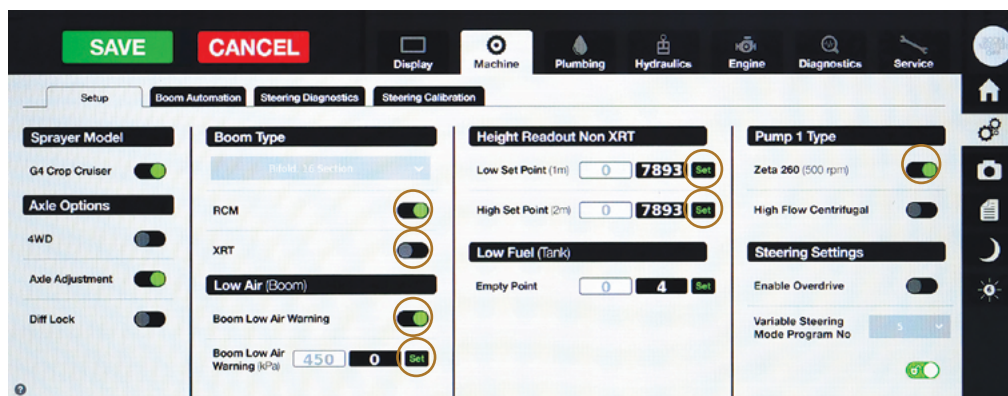
ii) Axle Options

- Select '4WD' only for machines with four wheel drive - enables full engine torque (maximum torque curve) in all gears
- Select 'Axle Adjustment' only for machines with adjustable width axles - enables touch button on Home screen.
- Select 'Diff Lock' when required - enables touch button on Home screen.

Touch buttons are Green when selected & Grey when deselected.

Pressing the Help (?) touch button displays the Help information screen shown below.





Press the appropriate 'Boom Type', 'Low Air (Boom)' & 'Height Readout Non XRT' touch buttons as required.
Press the 'Help (?)' touch button for further information if needed.

iii) Boom Type

Press the touch buttons applicable to your machine:

- Bi-fold & number of boom sections is automatically detected
- Activate the 'RCM' touch button Only if the RCM option is fitted - enables Raven RCM warnings & data transfer
- Activate the 'XRT' touch button Only if the XRT option is fitted - enables Raven XRT data display

Touch buttons are Green when activated & Grey when deactivated.

iv) Low Air (Boom)

- Activate the 'Low Boom Air Warning' if required - enables warning if tank or boom air pressure is below the value set in the low air warning kPa
- Low air warning kPa - sets the low air warning alarm point - can only be set if 'Low Boom Air Warning' is activated. Press the 'Set' touch button to enter the value required, using the keyboard displayed, then press Enter.

v) Height Readout Non XRT

Sets the high & low points (ground level to nozzle tip at 1 metre & 2 metres - allowing boom centre height to be displayed on the Home screen.

To set the 'Low Set Point (1m)':

Adjust the boom exactly 1 metre above the ground, then, press the 'Set' touch button to record the setting value.

To set the 'High Set Point (2m)':

Adjust the boom exactly 2 metres above the ground, then, press the 'Set' touch button to record the setting value.

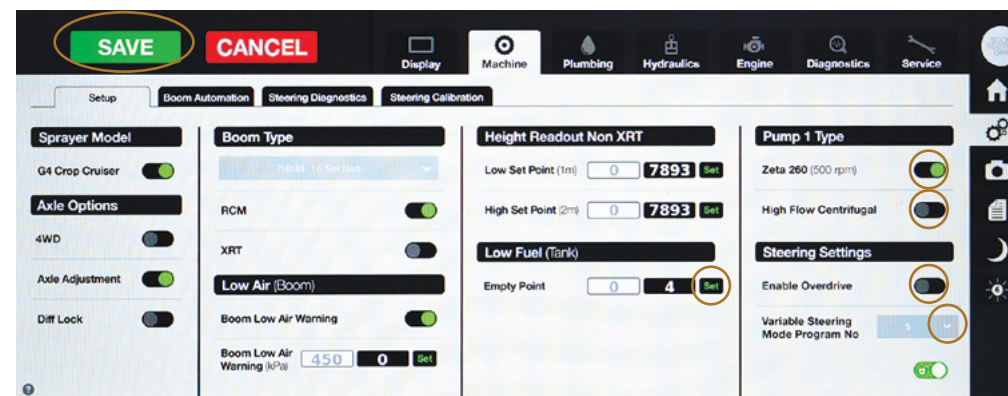
These settings are not applicable if the XRT option is fitted.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change is made in the G-Hub system.

If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain.

The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.



Press appropriate 'Low Fuel (Tank)', 'Pump 1 Type' & 'Steering Settings' touch buttons as required.
Press the 'Help (?)' touch button for further information if needed.

vi) Low Fuel (Tank)

The 'Empty Point' sensor reading will range from 0 to 5000 mV depending of the amount of fuel in the tank.

The 'Set' touch button is used calibrate an 'Empty Point' above a '0 mV' sensor reading. Use a value between 335 and 300.

Press the 'Set' touch button to enter the value required, using the keyboard displayed, then press Enter.

vii) Pump 1 Type

Activate the 'Pump 1 Type' touch button applicable for your machine:

- Zeta 260 or
- High flow centrifugal pump.

The touch button is Green when selected or Grey when deselected.

NOTE

Press the 'Help (?)' touch button for further information and a help information screen appears.

viii) Steering Settings

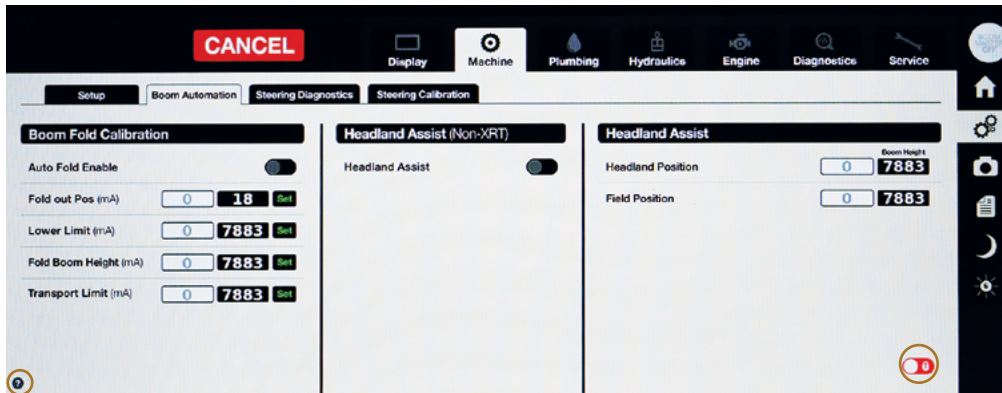
- When activated, 'Enable Overdrive' allows the transmission to select 5th & 6th 'overdrive' gears in 'Spray Mode'.

The steering orbital should be turned Off with 'Road Mode' when steering is not required

- 'Variable Steering Mode Program No' sets the lock to lock turning ratio of the steering orbital when in "spray mode" only. Use the touch button to select a value from 1 to 5 ('1' being least aggressive & '5' most aggressive). As Crop Cruiser speed increases, the ratio returns to standard ratio for safety.

When 'Machine Setup' is completed, press the 'SAVE' touch button on the top left hand side of the screen to save the settings into the G-Hub system. If you don't press 'SAVE' touch button, the settings entered on the Machine screen will be lost.

After Save is pressed, the G-Hub Home screen will return. It will then be necessary to press the 'Settings' touch button to continue with pre-setting.



The 'Boom Automation' touch button displays 'Boom Fold Calibration', 'Headland Assist (Non-XRT)' and 'Headland Assist' menus with a 'Help (?)' & 'Locked' touch button. Press the red 'Locked' touch button to unlock the screen.

B Boom Automation

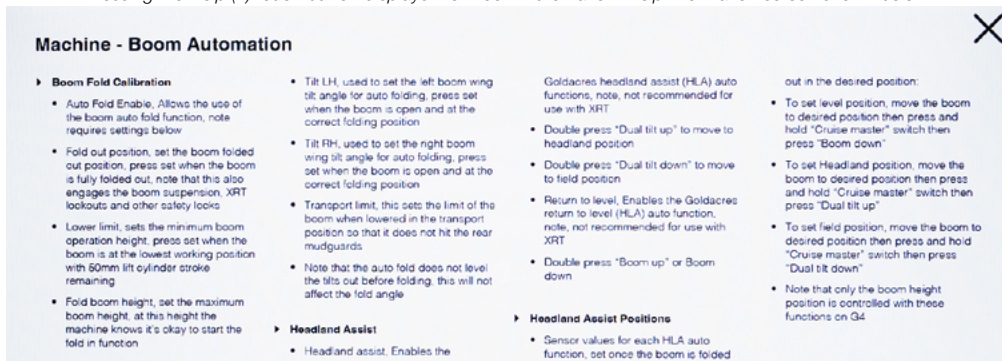
Press the 'Boom Automation' tab touch button & the Boom Automation screen displays:

- Boom Fold Calibration
- Headland Assist (Non-XRT)
- Headland Assist.

The 'Machine Setup' screen is locked for protection from uninformed or accidental alteration and must be unlocked before any changes can be made.

A 'Help (?)' touch button in the lower left hand corner of the screen can be pressed for further information.

Pressing the Help (?) touch button displays the 'Boom Automation' Help information screen shown below.



i) Boom Fold Calibration

Press the 'Auto Fold Enable' touch button to activate or deactivate the Boom Auto Fold function.

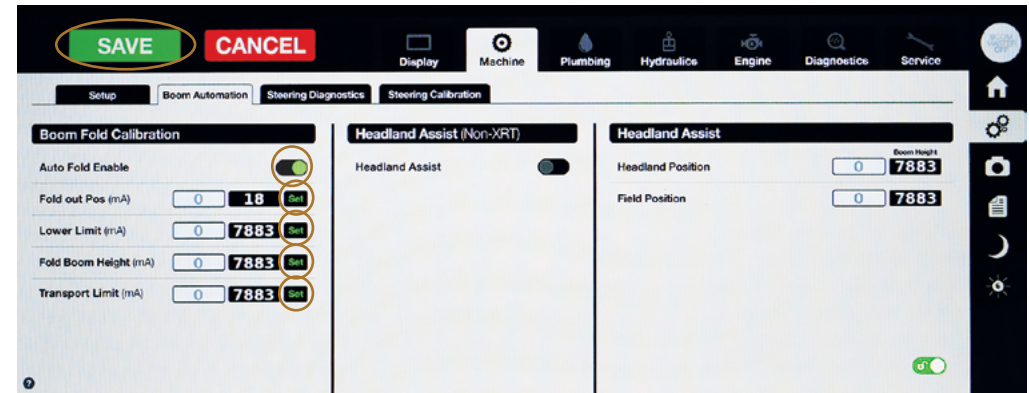
When active, the touch button is Green & Grey when deactivated.

When activated, proceed with the following necessary auto fold settings:

- Fold out Pos (mA)**

The 'Fold out Pos (mA)' sets the fold out position of the boom.

To set the position, operate the boom and when the boom is fully folded out, press



The unlocked 'Boom Automation' screen allows the operator to enable the 'Enable Auto Fold' function & set each of the 'Boom Fold Calibration' settings. Press the SAVE touch button to save the 'Boom Automation' settings & exit the screen.

the 'Set' touch button & the value appears in the left Fold out Pos (mA) display.

When set, boom suspension, XRT lockouts & other safety locks are engaged.

- Lower Limit (mA)**

The 'Lower Limit (mA)' sets the minimum boom operation height.

To set the position, operate the boom and when the boom is at the lowest working position (with 50mm lift cylinder stroke remaining), press the 'Set' touch button and the value appears in the left display.

- Fold Boom Height (mA)**

The 'Fold Boom Height (mA)' sets the maximum boom operating height.

To set the position, operate the boom and when the boom is at maximum boom height, press the 'Set' touch button and the value appears in the left display.

- Transport Limit (mA)**

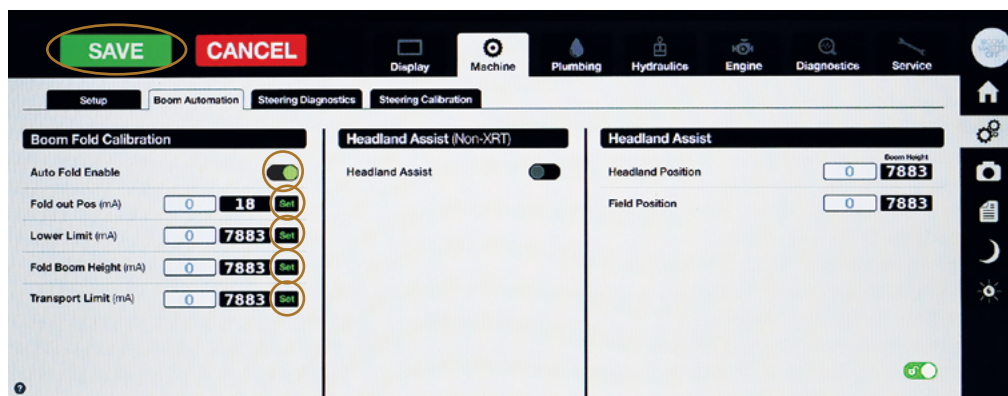
The 'Transport Limit (mA)' sets the lower transport limit of the folded boom to avoid the boom hitting the rear mudguards.

To set the position, operate the boom and when the boom is fully folded to transport position, press the 'Set' touch button and the value appears in the left display.

When 'Boom Automation' settings are completed, press the 'SAVE' touch button at the top left hand side of the screen to save the settings into the G-Hub system.

If you don't press 'SAVE' touch button, the calibration settings entered on the Machine screen will be lost.

After Save is pressed, the G-Hub Home screen will return. It will then be necessary to press the 'Settings' touch button to continue with pre-setting.



The unlocked 'Boom Automation' screen allows the operator to enable the 'Enable Auto Fold' function & set each of the 'Boom Fold Calibration' settings. Press the SAVE touch button to save the 'Boom Automation' settings & exit the screen.

ii) Headland Assist

The 'Headland Assist' touch button is used enable or disable the Headland Assist (HLA) auto functions on Crop Cruisers not fitted with Non-XRT.

When enabled, the touch button goes Green and Grey when disabled.

Do not enable the Headland Assist function when the XRT Option is fitted.

The 'Return to Level' touch button is used enable or disable the Return to Level (HLA) auto function.

When enabled, the touch button goes Green and Grey when disabled.

Do not enable the Headland Assist function here when the XRT Option is fitted.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change made in the G-Hub system.

If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain.

The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.

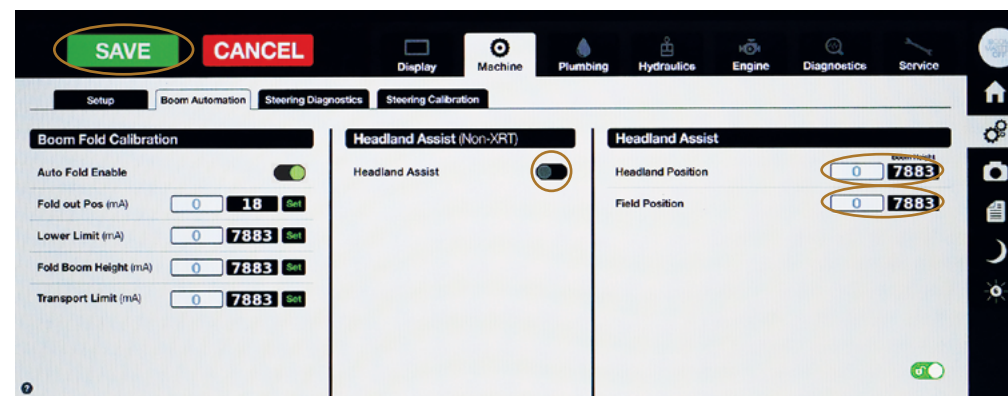
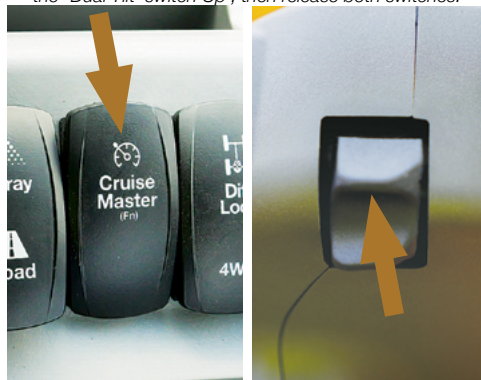
iii) Headland Assist (Non-XRT)

The sensor values for each HLA (Non-XRT) auto function are set by first, folding out the boom to spray position, then setting the Headland and Field positions.

To set the 'Headland Position', move the boom to the desired 'Headland' position.

When in position, press & hold the 'Cruise Master' switch and simultaneously press the 'Dual Tilt' switch Up', then release both switches.

With the boom in the desired 'Headland' position, press & hold the 'Cruise Master' switch and simultaneously press the 'Dual Tilt' switch Up', then release both switches.



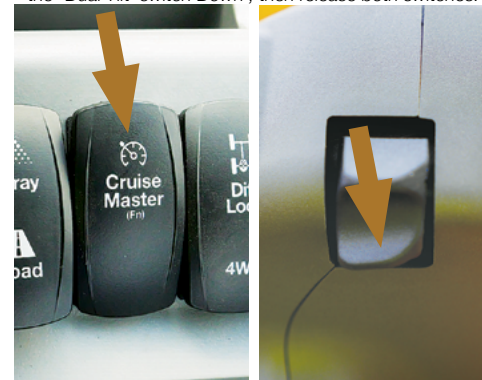
Press the touch button to Enable the 'Head Assist' (Non-XRT only), then set the 'Headland Position' & 'Field Position' of the boom for Headland Assist. Press the SAVE touch button to save the 'Boom Automation' settings & exit the screen.

To set the 'Field Position', move the boom to the desired 'Field' position.

When in position, press & hold the 'Cruise Master' switch and simultaneously press the 'Dual Tilt' switch Down, then release both switches.

When 'Headland Assist' settings are completed, press the 'SAVE' touch button at the top left hand side of the screen to save the settings into the G-Hub system, otherwise the settings entered on the Machine screen will be lost.

With the boom in the desired 'Headland' position, press & hold the 'Cruise Master' switch and simultaneously press the 'Dual Tilt' switch Down', then release both switches.



C Steering Diagnostics

Press the 'Steering Diagnostics' tab touch button to display 'Steering Diagnostics' used assist steering troubleshooting & diagnostics.

The Crop Cruiser utilises a Danfoss OSPE steering orbital with PVED CLS control valve as a fully integrated GPS steering ready solution.

The valve is compliant with all current legislation & safety standards, and removes the need for a customer to add any extra hydraulic valves to the sprayer.

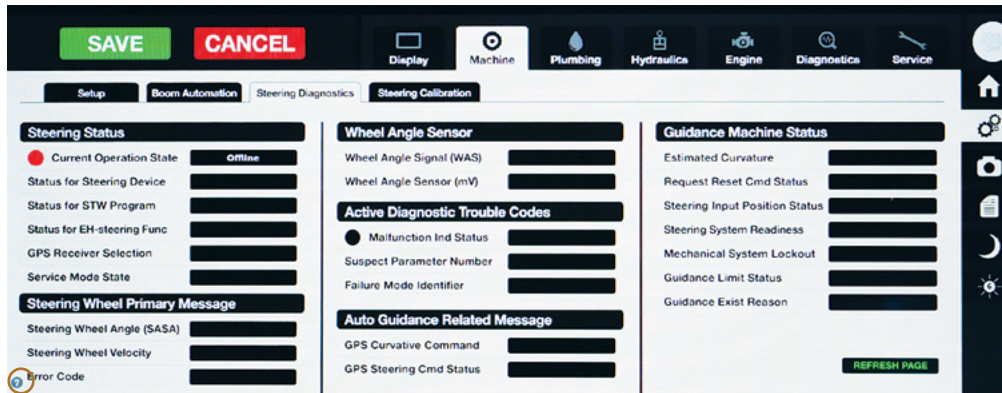
The safety information for vehicle speed & MMI information is sent from the G-Hub display located in the cabin.

The valve is electrically locked out when the Spray/Road Mode switch is in the Road Mode to prevent accidental activation.

If the valve is non responsive there is an LED indicator light on the bottom of the orbital to indicate its status.

NOTE

If the Crop Cruiser is started in Spray Mode, the steering orbital will be in safe state, then the Spray/Road Mode switch must be cycled to Road Mode & back to Spray Mode to prevent accidental activation of the GPS steering.



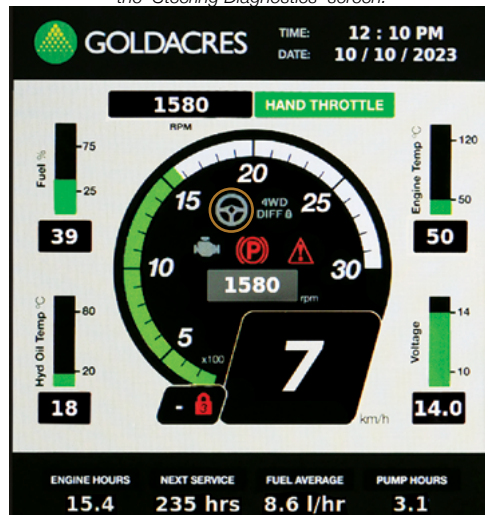
The 'Steering Diagnostics' screen. No pre-setting is required with this screen. Press the 'Help (?)' touch button for further information if required.

The Steering Wheel symbol (touch button) on the G-Hub Home screen provides quick access to the 'Steering Diagnostics' screen.

The screen includes the following:

- Steering Status
- Steering Wheel Primary Message
- Wheel Angle Sensor
- Active Diagnostic Trouble Codes
- Auto Guidance Related Message

Press the 'Steering Wheel' symbol touch button to open the 'Steering Diagnostics' screen.



- Guidance Machine Status
- 'Refresh Page' touch button
- 'Help (?)' touch button.

D Steering Calibration

The 'Steering Calibration' screen is used for setting-up & calibration of the steering system.

Press the 'Steering Calibration' tab touch button to display the screen with the following menus:

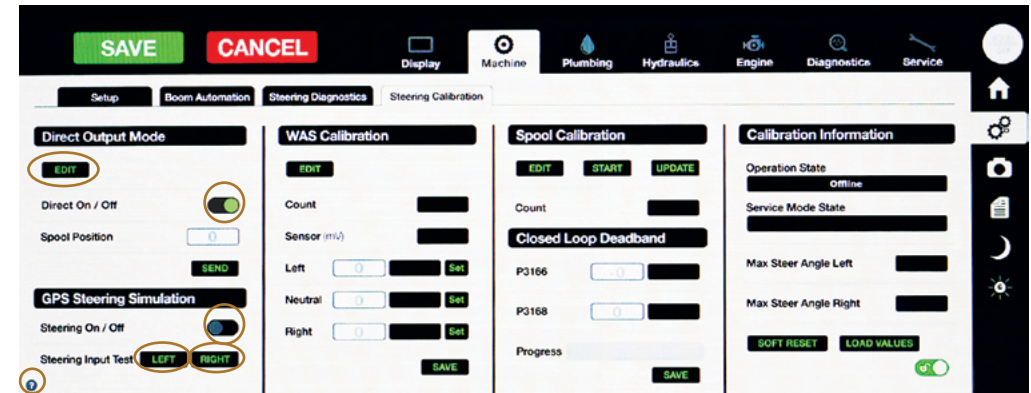
- Direct Output Mode
- GPS Steering Simulation
- WAS Calibration
- Spool Calibration
- Closed Loop Deadband
- Calibration Information &
- 'Help (?)' touch button.

The 'Steering Calibration' screen is locked for protection.

The screen must be unlocked before any setting or alterations can be made.

To unlock the screen, follow the instructions previously provided in this chapter.

A 'Help (?)' touch button in the lower left hand corner of the screen can be pressed for further information.



Press the Edit touch button, then press the 'Direct On/Off' touch button to activate the cut-off solenoid. Press the Steering 'On/Off' touch button to activate the GPS steering simulator. Press the 'Help (?)' touch button for information.

i) Direct Output Mode

The Direct Output Mode is used to manually check the spool valve is working correctly and fine tuning closed loop dead band values.

Press the 'Edit' touch button and the valve will then change to Service Mode, then press the 'Direct On/Off' touch button to activate the cut-off solenoid. When active, the touch button is Green & Grey when deactivated.

Enter a spool position to request, eg, 900 or 1100 (the range available is from 0 [full left to 2000 [full right]]. 1000 is the valve's neutral position. Therefore 900 will be 100 to the left and 1100 will be 100 to the right

The spool valve will require a soft reset to return to operation mode.

ii) GPS Steering Simulation

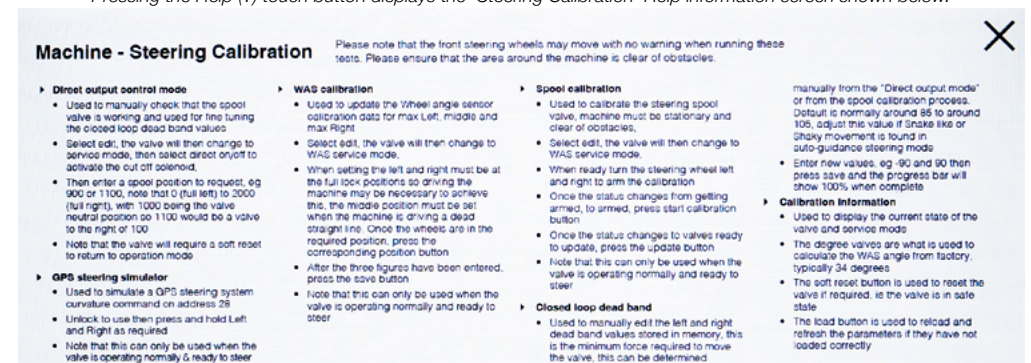
The GPS Seering Simulator is used to simulate a GPS steering system curvature command on address 28.

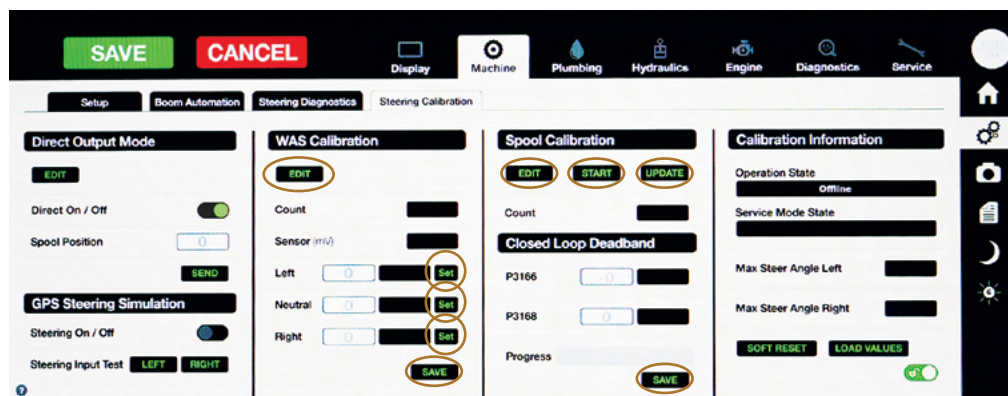
Press the 'Steering On/Off' touch button to activate the GPS steering simulator. When active, the touch button is Green & Grey when deactivated.

Then, press & hold the 'Steering Input Test' 'Left' and 'Right' touch buttons as required.

The spool valve must be operating normally & ready to steer for this adjustment to be made.

Pressing the Help (?) touch button displays the 'Steering Calibration' Help information screen shown below.





Press the WAS Calibration 'Edit' touch button, then follow instructions to set & save the settings. Follow the Spool Calibration instructions to set & save settings. Press the 'Help (?)' touch button for information.

iii) WAS Calibration

WAS Calibration is used to update the Wheel angle sensor calibration data for Max Left, Middle and Max Right

Press the 'Edit' touch button & the valve will then change to 'WAS Service Mode'.

Drive the Crop Cruiser to achieve the following wheel positions and settings:

- 'Left' - turn wheels to full 'Left' lock, then press the 'Left' 'Set' touch button
- 'Neutral' turn wheels to driving a dead straight line, then press the 'Neutral' 'Set' touch button
- 'Right' - turn wheels to full 'Right' lock, then press the 'Right' 'Set' touch button.

Press the WAS Calibration 'SAVE' touch button (at the base of the screen) after setting the three values to save the settings.

iv) Spool Calibration

The 'Spool Calibration' is used to calibrate the steering spool valve.

The Crop Cruiser must be stationary & clear of obstacles for the calibration.

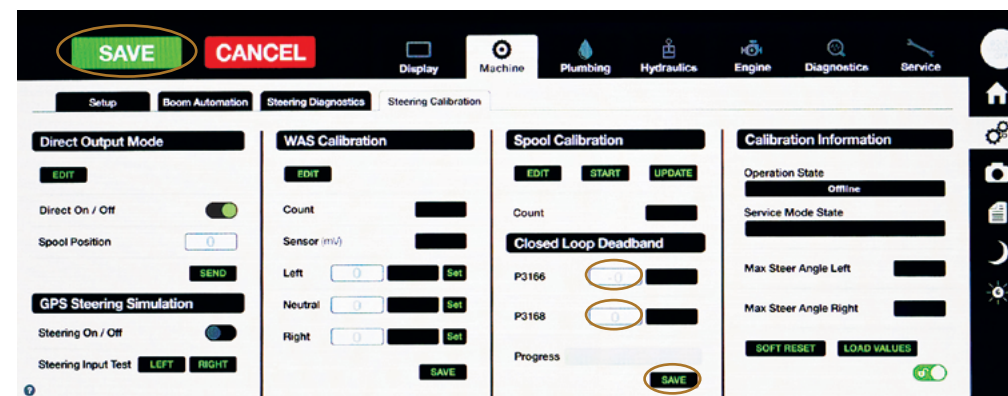
Press the 'Edit' touch button & the valve will then change to 'Spool Service Mode'.

When ready, turn the steering wheel Left & Right to Arm the calibration

When valve status changes from 'Getting Armed' to 'Armed', press the 'START' touch button

When valve status changes to 'Valves Ready to Update', press the 'Update' touch button.

Press the Spool Calibration 'SAVE' touch button (at the base of the screen) after setting the three values to save the settings.



Press the '-0' & '0' touch buttons to enter new values, eg -90 and 90, then press 'SAVE'. Press the 'SOFT RESET', 'LOAD VALUES' touch buttons as required. Press the top LHS 'SAVE' touch button to save settings & exit the screen.

vi) Closed Loop Dead Band

The 'Closed Loop Dead Band' is used to manually edit the Left and Right dead band values stored in memory.

The Closed Loop Dead Band value is the minimum force required to move the valve.

This can be determined manually from the 'Direct Output Mode' or from the spool calibration process. The default values is normally around 85 to 105 (- & +).

Adjust both values (- & +) if snake-like or shaky movement is found in the auto-guidance steering mode.

Press the '-0' & '0' touch buttons and enter new values, eg, '-90' & '90', then press the SAVE touch button (at the base of the screen). The progress bar will show 100% when completed.

vii) Calibration Information

Calibration information displays the current state of the valve in Operation State and Service Mode State:

'Max Steer Angle Left' & 'Max Steer Angle Right' (degree valves) are WAS angle factory calculation values - typically 34 degrees.

Press the 'SOFT RESET' touch button to reset the valve if required, ie, while the valve is in safe state.

Press the 'LOAD BUTTON' to reload & refresh the parameters if they have not loaded correctly. When 'Machine Setup' is completed, press the 'SAVE' touch button on the top left hand side of the screen to save the settings into the G-Hub system.

After Save is pressed, the G-Hub Home screen will return. It will then be necessary to press the 'Settings' touch button to continue with pre-setting.

WARNING

Wheels may move or turn unexpectedly when wheel settings are changed.
Ensure the Crop Cruiser is safely & securely parked and all persons are clear of potential danger before recalibrating, otherwise personal injury or damage may occur.

NOTE

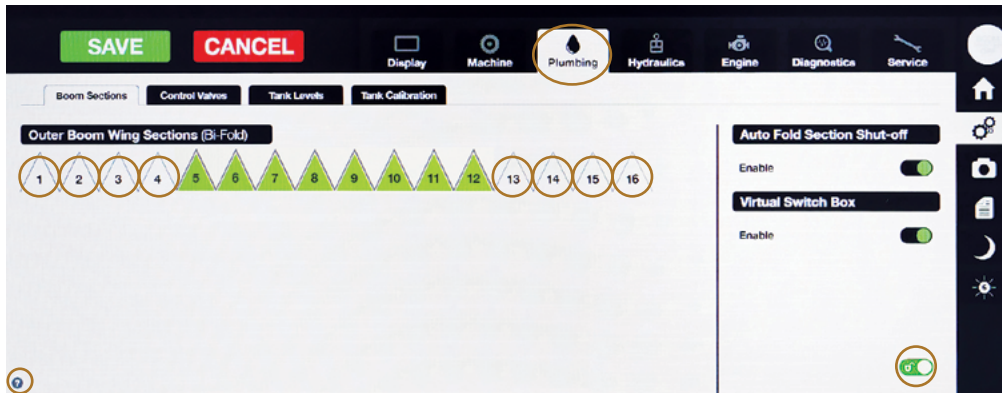
The Spool Calibration can only be done when the spool valve is operating normally & ready to steer.
After editing, the spool valve requires a soft reset to return to operation mode.

NOTE

The GPS steering simulator adjustment can only be done when the spool valve is operating normally & ready to steer.

NOTE

The WAS Calibration can only be done when the spool valve is operating normally & ready to steer.



First 'Unlock' the screen, then press the individual touch buttons to select the 'Outer Boom Wing Sections (Bi-Fold)' and SAVE the settings. Press the 'Help (?)' touch button for more information.

3 Plumbing

Press the Plumbing tab touch button to open the Plumbing settings screen and the Plumbing settings screen opens displaying several tabs (opening on the first tab):

- A Boom Sections
- B Control Valves
- C Tank Levels
- D Tank Calibration.

A Boom Sections

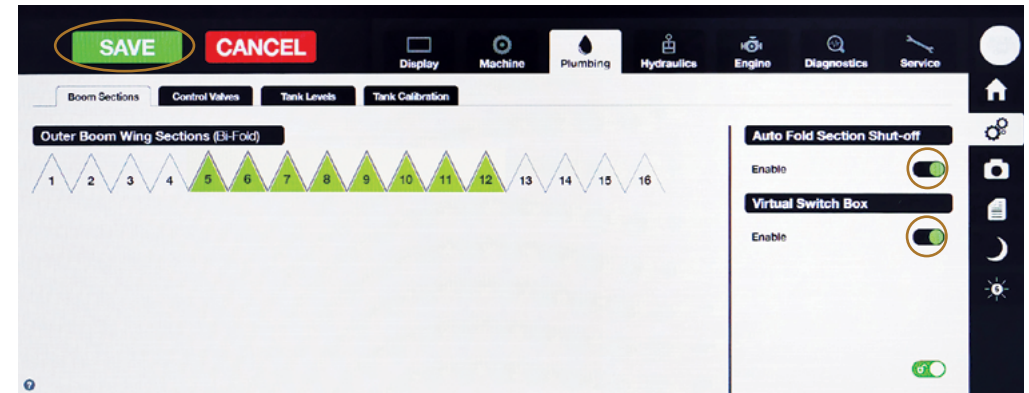
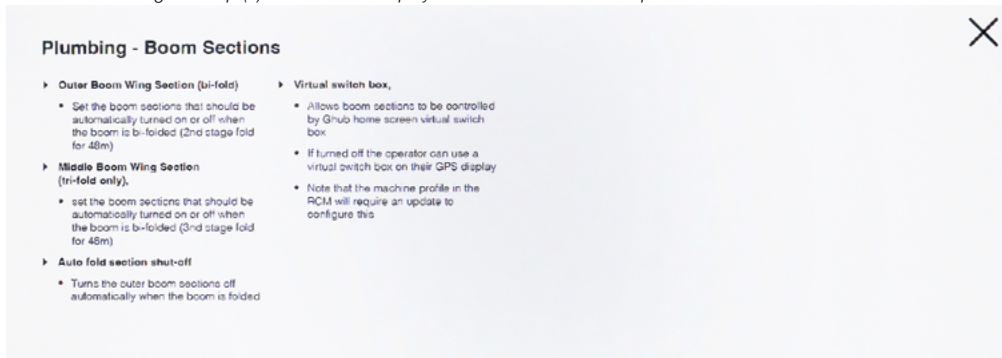
'Boom Sections' provide for setting selected boom sections to be automatically shut off when using Bi-fold and Tri-fold boom functions.

The 'Boom Sections' screen is locked for protection and must be unlocked before any setting or alterations can be made.

To unlock the screen, follow the instructions previously provided in this chapter.

A 'Help (?)' touch button in the lower left hand corner of the screen can be pressed for further information.

Pressing the Help (?) touch button displays the 'Boom Sections' Help information screen shown below.



Press the 'Enable' touch button of the 'Auto Fold Section Shut-off' to enable or disable the Auto Bifold Shut-off function. Sections (Bi-Fold) and SAVE the settings. Press the 'Help (?)' touch button for more information.

i) Outer Boom Wing Sections (Bi-fold)

Press the individual touch buttons to select the boom sections which automatically remain On or switch Off when the boom 'Auto Fold Section Shut-off' is enabled.

Sections which remain On display Green.

Sections to switch Off display Grey.

ii) Auto Fold Section Shut-off

The 'Auto Fold Section Shut-off' when enabled, automatically shuts off outer boom sections when the boom is (see above).

Press the 'Enable' touch button of the 'Auto Fold Section Shut-off' to enable or disable the function.

When enabled, the touch button is Green & Grey when disabled.

iii) Virtual Switch Box

The 'Virtual Switch Box' allows boom sections to be controlled by G-Hub home screen virtual switch box.

If turned Off, the operator can use a virtual switch box on their GPS display.

When 'Boom Sections' settings are completed, press the 'SAVE' touch button on the top left hand side of the screen to save the settings into the G-Hub system.

After Save is pressed, the G-Hub Home screen will return. It will then be necessary to press the 'Settings' touch button to continue with pre-setting.

NOTE

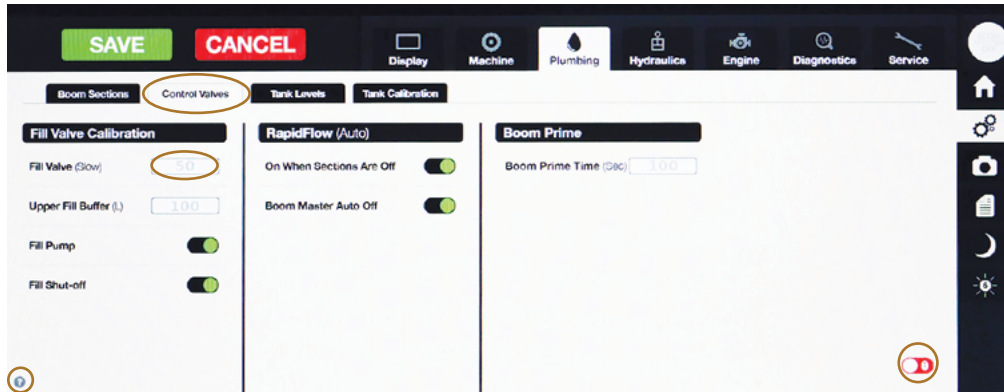
Machine profile in the RCM will require an update to configure the G-Hub 'Virtual Switch Box' changes.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change made in the G-Hub system.

If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain.

The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.



Press the 'Control Valves' tab touch button to open the Control Valves settings screen, 'Unlock' the screen, then press the 'Fill Valve Slow' touch button to enter the value required. Press the 'Help (?)' touch button for more information.

B Control Valves

Press the Control Valves tab touch button to open the Control Valves screen which displays:

- Fill Valve Calibration
- Rapid Flow (Auto)
- Boom Prime.

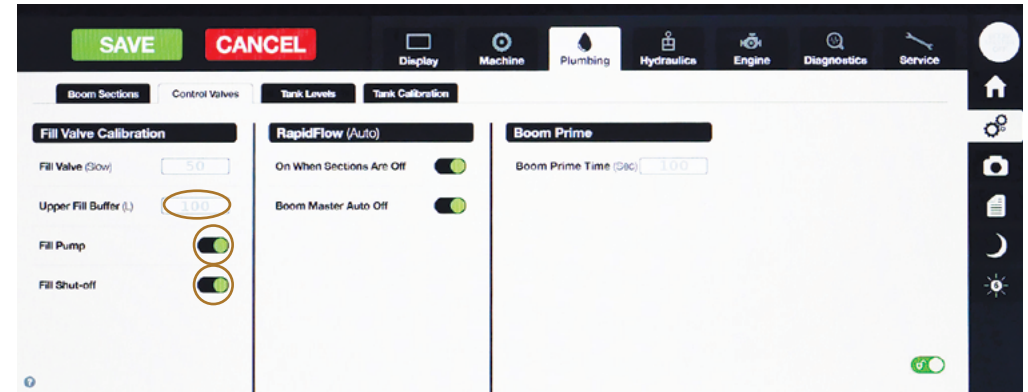
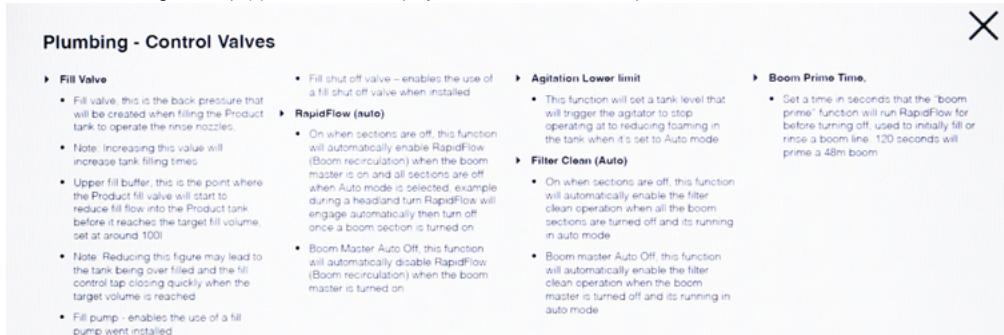
The 'Boom Sections' screen is locked for protection and must be unlocked before any setting or alterations can be made.

i) Fill Valve Calibration

The Fill Valve Calibration settings comprise:

- Fill Valve (Slow)
- Upper Fill Buffer (L)
- Fill Pump
- Fill Shut-off Valve.

Pressing the Help (?) touch button displays the 'Control Valves' Help information screen shown below.



Press the 'Upper Fill Buffer (L)' touch button to enter the value required. Press the 'Fill Pump' and 'Fill Shut-off' touch buttons to enable these functions when the fill pump is fitted.

b) Upper Fill Buffer (L)

'Upper Fill Buffer L' is the point at which the product fill valve starts to reduce fill flow into the Product tank before it reaches the target fill volume. Set at around 100.

To Set the 'Upper Fill Buffer (L)':

- Press the 'Upper Fill Buffer (L)' display touch button and a numerical keypad appears.
- Press the numbers to set the value eg, 100 (litres), then press Enter. The screen returns to the Control Valves tab screen with eg, '100' displayed in the 'Upper Fill Buffer (L)' display.

Reducing this value may lead to the Tank being over filled & the Fill control tap closing quickly when the target volume is reached.

c) Fill Pump

The 'Fill Pump' touch button enables the use of a fill pump when fitted.

Press the 'Enable' touch button of the 'Fill Pump' to enable or disable the function. When enabled, the touch button is Green & Grey when disabled.

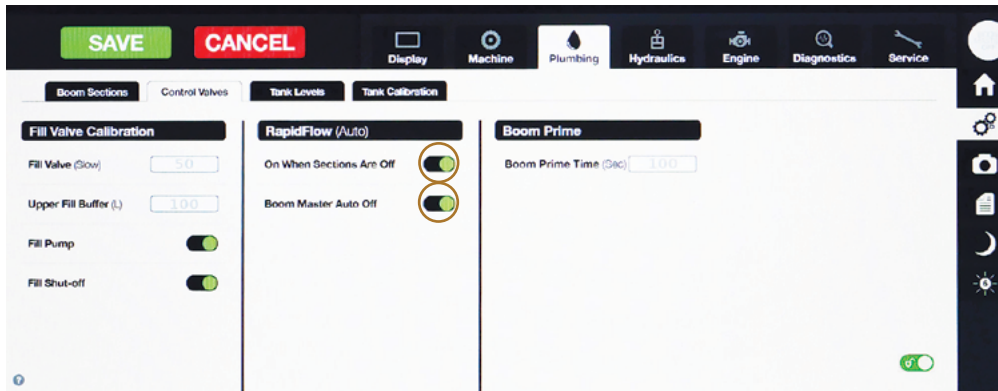
d) Fill Shut-off Valve

The 'Fill Shut-off Valve' touch button enables the use of a Fill Shut-off Valve when fitted.

Press the 'Enable' touch button of the 'Fill Shut-off' to enable or disable the function. When enabled, the touch button is Green & Grey when disabled.

NOTE

The 'Fill Valve (Slow)' value of 30 is a recommended initial calibration which can be altered if required. Range 0-100%. Reduction in 'Upper Fill Buffer L' value may lead to the Tank being over filled and the Fill control valve closing quickly when Target volume is reached.



Press the 'On When Sections Off' & 'Boom Master Auto Off' functions to activate or deactivate as required.

ii) RapidFlow (Auto)

The Rapid Flow (Auto) settings (for boom recirculation) comprise:

- a) Fill Valve (Slow)
- b) Upper Fill Buffer (L)

a) On When Sections Are Off

Automatically enables RapidFlow (boom recirculation) when the Boom Master switch is On & all boom sections Off (only if Boom Master Auto is activated). For example, during headland turns, RapidFlow will automatically engage, then turn Off when boom sections are back On.

To activate the 'On When Sections Are Off', press the 'On When Sections Are Off' touch button. The touch button is Green when enabled & Grey when disabled.

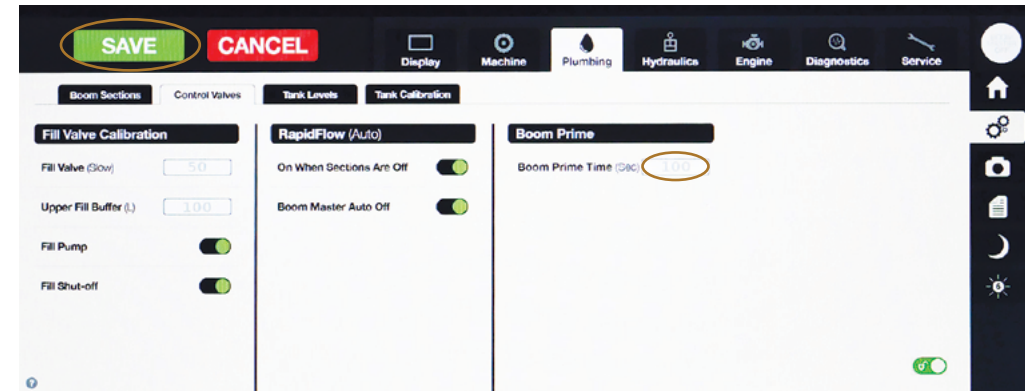
b) Boom Master Auto Off

If activated (Green), the 'Boom Master Auto Off' automatically engages RapidFlow when boom sections are Off and disengages RapidFlow when boom sections are On.

To activate the 'On When Sections Are Off' setting, press the 'On When Sections Are Off' touch button. The touch button is Green when activated & Grey when deactivated.

NOTE

When setting the Rapid Flow (Auto) settings set the 'On When Sections Are Off' OR the 'Boom Master Auto Off'. Select one or the other.
Both can be selected (Green) if desired.



Press the 'Boom Prime Time (Sec)' touch button and enter the value required. Press the SAVE touch button to save the 'Control Valves' settings & exit the screen.

iii) Boom Prime

'Boom Prime' sets a time in seconds in which the "boom prime" function will run RapidFlow before turning Off.

It is used to initially fill or rinse a boom line. 120 seconds will prime a 48m boom

To Set the 'Boom Prime Time (sec)':

- 1 Press the 'Boom Prime Time (sec)' display touch button and a numerical keypad appears.
- 2 Press the numbers to set the value at 120 (seconds), then press Enter. The screen returns to the Agitation Spray Mode (Auto) screen with '120' displayed in the 'Boom Prime Time (sec)' display.

When 'Control Valves' settings are completed, press the 'SAVE' touch button on the top left hand side of the screen to save the settings into the G-Hub system.

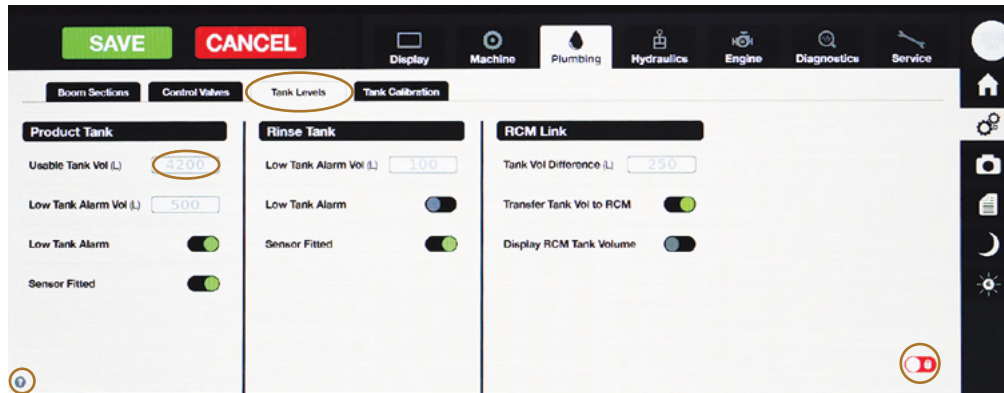
After Save is pressed, the G-Hub Home screen will return. It will then be necessary to press the 'Settings' touch button to continue with pre-setting.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change made in the G-Hub system.

If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain.

The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.



Press the 'Tank Levels' tab touch button to display the Tank Levels screen. Unlock the screen, then set 'Useable Tank Vol (L)' & 'Low Tank Alarm Vol (L)' and enable the 'Low Tank Alarm'. Press the 'Help (?)' touch button for more information.

C Tank Levels

Press the Tank Levels tab touch button to open the Tank Levels screen which displays:

- Product Tank
- Rinse Tank
- RCM Link.

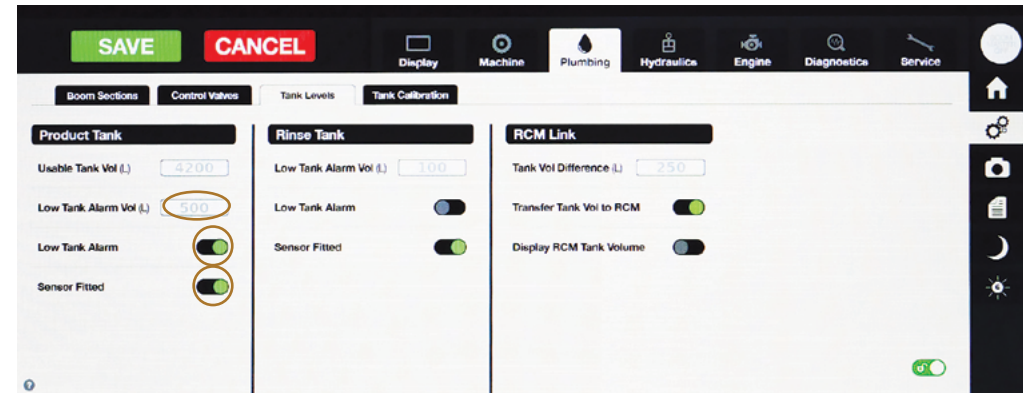
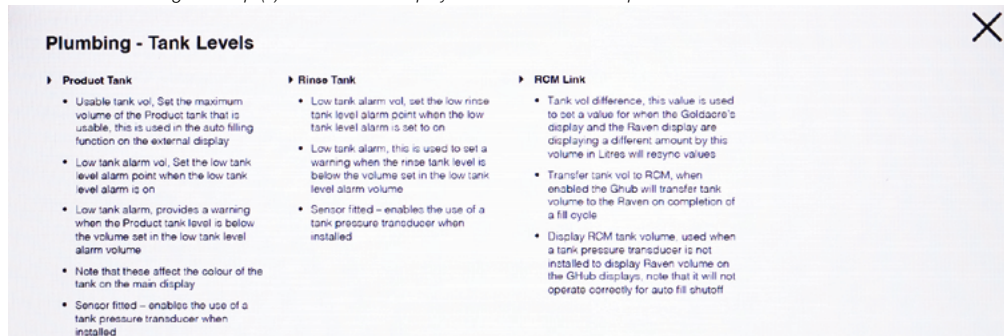
The 'Boom Sections' screen is locked for protection and must be unlocked before any setting or alterations can be made.

i) Product Tank

'Product Tank' settings comprise:

- Useable Tank Volume (L)
- Low Tank Alarm Vol (L)
- Low Tank Alarm &
- Sensor Fitted.

Pressing the Help (?) touch button displays the 'Tank Levels' Help information screen shown below.



Set the 'Low Tank Alarm Vol (L)' and enable the 'Low Tank Alarm'. Enable the Sensor if fitted. Press the SAVE touch button to save the 'Tank Levels' settings & exit the screen.

- Press the numbers to set the value eg, 6000 then press Enter. The screen returns to the Tank Levels tab screen with 6000 displayed in the 'Useable Tank Volume (L)' display.

Actual tank volume may be more eg, 6200 & may be used if desired.

b) Low Tank Alarm Vol (L)

'Low Tank Alarm Volume (L)' sets the Product Tank volume in litres for the low tank alarm.

To Set the Low Tank Alarm Vol (L):

- Press the 'Low Tank Volume (L)' display touch button and a numerical keypad appears.
- Press the numbers to set the value at 1000, then press Enter. The screen returns to the Tank Levels tab screen with 1000 displayed in the 'Low Tank Volume (L)' display.

c) Low Tank Alarm

'Low Tank Alarm' activates or deactivates the low level alarm of the Product tank. When activated this alarm warns when the Product tank level goes below the set level.

To Set the Low Tank Alarm:

Press the 'Low Tank Alarm' touch button to enable or disable the alarm.

The touch button is Green when enabled & Grey when disabled.

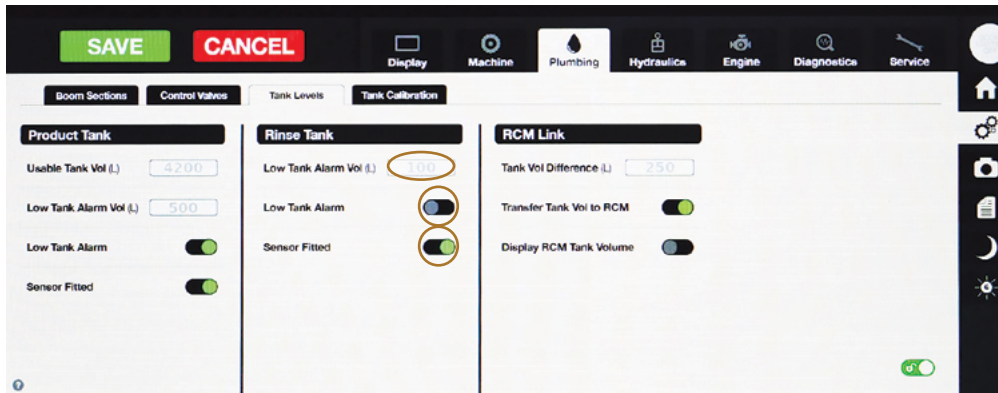
d) Sensor Fitted

'Sensor Fitted' enables or disables the use of a tank pressure transducer when fitted.

To Enable the Sensor:

Press the 'Sensor Fitted' touch button to enable or disable the sensor.

The touch button is Green when enabled & Grey when disabled.



Set the 'Low Tank Alarm Vol (L)' and enable the 'Low Tank Alarm'. Enable the Sensor if fitted. Press the SAVE touch button to save the 'Tank Levels' settings & exit the screen.

ii) Rinse Tank

The Rinse Tank settings comprise:

- Low Tank Alarm Volume (L)
- Low Tank Alarm
- Low Tank Alarm

a) Low Tank Alarm Volume (L)

The 'Low Tank Alarm Volume (L)' sets the volume in litres for the low level alarm in the rinse tank.

The 'Low Tank Alarm' - enables or disables the low level alarm of the rinse tank.

To Set the Low Tank Alarm Vol (L):

- Press the 'Low Tank Volume (L)' display touch button & a numerical keypad appears.
- Press the numbers to set the value at 50, then press Enter. The screen returns to the Tank Levels tab screen with '50' displayed in the 'Low Tank Volume (L)' display.

b) Low Tank Alarm

The 'Low Tank Alarm' enables or disables the low level alarm of the rinse tank.

To Set the Low Tank Alarm:

Press the 'Low Tank Alarm' touch button to enable or disable the alarm.

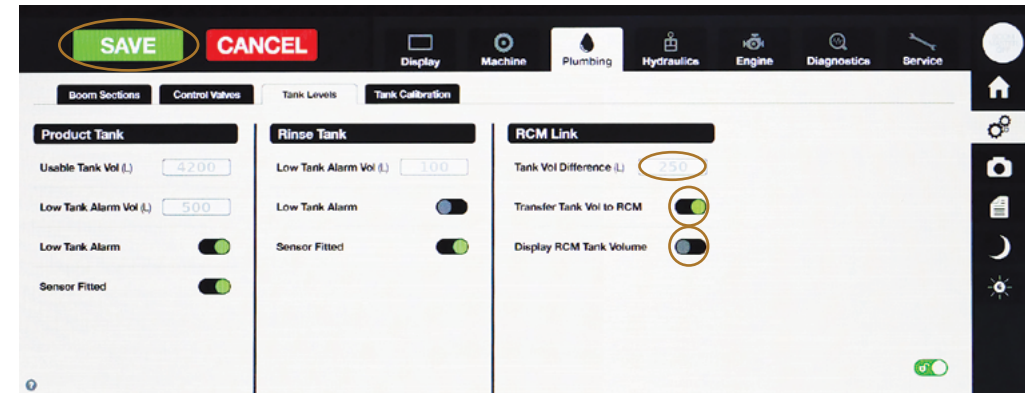
The touch button displays Green when enabled & Grey when disabled.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change made in the G-Hub system.

If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain.

The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.



Set the 'Tank Vol Difference (L)' and enable the 'Transfer Tank Vol to RCM'. Enable the 'Display RCM Tank Volume' if required. Press the SAVE touch button to save the 'Tank Levels' settings & exit the screen.

iii) RCM Link

The RCM Link comprises:

- Tank Vol Difference (L)
- Transfer Tank Vol to RCM
- Display RCM Tank Vol.

a) Tank Vol Difference (L)

'Tank Vol Difference (L)' sets the volume difference alarm point to warn if the G-Hub display & Raven display are displaying differing amounts

To Set the Tank Vol Difference (L):

- Press the 'Tank Vol Difference (L)' display touch button & a numerical keypad appears.
- Press the numbers to set the value, then press Enter. The screen returns with the value displayed. If set to '0' the alarm will be disabled.

b) Transfer Tank Vol to RCM

'Transfer Tank Vol to RCM' enables the G-Hub controller to transfer tank volume to the Raven controller at completion of a Fill cycle.

To Set Transfer Tank Vol to RCM, press the 'Low Tank Alarm' touch button to enable or disable the alarm.

The touch button is Green when enabled & Grey when disabled.

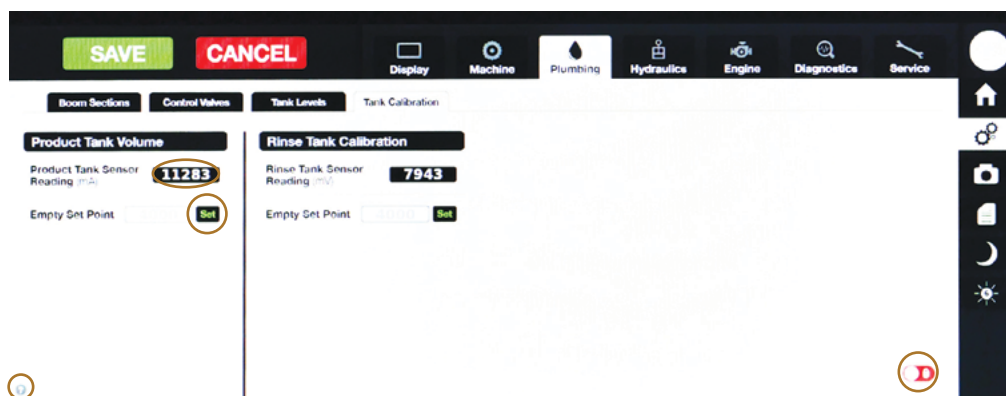
c) Display RCM Tank Vol

'Display RCM Tank Vol' is used when when a tank pressure transducer is not installed to display the Raven volume on the G-Hub screen.

To set the 'Display RCM Tank Vol', press the 'Display RCM Tank Vol' touch button to enable or disable the alarm.

The touch button is Green when enabled & Grey when disabled.

When 'Tank Levels' settings are completed, press the 'SAVE' touch button on the top left hand side of the screen to save the settings into the G-Hub system.



Press the 'Tank Calibration' tab touch button to display the Tank Calibration screen. Unlock the screen, then set the Product Tank Volume 'Empty Set Point' & Rinse Tank Calibration 'Empty Set Point'. Press the SAVE touch button to save settings.

D Tank Calibration

Press the Tank Calibration touch button to open the Tank Calibration screen which displays:

- Product Tank Volume
- Rinse Tank Calibration.

The 'Boom Sections' screen is locked for protection and must be unlocked before any setting or alterations can be made.

i) Product Tank Volume

The Product Tank Volume settings comprise:

- Product Tank Sensor Reading (mA)
- Empty Set Point.

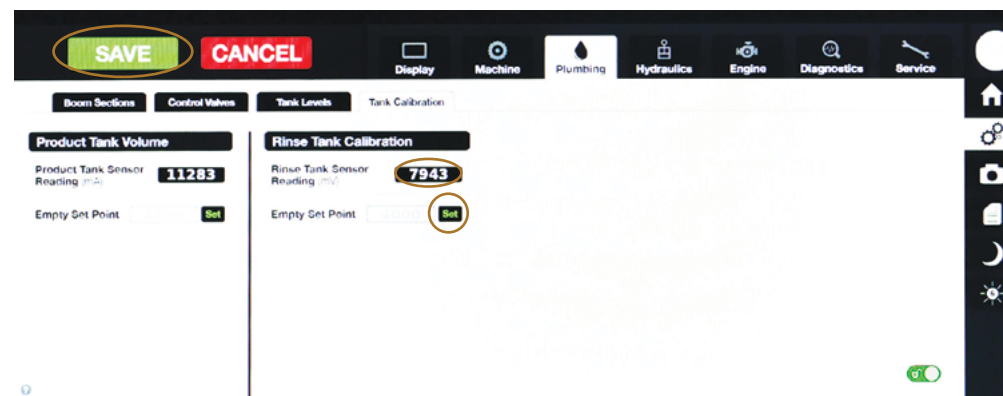
a) Product Tank Sensor Reading (mA)

The 'Product Tank Sensor Reading (mA)' is the current value of the product tank pressure transducer sensor. This will vary depending on volume between 4000 & 20000.

b) Empty Set Point

The 'Empty Set Point' is the product tank pressure transducer sensor reading when the tank is empty.

If changed from 4000mA, the tank calibration curve will offset.



Set the 'Empty Set Point' and press the SAVE touch button to save the 'Tank Calibration' settings & exit the screen.

To Set the Empty Set Point:

- Press the 'Low Tank Volume (L)' display touch button & a numerical keypad appears.
- Press keypad numbers to set the value between 4000 & 20000, then press Enter.

OR

Press the 'Set' touch button when the Rinse tank is empty to set the value.

b) Empty Set Point

The 'Empty Set Point' which is the Rinse tank pressure transducer sensor reading when the Rinse tank is empty.

To Set the Empty Set Point:

- Press the 'Empty Set Point' display touch button & a numerical keypad appears.
- Press keypad numbers to set the value between 1000 & 5000, then press Enter.

OR

Press the 'Set' touch button when the Rinse tank is empty to set the value.

ii) Rinse Tank Calibration

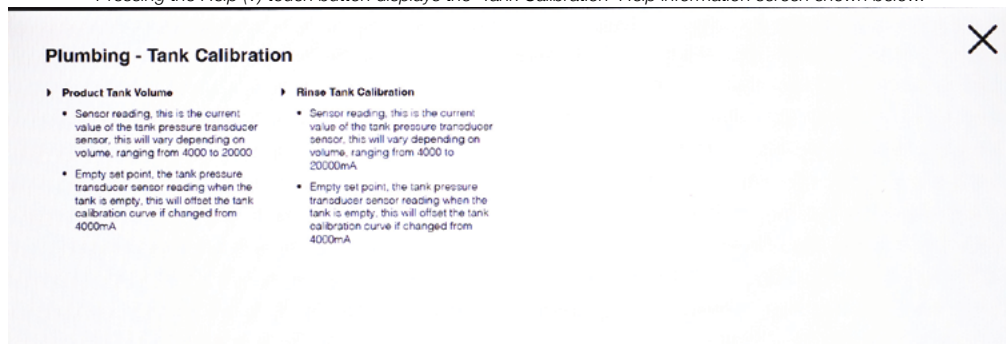
The Rinse Tank Calibration settings comprise:

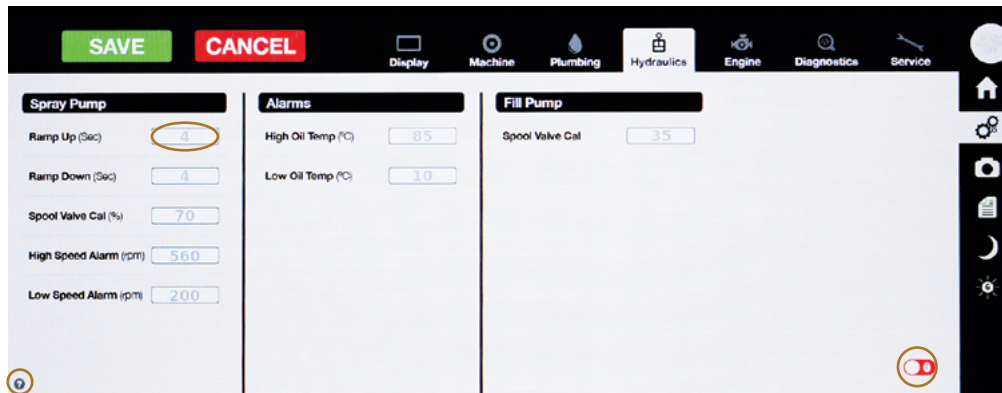
- Product Tank Sensor Reading (mA)
- Empty Set Point.

a) Product Tank Sensor Reading (mA)

The 'Flush Tank Sensor Reading (mA)' is the current value of the rinse tank pressure transducer sensor. This will vary depending on volume between 1000mV & 5000mV.

Pressing the Help (?) touch button displays the 'Tank Calibration' Help information screen shown below.





Press the 'Hydraulics' tab touch button to display the Hydraulics screen. Unlock the screen, then set the Spray Pump 'Ramp Up (sec)' time. Press the SAVE touch button to save settings. Press the 'Help (?)' touch button for more information.

4 Hydraulics

Press the Hydraulics tab touch button to open the Hydraulics settings screen and the Hydraulics settings screen opens displaying:

- Spray Pump
- Alarms
- Fill Pump

The Hydraulics screen is locked to protect from uninformed or accidental alteration.

The screen must be unlocked before any setting or alterations can be made. Refer to previous pages for instructions.

i) Spray Pump

Spray Pump settings comprise:

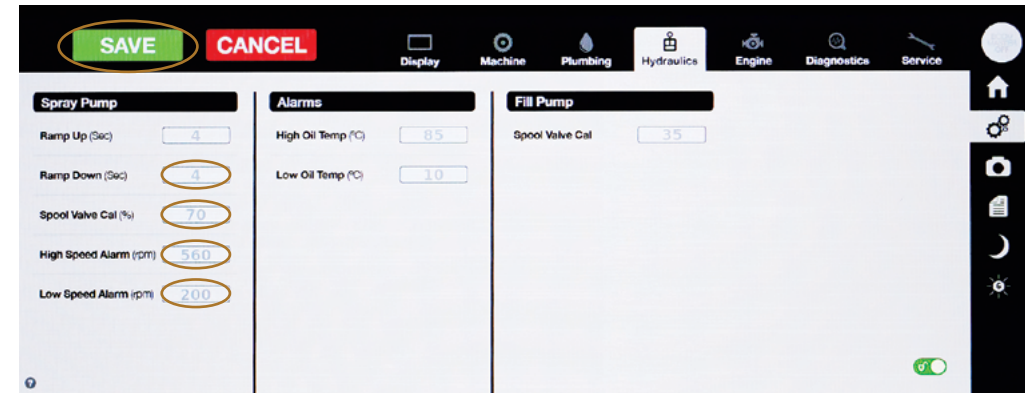
- Ramp Up (sec)
- Ramp Down (sec)
- Spool Valve Cal (%)
- High Speed Alarm (rpm)
- Low Speed Alarm (rpm).

a) Ramp Up (sec)

'Ramp Up (sec)' is the time in seconds for the pump to reach set speed. Settings range from 1 to 5 seconds.

To Set 'Ramp Up (sec)' time:

- Press the 'Ramp Up (sec)' display touch button and a numerical keypad appears.



Press the touch buttons to set 'Ramp Down (sec)', 'Spool Valve Cal (%)', 'High Speed Alarm (rpm)' and 'Low Speed Alarm (rpm)'. Press the SAVE touch button to save settings.

- Press the numbers to set a value between 1 & 5, then press Enter. The screen returns to the Hydraulics tab screen with eg, 3 displayed in the 'Ramp Up (sec)' display.

b) Ramp Down (sec)

'Ramp Down (sec)' is the time in seconds for the pump to stop after being switched Off. Settings range from 1 to 5 seconds.

To Set 'Ramp Down (sec)' time:

- Press the 'Ramp Down (sec)' display touch button & a numerical keypad appears.
- Press the numbers to set the value between 1 & 5, then press Enter.

c) Spool Valve Cal (%)

'Spool Valve Cal (%)' is used to control pump speed. Increase value to increase pump speed. Recommended is between 10 & 70 and set to 255 for Hawkeye to remove Ramp up time.

To Set 'Spool Valve Cal (%)':

- Press the 'Spool Valve Cal (%)' display touch button & a numerical keypad appears.
- Press the keypad numbers to set the required value, then press Enter.

High Speed Alarm (rpm)

'High Speed Alarm (rpm)' touch button is used to set an alarm for when pump speed exceeds the set rpm.

To Set 'High Speed Alarm (rpm)':

- Press the 'High Speed Alarm (rpm)' display touch button & a numerical keypad appears.
- Press the keypad numbers to set the required value, then press Enter.

Low Speed Alarm (rpm)

'Low Speed Alarm (rpm)' touch button is used to set an alarm for when pump speed falls below the set rpm.

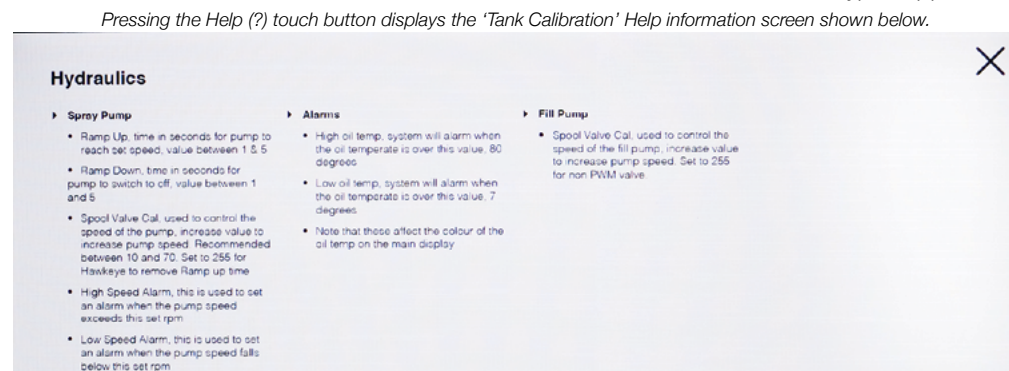
To Set 'Low Speed Alarm (rpm)':

- Press the 'Low Speed Alarm (rpm)' display touch button & a numerical keypad appears.
- Press the numbers to set the required value, then press Enter.

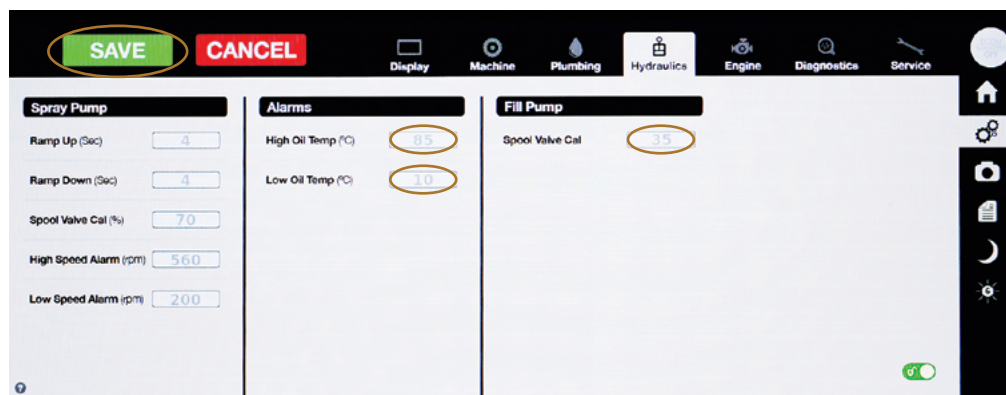
NOTE

The Spool Valve Cal (%) requires an engine operating speed of 1800 rpm (not idle) & values depend on pump type:

- Positive displacement (ie, Zeta) - start with 38 & adjust
- Centrifugal (ie, Arag) - start with 40 & adjust as needed
- For Hawkeye fitted machines - set the value to 100.



Preparation for Use – Setting Up



Press the touch buttons to set the 'High Oil Temp (°C)' & 'Low Oil Temp (°C)' alarm settings, then set the 'Spool Valve Cal' setting. Press the SAVE touch button to save the 'Hydraulics' settings & exit the screen.

ii) Alarms

Alarm settings comprise:

- High Oil Temp (°C)
- Low Oil Temp (°C)

a) High Oil Temp (°C)

The 'High Oil Temp (°C)' alarm sounds if oil temperature goes above 80 degrees C.

To Set 'High Oil Temperature (°C)':

- Press the 'High Oil Temperature (°C)' display touch button & a numerical keypad appears.
- Press the numbers to set the required value, then press Enter.

b) Low Oil Temp (°C)

The 'Low Oil Temp (°C)' alarm sounds if oil temperature goes below 7 degrees C.

To Set 'Low Oil Temperature (°C)':

- Press the 'Low Oil Temperature (°C)' display touch button & a numerical keypad appears.
- Press the numbers to set the required value, then press Enter.

iii) Fill Pump

The Fill Pump setting comprises the 'Spool Valve Cal' setting which is used to control the speed of the Fill pump.

Increase the value to increase pump speed. Set non PWM valves to 100.

To Set 'Spool Valve Cal':

- Press the 'Low Oil Temperature (°C)' display touch button & a numerical keypad appears.
- Press the numbers to set the required value, then press Enter.

When 'Hydraulics' settings are completed, press the 'SAVE' touch button on the top left hand side of the screen to save the settings.

After Save is pressed, the G-Hub Home screen will return. It will then be necessary to press the 'Settings' touch button to continue with pre-setting.

NOTE

The High Speed Alarm (rpm) setting value depends on the type of pump being used:

- Positive displacement (ie, Zeta) - 540 rpm max speed
- Centrifugal (ie, Arag) - max operating speed is 4500 rpm.



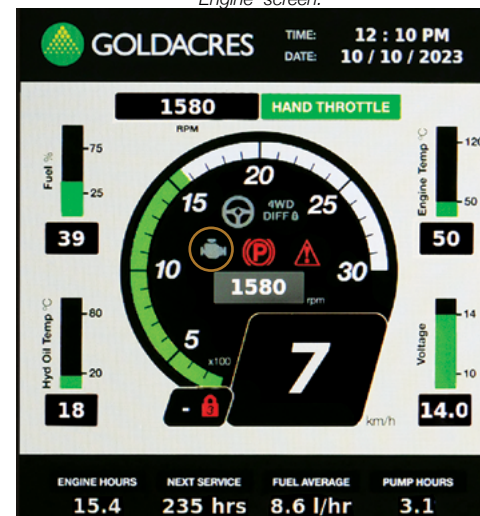
Press the 'Engine' touch button to display the current Engine information.

5 Engine

Press the Engine touch button to open the Engine screen displaying a series of tabs:

- Engine
- Transmission
- Cruise
- RPM
- Faults.

Press the 'Engine' symbol touch button to open the 'Engine' screen.



Pre-setting is required in C & D tab screens.

For quick operating access, press the Engine symbol touch button on the Main screen.

A Engine

There is no pre-setting required in the Engine tab screen.

Trip items iii), iv) & v) include 'Reset' touch buttons to reset displays back to zero.

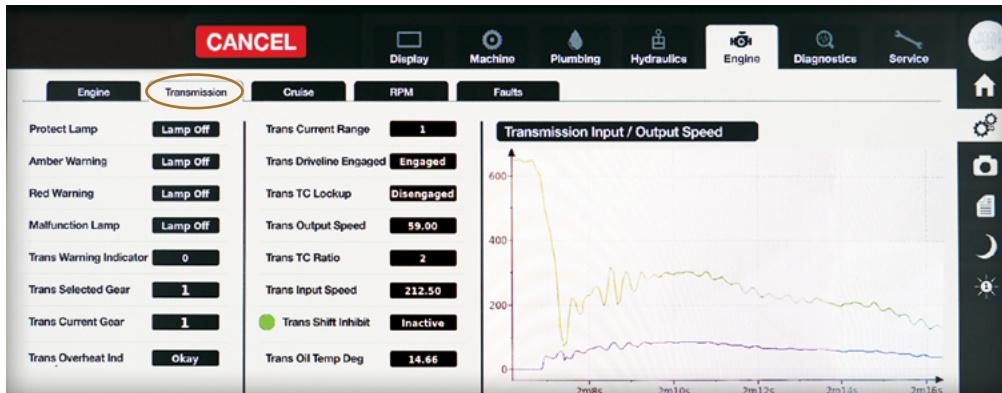
To reset 'Trip' values back to zero, press the appropriate Reset' touch button.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change made in the G-Hub system.

If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain.

The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.



Press the 'Transmission' touch button to display the current Transmission information.

The Engine tab displays 'Operation State' 'Running' OR 'Stopped' and the operation status of the following items:

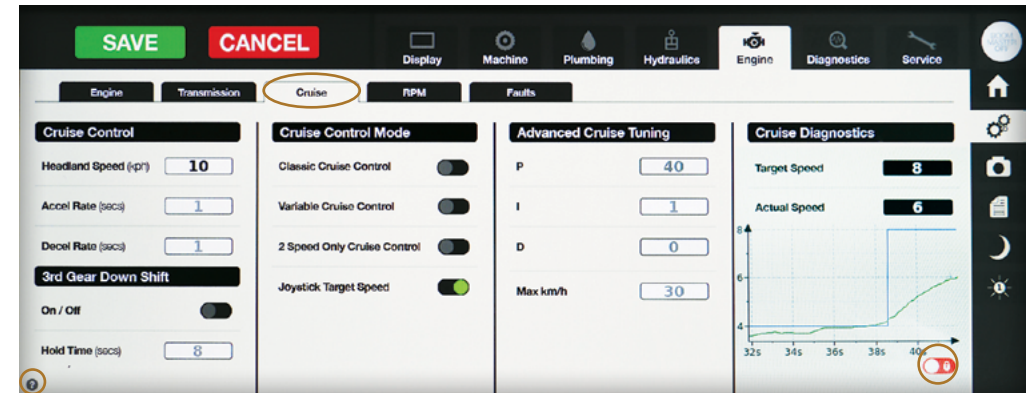
- Amber Lamp On/Off
- Red Lamp On/Off
- Trip Fuel (L) Average Fuel Rate (l/hr)
- Trip Engine (hrs)
- Trip (km)
- Boost (kPa)
- Instant Fuel Rate (l/hr)
- Total Fuel Used (L)
- Total Idle Fuel Used (L)
- Av Lifetime Fuel (l/hr)
- Total Engine (hrs)
- Total Idle (hrs)
- ECU (hrs)
- Oil Pressure
- Coolant Level
- Load %
- Estimated Fan %
- Intake Temperature
- Water in Fuel
- RPM and Fuel Rate display graph.

B Transmission

Press the Transmission tab touch button to open the Transmission screen displaying current transmission information:

- Protect Lamp
- Amber Warning
- Red Warning
- Malfunction Lamp
- Trans Warning Indicator
- Trans Selected Gear
- Trans Current Gear
- Trans Overheat Ind
- Trans Current Range
- Trans Driveline Engaged
- Trans TC Lockup
- Trans Output Speed
- Trans TC Ratio
- Trans Input Speed
- Trans Shift Inhibit
- Trans Oil Temp Deg
- Transmission Input/Output Speed display graph.

There is no pre-setting required in the Transmission tab screen.



Press the 'Cruise' touch button to display the current Cruise screen. Unlock the screen to make setting changes. Press the 'Help (?)' touch button for more information.

C Cruise

Press the 'Cruise' tab touch button to open the Cruise screen displaying 5 main headings:

- Cruise Control
- 3rd Gear Down Shift
- Cruise Control Mode
- Advanced Cruise Tuning
- Cruise Diagnostics.

The Hydraulics screen is locked to protect from uninformed or accidental alteration.

The screen must be unlocked before any setting or alterations can be made.

Pressing the Help (?) touch button displays the 'Engine - Cruise' Help information screen shown below.

Engine - Cruise

Cruise Control

- Headland speed, this is the lower speed that the machine will slow down to when the variable or two speed cruise function is active, max 25 km/h (16 mph). The upper cruise limit speed is set via the joystick cruise set button.
- Accel Rate (seconds) This is the rate that the machine will try and chase the target upper speed when changing cruise speeds, between 1-8, usually set a 1 second.
- Decel Rate (seconds) This is the rate that the machine will try and chase the target lower speed when changing cruise speeds, between 1-8, usually set a 1 second.

3rd gear down shift

- On/Off, this will enable the cruise to preselect 3rd gear on the transmission as needed.

Cruise Control Mode

- Classic cruise, this is used to activate the cruise control in classic mode, this will use the higher cruise set speed only.
- Variable cruise control, this is used to activate the joystick to be used in variable cruise control mode, this will give the operator variable speeds between the upper and lower cruise limits by sliding the joystick, forward is increase speed. The lower speed is set on this page and the upper limit is set via the joystick cruise set button.
- 2 speed only cruise, this is used to activate the joystick to be used in non-variable cruise control mode, this will give the operator the choice of two speeds, the upper and lower cruise limits by sliding the joystick, forward is increase speed. The lower speed is set on this page and the upper limit is set via the joystick cruise set button.
- Joystick Target Speed, this is used to activate the joystick to be used to target a speed. By sliding the joystick forwards or backwards the operator will be able to

Advanced cruise tuning

- PID is a control loop mechanism employing feedback to control the cruise in joystick 'Target Speed' mode, see manual for details before making any adjustments.
- P, Proportional gain parameter
- I, Integral gain parameter
- D, Derivative gain parameter
- Max km/h, Max speed that will be targeted.

Cruise Diagnostics

- Target speed, as requested by cruise control system
- Actual speed, actual speed of the machine

Press the 'Help (?)' touch button at the bottom left hand side of the screen for further information if required.

i) Cruise Control

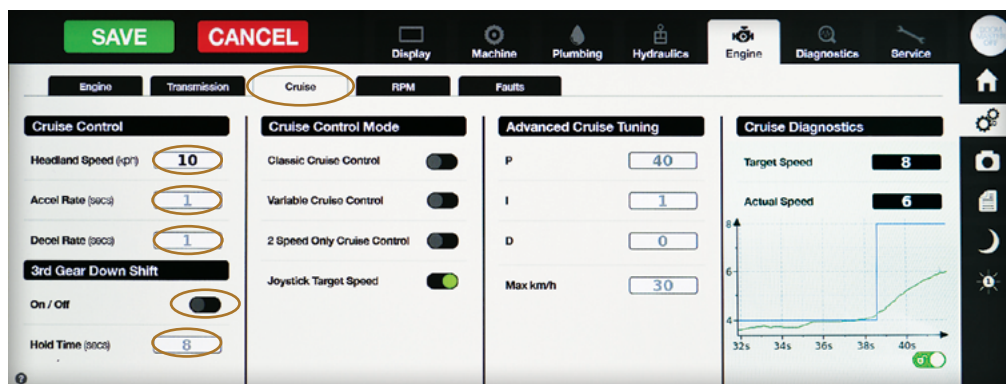
The 'Cruise Control' settings comprise:

- Headland Speed (kph)
- Accel Rate (secs)
- Decel Rate (secs).

a) Headland Speed (kph)

'Headland Speed (kph)' is the lower speed to which the Cruiser slows when using Variable or Two Speed Cruise Control mode. Max speed setting is 25 Km/h.

Preparation for Use – Setting Up



Press the touch buttons to set the 'Headland speed (kph)', 'Accel Rate (secs)' & 'Decel Rate (secs)'. Press the 'On / Off' and 'Hold time (secs)' touch buttons to set '3rd Gear Down Shift' settings as required.

The upper speed limit is set via the joystick Cruise Set push button.

To Set the Headland Speed (kph):

- 1 Press the 'Headland Speed (kph)' display touch button & a numerical keypad appears.
- 2 Press the numbers to set the required value (eg, 10), then press Enter.

b) Accel Rate (secs)

The 'Accel Rate (secs)' setting determines the acceleration rate used by the Cruiser to reach its higher speed target when changing up gears.

Enter a value from 1 to 8. The higher the number, the longer it takes to reach the target. Usually set 1 second.

To Set the Accel Rate (sec):

- 1 Press the 'Accel Rate (secs)' display touch button & a numerical keypad appears.
- 2 Press the number to set the required value (eg, 1), then press Enter.
'Accel Rate (secs)' - The higher the number the longer it takes to reach the target

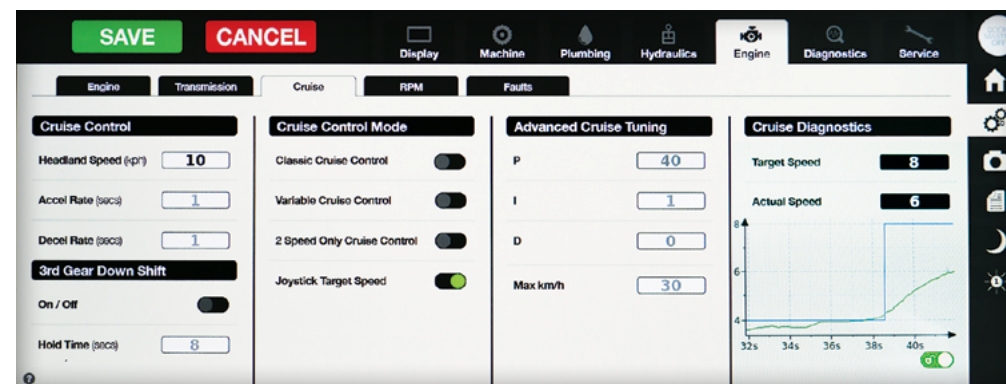
c) Decel Rate (secs)

The 'Decel Rate (secs)' setting determines the acceleration rate used by the Cruiser to reach its higher speed target when changing up gears.

Enter a value from 1 to 8. The higher the number, the longer it takes to reach the target. Usually set 1 second.

To Set the Decel Rate (secs):

- 1 Press the 'Decel Rate (sec)' display touch button & a numerical keypad appears.
- 2 Press the numbers to set the required value (eg, 1), then press Enter.
'Decel Rate (secs)' - The higher the number the longer it takes to reach the target.



Set the 'Headland Speed (kph)', 'Accel Rate (sec)' & 'Decel Rate (sec)' values. Enable the '3rd Gear Down Shift' if required, then set the 'Hold Time (sec)'.

ii) 3rd Gear Down Shift

'3rd Gear Down Shift' settings comprise:

- a) On / Off
- b) Hold Time (secs)

a) On/Off

Enables the Cruise function to preselect transmission 3rd gear as needed.

b) Hold Time (secs)

'Hold Time (secs)' is the number of seconds 3rd gear is held.

- In Variable or Two Speed Cruise Control mode when requested speed reduction is large enough that engine braking will assist slowing down to target speed - at which Hold is removed
- Activate in Classic Cruise Control mode by pulling the Joystick fully back.
- Manually activate by pushing the 'Mode' push button on the gear selector.

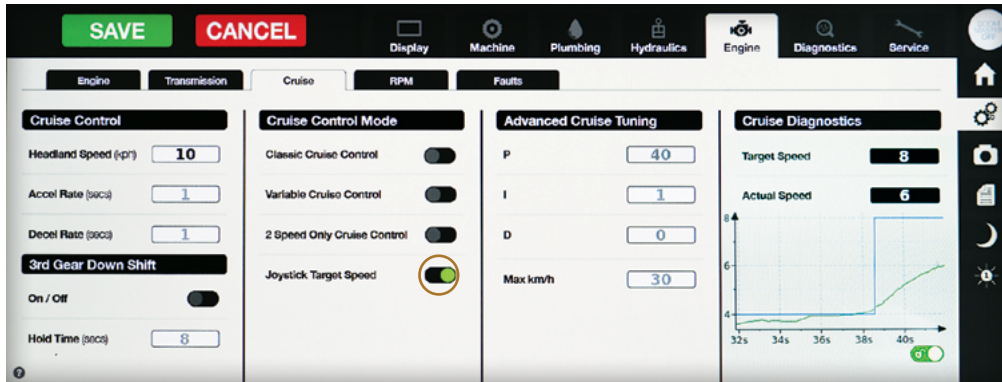
A lock icon appears over the gear selection displayed on the home screen & the push button gear selector will show 3rd as the maximum gear to be selected. The transmission will only down shift when it is safe to do so.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change made in the G-Hub system.

If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain.

The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.



Enable the 'Cruise Control Mode' required, eg, 'Joystick Target Speed'.

iii) Cruise Control Mode

'Cruise Control Mode' settings provide 4 different Cruise Control modes:

- Classic Cruise Control
- Variable Cruise Control
- 2 Speed Only Cruise Control
- Joystick Target Speed.

Use Mode touch buttons to enable or disable. Only one mode can be enabled at a time.

a) Classic Cruise Control

'Classic Cruise Control' uses higher set cruise speed only.

b) Variable Cruise Control

'Variable Cruise Control' uses the Joystick to change speed between the Upper & Lower set cruise speeds.

The Lower speed limit is set on this screen & Upper speed limit on the Joystick using the 'Cruise Set/Decrease' push button.

c) 2 Speed Only Cruise Control

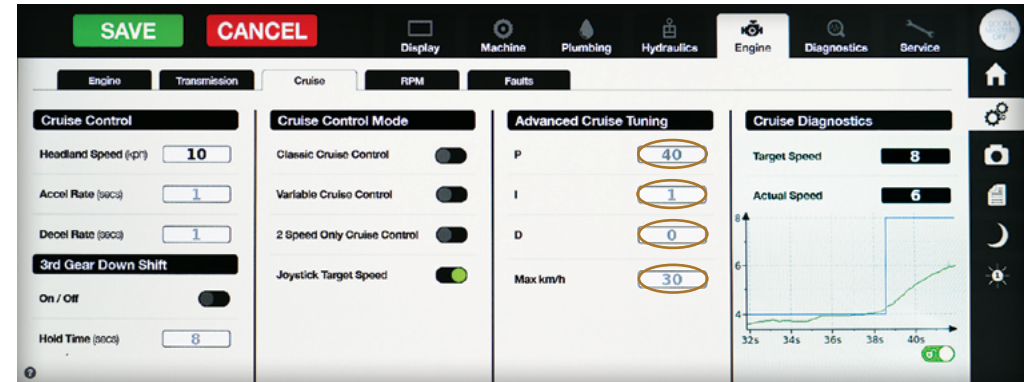
'2 Speed Only Cruise Control' provides the operator with two speeds (Upper & Lower) by moving the Joystick forwards or rearwards.

The Lower speed limit is set on this screen & Upper speed limit on the Joystick using the 'Cruise Set/Decrease' push button.

d) Joystick Target Speed

Used to enable or disable the joystick which is used to target a speed. By sliding the joystick forwards or backwards the operator sets a target speed to which the machine will drive.

'Advanced Cruise Tuning' parameters can be used to alter how the 'Joystick Target Speed' mode responds (See following instructions, 'iv) Advanced Cruise Tuning').



'Advanced Cruise Tuning' is only applicable to the 'Joystick Target Speed' mode. The goal of tuning is to ensure minimal process oscillation around the target setpoint after a disturbance has occurred.

iv) Advanced Cruise Tuning

'Advanced Cruise Tuning' is only applicable to the 'Joystick Target Speed' mode.

'Advanced Cruise Tuning' features a 'PID Controller' using a PID algorithm where:

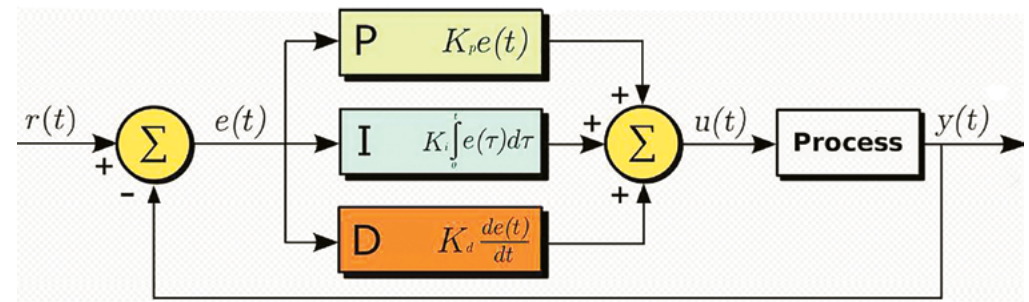
- 'P' is 'Proportional' gain parameter
- 'I' is Integral gain parameter
- 'D' is Derivative' gain parameter
- 'Max km/h' is Max speed targeted.

The combined 'PID' functions of the Controller automatically & efficiently action the desired speed by increasing or decreasing the engine output to match the operating conditions.

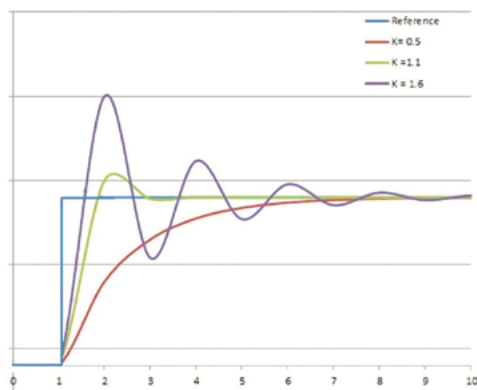
'PID' values can be refined or fine-tuned by an operator to better match operator style, terrain and soil conditions.

There is a science to tuning a PID loop but the most widely used tuning method is trial and error.

The PID Controller algorithm uses 'P' 'I' 'D' inputs to automatically & efficiently control engine speed to achieve target speed.



Preparation for Use – Setting Up



The 'Cruise Diagnostics' live graph (above) illustrates the tuning goal for minimal process oscillation around the target setpoint - after a disturbance has occurred.

The goal of tuning (using the 'Cruise Diagnostics' live graph) is to ensure minimal process oscillation around the target setpoint after a disturbance has occurred.

Observe the 'Cruise Diagnostics' information and make alterations if needed to improve performance.

'P' = Response gain

Increase P = more aggressive in chasing target speed.

Decrease P = less aggressing in chasing target speed.

'I' = Error removal

Increase 'I' slowly to remove oscillating error from target speed.

'D' = Error over time

Increase 'D' slowly to remove error from target speed over time.

To Fine-Tune Advanced Cruise Tuning:

- 1 Individually press each display 'P', 'I' 'D' & 'Max km/h' touch button & a numerical keypad appears.
- 2 Press the numbers to set the required value, then press Enter.

Initially set:

- 'P' = 40
- 'I' = 1
- 'D' = 0

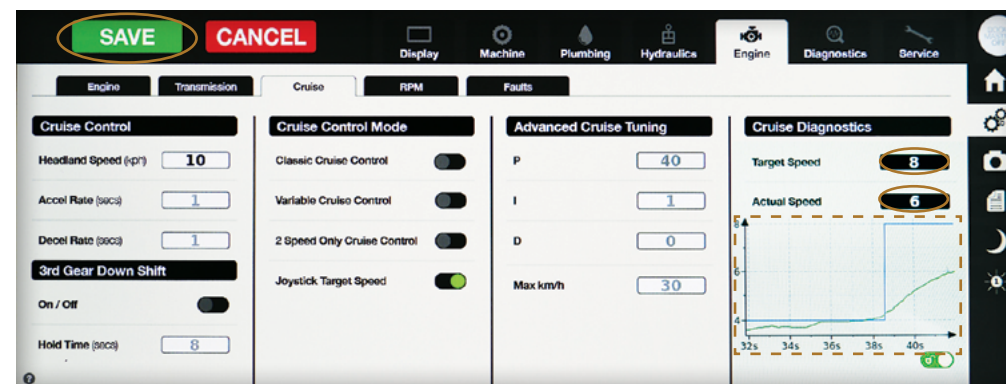
Typically fine tune by only adjusting one variable at a time.

- 3 Therefore, first fine tune 'P'.

Once 'P' is okay (minimal 'P' process oscillation after a disturbance), then move onto 'I'.

- 4 Fine tune 'I' & when okay (minimal 'I' process oscillation after a disturbance), then move onto 'D'.

- 5 Fine tune 'D' for minimal 'D' process oscillation after a disturbance.



'Cruise Diagnostics' (only applicable to the 'Joystick Target Speed' mode) displays 'Target Speed', 'Actual Speed' & a live performance graph. Press the SAVE touch button to save the 'Control Valve' settings & exit the screen.

v) Cruise Diagnostics

'Cruise Diagnostics' is used to assist fine-tuning cruise performance, using:

- Target speed, as requested by cruise control system
- Actual speed, actual speed of the machine.

The 'Cruise Diagnostics' screen displays:

- Target Speed (Joystick position)
- Actual Speed (current speed)
- Live graph (current performance).

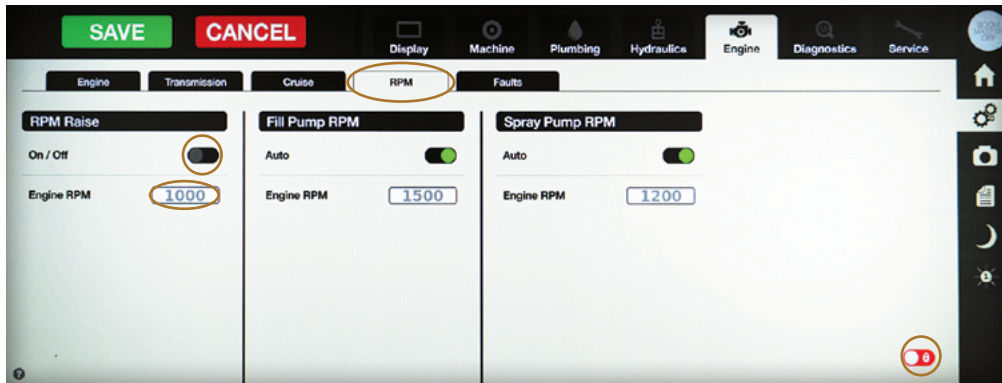
When 'Cruise' settings are completed, press the 'SAVE' touch button on the top left hand side of the screen to save the settings.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change made in the G-Hub system.

If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain.

The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.



Press the 'RPM' touch button to display the RPM tab screen. Unlock the screen to make any changes. Enable 'RPM Raise', then set the 'RPM Raise' speed as required.

D RPM

Press the RPM tab touch button to open the RPM tab screen displaying:

- RPM Raise
- Fill Pump RPM
- Spray Pump RPM.

The 'RPM' screen is locked for protection from uninformed or accidental alteration.

The screen must be unlocked before any setting or alterations can be made.

To unlock the screen, follow the instructions previously provided in this chapter.

Press the 'Help (?)' touch button at the bottom left hand side of the screen for further information if required.

NOTE

The 'SAVE' touch button will appear on the left hand side of the screen if a new value is entered or a change made in the G-Hub system.

If the 'SAVE' touch button is not pressed, then any current changes or entered value or values will be lost and previous settings will remain.

The 'SAVE' touch button can be pressed at any stage or screen change to ensure new settings are saved and not accidentally lost.

i) RPM Raise

'RPM Raise' sets an engine speed to be activated on the G-Hub screen when a higher than idle speed is required with Cruiser stationary, eg, when warming up the engine, warming up oil systems and other requirements.

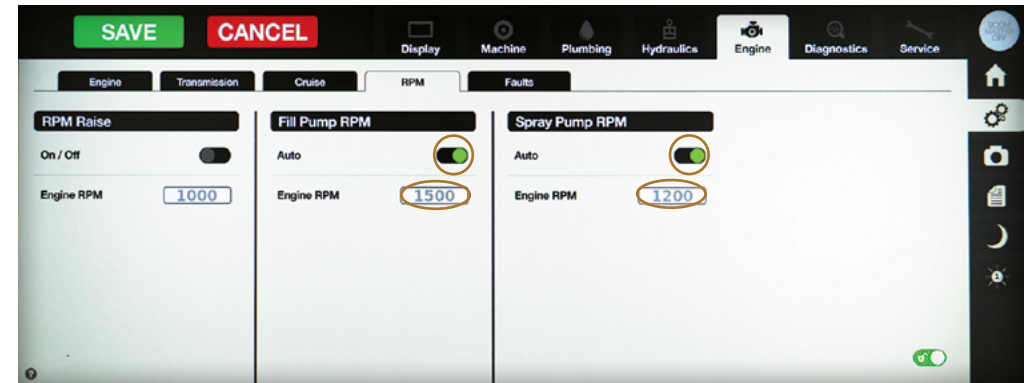
To Enable the RPM Raise:

Press the RPM Raise 'On/Off' touch button to select On or OFF.

The touch button displays Green when On & Grey when Off.

To Set the Engine RPM Raise:

- Press the 'Engine RPM' display touch button & a numerical keypad appears.
- Press the numbers to set the required engine RPM (eg, 1500), then press Enter.



Enable 'Fill Pump RPM', then set the 'Engine RPM'. Enable 'Spray Pump RPM', then set the 'Engine RPM'. Press the SAVE touch button to save the 'Control Valve' settings & exit the screen.

ii) Fill Pump RPM

'Fill Pump RPM' sets an engine speed which is automatically activated from the External Display (at the Filling Station with the Cruiser is stationary), when the 'Fill Pump' is activated for filling.

To Enable the Fill Pump RPM:

Press the Fill Pump RPM 'Auto' touch button to enable or disable the function.

The touch button displays Green when enabled & Grey when disabled.

To Set the Fill Pump RPM:

- Press the 'Engine RPM' display touch button & a numerical keypad appears.
- Press the numbers to set the required value, (eg, 1200), then press Enter.

iii) Spray Pump RPM

'Spray Pump RPM' sets an engine speed to be automatically activated from the External Display (at the Filling Station with the Cruiser is stationary), when the 'Spray Pump' is activated for filling - usual setting 1200 to 1500 RPM

To Enable the Spray Pump RPM:

Press the Spray Pump RPM 'Auto' touch button to select or deselect it.

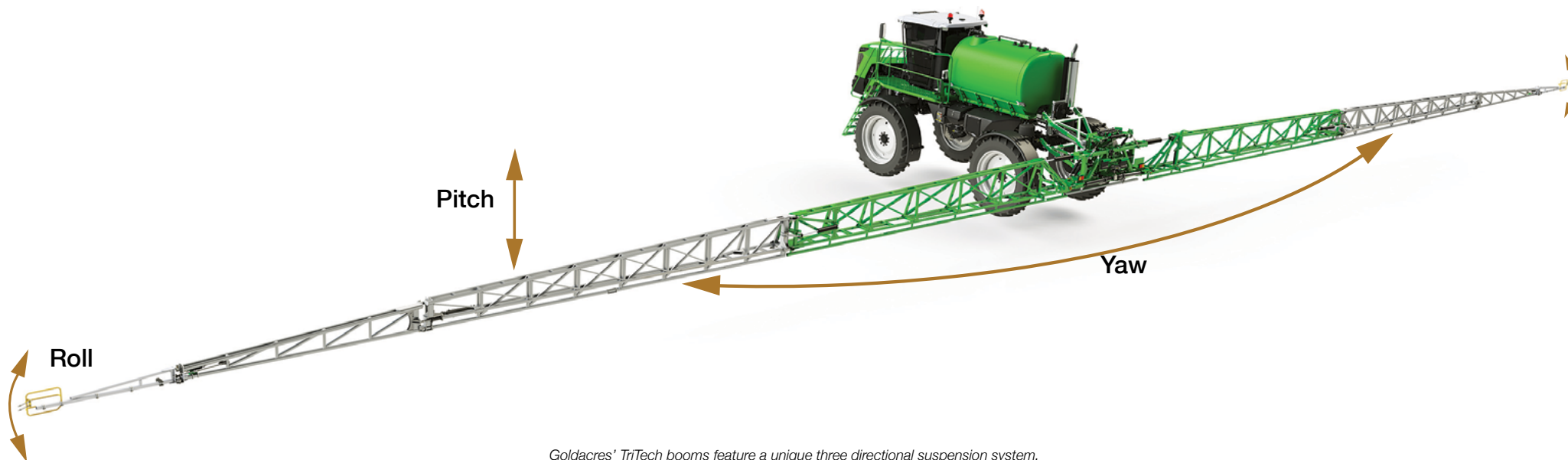
The touch button displays Green when enabled & Grey when disabled.

To Set the Spray Pump RPM:

- Press the 'Engine RPM' display touch button & a numerical keypad appears.
- Press the numbers to set the required value, (eg, 1500), then press 'Enter'.

The Engine RPM screen is the last screen of the pre-setting procedures of the G-Hub.

It is important to press the 'SAVE' touch button (at top left hand side of the screen) to save the entered pre-set values into the G-Hub system.



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

Check Boom Settings

The G4 Crop Cruiser Series 2 can be fitted with 36, 42 & 48 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 deliver each boom is pre-set and tested for spraying application.

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

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

Boom Centre Section

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

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

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

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

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

Goldacres unique TriTech boom suspension system provides three directional suspension:

- **Pitch Suspension**

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

- **Roll Suspension**

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

- **Yaw Suspension**

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

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



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

Pre-Set the AutoBoom XRT (Option)

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

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

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



Optional XRT boom radar sensor .

For instructions on the configuring & operating the AutoBoom XRT controller, refer to:

- Raven XRT Operation Manual
- Goldacres Guide: 'Raven XRT, boom levelling, G4 Series 2, suit 36 m boom - REV00 GA1000054.



Lift up the Armrest console and release the G-Hub cable harness from underneath.

Alternate Screen Mounting

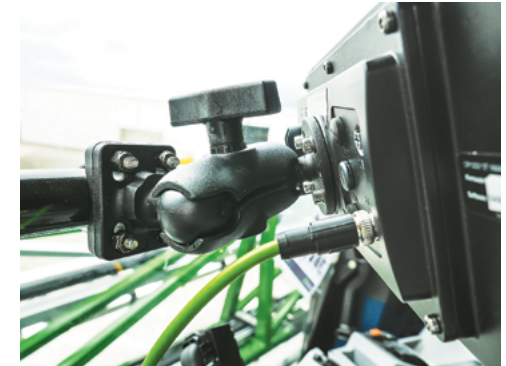
Alternate screen mounting is available for both the G-Hub Controller and GPS screens according to operator preference.

G-Hub Controller Screen

The G-Hub Controller Screen can be mounted on the cabin rail according to operator preference.

To Mount the G-Hub Screen on the Cabin Rail:

- 1 Ensure the Engine key is in Off position.
- 2 Disconnect the G-Hub cables at the rear of the console & remove the console.
- 3 Lift up the Armrest Console & release the G-Hub cable harness from underneath.
- 4 Lower the Armrest Console & realign the G-Hub cable harness for the cabin rail mounting.



Position the ball mount on the cabin rail & fit the G-Hub Console & cables.

- 5 Position the ball mount on the cabin rail & fit the G-Hub Console & cables.
- 6 Adjust the position of the G-Hub Controller to suit the operator.

GPS Screen

The GPS Screen can be mounted to the Armrest Console according to operator preference.

To Mount the GPS screen on the Armrest Console:

- 1 Ensure the Engine key is in Off position.
- 2 Remove the G-Hub Screen from the Armrest Console & mount it to the cabin rail as per instructions for the G-Hub Controller Screen.
- 3 Fit the GPS Screen to the ball mount on the Armrest Console & fit the GPS cables.
- 4 Adjust the position of the GPS Screen to suit the operator.

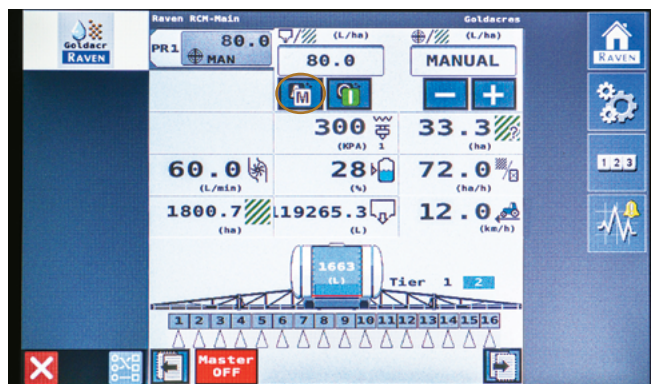
5 - Calibration – Set & Check Application Rates 99

Sprayer Calibration	100
Calibration Procedure	100
1 Application Rate Required	100
2 Calculate Required Nozzle Output	101
3 Nozzle Selection	101
4 Controller Set-Up	103
5 Test Actual Sprayer Output	107
Other Calibration Items	109
1 Boom Width	109
2 Vehicle Speed	110
3 Flow Meter	110
4 Regulator Valve	110
Record All Data For Future Reference	111
AIXR Teejet Application Chart	112
TTJ60 Teejet Application Chart	113
Calibration/Application Work Sheet	114

5 Set & Check Application Rates – Calibration



The Raven Control Module (RCM) home screen showing 'Automatic' mode.



The Raven Control Module (RCM) 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.

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

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

Calibration Procedure

Five steps are required to complete calibration:

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

1 Application Rate Required

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

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

NOTE

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

NOTE

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

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

NOTE

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



Calculate the required nozzle output.



Selected & fit the appropriate nozzles for the application.

2 Calculate Required Nozzle Output

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

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

Nozzle output can be calculated using the following formulae:

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

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

An alternative formula is:

- **Nozzle Flow Rate (l/min) =** Speed (km) x Nozzle Spacing (cm) x Application Rate (l/ha) ÷ 60,000
- eg, $(12 \times 50 \times 80) \div 60,000 = 0.8$ 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 on pages 104 - 107) 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 Cruiser - single line, 3TS option, 3TS Pro option or Hawkeye option.

NOTE

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

	DROPSIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	I/ha							
				5 km/h	6 km/h	7 km/h	8 km/h	10 km/h	12 km/h	16 km/h	20 km/h
AIXR110015 (100)	1.0	XC	0.34	81.6	68.0	58.3	51.0	40.8	34.0	25.5	20.0
	2.0	C	0.48	115	96.0	82.3	72.0	57.6	48.0	36.0	28.8
	3.0	C	0.59	142	118	101	88.5	70.8	59.0	44.3	35.4
	4.0	M	0.68	163	136	117	102	81.6	68.0	51.0	40.8
	5.0	M	0.76	182	152	130	114	91.2	76.0	57.0	45.6
	6.0	M	0.83	199	166	142	125	99.6	83.0	62.3	50.0
AIXR11002 (50)	1.0	XC	0.46	110	92.0	78.9	69.0	55.2	46.0	34.5	27.6
	2.0	VC	0.65	156	130	111	97.5	78.0	65.0	48.8	39.0
	3.0	C	0.79	190	158	135	119	94.8	79.0	59.3	47.4
	4.0	M	0.91	218	182	156	137	109	91.0	68.3	54.6
	5.0	M	1.02	245	204	175	153	122	102	76.5	61.2
	6.0	M	1.12	269	224	192	168	134	112	84.0	67.2
AIXR110025 (50)	1.0	XC	0.57	137	114	97.7	85.5	68.4	57.0	42.8	34.2
	2.0	VC	0.81	194	162	139	122	97.2	81.0	60.8	48.6
	3.0	VC	0.99	238	198	170	149	119	99.0	74.3	59.4
	4.0	C	1.14	274	228	195	171	137	114	85.5	68.3
	5.0	C	1.28	307	256	219	192	154	128	96.0	76.8
	6.0	M	1.40	336	280	240	210	168	140	105	84.0

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

Single Line Boom

Find one nozzle which is nearest to the application requirements.

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

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

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

Refer to pages 104 - 107 for commonly used Teejet and Lechler broadcast nozzle charts.

Example: Nozzle Selection for a Single line Boom

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

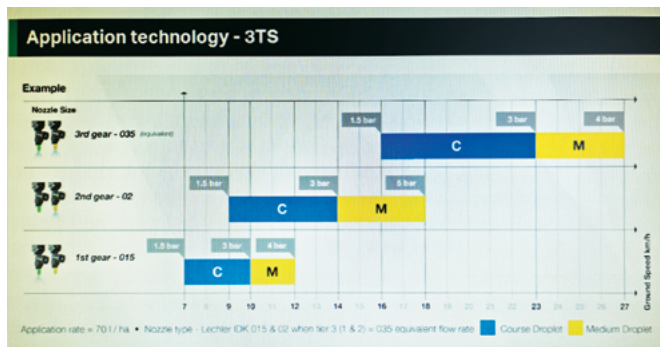
Look down the nozzle capacity column (l/min) and select a nozzle to suit an output of 0.8 l/min (shown above).

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

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

Fit the selected nozzle to the boom.

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



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

3TS Option

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

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







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

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

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

www.teejet.com

www.lechler.com

 	 bar	DROP SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	l/h						
					5 km/h	6 km/h	7 km/h	8 km/h	10 km/h	12 km/h	16 km/h
 AI XR10015 (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
 AI XR11002 (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
 AI XR110025 (50)	6.0	M	—	1.12	269	224	192	168	134	112	84.0
	1.0	XC	**	0.57	137	114	97.7	85.5	68.4	57.0	42.8
	2.0	VC	**	0.81	194	162	139	122	97.2	81.0	60.8
	3.0	VC	**	0.99	238	198	170	149	119	99.0	74.3
	4.0	C	**	1.14	274	228	195	171	137	114	85.5
	5.0	C	**	1.28	307	256	219	192	154	128	96.0
	6.0	M	—	1.40	336	280	240	210	168	140	105

The 1st AXIR110015 nozzle @ 2 Bar gives 0.48l/min & an output of 0.68l/min @ 4 Bar
& 2nd AXIR11002 nozzle @ 3 Bar gives 0.79l/min & an output of 1.02l/min @ 5 Bar.

Example: Nozzle Selection for the 3TS Option

Using the AIXR Teejet Application Chart:

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

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

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

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

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

Fit the selected nozzles to the boom.

NOTE

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

NOTE

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

NOTE

Calculation is required to ensure spraying pressures do not exceed operating parameters.

	bar	DROP SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	5 km/h	6 km/h	7 km/h	8 km/h	10 km/h	12 km/h	16 km/h	18 km/h	20 km/h
AIXR110015 (100)	1.0	XC	—	0.34	81.6	68.0	58.3	51.0	40.8	34.0	25.5	22.7	20.4
	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
AIXR11002 (50)	6.0	M	—	0.83	199	166	142	125	99.6	83.0	62.3	55.3	49.8
	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
AIXR110025 (50)	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
	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

The 3TS Pro option requires three nozzles to be selected giving the operator a greater range of application rates and travel speeds.

Example: Nozzle Selection for the 3TS Pro Option

Using the AIXR Teejet Application Chart:

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

The AIXR110015 nozzle @ 2 Bar gives 0.48l/min which is 82.3 l/ha at 7 kmh and an output of 0.68l/min @ 4 Bar which is 81.6 l/ha at 10 kmh.

The AIXR11002 nozzle @ 2 Bar gives 0.65l/min which is 78.0 l/ha at 10 kmh and an output of 1.02l/min @ 5 Bar which is 76.5 l/ha at 16 kmh.

The AIXR110025 nozzle @ 2 Bar gives 0.81l/min which is 81.0 l/ha at 12 kmh and an output of 1.28l/min @ 5 Bar which is 76.8 l/ha at 20 kmh.

These nozzles should allow the controller to apply 80 litres per ha at speeds ranging from 7 up to 40 kmh

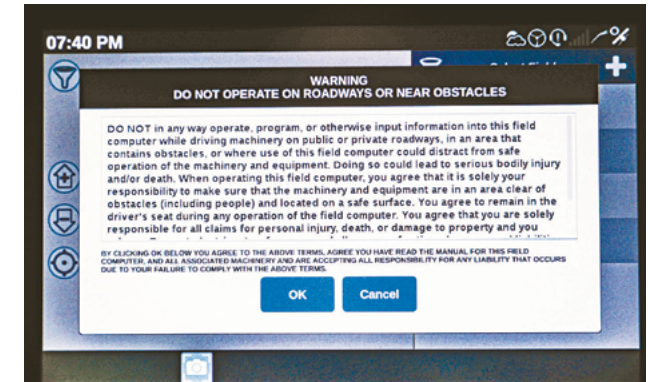
Fit the selected nozzle to the boom.

NOTE

There are often very serious limitation to possible maximum spray speeds. Maximum spray speeds are limited by safety factors, chemicals used, maximum boom output in l/min, type of target, field conditions, terrain and weather conditions.

Hawkeye Option (Nozzle Control System)

The Hawkeye Pulse Width Modulated (PWM) technology is an available option. If fitted refer to the manufacturer's manual.



Opening Warning screen of the optional Raven CR7.

4 Controller Set-Up

New application rate values must be entered into Automatic Control Module (RCM) according to the boom's nozzle configuration.

The Cruiser may be fitted with one of four nozzle control option technologies:

- Single line boom
- 3TS option
- 3TS Pro option
- Hawkeye option (nozzle control system).

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 New Values:

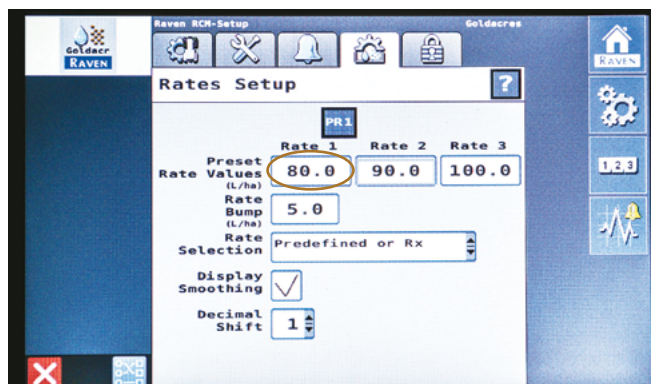
- Start the engine.
- "WARNING DO NOT OPERATE ON ROADWAYS OR NEAR OBSTACLES" appears on the optional Raven CR7 screen or ISO bus screen.

Press the OK button and the home screen appears.

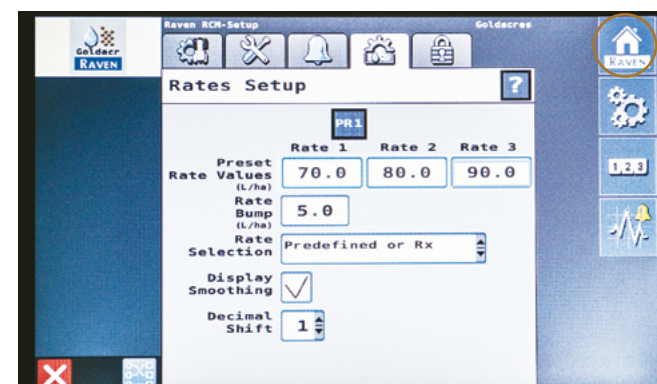
5 Set & Check Application Rates – Calibration



Press the 'Set-Up' touch button on the Raven home screen.



Press the 'Preset Rate Value Rate 1' touch button.



The screen returns to the Rates Setup screen with the new rates displayed. Press the home screen touch button to return to the home screen.

- 3 Press the 'Set-Up' touch button on the home screen, and the 'Applicator Setup' screen appears.
- 4 Press the 'Rates Setup' touch button and the 'Rates Set-up' screen appears.

- 5 Press the 'Preset Value Rate 1' touch button and a numerical keypad appears.
- 6 Press the 'X' touch button to clear the existing number and press the touch buttons to enter the Application Rate, eg, 70, then press the 'Tick' touch button.
The screen returns to the Rates Setup screen with '70' displayed in the Preset Value Rate 1 value.

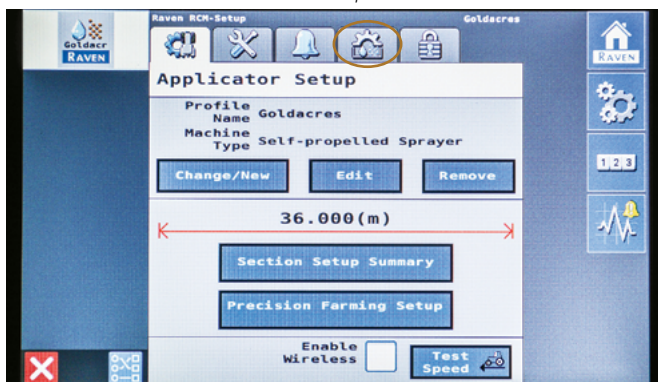
- 7 Repeat steps 5 & 6 to enter preset rate values for Rate 2 (eg, 80 l/ha) and Rate 3 (eg, 90 l/ha).
The screen returns to the Rates Setup screen with all rates displayed (eg, 70, 80, & 90) displayed.
- 8 Press the 'Rate Bump' touch button and a numerical keypad appears.
- 6 Press the touch buttons to enter the desired 'Rate Bump' value (l/ha), eg, 5, then press the 'Tick' touch button.
The screen returns to the Rates Setup screen with eg, '5' shown in the Rate Bump display.
- 8 Press the home touch button to return to the home screen.

This completes the controller entries for the single line boom calibration.

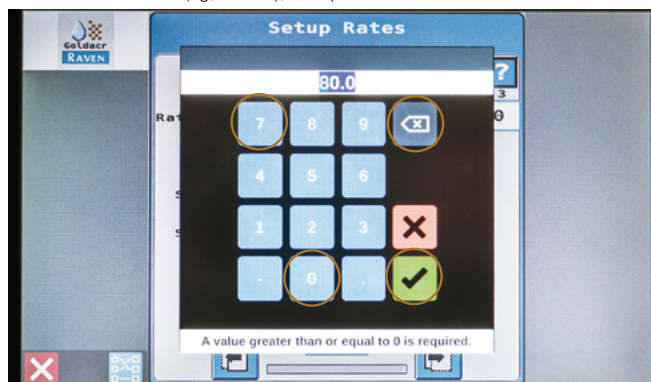
NOTE

The spraying system has the capability to enter up to 3 pre-set application rates.

Press the 'Rates Setup' touch button.



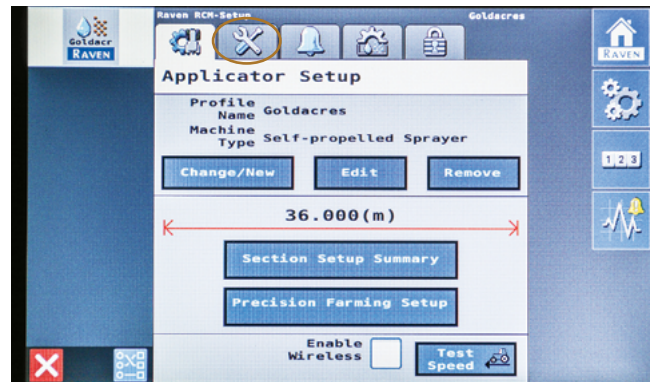
Press the appropriate touch buttons to enter the spray application rate required for Rate 1 (eg, 70 l/ha), then press the 'Tick' touch button.



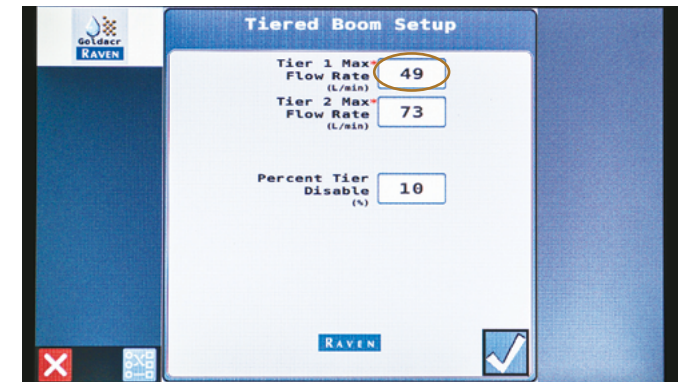
NOTE

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.



Press the 'Systems Settings' touch button.



Press the 'Tier 1 Max Flow Rate' touch button.

b) Enter Values for the 3TS Option

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

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

To Enter New Application Rates:

Follow the steps 1 - 8 previously given under 'Enter Values for the Single Line Boom'.

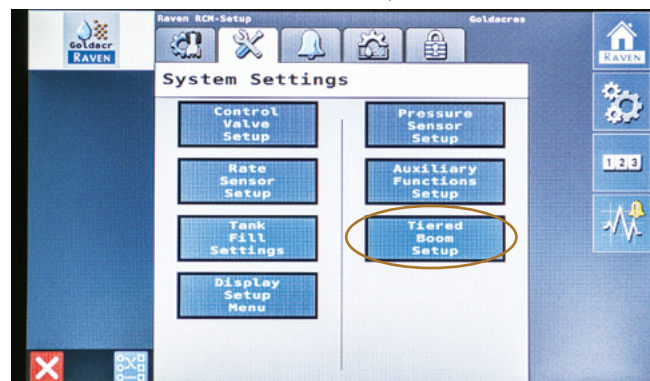
To Enter Maximum Flow Rates:

- 1 Press the 'Systems Settings' touch button and the 'Systems Settings' screen appears.
- 2 Press the 'Tiered Boom Setup' touch button and the 'Tiered Boom Set-up' screen appears.

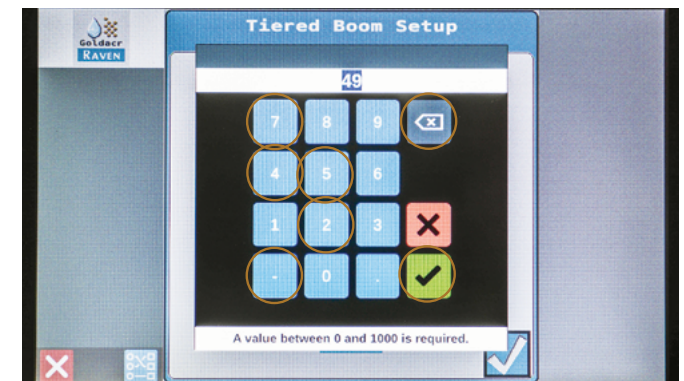
- 3 Press the 'Tier 1 Max Flow Rate' touch button and a numerical keypad appears.
- 4 Calculate Max Flow Rate of the 1st Tier nozzles fitted to the boom, eg, AXIR110015 nozzle @ 5 Bar 0.761 l/min. Multiply 0.76 x 72 (number of nozzles) = 54.7 l/min.
- 5 Press the 'X' touch button to clear the existing number and press the touch buttons to enter the Max Flow Rate, eg, 54.7, then press the 'Tick' touch button.

The screen returns to the Tiered Boom Setup screen with '54.7' in the Tier 1 Max Flow Rate value.

Press the 'Tiered Boom Setup' touch button.



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

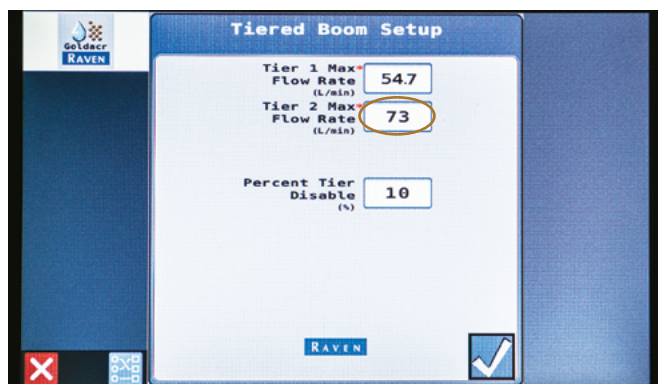


NOTE

Tier Max Flow Rates

The Tier Max Flow Rates is the maximum boom flow rate that a tier will reach before switching On the next tier.

5 Set & Check Application Rates – Calibration



Press the 'Tier 2 Max Flow Rate' touch button.

- 6 Press the 'Tier 2 Max Flow Rate' touch button and a numerical keypad appears.
- 7 Calculate Max Flow Rate of the 2nd Tier nozzles fitted to the boom, eg, AXIR11002 nozzle @ 5 Bar 1.02 l/min.
Multiply 1.02 x 72 (number of nozzles) = 73.5 l/min.
- 8 Press the 'X' touch button to clear the existing number and press the touch buttons to enter the Max Flow Rate, eg, 73.5, then press the 'Tick' touch button.
The screen returns to the Tiered Boom Setup screen with '73.5' in the Tier 2 Max Flow Rate value.
- 9 Press the 'Tick' touch button and the screen returns to the System Setting screen.

This completes the controller entries for the 3TS Option boom calibration.

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.

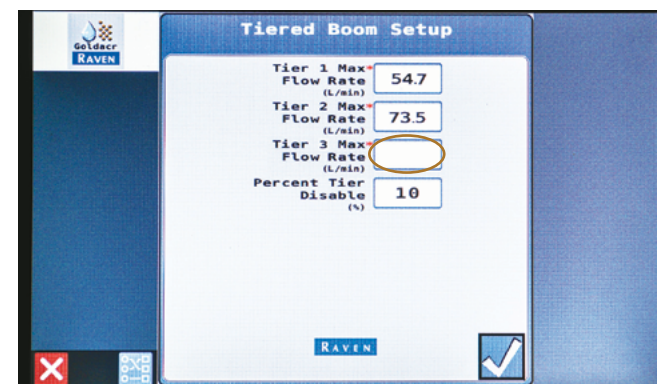
c) Enter Values for 3TS Pro Option

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

- Spray application rates
- Maximum flow rate (for each tier/nozzle fitted [3 tiers]).

To Enter New Application Rates:

Follow the steps 1 - 8 previously given under 'Enter Values for the Single Line Boom'.

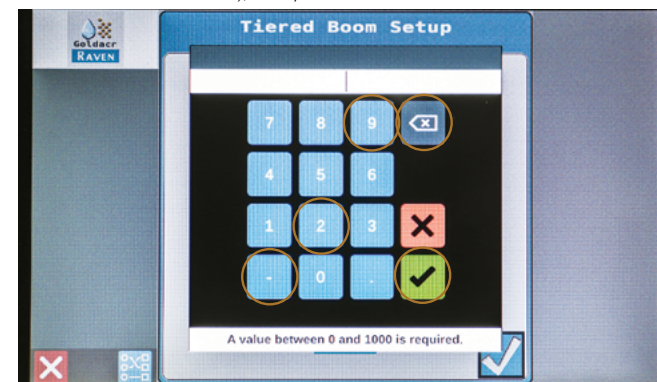


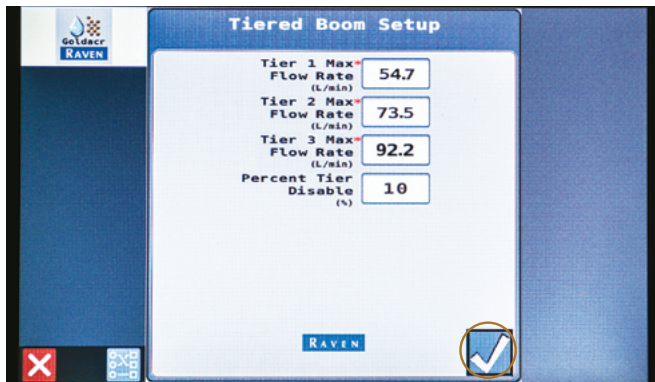
Press the 'Tier 3 Max Flow Rate' touch button.

To Enter New Maximum Flow Rates:

- 1 Follow the steps 1 - 8 previously given for the 3TS Option entering the appropriate values, then
- 2 Press the 'Tier 3 Max Flow Rate' touch button and a numerical keypad appears.
- 3 Calculate Max Flow Rate of the 3rd Tier nozzles fitted to the boom, eg, AXIR110025 nozzle @ 5 Bar 1.28 l/min.
Multiply 1.28 x 72 (number of nozzles) = 92.2 l/min.
- 4 Press the 'X' touch button to clear the existing number and press the touch buttons to enter the Max Flow Rate, eg, '92.2', then press the 'Tick' touch button.

Press the appropriate touch buttons to enter the Max Flow Rate for Tier 3 (eg, 92.2 l/min), then press the 'Tick' touch button.



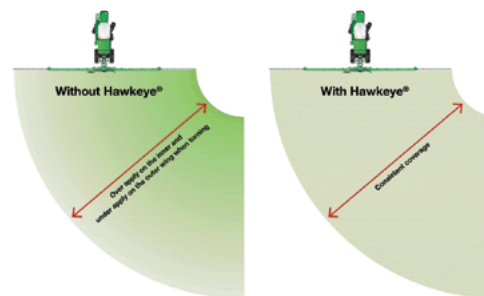


Press the 'Tick' touch button.

The screen returns to the Tiered Boom Setup screen with '92.2' displayed in the Tier 3 Max Flow Rate value.

- 5 Press the 'Tick' touch button and the screen returns to the System Setting screen.

This completes the controller entries for the 3TS Pro Option boom calibration.



Nozzle by nozzle turn compensation with the Hawkeye option.

d) Hawkeye Option (Nozzle Control System)

The Hawkeye Pulse Width Modulated (PWM) technology is an available option.

Hawkeye 2.0 is offered on 36m and 48m booms with nozzle spacing at 250mm & 500mm providing:

- Nozzle by nozzle turn compensation with each nozzle featuring its own microprocessor & perform diagnostic functions.
- Up to 16 virtual sections & individual nozzle control.

For instructions on configuring & operating the Hawkeye, refer to the Raven Hawkeye Operation Manual supplied.



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

5 Test Actual Sprayer Output

Testing the Actual Sprayer Output to ensure the accuracy of the application rate before spraying is essential.

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).

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.

5 Set & Check Application Rates – Calibration

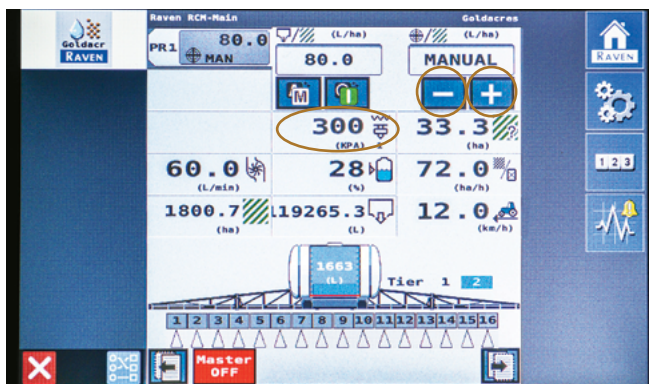


Press the 'A' touch button to change the Raven Rate Controller from Automatic to Manual mode.

To Do the "Jug Test"

- 1 Start the Cruiser engine and unfold the boom in a suitable area & set the height of the boom to allow easy access to nozzles.
- 2 Press the 'A' touch button (Automatic/Manual) on the Raven Rate Controller shift to Manual mode. The touch button changes to 'M' and MANUAL appears in the '(L/ha) display'.
- 3 Press the touch buttons to start the 'Product Pump' on the G-Hub screen, then press the 'Boom Master On' touch button to start the nozzles spraying.

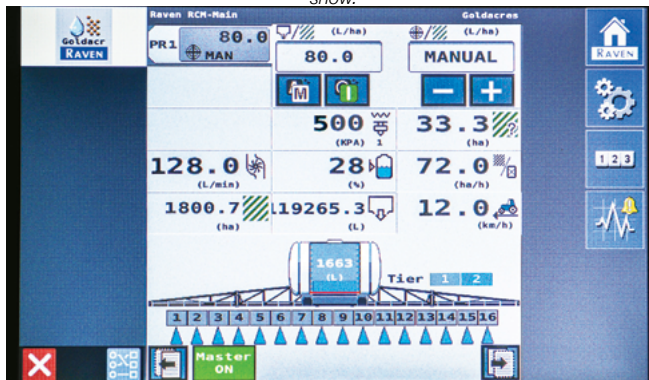
Press the touch buttons on the G-Hub screen to start the nozzle spraying.



Press the '-/+' (Minus/Plus) touch buttons to adjust the spray pressure '(kPa)' and bring the operating pressure up to 300kPa.

- 4 Press the '-/+' (Minus/Plus) touch buttons to adjust the spray pressure '(kPa) display' to the mid range operating pressure of a chosen nozzle output, eg, AXIR110015 nozzle @ 3 Bar (300kPa). Press the touch button(s) until 300 kPa is displayed.
- 5 Check the Raven Controller screen is showing 300 kPa. Adjust if needed, using the '-/+' touch buttons.
- 6 Check the Tier display on the screen (near boom illustration) to ensure all Tiers are spraying for the Jug test:
 - Single line boom - all nozzles operating for the Jug test
 - 3TS option - all nozzles operating for the Jug test
 - 3TS Pro option - all nozzles operating for the Jug test.

Check the Raven Controller screen to ensure all Tiers are spraying. If not, use the '-/+' touch buttons to increase pressure by increments of 100 kPa until all Tiers show.



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

Adjust pressure upwards to 400 or 500 kPa using the '-/+' touch buttons until all tiers are spraying (relative to the boom used).

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

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

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

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





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

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

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

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

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

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.



Illustration of the RapidFlow and RapidFire nozzle technologies.

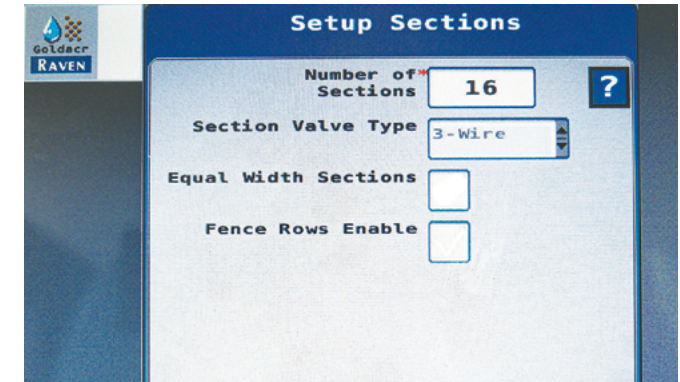
- 12 Test and check any replacement nozzles by collecting and measuring the output of each replacement.
- 13 Record each replacement and its output.
- 14 For each nozzle type tested, add the measured outputs together, then divide the total by the number of test nozzles to obtain the average nozzle output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

eg, Using the 3TS two tier system:

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

NOTE

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



Check boom width & section set-up values in the RCM.

Other Calibration Items

Other items critical to accurate calibration & application include:

- 1 Boom Width
- 2 Vehicle Speed
- 3 Flow Meter
- 4 Regulator Valve.

1 Boom Width

The Boom Width values are entered into the RCM controller during the initial set-up of the machine. Check controller settings have not been changed.

Refer to Chapter 4 'Setting Up', 'Pre-Set the Raven Control Module (RCM)' for instructions.

NOTE

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

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

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



A dealer fitted John Deere Starfire GPS Receiver.

2 Vehicle Speed

The Cruiser ground speed reading displayed on the G-Hub screen is sourced from the transmission speed sensor.

The Raven Rate Controller (RCM) speed reading is sourced via the ISO controller from the installed GPS system.

Any discrepancies or inaccuracies with Cruiser speed displayed on the ISOBus UT must be addressed via the GPS system.

If speed problems occur, contact your GPS supplier.



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

3 Flow Meter

The Flow Meter (used by the controller to monitor flow rates) is critical to the accuracy of application rates.

The Flow Meter should be regularly inspected and cleaned of debris.

The ISO Bus UT has a built-in feature to conduct a flow meter calibration test.

For information on the test procedure, refer to the Raven Rate Control Module Operation Manual (RCM) supplied with the Cruiser.

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



The Regulator Valve, located behind the Quick Fill panel, should regularly be checked & calibrated.

4 Regulator Valve

The Regulator Valve or Flow Control Valve (used by the Controller to adjust & control pressure & flow rates) is critical to the accuracy of spraying rates and should be checked & calibrated on a regular basis.

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).

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 sheet for operational use as required.

5 Set & Check Application Rates – Calibration

AIXR Teejet Application Chart

AIXR Teejet Application Chart					DROPLET SIZE CATEGORIES													CAP PART NUMBER
					XF EXTREMELY FINE	VF VERY FINE	F FINE	M MEDIUM	C COARSE	VC VERY COARSE	XC EXTREMELY COARSE	UC ULTRA COARSE						
		DROP SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	5 km/h	6 km/h	7 km/h	8 km/h	10 km/h	12 km/h	16 km/h	18 km/h	20 km/h					
AIXR110015 (100)	1.0	XC	—	0.34	81.6	68.0	58.3	51.0	40.8	34.0	25.5	22.7	20.4		11441A-CELR			
	2.0	C	—	0.48	115	96.0	82.3	72.0	57.6	48.0	36.0	32.0	28.8					
	3.0	C	—	0.59	142	118	101	88.5	70.8	59.0	44.3	39.3	35.4					
	4.0	M	—	0.68	163	136	117	102	81.6	68.0	51.0	45.3	40.8					
	5.0	M	—	0.76	182	152	130	114	91.2	76.0	57.0	50.7	45.6					
	6.0	M	—	0.83	199	166	142	125	99.6	83.0	62.3	55.3	49.8					
AIXR11002 (50)	1.0	XC	—	0.46	110	92.0	78.9	69.0	55.2	46.0	34.5	30.7	27.6					
	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					
	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



MATERIALS:
VISIFLO ACETAL



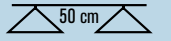


SPRAY ANGLE:
110°

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

TTJ60 Teejet Application Chart					DROPLET SIZE CATEGORIES										CAP PART NUMBER
	 bar	DROP SIZE	LERAP RATINGS	CAPACITY ONE NOZZLE IN L/MIN	 l/ha										
					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	T1441A-CELR	
	2.0	C	—	0.65	156	130	111	97.5	78.0	65.0	48.8	43.3	39.0		
	3.0	M	—	0.79	190	158	135	119	94.8	79.0	59.3	52.7	47.4		
	4.0	M	—	0.91	218	182	156	137	109	91.0	68.3	60.7	54.6		
	5.0	M	—	1.02	245	204	175	153	122	102	76.5	68.0	61.2		
	6.0	M	—	1.12	269	224	192	168	134	112	84.0	74.7	67.2		
TTJ60-110025 (100)	1.5	VC	**	0.70	168	140	120	105	84.0	70.0	52.5	46.7	42.0		
	2.0	C	**	0.81	194	162	139	122	97.2	81.0	60.8	54.0	48.6		
	3.0	C	--	0.99	238	198	170	149	119	99.0	74.3	66.0	59.4		
	4.0	M	--	1.14	274	228	195	171	137	114	85.5	76.0	68.4		
	5.0	M	--	1.28	307	256	219	192	154	128	96.0	85.3	76.8		
	6.0	M	--	1.40	336	280	240	210	168	140	105	93.3	84.0		
TTJ60-11003 (100)	1.5	VC	**	0.83	199	166	142	125	99.6	83.0	62.3	55.3	49.8		
	2.0	C	**	0.96	230	192	165	144	115	96.0	72.0	64.0	57.6		
	3.0	C	--	1.18	283	236	202	177	142	118	88.5	78.7	70.8		
	4.0	M	--	1.36	326	272	233	204	163	136	102	90.7	81.6		
	5.0	M	--	1.52	365	304	261	228	182	152	114	101	91.2		
	6.0	M	--	1.67	401	334	286	251	200	167	125	111	100		
TTJ60-11004 (50)	1.5	VC	**	1.12	269	224	192	168	134	112	84.0	74.7	67.2		
	2.0	C	**	1.29	310	258	221	194	155	129	96.8	86.0	77.4		
	3.0	C	--	1.58	379	316	271	237	190	158	119	105	94.8		
	4.0	M	--	1.82	437	364	312	273	218	182	137	121	109		
	5.0	M	--	2.04	490	408	350	306	245	204	153	136	122		
	6.0	M	--	2.23	535	446	382	335	268	223	167	149	134		
TTJ60-11005 (50)	1.5	VC	**	1.39	334	278	238	209	167	139	104	92.7	83.4		
	2.0	C	**	1.61	386	322	276	242	193	161	121	107	96.6		
	3.0	C	**	1.97	473	394	338	296	236	197	148	131	118		
	4.0	M	--	2.27	545	454	389	341	272	227	170	151	136		
	5.0	M	--	2.54	610	508	435	381	305	254	191	169	152		
	6.0	M	--	2.79	670	558	478	419	335	279	209	186	167		
TTJ60-11006 (50)	1.5	VC	—	1.68	403	336	288	252	202	168	126	112	101		
	2.0	VC	—	1.94	466	388	333	291	233	194	146	129	116		
	3.0	C	—	2.37	569	474	406	356	284	237	178	158	142		
	4.0	C	—	2.74	658	548	470	411	329	274	206	183	164		
	5.0	M	—	3.06	734	612	525	459	367	306	230	204	184		
	6.0	M	—	3.35	804	670	574	503	402	335	251	223	201		
TTJ60-11008 (50)	1.5	VC	—	2.23	535	446	382	335	268	223	167	149	134		
	2.0	VC	—	2.58	619	516	442	387	310	258	194	172	155		
	3.0	C	—	3.16	758	632	542	474	379	316	237	211	190		
	4.0	C	—	3.65	876	730	626	548	438	365	274	243	219		
	5.0	C	—	4.08	979	816	699	612	490	408	306	272	245		
	6.0	M	—	4.47	1073	894	766	671	536	447	335	298	268		
TTJ60-11010 (50)	1.5	XC	—	2.79	670	558	478	419	335	279	209	186	167		
	2.0	VC	—	3.23	775	646	554	485	388	323	242	215	194		
	3.0	VC	—	3.95	948	790	677	593	474	395	296	263	237		
	4.0	C	—	4.56	1094	912	782	684	547	456	342	304	274		
	5.0	C	—	5.10	1224	1020	874	765	612	510	383	340	306		
	6.0	C	—	5.59	1342	1118	958	839	671	559	419	373	335		

TTJ60 TURBO TWINJET® FLAT SPRAY TIPS

IDEAL COVERAGE
& TURBO-CHARGED
DROPLETS

The TTJ60 produces a symmetrical twin spray pattern which provides superior coverage of small, hard-to-reach vertical targets. Due to the unique Turbo construction of the spray tip, it produces optimally-sized droplets for high coverage, with anti-drift characteristics resulting in a high quality spray application.

Features & Benefits

- Twin fan provides uniform coverage and penetration to the canopy
- Consistent droplet size spectrum and less driftable droplets for better coverage
- Medium to very coarse drift-resistant Turbo droplets



USE WITH:
CONTACT HERBICIDES
CONTACT FUNGICIDES
CONTACT INSECTICIDES



PRESSURE:
1.5-6 BAR



SPRAY PATTERN:
TWIN FAN



MATERIALS:
VISIFLO ACETAL

NOTE

The nozzle charts shown in this manual are for instruction purposes only. Always jug test the accuracy of your nozzles. Also check with the nozzle manufacturer to ensure you are using the correct charts as updates may occur at any time.

6 - Operation – Ready to Spray

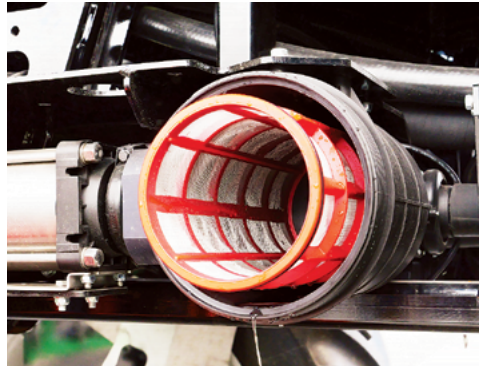
115

Pre-Operation Check	116
Quick Start Guide	118
Starting-Up	118
Driving	118
Shutting-Down	119
Boom Folding/Unfolding	119
Automatic Boom Folding - IN Only	119
Bi-fold Boom Folding	120
Bi-fold Boom Unfolding	120
Manually Folding the Boom	120
Joystick Boom Controls	121
Dual Tilting Both Boom Wings	121
Boom Tilt - L Up/Down & R Up/Down	121
Boom Master On/Off	122
Boom Lift/Lower	122
Fenceline Nozzles	123
GPS Autosteer On/Off	123
Cruise Control	123
Hand & Foot Throttles	124
i) Classic Cruise Control	125
ii) Variable Cruise Control	125
iii) Two Speed Cruise Control	125
vi) Joystick Target Speed	126
Cruise Set/Decrease	126
Cruise Resume/Increase	127
Cruise Cancel	127
Transmission Shifter	127

Monitor Display	127
Mode Switches	129
Filling the Sprayer	130
Water Source	130
Tank Filling Inlet	130
Quick Filling Station Pod	131
Product Tank Volume (Fill) Screen	131
Clean Screen	132
Faults Screen	132
Fill Screen Functions	132
To Fill the Product Tank	133
To Fill the Rinse Tank	134
Adding Chemicals to the Product Tank	135
Chemical Induction Hopper	135
Chemical Probe Inlet	137
Hopper Rinse Functions	141
Product Tank Agitation	144
Spraying Application	144
Rinsing the Sprayer After Spraying	146
Quick Rinse or Boom Rinse	147
Basic Rinse	148
Total Rinse & Decontamination	152
Pressure Filter Removal & Cleaning	153
Suction Filter Removal & Cleaning	154
End of Day	155
End of Season	155
Towbar	155
Adjustable Wheel Track	156



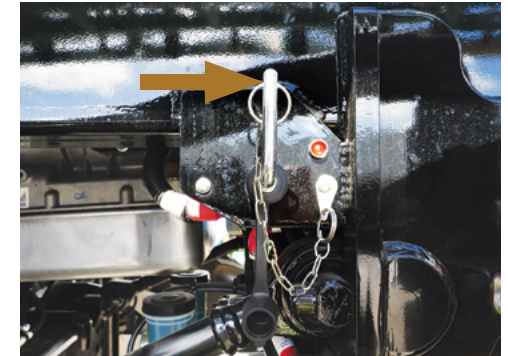
G4 Crop Cruiser Operator's Manual.



Check the suction filter is clean.



Check tyre inflation and wheel nuts.



Rotate the handle to vertical position to engage the battery isolator switch to power the Crop Cruiser systems.

Pre-Operation Check

Before Starting the Crop Cruiser:

- Read the G4 Crop Cruiser Operator's Manual thoroughly, before attempting to use this machine
- Read & follow instructions on chemical manufacturers labels
- Refer to instructions provided in other operator manuals supplied
- Always wear appropriate protective clothing.
- Before operating the machine, check all fluid levels (oil, water & fuel).
- Check all maintenance procedures have been followed
- Complete scheduled lubrication
- Inspect the machine to ensure there is no damage or wear which could lead to injury, further damage or reduced performance
- Check all plumbing lines & fittings to ensure they are tight, not damaged or leaking
- Check to ensure frost and/or vermin have not damaged the machine
- Check the suction filter is clean
- Check the pressure filter is clean
- Check nozzles are spraying correctly
- Check all hydraulic connections
- Check boom controls functions
- Check all spraying control functions (refer to the instructions in this manual)
- Check for loose components

- Check tyres are correctly inflated
- Check wheel nuts are correctly tensioned (refer to torque settings)
- Check all lights are working correctly
- Check all bolts & nuts are tight & secure
- Ensure there is a sufficient clean water in the hand wash tank for personal hygiene and chemical safety
- Organise communication with someone to come to your aid, if required.

A more comprehensive checklist of routine checks is provided in chapter 8, 'Lubrication & Maintenance'.

Starting the Cruiser

Before starting the Crop Cruiser, the battery isolator switch must be engaged to power the machine systems.

To start the engine, the transmission must be in neutral. Insert the ignition key and turn clockwise (the ignition key is located on the rear right console).

After starting the Cruiser, allow hydraulic oil to warm up before operating hydraulic functions.

Before Starting in Cold Conditions

If the Cruiser 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.

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.

NOTE

The operator must wear the operator safety belt at all times when seated in the cabin or when the machine is in motion.



Ensure the Crop Cruiser meets your State vehicle height & width restrictions before driving on roads.

Machine Transit Safety

A Cruiser height is approximately 4.2m high & aerials on the roof, make it 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 overhead power lines - on the road & in some paddocks.

Overhead Power Lines

Check the transport routes & 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.

⚠ DANGER

Check the area to be sprayed for overhead 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 such as 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.

⚠ WARNING

If spraying is to be done at night, ensure that adequate lighting is available around the machine and the area to be sprayed.

NOTE

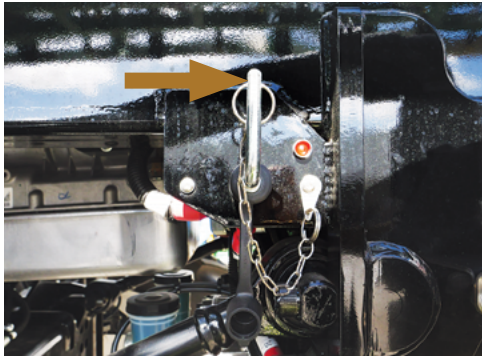
Check nozzle patterns for irregularities. If there are irregularities, clean the nozzles and refit. If the problem persists they could be worn so remove and replace.



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 Cruiser (from new).



Rotate the handle to vertical position to engage the battery isolator switch to power the Crop Cruiser systems.



Turn the Ignition key to On/Acessories



Turn the Ignition key to crank & start the engine.



Disengage the Park Brake - slide back the orange lock, then press the switch rearward (Off position).

Quick Start Guide

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

Follow the Quick Start instructions to start the engine, drive and shut-down the Crop Cruiser.

- 3 Check Park Brake switch is ON.
- 4 Turn the Ignition key to On/Acessories (lightning symbol).
- 5 Wait until you hear the reverse beeper sound.
- 6 Check the Park Brake switch is ON.
- 7 Turn & hold the Ignition Key momentarily in crank position until engine starts.

Starting-Up

- 1 Perform a pre-operation check of the Crop Cruiser.
- 2 Engage the Battery Isolator (located on the right hand side chassis by the engine).

NOTE

Before starting the engine:

- All fluid levels must be checked.
- Ensure the battery isolator switch is engaged - to provide power to the sprayer systems.
- Ensure the transmission in neutral. Otherwise the engine will not start.

Engage the Park Brake - slide back the orange lock & press the switch forward (On position).



CAUTION

The operator & any passenger must be seated in the cabin and wearing the seat safety belt at all times when the machine is in motion.

When in-cabin functions are used no one should be on any platforms or anywhere else but the intended in-cabin seating.

NOTE

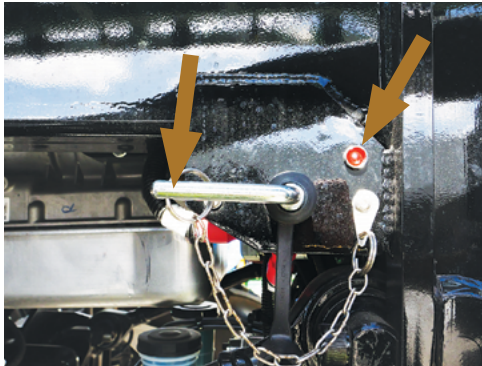
For more detailed information on the Transmission Shifter refer to pages 47-49 of Chapter 3.

Driving

- 1 Run engine for least 30 seconds to allow the compressor to build the required system air pressure.
- 2 Check the Foot Brake for response, then hold the Foot Brake down.
- 3 Disengage Park Brake.
- 4 Press the 'D' switch to engage Forward drive or the 'R' switch to engage Reverse.
- 5 Use the steering wheel, foot accelerator & foot brake to drive safely.

Press the 'D' switch to engage 1st gear. 1-6. Press the Arrow switches to change Up or Down (gears 1-6).





Wait for the Red LED to switch off before rotating the handle to disengage the Battery Isolator switch.

Shutting-Down

To Shut-Down the Crop Cruiser:

- 1 Bring the Crop Cruiser to a complete stop.
- 2 Press the 'N' switch (Neutral gear) .
- 3 Engage Park Brake.
- 4 Turn the ignition key to stop position.
Wait 30 seconds to allow the G-Hub Controller system enough time to save the data before disengaging the Battery Isolator Switch.
- 5 A Red LED indicator light is located above the Battery Isolator switch handle.
Disengage the Battery Isolator switch ONLY when the Red LED is not illuminated.

NOTE

An alarm sounds & a warning illuminates, if the transmission is moved into a gear other than Neutral when the Park Brake is engaged.



Boom Rest, Boom Fold & Boom Bi-fold rocker switches used for folding & unfolding the boom.

Boom Folding/Unfolding

The Boom Folding/Unfolding panel comprises three rocker switches which control the folding and unfolding of the boom (shown above).

As well as usual folding and unfolding of the boom, a Bifold procedure allows the outside boom sections to be folded reducing spray width for purposes such as finishing along fencelines and other applications.

The 'Boom Unfolding' process is manually operated using Boom Unfolding Switches & the Joystick push buttons & rocker switch.

Boom Folding can be done either, manually or automatically (depending on G-Hub settings) for 24m, 28m, 30m & 36m booms.

CAUTION

When stationary and folding the booms, ensure there is adequate clearance for booms to clear all objects and people.
If an object strikes the boom while folding, the boom may be damaged. If the boom strikes a person while folding, injury or death may result.



Press & hold the OUT end of the 'Boom Rest' (then Boom Lift button on the Joystick), then OUT end of the Boom Fold.

Unfolding the Boom

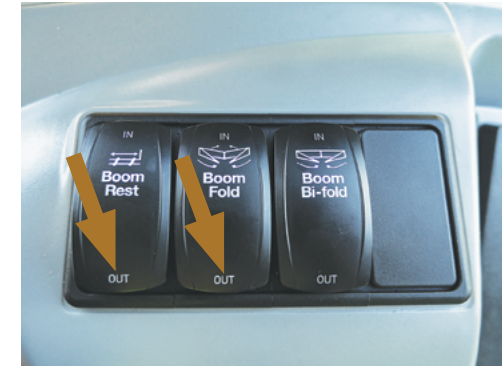
The Boom Unfolding Procedure is manually controlled by using the 'Boom Rest', 'Boom Fold' rocker switches & Joystick push buttons.

To Unfold the Boom:

- i) Press & hold the OUT end of the 'Boom Rest' rocker switch to unfold the Boom Rest locks.
- ii) Press & hold the Boom Lift push button on the Joystick to raise the boom until it clears the Boom Rests.
- iii) Press & hold down the OUT end of the Boom Fold rocker switch to completely unfold the boom until it is aligned with the boom centre section, then release the switch.
- iv) Press the Boom Lower push button on the Joystick to lower the boom to its desired working height, then release the switch.

CAUTION

The booms must not be folded or unfolded, while the sprayer is moving.
While a boom is moving from fully open to fully closed (and vice versa), greater stress is 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 & hold the IN end of the 'Boom Fold', then Joystick 'Boom Lower' button, then the IN end of the 'Boom Rest'

Automatic Boom Folding - IN Only

To fold a boom automatically, the calibration values must first be entered into the G-hub Controller for tilt left, tilt right & boom lift.

To Automatically Fold the Boom:

- i) With the boom unfolded, press & hold down the IN end of the Boom Fold rocker switch. The boom will fully rise, tilt & fold-in over the boom rests.
- ii) When fully folded-in, press the Boom Lower push button on the Joystick to lower the boom until it stops at its preset height. The main boom lift suspension accumulator will then automatically lock out.
- iii) Press & hold down the IN end of the Boom Rest rocker switch to completely move into the Boom Rest & lock the boom.
- iv) Press & hold the IN end of the Boom Fold rocker switch, momentarily, to tighten the boom wings in the Boom Rests.

NOTE

To make the boom fold cylinders extend or compress equally on both sides:
Continue holding the OUT end of the Boom Fold push button for a few extra seconds when the boom is fully unfolded.
Conversely, hold down the IN end of the Boom Fold push button for a few extra seconds when the boom is fully



Press & hold down the IN end of the Boom Bi-fold rocker switch to fold the boom outer wings sections In & saddle them onto the inner boom sections.

Bi-fold Boom Folding

With the boom fully unfolded (open working position), press & hold down the IN end of the Boom Bi-fold rocker switch down (shown above) to fold the boom outer wings sections in and saddle them onto the inner boom sections.

Do not release the Boom Bi-fold switch until the boom outer wing section are fully folded-in or boom stress may occur.



Bi-fold Boom Unfolding

With the outer boom sections previously folded in (using the Bi-fold Boom Folding above), press & hold down the OUT end of the Boom Bi-fold' rocker switch to fold the boom outer sections back out.

Do not release the Boom Bi-fold switch until the boom outer wing sections are fully folded-out or boom stress may occur.



Press & hold the Boom Lift part of the push button on the Joystick Controller to raise the boom to its full height.

Manually Folding the Boom

The boom can be folded manually, but only when the calibration values in the G-hub controller are set to zero for tilt left, tilt right & boom lift.

To Fold the Boom Manually:

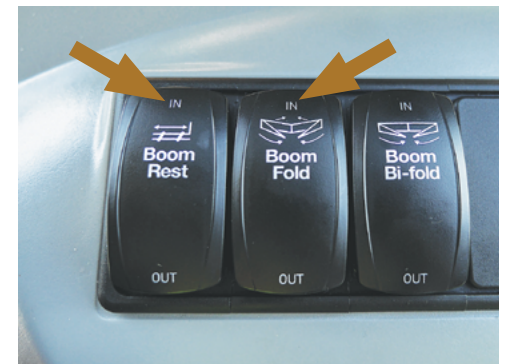
- In the unfolded boom position, press the Boom Lift push button on the Joystick to raise the boom to its full height.
- Press & hold IN the outer end of the Dual Tilt push button on the Joystick to tilt boom wings up approximately 5 degrees above horizontal - high enough to clear boom rests but low enough to avoid hitting the rear vision mirrors when folding into position. Release the push button when desired tilt is reached.



Press & hold IN the outer end of the Dual Tilt rocker switch on the Joystick to tilt boom wings up approximately 5 degrees above horizontal.

- Press & hold down the IN end of the Boom Fold rocker switch to complete the boom folding.
- Press & hold down the Boom Lower push button on the Joystick to lower the booms wings onto the Boom Rests.
- Press & hold down the 'Boom Rest' IN switch to fold-in & lock the left hand side Boom Rest.
- Finally, press the IN end of the Boom Fold rocker switch, momentarily, to fold-in the booms tight in the Boom Rests.

The Boom Rest IN switch & Boom Fold IN switches.



CAUTION

Do not release the Boom Bi-fold switch until the boom outer wing sections are fully folded-out or boom stress may occur.

CAUTION

Do not release the Boom Fold & Bi-fold switches until the boom inner and outer wing sections are fully folded-out or boom stress may occur.

CAUTION

The booms must be folded continuously without stopping and starting during the sequence. Stopping & starting boom folding may result in damage to the boom.



Press & hold IN the inner end of the Dual Tilt rocker switch on the Joystick to lower the boom wing ends.

Joystick Boom Controls

Boom push buttons & a rocker switch on the Joystick provide the following functions:

- Dual Tilting Both Boom Wings (rocker switch)
- Boom Tilt - L Up/Down & R Up/Down
- Boom Master On/Off
- Boom Lift/Lower
- Fence Nozzle L/R.

Dual Tilting Both Boom Wings

The Dual Tilt rocker switch is used to lower or raise the tilt of the boom wings during operations and when folding & unfolding booms manually.

To Dual Tilt-Down Both Boom Wings:

- Press & hold Down the Dual Tilt Up/Down rocker switch on the Left Side to lower both left & right boom wings together.
- Release the rocker switch to hold the wings in their desired raised position.



Press & hold IN the outer end of the Dual Tilt rocker switch on the Joystick to raise the boom wing ends.

To Dual Tilt-Up Both Boom Wings:

- Press & hold Up the Dual Tilt Up/Down rocker switch on the Left Side to lower both left & right boom wings together.
- Release the rocker switch to hold the wings in their desired raised position.



Press & hold the L Arrow Up part of the Boom Tilt push button to tilt up the left hand boom end.

Boom Tilt - L Up/Down & R Up/Down

The Boom Tilt - L Up/Down & R Up/Down ker switch is used to individually lift or lower the angle the boom from left to right or right to left to more closely follow ground contour.

The boom wings pivot on the centre section and the left or right boom wing is raised or lowered - the outer end of the wing moves furthest.

To Tilt Up the Left Hand Boom:

- Press & hold the L Arrow Up part of the Boom Tilt push button .
- Release the ker switch when the desired tilt is achieved.



Press & hold the L Arrow Down part of the Boom Tilt push button to tilt down the left hand boom end.

To Tilt Down the Left Hand Boom:

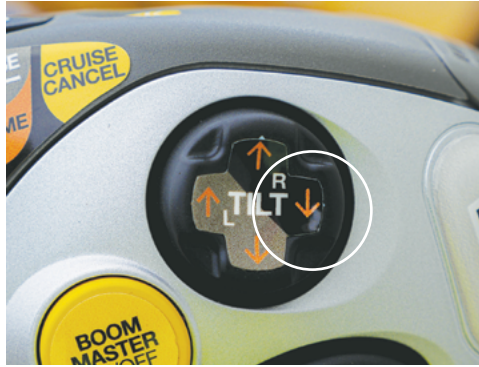
- Press & hold the L Arrow Down on the Boom Tilt ker switch .
- Release the push button to hold the wing in its desired lowered position.



Press & hold the R Arrow Up on the Boom Tilt push button to tilt up the right hand boom end.

To Tilt Up the Right Hand Boom:

- i) Press & hold the R Arrow Up on the Boom Tilt push button.
- ii) Release the push button when the desired tilt is achieved.



Press & hold the R Arrow Down on the Boom Tilt push button to tilt down the right hand boom end.

To Tilt Down the Right Hand Boom:

- i) Press & hold the R Arrow Down on the Boom Tilt push button.
- ii) Release the push button when the desired tilt is achieved.



Press the Boom Master push button to start boom spraying.
Press the Boom Master push button to stop boom spraying.

Boom Master On/Off

The yellow Boom Master On/Off push button cycles the Boom Master switching boom spraying On/Off.

To Switch On/Off the Boom Spraying:

- i) Press to Boom Master On/Off push button to Start the boom spraying.
- ii) Press to Boom Master On/Off push button to Stop the boom spraying.



Press & hold the Boom Lift push button to raise boom height.
Press & hold the Boom Lower push button to lower boom height.

Boom Lift/Lower

The Boom Lift/Lower push button sides are used to raise or lower the vertical height of the boom.

To Raise the Boom:

- i) Press & hold the Boom Lift on the push button to raise the boom to its desired level.
- ii) Release the push button to hold the desired boom level.

To Lower the Boom:

- i) Press & hold the Boom Lower on the push button to lower the boom to its desired level.
- ii) Release the push button to hold the desired boom level.

NOTE

The pump must be running for nozzles to spray.
See page ? for instructions on engaging & disengaging the pump.



Press the L end of the Fence Nozzle push button to Start the left Fenceline nozzle spraying. Press again to Stop spraying.

Fenceline Nozzles

The Fence Nozzle L/R push button ends are used to individually switch On or Off the Left & Right Fenceline Nozzles.

To Switch On/Off the Left Fence Nozzle:

- Press the L end of the Fence Nozzle push button to Start spraying from the left Fenceline nozzle.

When the Fenceline nozzle is spraying, a red LED light on the left hand boom tip is illuminated & the G-Hub main screen fenceline emblem lights Green.

- Press the L end of the Fence Nozzle push button to Stop spraying from the left Fenceline nozzle.

NOTE

Boom Section 1 must be On and spraying for the left hand Fenceline nozzle to operate.



Press the R end of the Fence Nozzle push button to Start the right Fenceline nozzle spraying. Press again to Stop spraying.

To Switch On/Off the Right Fence Nozzle:

- Press the R end of the Fence Nozzle push button to Start spraying from the right Fenceline nozzle.

When the Fenceline nozzle is spraying, a red LED light on the right hand boom tip is illuminated & the G-Hub main screen fenceline emblem lights Green.

- Press the R end of the Fence Nozzle push button to Stop spraying from the right Fenceline nozzle.

NOTE

Boom Section 16 must be On and spraying for the right hand Fenceline nozzle to operate.



Press the Auto push button to engage the Autosteer (if fitted). Press the Auto push button to disengage the Autosteer.

GPS Autosteer On/Off

Autosteer is retrofitted by the dealer/customer according to their requirements.

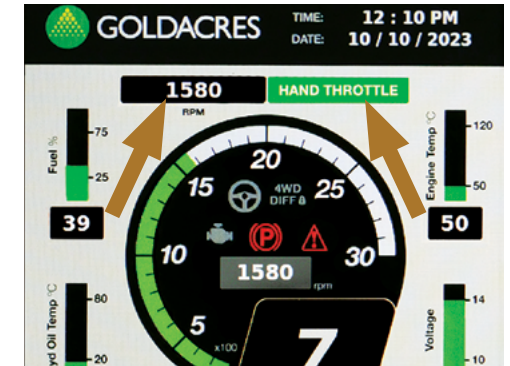
The black AUTO push button cycles the GPS Autosteer ON/OFF.

To engage/disengage Autosteer (if fitted):

- Press to Auto push button to activate the Autosteer.
- Press to Auto push button to deactivate the Autosteer.

NOTE

The Autosteer function must be wired in or use CAN communications for the Autosteer to operate.



Hand Throttle can be selected & used with 'Classic', 'Variable' & '2 Speed Only' Cruise Control modes.

Cruise Control

Goldacres Joystick and G-Hub control system give the choice of four Cruise Control modes:

- Classic Cruise Control
- Variable Cruise Control
- Two Speed Only Cruise Control
- Joystick Target Speed.

Only one 'Cruise Control' mode can be selected & used at any given time.

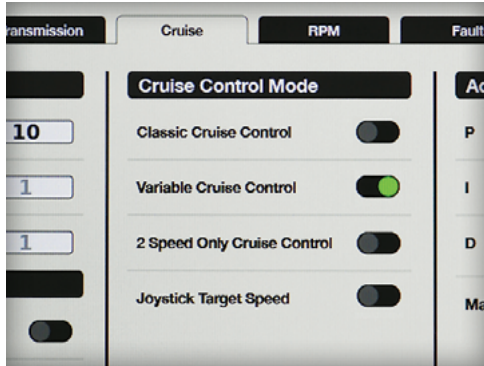
The Joystick can be used as a Hand Throttle in 'Classic', 'Variable' & '2 Speed Only' Cruise Control modes.

Cruise Control mode can be changed in the settings menu on the G-Hub Controller.

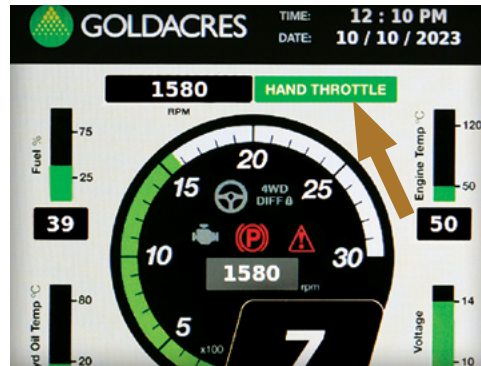
The 'Cruise Master' push switch must first be activated & the Cruise mode is displayed on the screen.

Three Joystick push buttons used with the G-Hub Cruise Control modes are:

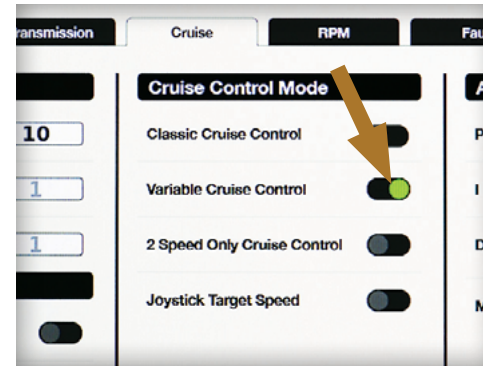
- Cruise Set/Decrease
- Cruise Resume/Increase
- Cruise Cancel.



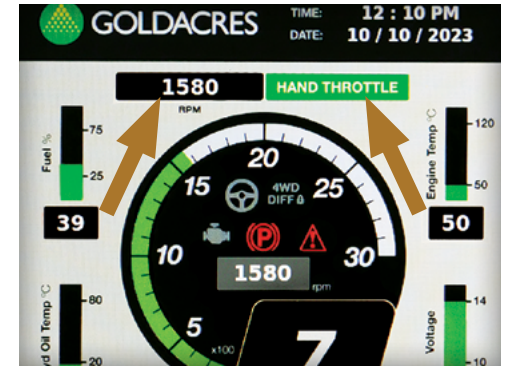
The Hand Throttle can be used with Classic, Variable or 2 Speed Cruise Control modes.



Press the Cruise Control touch button to open the Cruise Control Mode selection screen.



The Cruise Control Mode selection screen with Variable Cruise Control selected (Green = Active).



Home screen displaying Hand Throttle inactive & Engine rpm.

Hand & Foot Throttles

In addition to the foot throttle engine speed control, a 'Hand Throttle' control using the Joystick is provided for three Cruise Control modes, namely, Classic, Variable & 2 Speed control modes.

The Cruiser can be driven using the Hand Throttle or Foot Throttle or both.

Hand Throttle

The Hand Throttle mode, featured in the software update, complements the existing foot throttle operation.

The Hand Throttle can be used in Neutral, Forward & Reverse (just like the foot throttle) and in conjunction with the foot throttle.

The Hand Throttle is On by default. However, it can only be used when the Cruise Master is turned Off.

If the foot throttle is used while the Hand Throttle control is active, the Hand Throttle will be temporally disabled while the foot throttle controls engine speed.

After the foot throttle is released, the target engine rpm automatically transfers back to Hand Throttle control.

To Use the Hand Throttle:

- 1 First select the Cruise mode required. Press the Cruise Mode touch button on the G-Hub home screen to open the Cruise Control Mode selection panel and select the Cruise mode required.
- 2 Second, check the Crop Cruiser is in Hand Throttle mode. If not, use the Cruise Master switch to select the Hand Throttle mode.
- 3 Pull the Hand Throttle back towards the operator into the 'Neutral Gate' position to first arm (activate) the Hand Throttle.

If the Hand Throttle is in the 'Neutral Gate' position when starting-up the Crop Cruiser, the Hand Throttle must be moved forward & back into the 'Neutral Gate' to arm (activate) it.

NOTE

If the Hand Throttle is in the 'Neutral Gate' position when starting-up the Crop Cruiser, then Hand Throttle must be moved forward and back into the 'Neutral Gate' to arm (activate) it.

- 4 Push the Hand Throttle forward to increase engine RPM and the G-Hub screen displays:

- 'HAND THROTTLE' (in a Green field above the tachometer)
- Engine Target RPM (adjacent)

The default maximum engine RPM when the hand throttle is fully forward is 2200 RPM.

The default 2200 RPM can be adjusted using the 'Cruise Increase' and 'Cruise Decrease' buttons on the Joystick, if required.

However, pressing the 'Cruise Cancel' button will result in the maximum RPM on the Hand Throttle being set back to its default maximum setting of 2200 RPM.

- 5 To reduce engine speed, pull the Hand Throttle back towards the 'Neutral Gate' position.

To Cancel the Hand Throttle

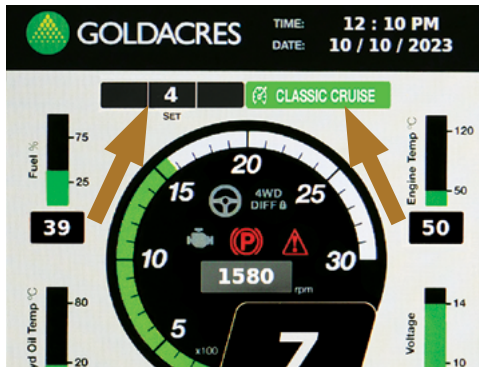
Use any of the following:

- Pull the Hand Throttle back to Neutral Gate
- Press the foot brake
- Press the Cruise Cancel button
- Change the transmission from D to N or N to D
- Turn the Cruise Master On
- Use the foot throttle for a continuous 30 second period.

If speed goes below 5km/hr, the hand throttle will automatically cancel.

Press the top of the Cruise Master switch to cycle to Hand Throttle.





'Classic Cruise Control' with set speed shown (left).

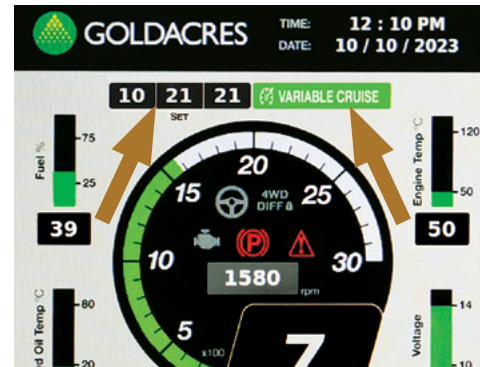
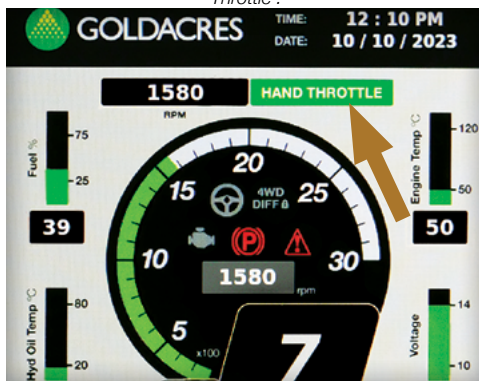
i) Classic Cruise Control

The Classic Cruise Control Mode allows the operator to simply accelerate to a desired speed, then press the 'Cruise Set' push button on the Joystick to set the speed. The Cruise speed can be cancelled and resumed at any time. Joystick movement is not active.

The 'Hand Throttle' can be selected for using the Joystick to manually control engine speed in 'Classic Cruise' mode.

Press the 'Classic Cruise' touch button to make the selection when required.

Press the 'Classic Cruise' touch button to select 'Hand Throttle'.



'Variable Cruise Control' with Set Speed shown centre left & Low Speed (left of centre) & High Speed (right of centre).

ii) Variable Cruise Control

Variable Cruise Control Mode allows the operator to set a High speed (for spraying) & a Low speed (for headlands), and then, to move the Joystick (Fore & Aft) for infinite variation of speed between the settings.

Low speed is pre-set.

High speed is set using the 'Cruise Set' push button when the joystick is pushed all the way forward.

The 'Hand Throttle' can be selected for using the Joystick to manually control engine speed in 'Variable Cruise' mode.

Variable Cruise Control Mode allows the operator to move the Joystick (Fore & Aft) for infinite speed variation.



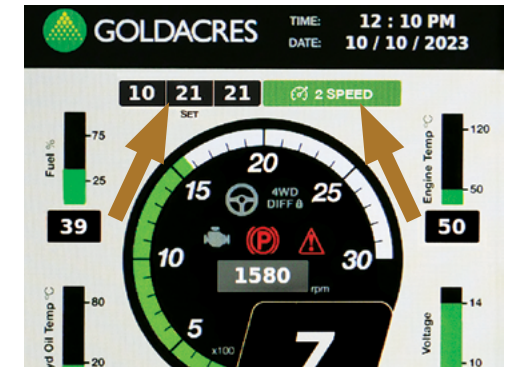
Press the 'Mode' push button to engage the Pre-Select 3rd Gear.

Press the 'Variable Cruise' touch button to make the selection when required.

Variable Cruise Control mode can be used in combination with 3rd Gear Pre-Select function which holds the transmission in 3rd gear.

The Pre-Select 3rd Gear is activated by pressing the 'Mode' push button on the Transmission Controller'.

Press the 'Classic Cruise' touch button to select 'Hand Throttle'.



'2 Speed Cruise Control' with Set Speed shown centre left & Low Speed (left of centre) & High Speed (right of centre).

iii) Two Speed Cruise Control

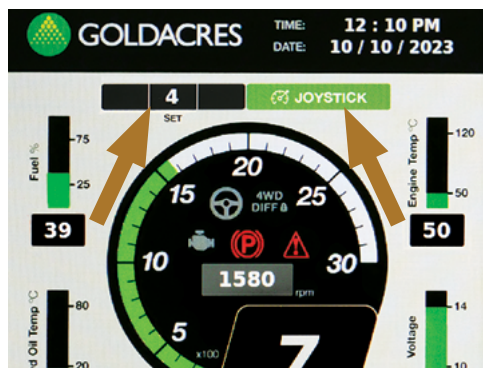
Two Speed Cruise Control operates similarly to Variable Cruise Control except the Cruiser is either operating at the Low Speed or the High speed.

There is no variable speed setting in between high and low speed settings:

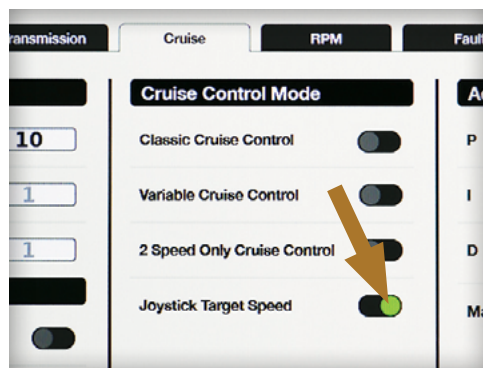
- Push the Joystick Forward (usually over centre) for high speed.
- Pull the Joystick Back (usually over centre) for low speed.

The 'Hand Throttle' can be selected for using the Joystick to manually control engine speed in 'Variable Cruise' mode.

Press the 'Variable Cruise' touch button to make the selection when required.



'Joystick Cruise Control' with speed setting shown centre left.



Joystick Target Speed activated in the Engine/Cruise screen.



Hand Throttle/Joystick.



Press the lower Cruise Set/Decrease push button to set the current ground speed for Cruise Control. Once set, press the push button again to decrease set ground speed.

vi) Joystick Target Speed

The 'Joystick Target Speed' mode can only be used when 'Joystick Target Speed' is activated in the Engine/Cruise screen.

Press the Cruise Mode touch button on the G-Hub home screen to open the Cruise Control Mode selection panel, then select the Cruise mode required

The 'Joystick Target Speed' is similar in operation to the Hand Throttle but acts like a Variable Cruise control.

The 'Joystick Target Speed' mode drives the engine RPM to achieve the target ground speed displayed on the G-Hub home screen.

The 'Advanced Cruise Tuning' can be used to adjust response rate and maximum target speed (Refer to Chapter 4 for more information).

The target speed can also be adjusted using the 'Cruise Increase' and 'Cruise Decrease' buttons on the Joystick.

This mode can be cancelled in the same way as other Cruise Control modes.

Driving in Either Hand Throttle or Joystick Target Speed Mode

Follow these instructions to drive the Crop Cruiser using either the 'Hand Throttle' or 'Joystick Target Speed' mode:

- 1 Set the Cruise Control mode & Throttle mode.
- 2 Release the Park brake.
- 3 Depress the Foot Brake pedal.
- 4 Select Forward or Reverse gear.
- 5 If a Forward gear is selected, move the Hand Throttle (Joystick) forward to increase engine speed and drive forward.

If Reverse gear is selected, move the Hand Throttle (Joystick) forward to increase engine speed and drive backwards.

- 6 To accelerate driving forwards or in reverse, push Hand Throttle (Joystick) forward.

The further forward the Hand Throttle (Joystick) is pushed, the faster Engine RPM and Crop Cruiser speed.

As the vehicle speed increases, the transmission will shift up gears as required.

If the operator's hand is removed from the Hand Throttle (Joystick), the throttle will hold its position and the Crop Cruiser will maintain its speed.

- 7 To decelerate, pull the Hand Throttle (Joystick) back toward the neutral gate.
The Crop Cruiser will decelerate and shift down gears as speed is reduced.
- 8 The Brake pedal can be depressed at any time to reduce speed or decelerate the Crop Cruiser.
Use of the Brake pedal will reset the throttle back to engine idle speed.
Pull the Hand Throttle (Joystick) back into the neutral gate to reset it, then push the Hand Throttle (Joystick) forward again to resume to required engine and driving speed.
- 9 To stop the Crop Cruiser, pull the Hand Throttle (Joystick) back into the neutral gate & depress the brake pedal until stopped.
- 10 Select Neutral on the Gear Selector.
- 11 Engage the Park Brake.

Cruise Set/Decrease

The 'Cruise Set/Decrease' push button is used to set the current ground speed as the Cruise Control Speed and to decrease the set ground speed.

To Set/Decrease Cruise Control Speed:

- i) The Cruise Indicator on the G-Hub Touch Screen must be active (Blue or Green) to enable use of the Cruise Set/Decrease push button & the Foot Brake must be released.

Press the Cruise Master switch on the console to change the Cruise Indicator on the G-Hub Touch Screen from Grey to Blue.

The Cruise Cancel push button can be used to cycle the Cruise Control between On [active] and Off [inactive].

- ii) Press the Cruise Set/Decrease push button to set the current ground speed as the Cruise Control Speed.
- iii) Once the Cruise Control Speed is set/engaged, press the Cruise Set/Decrease push button down to decrease the set ground speed.

To disable Cruise Control, press the Cruise Cancel push button or apply the Foot Brake which also cancels the Cruise Control.



Press the upper Cruise Set/Increase push button to resume current ground speed for Cruise Control & once set, press the push button again to increase the set ground speed.

Cruise Resume/Increase

The Cruise Resume/Increase push button is used to resume the previously set current ground speed as the Cruise Control and increase the set ground speed.

To Resume/Increase Cruise Control Speed:

- Press the Cruise Resume/Increase push button to resume the previously set ground speed as the Cruise Control Speed.
- Once the Cruise Control Speed is set/engaged, press the Cruise Resume/Increase push button down to increase the set ground speed.

To disable Cruise Control, press the Cruise Cancel push button or apply the Foot Brake which also cancels the Cruise Control.



Press the Cruise Cancel switch on the on the Joystick to cancel the cruise control function. Press again to reactivate the cruise control.

Cruise Cancel

The yellow Cruise Cancel push button is used to cancel the active Cruise Control. Applying the Foot Brake also cancels the Cruise Control.

The Cruise Master switch is also used to cycle the Cruise Control between On [active] and Off [inactive].

Applying the Foot Brake also cancels Cruise Control.



Transmission Shifter.

Transmission Shifter

To Engage a Gear & Drive:

- Check the display shows N (Neutral). If not select Neutral by pressing the N push button.
- Apply the foot service brake located to the right of the steering column
- Release the Park Brake.
- Press the 'D' push button to drive forward or the 'R' push button to reverse.

To Stop Driving & Disengage Gears:

- Apply the foot service brake located at near base (right) of the steering column.
- Pressing the 'N' push button to place the unit in Neutral (all gears deactivated).
- Apply the Park Brake.

NOTE

An alarm sounds & a warning illuminates, if the transmission is moved into a gear other than Neutral when the Park Brake is engaged.



Select & Monitor displays showing Neutral.

Monitor Display

The Monitor Display allows the operator to glance down & quickly observe which gear is being used.

Select Display (left side)

In the Select Display, a single LED character shows the gear selected by the operator. It will display D, R, or N or Gear Number of the gear selected.

Monitor Display (right side)

In the Monitor Display, a single LED character shows which transmission gear is currently engaged. This includes R, N, and Gear Number of the forward gear but not D (Drive).

Select & Monitor displays showing Reverse gear.





Press the 'R' push button to engage reverse gear for reversing the sprayer.

Reverse Gear

Press the 'R' push button to engage reverse gear to reverse the sprayer.

Neutral

Press the 'N' push button to place the unit in Neutral (all gears deactivated).

The gear selector must be in Neutral to start the engine & before selection of a gear to start driving.

Press the N push button to deactivate all gears.



Press the D push button to engage reverse gear for reversing the sprayer.

Drive

Press 'D' push button to engage forward gears. When Drive is pressed, the 1st gear through to 6th gear is available and will be selected by the Electronic Control Module (ECM) when changing Up or Down.

Overdrive gears 5th & 6th can only be engaged in Road Mode if the Enable Overdrive is not preset. Refer to Chapter 4, Setting Up.

Enable Overdrive when selected allows the operator to use the 5th & 6th gears while in Spray Mode and maintain the operation of Autosteer.

NOTE

The G-Hub system will log any faults that occur. Go to Chapter 9 'Trouble Shooting' for more information.

NOTE

If Drive (D) or Reverse (R) are pressed while the Park Brake is still On, a gear cannot be engaged by the transmission and an audible alarm will sound.



Press the Gear Up (Arrow up) or Gear Down (Arrow down) push button to manually change gears Up or Down.

Gear Up

The 'Arrow Gear Up' push button allows the operator to manually upshift the transmission one gear at a time when the transmission is in Drive. Press the 'Arrow Gear Up' push button once for each gear change.

The Select Display shows the gear range selected & the Monitor Display shows the gear currently engaged.

Gear Down

The 'Arrow Gear Down' push button allows the operator to manually downshift the transmission one gear at a time until the 1st gear is reached.

Press the 'Arrow Gear Down' push button once for each gear change. The Select Display shows the gear range selected & the Monitor Display shows which gear currently engaged.

NOTE

The transmission cannot not shift above the gear range selected. When Drive (D) is pressed the full range of automatic shifting is restored.



Press the 'Mode' push button to engage the Pre-Select

Pre-Select 3rd Gear

The Pre-Select 3rd Gear push button allows the operator to quickly select 3rd gear.

It is activated by pressing the 'Mode' push button on the Transmission Controller'. A light illuminates in the top right corner of the Pre-Select 3rd Gear push button when it is activated (selected).

The indicator light of the push button goes dark to indicate when the gear selection is inactive (Off).

8 Service Indicator Light

If the Service Indicator Light is illuminated, then there is a fault in the electrical shift system. A qualified technician should inspect the system as soon as possible.

If the Service Indicator Light illuminates, there is a fault in the electrical shift system and a qualified technician is required.





The Mode Switches panel (The Differential Lock Switch is a 4WD model option only).

Mode Switches

The Mode Switches panel located on the Armrest Control Console contains four switches:

- 1 Spray Mode / Road Mode Switch.
- 2 Cruise Master Switch (Off).
- 3 Differential Lock ([Off] 4WD option only).
- 4 Park Brake Switch (On).

1 Spray Mode/Road Mode Switch

The Spray Mode/Road Mode Switch provides Spray Mode or Road Mode operation.

To Activate Spray Mode:

Press the top of the Spray Mode/Road Mode Switch.

In Spray Mode, the transmission will only go up to 4th gear speeds for spraying.

Unless overdrive is enabled, Spray Mode also activates autosteer (if fitted).

NOTE

- An Overdrive setting in G-Hub allows operating in:
- 5th gear with auto-steer enabled and
 - 5th gear in spray mode.
- This is used when ground conditions are hard and the sprayer engine RPM can be lowered.



Press the top of the Spray Mode/Road Mode switch to activate Spray Mode

To Activate Road Mode:

Press the bottom of the Spray Mode/Road Mode Switch.

In Road Mode the 5th & 6th gear are selectable for speeds up to 50 Km/h.

In Road Mode, Autosteer (if fitted) is normally disabled unless an Overdrive setting in the G-Hub is activated. See Chapter 4, 'Setting Up'

2 Cruise Master

The Cruise Master switch cycles the Cruise Control On or Off changing the state of cruise on the G-Hub Controller from Grey to Blue.

To Activate Cruise Control:

Press the front of the Cruise Master switch and the G-Hub Controller Cruise Indicator illuminates Blue.

To Deactivate Cruise Control:

Press the front of the Cruise Master switch and the G-Hub Controller Cruise Indicator illuminates Grey.



Press the top of the Cruise Master switch to activate or deactivate Cruise Control.

3 Differential Lock (4WD only)

On 4WD modes only, pressing the Differential Lock switch forward momentarily cycles the transfer case centre differential lock On or Off.

This switch option will only be present on 4WD optioned machines.

On 4WD models only, press the top of the Diff Lock switch to cycle the differential lock On or Off.



To engage the Park Brake (On), slide the orange lock rearward & press the top of the switch.

4 Park Brake Switch

This Park Brake Switch must be ON (in the forward position) before starting the engine.

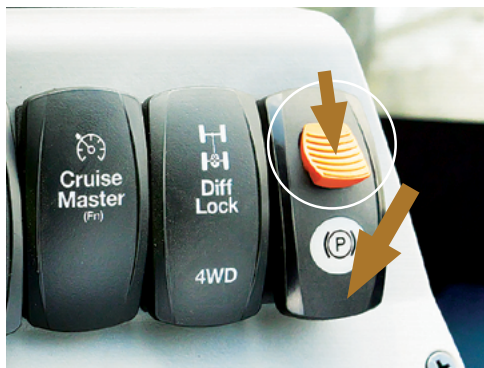
To Engage the Park Brake:

- i) Slide the orange lock rearwards, then
- ii) Press the switch forward to engage the Park Brake (On).

CAUTION

When travelling on roads with a 4WD sprayer, the differential lock must be OFF. Failure to disengage the differential lock may cause damage to the gear train which is not covered by warranty. On 4WD sprayers, a WARNING will appear on the G-Hub screen @ 30Km/h.

Ready to Spray – Operation



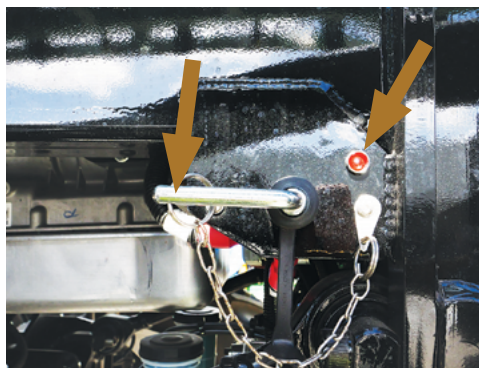
Disengage the Park Brake - slide the orange lock rearward, then press the rear of the switch (Off position).

To Disengage the Park Brake (once the engine has started):

- Apply the foot brake
- Slide back the orange lock, then press the bottom of the switch to disengage the Park Brake (Off).
- A drive gear can now be selected.

When stopping the Cruiser, the Foot Brake must be applied to bring the sprayer to a **complete stop**, then the transmission switch must be placed in N (Neutral) position - before the Park Brake Switch is engaged (ON).

Apply the Foot Brake when changing the Park Brake mode (On/Off) & when bringing the Cruiser to a complete stop.



Wait for the Red LED to switch off before rotating the handle to disengage the Battery Isolator switch.

Shutting-Down

To Shut-Down the Cruiser:

- Bring the Cruiser to a complete stop.
- Press the 'N' switch (Neutral gear) .
- Engage Park Brake.
- Turn the ignition key to stop position.

Wait 30 seconds to allow the G-Hub Controller system enough time to save the data before disengaging the Battery Isolator Switch.

- A Red LED indicator light is located above the Battery Isolator switch handle.

Disengage the Battery Isolator switch **ONLY** when the Red LED is not illuminated.



The Quick Fill Station located on the left side of the Crop Cruiser.

Filling the Sprayer

The Crop Cruiser is fitted with 3 spraying system tanks:

- Product tank (4000 litre)
- Rinse tank (300 litre)
- Hand Wash tank (70 litre)

When filling it is recommended that the Crop Cruiser be safely parked in an appropriate area with the engine running.

All filling functions are controlled at the Filling Quick Filling Station on the left hand side of the Crop Cruiser.

Water Source

To fill the Crop Cruiser tanks ready for spraying, requires an external water source.



The 3" Clean Fill inlet located underneath the filling pod with camlock cap fitted.

Tank Filling Inlet

The Tank Filling Inlet for both Product tank & Rinse tank is a 3" camlock connection point located under the Quick Fill Station pod.

The tanks can be filled with an:

- Optional onboard hydraulically driven fill pump or
- External fill pump.

Instructions follow.

CAUTION

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

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

For example, liquid Nitrogen has a density of 1.28 kg per litre. The Crop Cruiser tank size might be 6000 litres BUT the equivalent water weight of liquid Nitrogen is calculated by dividing 4000 by 1.28 kg = 3891 litres.

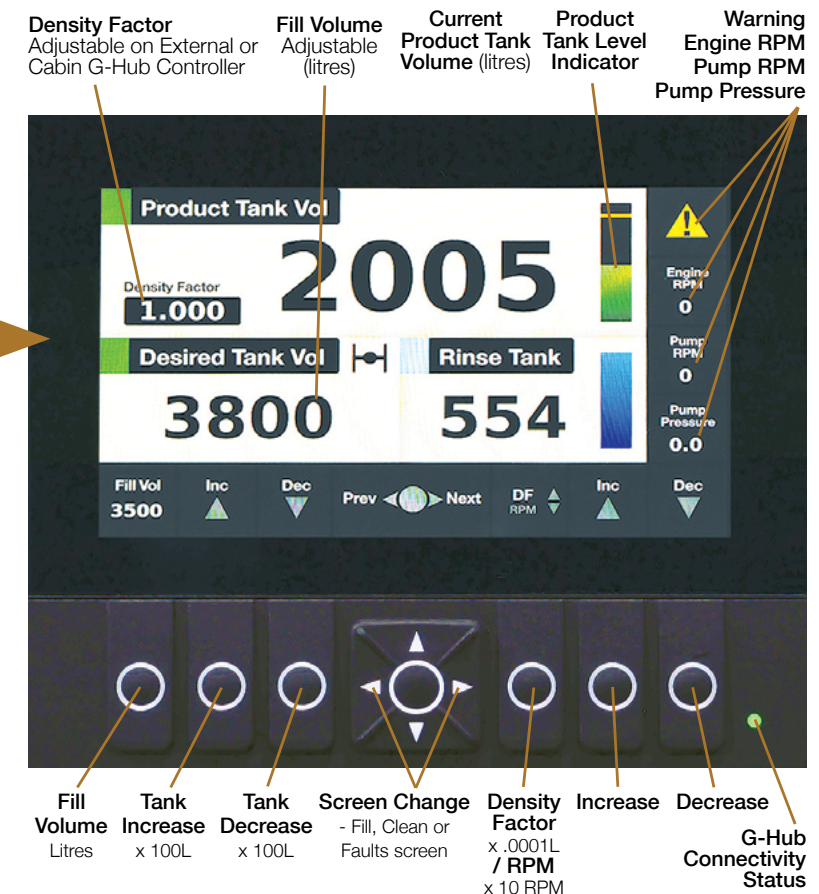
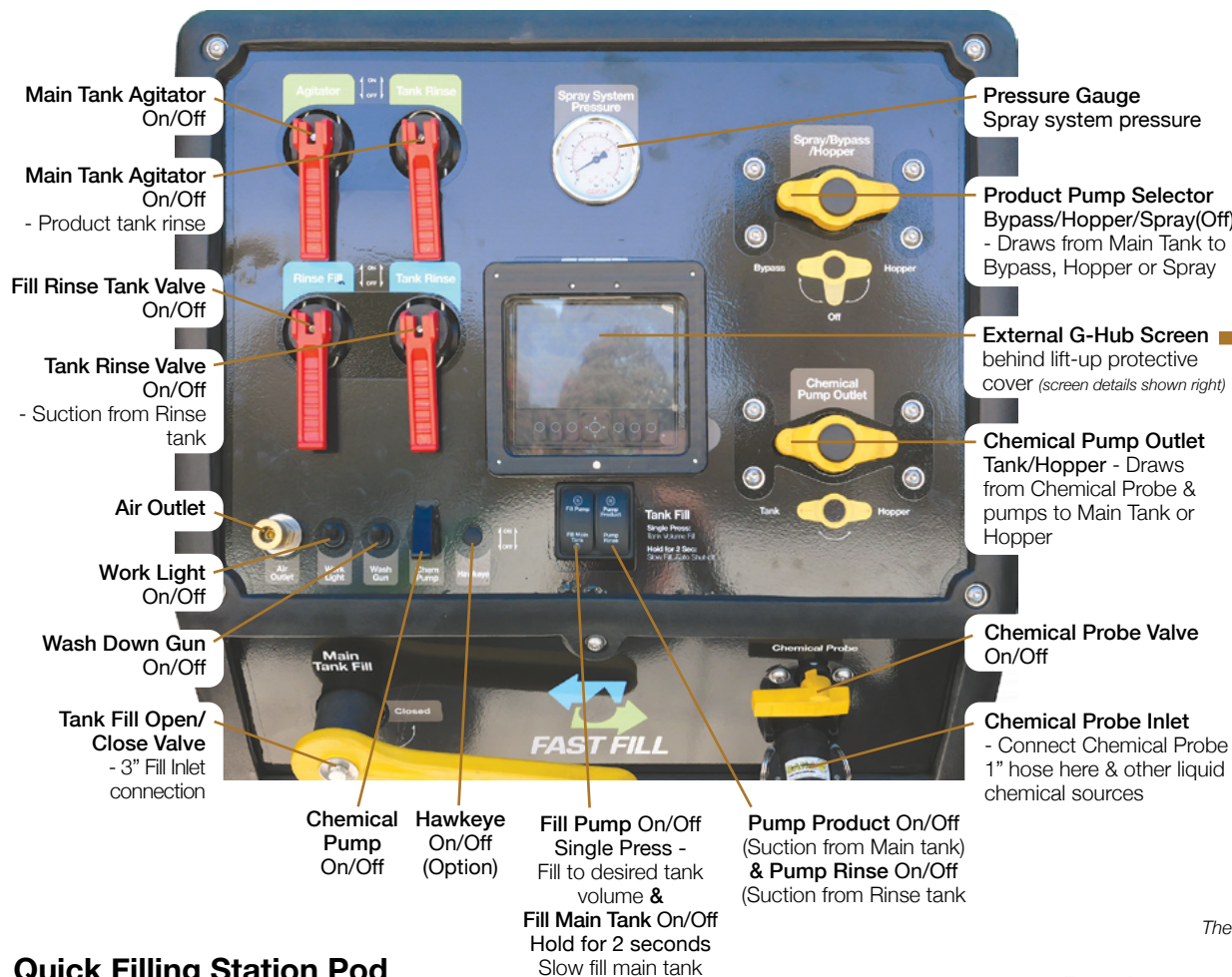
This means the total volume of liquid Nitrogen allowed in a 4000 litre tank is 3891 litres. It is very important not exceed weight limits.

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.

NOTE

Always use clean, fresh water, free of suspended organic matter or clay.
Some chemicals are deactivated when they contact these materials



The External G-Hub 'Product Volume (Fill) Screen' showing layout, volumes, filling functions & push buttons.

Quick Filling Station Pod

The Quick Filling Station Pod (shown above) comprises hose connectors, valves, switches and External G-Hub Screen - used to control all filling & cleaning functions - spray pump, fill pump, agitator, rinsing and induction hopper functions.

The External G-Hub Screen comprises a 5" full colour screen with a push button panel. It has 3 display screens:

- Product Tank Volume (Fill) Screen - for the sprayer filling functions
- Clean Screen - list & push buttons for cleaning functions (shown later in this chapter).
- Faults Screen - lists current faults.

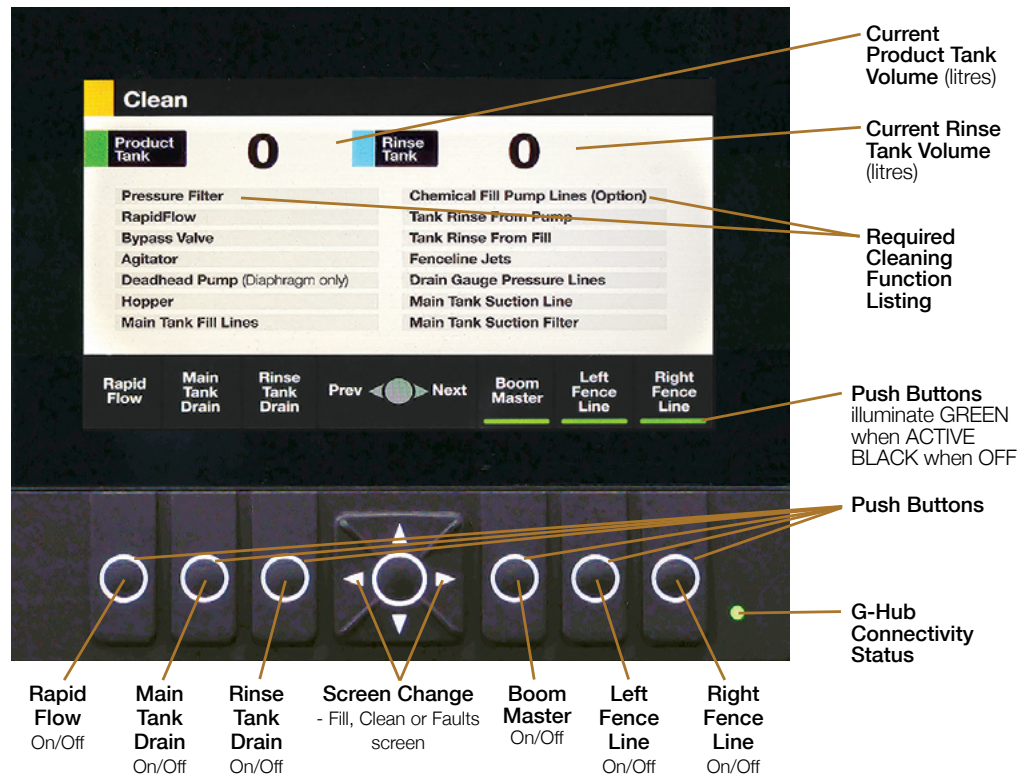
A Touch Button Panel is located in the lower part of the External G-Hub Screen.

Product Tank Volume (Fill) Screen

The Product Tank Volume (Fill) Screen includes:

- G-Hub Connectivity Status light (bottom right corner) illuminates Green when Connected or Red = Not connected
- 'Density Factor' adjustment
- 'RPM' adjustment
- Product 'Fill Vol' Increase/Decrease.

- Product & Rinse tank 'Current Volume' in litres & 'Indicators'.
- Hopper feed 'choke indicator' (increase flow for hopper functions)
- Warning
- Engine RPM
- Product Pump RPM
- Pump Pressure (kPa).



The External G-Hub 'Clean Screen' showing layout, volumes, cleaning functions & push buttons.

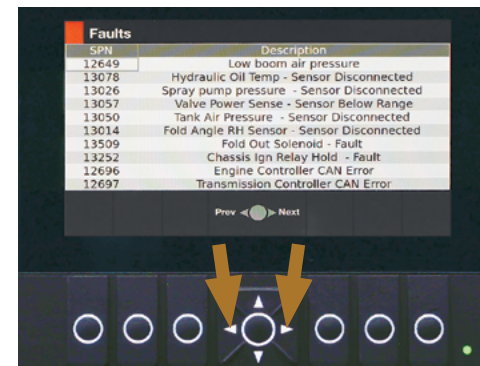
Clean Screen

To display the 'Clean' screen, press the 'Screen Change' arrow push buttons (in the centre of the push buttons) at the base of the screen.

The 'Clean' screen (shown above) provides:

- Product Tank - current volume of liquid in the tank
- Rinse Tank - current volume of liquid in the tank
- List of required cleaning functions to completely rinse & clean the sprayer

- Push Button functions - shown at the base of the screen
- G-Hub Connectivity Status light (bottom right corner) illuminates Green when Connected or Red = Not connected.



Press the 'Screen Change' arrow touch buttons to display the 'Faults' screen when required.

Faults Screen

To display the 'Faults' screen, press the 'Screen Change' arrow push buttons (in the centre of the push buttons) at the base of the screen.

The 'Faults' screen (shown below) lists current faults - useful for trouble shooting.



Press the 'Inc or 'Dec' arrow touch buttons to enter desired the 'Fill' volume.

Fill Screen Functions

Three 'Desired Tank Volume' (Fill) functions are adjusted on the external screen:

1 'Desired Tank Vol'

The desired tank volume is the Product Tank volume required for this Fill.

Adjust each Product tank fill volume as required.

To adjust Product Tank 'Desired Tank Vol':

- Press the 'Inc' or 'Dec' arrow touch buttons intermittently to increase or decrease volume by 100L increments.
- Press & hold the 'Inc' or 'Dec' arrow touch buttons until volume required is displayed on the screen.

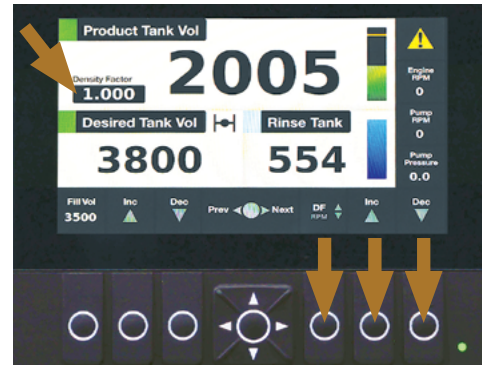


Press the 'DF/RPM' touch button to select 'DF', then press the 'Inc/Dec' touch button to enter the value required.

2 'Density Factor'

To adjust 'Density Factor':

- Press the 'DF / RPM' touch button to select 'DF' ('DF' illuminates when selected).
- Press the 'Inc' or 'Dec' arrow touch buttons intermittently to Increase or Decrease the Density Factor by 0.001 increments.



Press the 'DF/RPM' touch button to select 'RPM', then press the 'Inc/Dec' touch button to enter the value required.

3 'RPM Raise'

To adjust 'RPM Raise':

- Press the 'DF / RPM' touch button to select 'RPM' ('RPM' illuminates when selected).
- Press the 'Inc' or 'Dec' arrow touch button intermittently to increase or decrease volume by 10 RPM increments.

Other functions of the external 'Fill' screen:

- An External Buzzer sounds when desired tank volume is achieved.
- 'Warning' - warnings may appear at the top of the screen. These self-clear.

NOTE

Both Cabin G-Hub & External G-Hub screens can be used at the same time.
For example, you can turn the pump On at the External fill station and Off in the Cabin if required.



Connect a 3" clean water source suction hose to the 3" 'Main Tank Fill' camlock coupling.

Suction & Delivery Lines

Use good quality suction hose and fittings that will not collapse or leak air under suction.

If pumping water from sources other than storage tanks, the use of an appropriate sized floating filter equipped with a check valve is recommended.

The suction line diameter should match the suction port diameter of 3" to maximise pump performance.

All filling functions require the Crop Cruiser to be safely parked in an appropriate area with the engine running.



Open the 'Main Tank Fill' ball valve(s) by moving the handle(s) down.

To Fill the Product Tank

- Connect a 3" suction hose (not supplied) to the 3" 'Main Tank Fill' camlock coupling with the other end of the hose connected to a clean water source.
- Open the 'Main Tank Fill' ball valve(s) by moving the handle(s) down.
- Open the cover to access the G-hub External Screen & press the screen selector touch buttons to select the 'Product Tank Vol (Fill)' screen.
- Adjust the Density Factor' if required - refer to previous instructions in this chapter.
- Set the 'Desired Tank Vol' on the screen - refer to previous instructions in this chapter.

The 'Desired Tank Vol' can be entered on the G-Hub Controller before leaving cabin.

The volume will always default to the usable tank volume set in the G-Hub Controller.

NOTE

Filling instructions provided are based on the Fill Pump option being fitted to the Crop Cruiser.
If not, instructions for the Crop Cruiser Fill Pump require an external fill pump to be operated in its place.

Ready to Spray – Operation



First, press-in the 'Fill Main Tank' switch to open the valve, then press-in the 'Fill Pump' switch to start filling the tank.

- 6 With the Crop Cruiser engine running at low idle, press-in the 'Fill Main Tank' switch to open the valve to the Product Tank.

- 6 Press-in the 'Fill Pump' switch to start pumping into the Product Tank.

The Crop Cruiser engine RPM will automatically raise if enabled in the G-Hub Controller settings.

The Fill speed can be reduced (if required) by holding the 'Fill Main Tank' switch IN for 2 seconds to engage the Slow Fill function & Automatic Shut-off - if more time is required.

Press & HOLD the 'Fill Pump' switch IN for 2 seconds to engage the slow fill function and automatic shut-off.



When filling is complete, close all Fill ball valves, disconnect the suction hose & refit the camlock cap

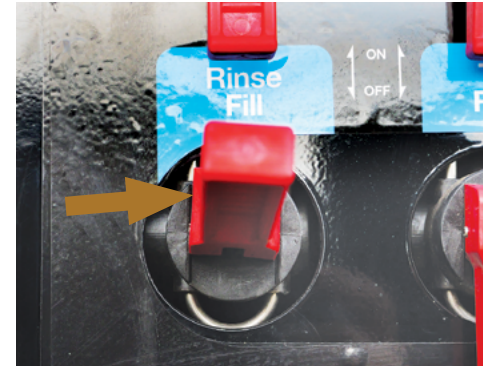
- 6 The Fill Pump automatically switches Off when the target product volume is reached.
The filling process can be stopped at any time by pressing-in the 'Fill Pump' switch again = Off.
- 7 On completion of all filling functions, close all 'Main Tank Fill' ball valves (Crop Cruiser & suction hose) and disconnect the suction hose from the camlock coupling.
- 8 Refit the 3" camlock cap.

NOTE

Before disconnecting the filling hose from the Fill Inlet, it should be noted the Micromatic rinse outlet, Drum Rinse & Hopper Rinse nozzles require clean water for rinsing.
If required, keep the filling hose connected to the Fill inlet until completion of rinsing functions.

CAUTION

It is important to not close the 'Fill' valve while the pump is running.
Running the pump with a closed suction inlet may damage the pump.



While filling the main tank, open the 'Rinse Fill' valve by moving the valve lever up. Close the valve when filled.

To Fill the Rinse Tank

To Fill the Rinse Tank:

- 1 Follow 'To Fill the Product Tank' steps 1-3.
- 2 Open the 'Rinse Fill' valve by moving the valve lever up.
- 3 With the Crop Cruiser engine running at low idle, press the 'Fill Pump' switch IN to start filling the Rinse tank.

The Crop Cruiser engine RPM will automatically raise if enabled in the G-Hub Controller settings.

Engine RPM can be adjusted on the external screen as required (refer to instructions on previous page).

NOTE

Filling instructions provided are based on the Fill Pump option being fitted to the Crop Cruiser.
If not, instructions for the Crop Cruiser Fill Pump require an external fill pump to be operated in its place.



Press-in the 'Fill Pump' switch to start filling the Rinse tank. Press-in the 'Fill Pump' switch again to stop filling.

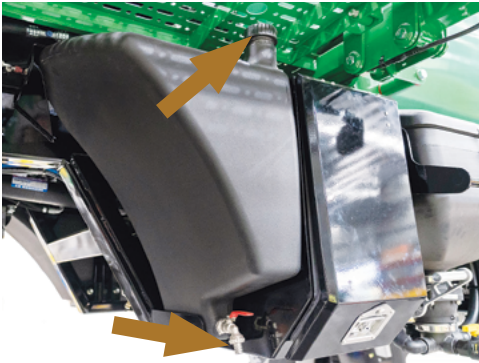
- 4 When the Rinse tank is filled, press the 'Fill Pump' switch IN to stop filling.
- 5 On completion of all filling functions, close all valves, then disconnect the suction hose from the camlock coupling & refit the 3" camlock cap.

NOTE

Before disconnecting the filling hose from the Fill Inlet, it should be noted the Micromatic rinse outlet, Drum Rinse & Hopper Rinse nozzles require clean water for rinsing.
If required, keep the filling hose connected to the Fill inlet until completion of rinsing functions.

Close the 'Rinse Fill' valve by moving the valve lever down. Close the valve after filling the Rinse tank.





Open the lid at the top of the tank & insert a fresh water hose or attach the hose to the outlet to fill the tank.

To Fill the Hand Wash Tank

- 1 Connect a fresh water hose to a fresh water source.
- 2 Open the lid on top of the fresh water tank located at the top of the tank near the top of storage cabinet.
An alternative method of filling the tank is to connect a hose to the Hand Wash Tank outlet.
- 3 Use the hose to fill the tank with fresh water.
- 4 Remove the hose and close the fresh water tank lid, or alternatively, close the valve, close the top lid and remove the hose.

NOTE

All functions for adding chemicals require the Crop Cruiser to be safely parked in an appropriate area, a clean water source connected to the clean fill inlet and the engine running.

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 required quantity after adding chemicals is completed.



Connect a 3" fill hose to the 'Clean Fill' inlet & Open the 'Fill' ball valve(s).

Adding Chemicals to the Product Tank

Chemicals can be added to the Product Tank using the:

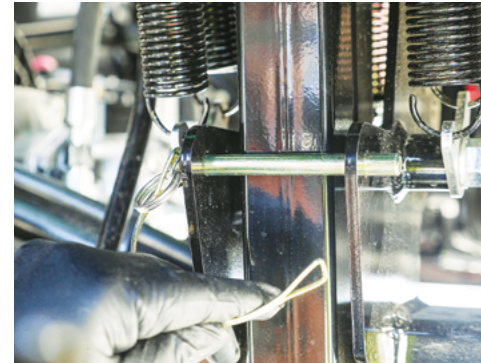
- Chemical Induction Hopper (granular & liquid chemicals)
- Chemical Probe (liquid only).

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

Clean water is required to ensure the Product Pump operates to create the venturi effect required for transfer fluid from the Chemical Induction Hopper to the Product Tank and to ensure adequate agitation when chemical is added.

NOTE

Ensure chemicals added are consistent with the density factor used when filling the Cruiser.
Water weighs 1.0 kg per litre) and conversion factors must be used when spraying liquids heavier than water.



Remove the safety pin & locking pin.

Chemical Induction Hopper

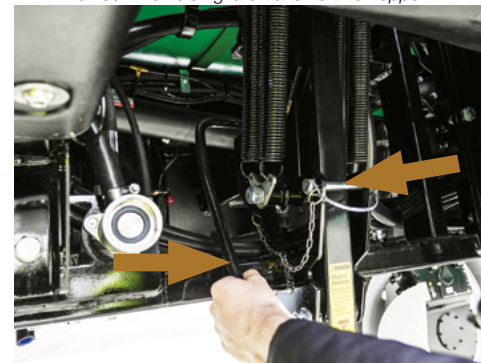
Chemical Induction Hopper functions include:

- Adding & mixing of granular & liquid chemicals or decontaminants before induction to the Product Tank.
- The Bottom Drain Valve can also be used for direct induction of liquid chemicals into the Product Tank.

To Lower the Chemical Induction Hopper

- 1 Ensure the hopper is empty by opening the Foot ball valve & Bottom drain valve.
Close ball valves after hopper is drained.

Remove the safety pin & locking pin, then lift the lever to unlock the holding latch & lower the hopper.



Pull the hopper down into its working position.

- 2 Remove the safety pin, then the locking pin from the hopper lifting arms.
- 3 Support the weight of the hopper, then pull the latch lever beside the hopper to unlock the latch holding the hopper in position.
- 4 Pull down the hopper slowly to its operating position.
- 5 Check the hoses connecting to the hopper are not restricted or kinked.

With hopper in working position, check hoses are not restricted or kinked.



Ready to Spray – Operation



Undo the latch & open the Hopper lid.



Add the chemical granules or powder to the flowing liquid.



Open the foot operated ball valve at the base of the Hopper to transfer mixed product into the Main Tank.



Lift-up to Close the foot operated ball valve at the bottom of the hopper.

To Add & Mix Chemical in the Hopper and transfer to the Product Tank

- 1 Undo the latch & open the Hopper lid.
- 2 Turn the 'Spray/Bypass/Hopper' valve to Hopper position
- 3 Press the 'Pump Product' switch IN to start the Product pump (sourcing from the Product tank).

The pump should operate at the speed necessary to generate at least 80 psi while mixing. Delivery pressure is displayed on the pressure gauge above the External G-Hub screen).

Turn the 'Spray/Bypass/Hopper' valve to Hopper position.



- 4 Add the required chemical granules, powder &/or liquid into the flowing water.
- 5 Open the Mixing Jet valve on the right hand side of the hopper to start mixing.
Leave mixing jet On while transferring chemical to the Product tank (step 6).

NOTE

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

Open the Mixing Jet valve on the RHS of the Hopper.



NOTE

On completion, rinse all chemicals from the Induction Hopper (refer to instructions in this Chapter 'Hopper Rinse Functions')

- 6 Open (push down) the ball valve foot lever at the base of the Hopper to transfer the mixed product into the Product tank.
- 7 On completion of transfer, close the Mixing Jet valve, Foot operated ball valve (lift up) & turn the 'Spray/Bypass/Hopper' valve to 'Bypass' position.

On completion of mixing, Close the Mixing Jet valve.



To Add Chemical to the Product Tank via the Bottom Drain Valve

To use the Bottom Drain Valve for induction of liquid chemicals to the Product Tank:

- 1 Open (Lift up) the ball valve foot lever at the base of the Hopper.
- 2 Ensure the Bottom Drain Valve is closed & remove the camlock coupling plug.
- 3 Connect the micromatic hose to the camlock coupling.

Ensure the Bottom Drain valve is closed & remove the camlock coupling plug.





Press-in the 'Product Pump' switch to start the pump sourcing from the a Product tank.

- 4 Press-in the 'Pump Product' switch to start the Product pump (sourcing from the Product tank).
The pump should operate at the speed necessary to generate at least 80 psi while mixing. Delivery pressure is displayed on the pressure gauge above the External G-Hub screen.
- 5 Open the Bottom Drain Valve to transfer chemical to the main tank.



On completionm disconnect the micromatic hose & refit the camlock coupling plug.

- 6 After the required amount of chemical has been transferred to the hopper, the Enviro coupler can be partially disconnected to allow air to suck into and clear fluids in the pump and hoses.
- 7 Close the Bottom Drain Valve on completion of chemical transfer.



Connect the Micromatic hose to the Crop Cruiser Micromatic rinse coupling outlet for rinsing.

To rinse the Micromatic Hose & Fittings:

- 1 Disconnect the Micromatic hose from its chemical source & connect it to a Micromatic coupling of the Crop Cruiser.
- 2 With the Probe hose still connected at the base of the Hopper, open the Hopper drain valve.
- 3 Lift up the 'Chem Pump' switch to On.
Rinse will transfer to the Chemical Induction Hopper or Product Tank.
- 4 Disconnect the micromatic coupling from the Crop Cruiser to suck air & purge air from the hose.
- 5 Push down the 'Chem Pump' switch to Off position to stop the pump.
- 6 Disconnect the Micromatic hose from the rinse coupling and Proble inlet.
- 7 Disconnect the Chemical Probe hose from the 1" Chemical Probe Inlet & replace the camlock plug.



Chemical Probe inlet.

Chemical Probe Inlet

The Chemical Probe Inlet can be used to add liquid chemicals to:

- The Chemical Induction Hopper or
- Directly to the Product Tank.

Adding Liquid Chemical to the Chemical Induction Hopper

Liquid chemicals can be added to the Induction Hopper using the:

- a) Chemical Probe, or
- b) Micromatic Coupling.

Open the Bottom Ball Valve to transfer chemical to the main tank.



NOTE

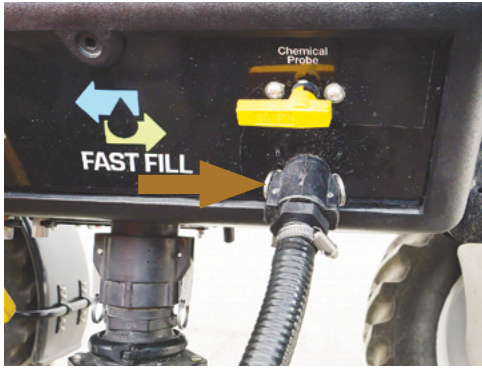
Before disconnecting the filling hose from the Fill Inlet, it should be noted the Micromatic rinse outlet, Drum Rinse & Hopper Rinse nozzles require clean water for rinsing.
If required, keep the filling hose connected to the Fill inlet until completion of rinsing functions.

NOTE

The higher the Product Pump delivery pressure, the greater the venturi suction and the quicker the hopper will transfer the chemical.
The delivery pressure should not exceed 120 PSI as set by the pressure relief valve setting.

NOTE

On completion, rinse all chemicals from the Induction Hopper (refer to instructions in this Chapter 'Hopper Rinse Functions').



Connect a chemical probe suction hose to the Chemical Probe inlet.



Rotate the 'Chemical Probe' valve to On position.



Place the Chemical Probe into the chemical & open the Probe Valve to transfer chemical to the Hopper.

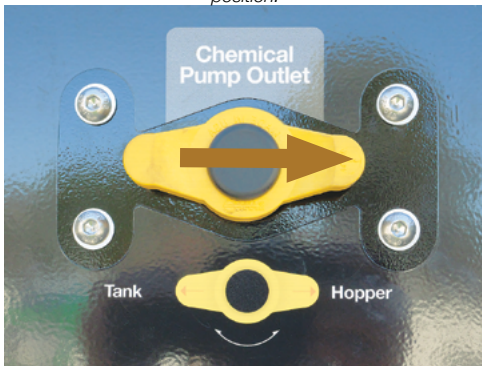


Rotate the Chemical Probe valve to Off. Disconnect the hose from the Probe Inlet & replace the camlock cap.

A) To Add Liquid Chemical to the Hopper Using the Chemical Probe

- 1 Connect a Chemical Probe suction hose to the 1" Chemical Probe camlock inlet fitting (shown above).
- 2 Rotate the 'Chemical Pump Outlet' valve to 'Hopper' position.
- 3 Rotate the 'Chemical Probe' valve to On position (shown above).
- 4 Lift up the 'Chem Pump' switch to On (shown below) to start the electrically operated chemical pump.
- 5 Place the Chemical Probe into the chemical & Open the Probe Valve to transfer the chemical to the Hopper.

Rotate the 'Chemical Pump Outlet' valve to 'Hopper' position.



Lift the 'Chem Pump' switch to On position.



After the required amount of chemical has been transferred lift the probe to suck air, then close the Probe Valve.



To rinse the Chemical Probe & Hose:

- 1 To rinse the Chemical Probe and hose, place the Probe into a container of clean water, then Open the Probe valve to suck clean water through the Probe and hose.
- 2 On completion of rinsing, lift the probe to suck air & purge the liquid from the probe and hose, then Close the Probe Valve.
- 3 Push down the 'Chem Pump' switch to Off position.
- 4 Disconnect the Chemical Probe hose from the 1" Chemical Probe Inlet & replace the camlock plug.

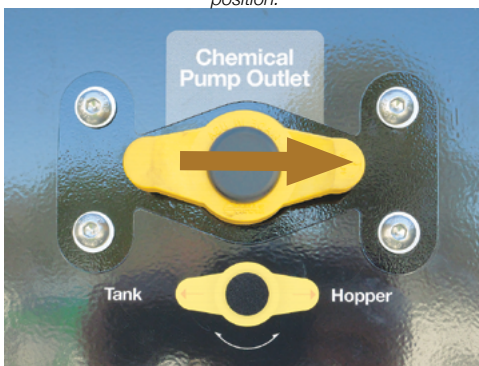


Connect a Micromatic suction hose to the Chemical Probe inlet.

B) To Add Liquid Chemical to Directly the Hopper Using the Micromatic Hose:

- 1 Connect a Micromatic hose to the 1" Probe inlet and the other end to the chemical source.
- 2 Rotate the 'Chemical Pump Outlet' valve to 'Hopper' position

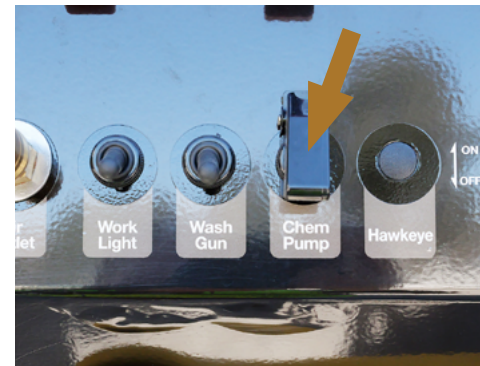
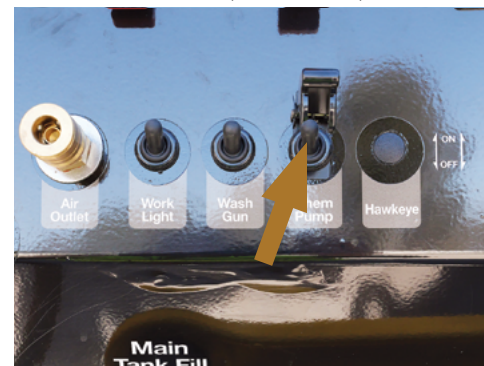
Rotate the 'Chemical Pump Outlet' valve to 'Hopper' position.



Rotate the 'Chemical Probe' valve to On position.

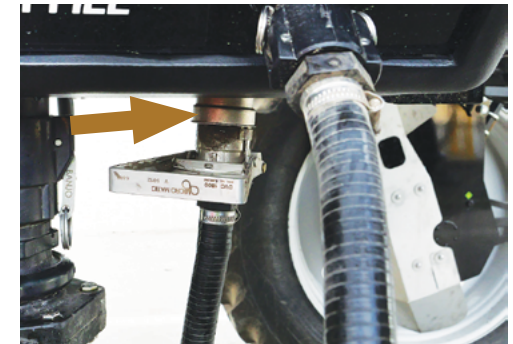
- 3 Rotate the 'Chemical Probe' valve to On position (shown above).
- 4 Lift up the 'Chem Pump' switch to On (shown below) to start the electrically operated chemical pump..
Chemical will begin transferring to the Chemical Induction Hopper.

Lift the 'Chem Pump' switch to On position.



Push down the 'Chem Pump' switch to Off position.

- 5 After the required amount of chemical has been transferred to the hopper, the Enviro coupler can be partially disconnected to allow air to suck into and clear the liquid from the Micromatic hose.
- 6 Push down the 'Chem Pump' switch to Off position to stop the pump.



Connect the Micromatic hose to the Crop Cruiser Micromatic rinse coupling outlet for rinsing.

To rinse the Micromatic Hose & Fittings:

- 1 Disconnect the Micromatic hose from its chemical source & connect it to a Micromatic coupling of the Crop Cruiser.
- 2 Rotate the 'Chemical Pump Outlet' valve to 'Hopper' or 'Tank' position.
- 3 Lift up the 'Chem Pump' switch to On.
Rinse will transfer to the Chemical Induction Hopper or Product Tank.
- 4 Disconnect the micromatic coupling from the Crop Cruiser to suck air & purge air from the hose.
- 5 Push down the 'Chem Pump' switch to Off position to stop the pump.
- 6 Disconnect the Micromatic hose from the rinse coupling and Probe inlet.
- 7 Disconnect the Chemical Probe hose from the 1" Chemical Probe Inlet & replace the camlock plug.

NOTE

Before disconnecting the filling hose from the Fill Inlet, it should be noted the Micromatic rinse outlet, Drum Rinse & Hopper Rinse nozzles require clean water for rinsing.
If required, keep the filling hose connected to the Fill inlet until completion of rinsing functions.

NOTE

Ensure chemicals added are consistent with the density factor used when filling the Cruiser.
Water weighs 1.0 kg per litre) and conversion factors must be used when spraying liquids heavier than water.



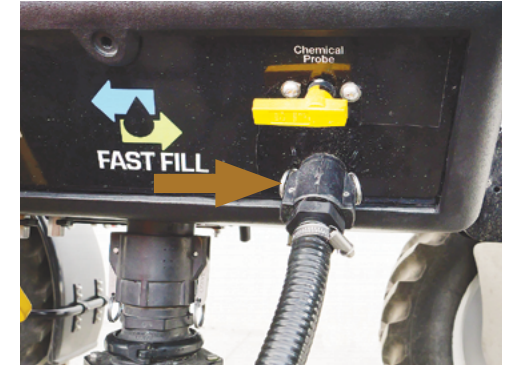
Connect a chemical probe suction hose to the Chemical Probe inlet.



Connect the chemical probe suction hose to the Chemical Probe inlet & rotate the 'Chemical Probe' valve to On.



Place the Chemical Probe into the chemical & open the Probe Valve to rinse the hoses.



Connect a Micromatic suction hose to the Chemical Probe inlet.

Adding Liquid Chemical Directly to the Product Tank

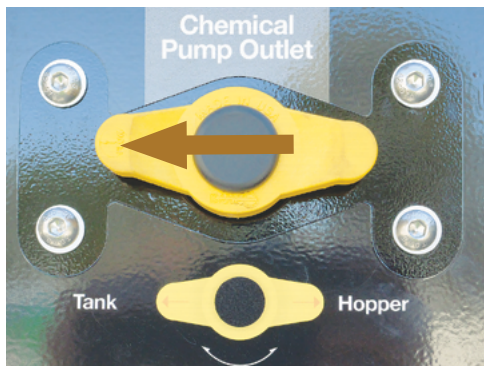
Liquid chemicals can be added directly to the Main Tank using the:

- Chemical Probe, or
- Micromatic Hose.

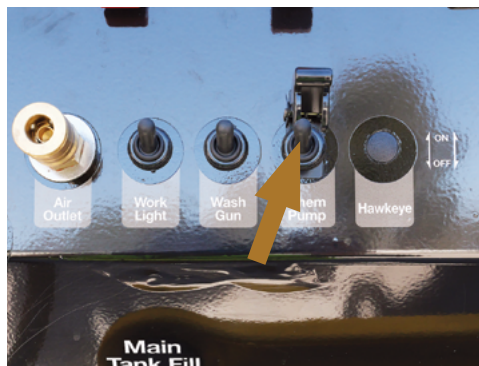
A) To Add Liquid Chemical Directly to the Product Tank using a Chemical Probe:

- Connect a Chemical Probe suction hose to the 1" Chemical Probe camlock inlet fitting (shown above).
- Rotate the 'Chemical Pump Outlet' valve to 'Hopper' position (shown below).

Rotate the 'Chemical Pump Outlet' valve to 'Tank' position.



Lift the 'Chem Pump' switch to On position.



The chemical will begin transferring to the Hopper.

- After the required amount of chemical is transferred to the hopper, pull the Probe out of the drum and allow the probe to suck air purging chemical out, then close the Probe Valve.
- Follow Rinse instructions for the Chemical Probe previously given in this chapter.

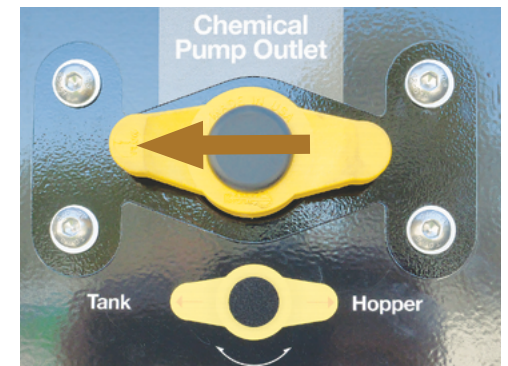
After the required amount of chemical has been transferred lift the probe to suck air, then close the Probe Valve.



B) To Add Liquid Chemical Directly to the Product Tank using a Micromatic Hose:

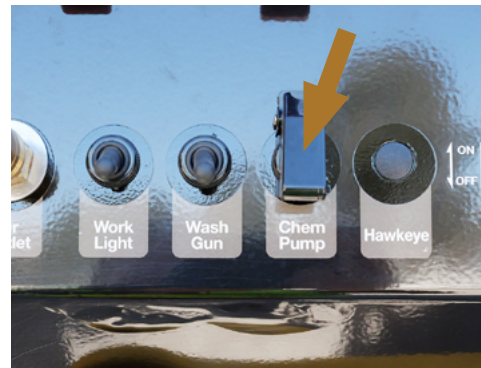
- Connect a Micromatic hose to the 1" Probe inlet and the other end to the chemical source.
- Rotate the 'Chemical Pump Outlet' valve to 'Hopper' position (shown below).

Rotate the 'Chemical Pump Outlet' valve to 'Tank' position.





Rotate the 'Chemical Probe' valve to On position.



Push down the 'Chem Pump' switch to Off position.



The Hopper Rinse Nozzle located under the hopper lid.



Open the hopper lid to access the Drum Rinse Nozzle.

- 3 Rotate the 'Chemical Probe' valve to On position (shown above).
- 4 Lift up the 'Chem Pump' switch to On (shown below) to start the electrically operated chemical pump.

Chemical will begin transferring to the Chemical Induction Hopper.

- 5 After the required amount of chemical has been transferred to the hopper, the Enviro coupler can be partially disconnected to allow air to suck into and clear the liquid from the Micromatic hose.
- 6 Push down the 'Chem Pump' switch to Off position to stop the pump.
- 7 Follow Rinse instructions for the Micromatic hose previously given in this chapter.

Hopper Rinse Functions

The Chemical Induction Hopper provides several rinsing functions:

- a) Drum Rinse Nozzle
- b) Hopper Rinse Nozzle
- a) Wash Down Gun

After rinsing, the Chemical Induction Hopper can be emptied by:

- Transferring contents to the Product Tank (see previous instruction) or
- Emptying the Hopper via the Bottom Drain valve.

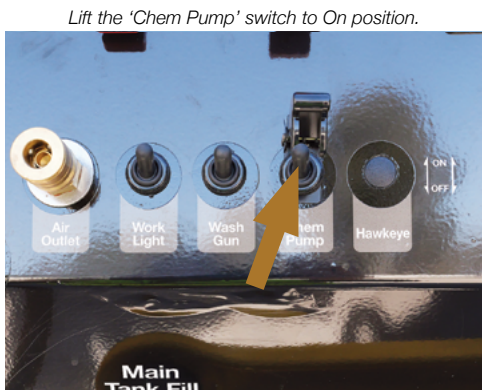
The Wash Down Handgun on the outside of the hopper.



a) To Use the Drum Rinse Nozzle:

- 1 Connect a 3" suction hose (not supplied) to the 3" 'Main Tank Fill' camlock coupling with the other end of the hose connected to a clean water source.
- 2 Open the 'Main Tank Fill' ball valve(s) by moving the handle(s) down.
- 3 Check the 'Hopper Rinse' valve on the top of the hopper is Closed.
- 4 Undo the latch & open the Hopper lid to access the Drum Rinse Nozzle..
- 5 Turn the 'Spray/Bypass/Hopper' valve to Hopper position

Turn the 'Spray/Bypass/Hopper' valve to Hopper position.



Lift the 'Chem Pump' switch to On position.

NOTE

Before disconnecting the filling hose from the Fill Inlet, it should be noted the Micromatic rinse outlet, Drum Rinse & Hopper Rinse nozzles require clean water for rinsing.

If required, keep the filling hose connected to the Fill inlet until completion of rinsing functions.

NOTE

Ensure chemicals added are consistent with the density factor used when filling the Cruiser.

Water weighs 1.0 kg per litre) and conversion factors must be used when spraying liquids heavier than water.

Ready to Spray – Operation



First, press-in the 'Fill Main Tank' switch to open the valve, then press-in the 'Fill Pump' switch to start filling the tank.

- 6 With the Crop Cruiser engine running at low idle, press the 'Fill Main Tank' switch IN to open the valve to the Product Tank.
- 7 Press-in the 'Fill Pump' switch to start the Fill pump.

The Crop Cruiser engine RPM will automatically raise if enabled in the G-Hub Controller settings.

The Fill speed can be reduced (if required) by holding the 'Fill Main Tank' switch IN for 2 seconds to engage the Slow Fill function & Automatic Shut-off - if more time is required.

If filling the Main Product tank at the same time and more pressure is required at the drum rinse, press & hold the Fill Product push button for 2 seconds.

NOTE

After adding chemical to the Product Tank, ensure both Pump Product and Agitation are On to keep the chemical evenly mixed in the tank ready for spraying.



Press the drum down on the Drum Rinse Nozzle to engage the rinsing function.

- 6 Place the opening of the chemical drum over & onto the Drum Rinse Nozzle inside the hopper.
- 7 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.
- 9 Press-in the 'Fill Pump' switch to stop the Fill pump.
- 10 Empty the Hopper rinse by emptying the Hopper to the Product Tank or draining the Hopper via the Bottom Drain valve.

Press-in the 'Fill Pump' switch to stop the Fill pump..



Close & lock down the hopper lid.

b) To Rinse the Chemical Induction Hopper

- 1 Connect a 3" suction hose (not supplied) to the 'Clean Fill' camlock coupling with the other end connected to a clean water source.
- 2 Open the 'Clean Fill' ball valve by moving the handle down.
- 3 Close & lock down the Hopper lid.
- 4 Turn the 'Spray/Bypass/Hopper' valve to Hopper position
- 5 Press the 'Fill Pump' switch IN to start the Fill pump.

Turn the 'Spray/Bypass/Hopper' valve to Hopper position.

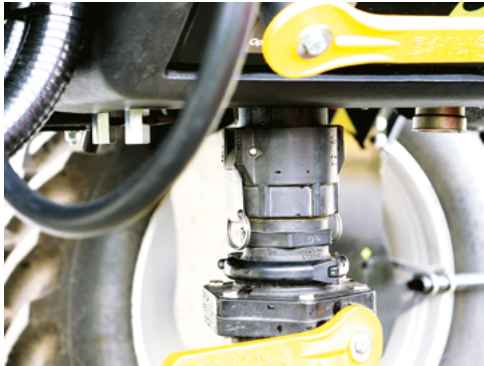


Open the Rinse Valve on top of the hopper lid.

- 6 Open the Rinse Valve on the top of the hopper.
- 7 Empty the rinse liquid from the hopper by:
 - Transferring contents of the Hopper to the Product Tank, or
 - Emptying the Hopper via the Bottom Drain valve.
- 8 Once the Hopper tank is clean, press the 'Fill Pump' switch IN to stop the Fill pump.
- 9 Close the Rinse Valve on the top of the hopper.

Close the Rinse Valve on top of the hopper lid.





Close the 'Fill' ball valves (Crop Cruiser inlet valve & Suction hose valve) before disconnecting the suction hose.

- 10 When all rinse functions are completed, close the 'Fill' ball valves (both Crop Cruiser inlet valve & Suction hose valve) and disconnect the suction hose from the camlock coupling.



Lift & remove the Wash Down Handgun from its holder on the side of the hopper.

c) To Use the Wash Down Gun

The Wash Down Gun is provided to assist rinsing & cleaning of the hopper and other items.

Clean water is supplied to the gun by a 12V electric pump which draws water from the rinse tank.

To use the Wash Down Gun:

- 1 Lift & remove the Wash Down Gun from its holder on the side of the hopper.
- 2 Check the hose is not kinked or pinched.



Lift up the 'Wash Gun' toggle switch On to start the pump.

- 3 Lift up the 'Wash Gun' toggle switch On to start the pump.
- 4 Point the Wash Down Gun towards the hopper area to be rinsed/cleaned, then squeeze the gun trigger to spray & wash.
- 5 Release the gun trigger to stop spraying.
- 6 On completion, press down 'Wash Gun' toggle switch Off to stop the pump.
- 7 Return the gun to its holder on the side of the hopper.



Lift-up to Close the foot operated ball valve at the bottom of the hopper.

To Empty the Hopper via the Bottom Drain Valve:

- 1 Lift up the foot operated ball valve at the bottom of the hopper to close the valve.
- 2 Remove the camlock coupling plug & Open the Bottom Drain valve.
This will drain the Hopper tank & hoses.
- 3 On completion Close the Bottom Drain valve.
- 4 Refit the camlock coupling plug.

NOTE

Before disconnecting the filling hose from the Fill Inlet, it should be noted the Micromatic rinse outlet, Drum Rinse & Hopper Rinse nozzles require clean water for rinsing. If required, keep the filling hose connected to the Fill inlet until completion of rinsing functions.

CAUTION

Wash the spray gun with clean water, not rinsate. Be mindful of where rinsate is deposited as it may contain chemical residue.

NOTE

Ensure the Rinse tank has a sufficient quantity of fresh water before using the wash down gun.

Point the Wash Down Gun & squeeze the trigger to spray.



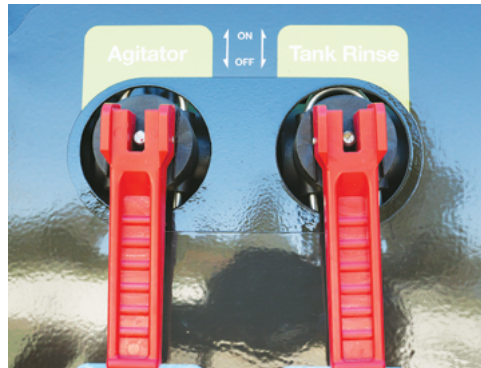
Remove the camlock coupling plug & Open the Bottom Drain valve.



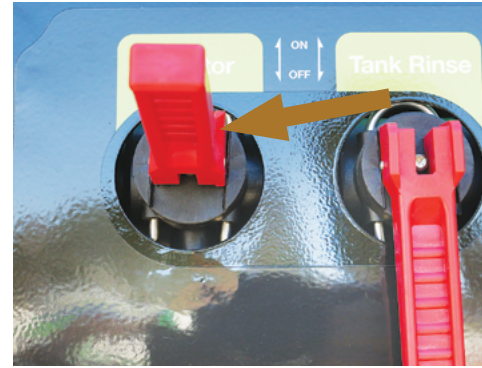
Ready to Spray – Operation



Lift & push the hopper up into its transport position.



Agitator & Tank Rinse valves in Off position.



Lift the lever of the Agitator valve to On position.



G4 Crop Cruiser with 36m boom.

To Raise the Chemical Induction Hopper into Transport Position

- 1 Check the hopper lid is closed and latched.
- 2 Lift and push the hopper up until it latches into its transport position.
- 3 Refit the locking pin to lock-in the hopper lifting arm and refit the safety clip.

Product Tank Agitation

Product agitation can be controlled manually or automatically through the G-Hub system.

For example, the agitator can be set for the centre high pressure jet to automatically switch off below certain tank level to reduce chances of foaming with less water.

Check the agitator for efficiency because agitator nozzles can block. Refer Chapter 8 'Lubrication & Maintenance' for details.

To Agitate While Stationary:

- 1 Ensure a minimum volume of 500 litres of clean water is in the Product Tank
- 2 Add all chemicals. See instructions - 'Filling the Sprayer' & 'Adding Chemicals to the Product Tank'.
- 3 Add remaining water as required.
- 4 Lift the lever of the 'Agitator' valve to On.
- 5 Rotate the 'Spray/Bypass/Hopper' valve to 'Bypass' position
- 4 Press-in the 'Pump Product' switch (On) to activate the spray pump & product tank agitation.

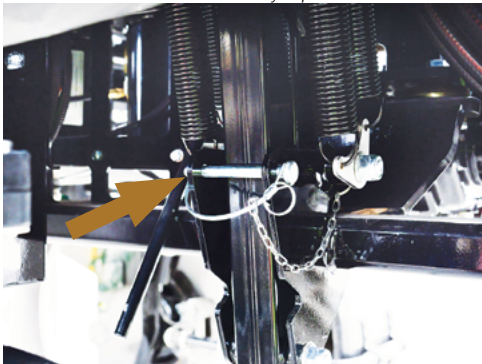
Rotate the 'Spray/Bypass/Hopper' valve to 'Bypass'

Spraying Application

After completion of filling, the Crop Cruiser is ready for spraying.

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

Refit the locking pin to lock-in the hopper lifting arm and refit the safety clip.



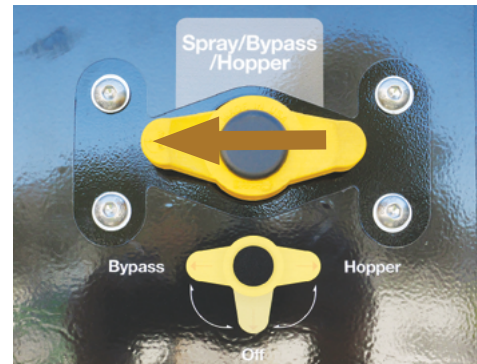
NOTE

After adding chemical to the Product Tank, ensure both Pump Product and Agitation are On to keep the chemical evenly mixed in the tank ready for spraying.

NOTE

If a tank has been filled & spray mixture has settled, agitate for as long as it takes to pump the total quantity of water in the tank to remix the chemicals.

For example: For a tank with 6000 litres using a 250 L/min pump, agitate for $6000 \div 250 = 15$ minutes



Press-in the 'Pump Product' switch to start pumping product & agitate the spray mixture in the Product tank.





Home screen of the Spray Rate Controller & Raven Control Module (RCM).

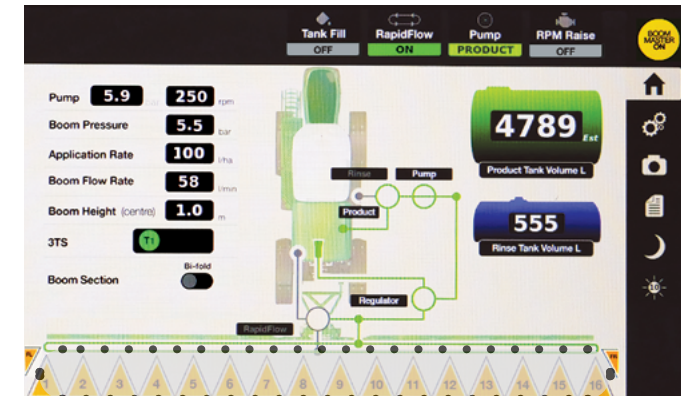
To Commence Spraying:

- 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 (for instructions).
- 3 Switch On the Raven Control Module (RCM), the Spray Rate Controller.
- 4 Check to ensure correct application rates have been entered.
- 4 Set the RapidFlow touch button to PRIME from the drop down selection to prime the boom lines.
- 5 When priming is completed, commence travelling on the spray swath.



G-Hub Home screen with RapidFlow PRIME completed & the Master Switch On for spraying (Fenceline nozzles Off).

- 6 Press the 'Master Switch' touch button of the Joystick On to commence spraying.
The Raven Control Module (RCM) now controls the spraying application rate according to the preset values entered by the operator.
Home Screen plumbing lines change from Grey to Green colour as spraying functions are engaged.
- 7 If fitted & configured, engage the GPS task controller to automatically cycle boom sections On & Off as required to avoid any overlapping of sprayed areas.
- 8 Screen touch buttons (1 to 16) can be used to manually switch boom sections On & Off.



'Boom Screen touch buttons' can be used to manually switch individual boom sections Off (Amber) or On (Green).

- 9 Fenceline nozzles can be switched On & Off as required by using the 'Fenceline' push button on the Joystick (Boom sections 1 & 16 must be On for fenceline nozzles to operate):
 - Press the 'L' end of the 'Fence Nozzle' push button to switch On the left boom tip Fenceline nozzle.
When activated, a red LED on the boom tip is illuminated.
To switch Off the fence line nozzle, press the push button.
 - Press the 'R' end of the 'Fence Nozzle' push button to switch On the right boom tip Fenceline nozzle.
When activated, a red LED on the boom tip is illuminated.
To switch Off the fence line nozzle, press the push button.

The Fenceline nozzle screen indicators show Green while On & Amber while Off.

DANGER

Always check for power lines while folding and unfolding the boom, as getting too close or any contact with power lines can be fatal.

CAUTION

Always ensure the sprayer is properly calibrated & tested before beginning to spray (refer to chapter 5, "Calibration - Checking your Application Rates"). Failure to properly calibrate and test chemical mixtures & nozzles may result in undesirable and damaging outcomes.

NOTE

The information above 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.

Ready to Spray – Operation



Press the 'Boom Master On/Off' push button on the Joystick to stop spraying.



Operating G4 Crop Cruiser with 36m boom.

10 As the Product Tank gets closer to minimum tank level (300 litres), it may be necessary to switch Off the Agitator to reduce foaming.

11 When the Product Tank is empty:

- Press the 'Boom Master On/Off' push button Off (using the Joystick to stop spraying)
- Stop the Agitator
- Stop the Pump, and
- Return to water source to refill (refer to 'Filling the Sprayer' & 'Adding Chemicals to the Product Tank'.

12 On completion of spraying at:

- End of the day
- End of a product or
- End of season,

follow the appropriate rinsing instructions to ensure all plumbing is flushed & completely clean.

Rinsing the Sprayer After Spraying

Never leave chemical or contaminated liquid within the Crop Cruiser's spraying system. After spraying the spraying system must be rinsed clean. Three modes of rinsing provided:

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

NOTE

The operator must wear the operator safety belt at all times when seated in the cabin or when the machine is in motion.

CAUTION

Do not run a centrifugal pump dry as damage will occur to the pump.

CAUTION

It is the responsibility of the operator to ensure the sprayer is fully rinsed and decontaminated whenever changing chemicals or storing the sprayer on completion of operation.

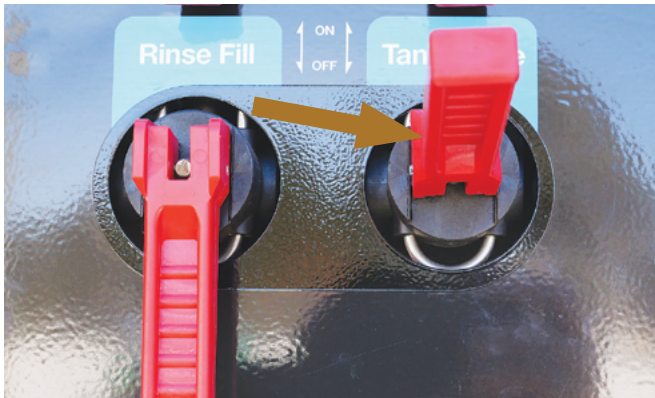
Failure to follow instructions provided and fully decontaminate the sprayer may result in crop damage and/or personal injury.

CAUTION

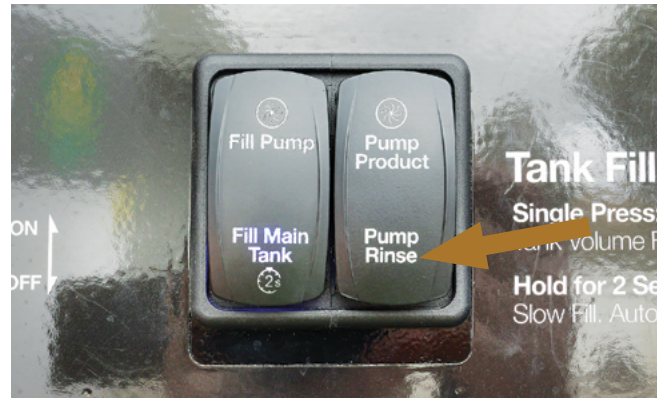
When rinsing is taking place, the rinsate is potentially very hazardous depending on chemical content.

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.



Lift the lever of the 'Tank Rinse' valve to On position.



Press-in the 'Pump Rinse' switch to start pumping from the Rinse Tank.



Press the 'Master Switch' push button 'On' to begin rinsing the boom nozzles.

Quick Rinse or Boom Rinse

Boom Rinse is recommend for use only at end of the day or for short operational breaks when it is intended to continue using the same chemicals.

Quick Rinse is operated from the Quick Filling Pod and draws clean water from the Rinse Tank.

Quick Rinse requires the Rinse Tank to be full prior to starting the Quick Rinse (refer to 'Tank Filling' instructions earlier in this chapter).

It is recommended that the Crop Cruiser be safely parked in an appropriate area with the engine running.

To Quick Rinse the Boom:

- 1 Lift the lever of the 'Tank Rinse' valve to On position (*shown above left*).
- 2 Press-in the 'Pump Rinse' switch to start pumping clean water from the Rinse Tank (*shown above*).
- 3 Display the External 'Clean' Screen, then press the 'RapidFlow' push button 'On' (*shown below*). Clean water now flows from the Rinse tank through the boom pipes into the Product tank.

If you wish to stop 'RapidFlow', press push button again. The same applies to each External Screen push button.

Press the 'Rapid Flow' push button to begin rinsing the boom pipes.



Press the 'Left & Right' Fence Line push buttons 'ON' to begin rinsing the Fence line nozzles.

CAUTION

It is important not to close the 'Main Tank Fill' valve while the pump is running. Running the pump with a closed suction inlet may damage the pump.



Located under the product tank, open the 'Product Tank Drain Valve' by moving the handle down. Close the valve by moving the handle to horizontal (as shown).

Basic Rinse

Basic Rinse is necessary at end of the day or when intending later to continue operating with the same chemicals.

Basic Rinsing requires clean water to be drawn from an external source using the Fill Pump & 3" 'Main Tank Fill' inlet. The procedure requires a minimum of 200 litres of clean water in the Product Tank and the Rinse Tank must be filled before proceeding.

To Basic Rinse the Spray System:

- 1 Safely park the Crop Cruiser & unfold the boom.
- 2 Quick rinse the boom and nozzles following the instructions on the previous page, then Open the Product Tank drain valve (shown above) by turning-down the yellow drain ball valve handle to completely drain the tank.
Close the valve when the tank is empty.

CAUTION

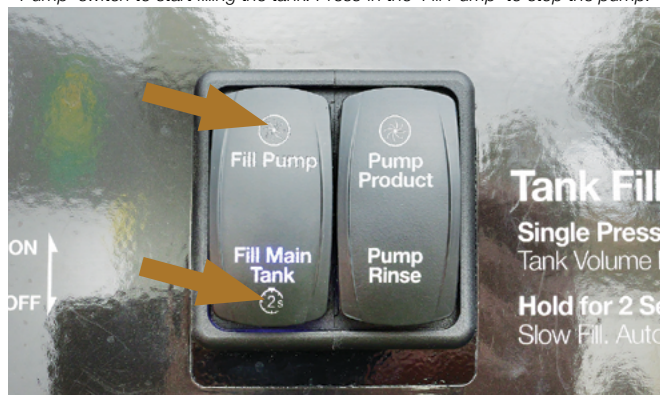
It is important not to close 'Main Tank Fill' valves while the pump is running. Running the pump with a closed suction inlet may damage the pump.



Connect a 3" suction hose to the 'Main Tank Fill', then open the ball valve(s) by moving the handle(s) down.

- 3 Connect a 3" suction hose (not supplied) to the 3" 'Main Tank Fill' inlet with the other end of the hose connected to a clean water source (refer to 'Tank Filling' instructions in this chapter).
- 4 Open the 'Main Tank Fill' ball valve(s) by moving the handle(s) down.
- 5 With the Crop Cruiser engine running at low idle, press-in the 'Fill Main Tank' switch to open the valve to the Product Tank (shown below).
- 6 Press-in the 'Fill Pump' switch to start pumping clean water into the Product Tank (shown below).

First, press-in the 'Fill Main Tank' switch to open the valve, then press-in the 'Fill Pump' switch to start filling the tank. Press-in the 'Fill Pump' to stop the pump.

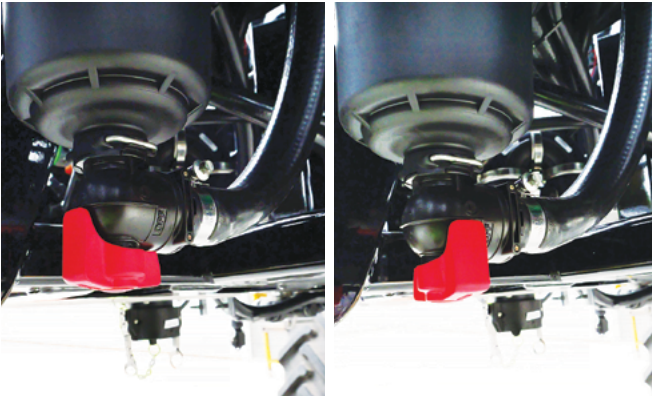


Open the External Screen cover & press 'Screen Change' arrow touch buttons to display the 'Clean' screen.

- 7 Fill the Product Tank with about 200 litres of clean water (refer to 'Tank Filling' instructions in this chapter).
- 8 Fill the Rinse Tank full of clean water (refer to 'Tank Filling' instructions in this chapter).
- 9 On completion of filling clean water to the Product and Rinse tanks, press-in the 'Fill Pump' switch to stop the pump.
- 10 Open the External Screen cover & press the 'Screen Change' push buttons to display the 'Clean' screen (shown above).
- 11 Press-in the 'Pump Product' switch to start pumping from the Product tank (shown below).

Press-in the 'Pump Product' switch to pump liquid from the Product tank. On completion, press-in the 'Pump Product' to stop the pump.





Open the pressure filter valve (above left) for enough time to rinse the filter, then Close the valve.

12 Proceed to rinse each item shown on the Clean Screen:

- **Pressure Filter**

With the Product Pump running, Open & Close the valve at the base of the pressure filter allowing enough time to rinse the filter.

- **Rapid Flow**

Press the 'RapidFlow' push button 'On' (shown below). Clean water now flows from the Product tank through the boom pipes & back into the Product tank.

To stop 'RapidFlow', press the push button again. The same applies to each External Screen push button.

Press the 'Rapid Flow' push button On (illuminates green when On) to rinse the boom pipes.



Rotate the 'Spray/Bypass/Hopper' valve to 'Bypass (Spray)' position for rinsing boom, tank and pump functions.

- **Bypass Valve**

(a) With the Product Pump running, rotate the 'Spray/Bypass/Hopper' valve to the 'Bypass' for rinsing pump, lines, boom & tank functions.

(b) With the Product Pump running, rotate the 'Spray/Bypass/Hopper' valve to the 'Hopper' for rinsing the hopper, hoses, mixing & transfer functions and to use the spray gun for cleaning.

Refer to previous instructions provided in this chapter for 'Hopper Rinse Functions'.

Rotate the 'Spray/Bypass/Hopper' valve to 'Hopper' position for rinsing the hopper, hoses, mixing & transfer functions and to use the spray gun for cleaning.



Raise the Agitator valve handle to 'On' position to rinse the tank agitator, then lower it to 'Off' position after rinsing.

- **Agitator**

With the Product Pump running, raise the 'Agitator' valve handle to 'On' position (shown above) to rinse the tank agitator. Close the valve after rinsing.

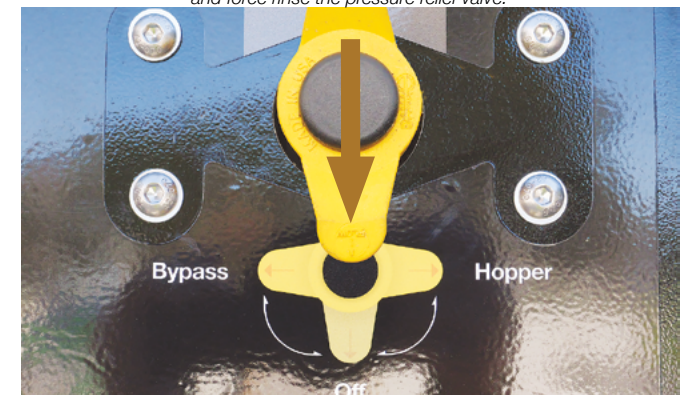
- **Deadhead Pump (Diaphragm pumps only)**

With the Product Pump running, rotate the 'Spray/Bypass/Hopper' valve to 'Off' (shown below) to deadhead the pump to force rinse through the bypass valve.

Rotate the valve back to 'Bypass' position after rinsing.

Do not attempt this with a centrifugal pump as no bypass valve is fitted & it may cause pump damage.

Rotate the 'Spray/Bypass/Hopper' valve to 'Off' position to deadhead the pump and force rinse the pressure relief valve.



Ready to Spray – Operation



Lower the Hopper & open its lid, then rinse all every part of the hopper and its functions. Refer to operating instruction provided earlier in this chapter.

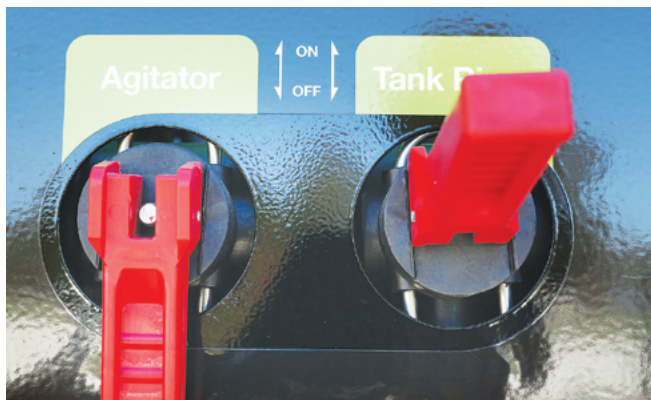
- **Hopper**

With the Hopper lowered into position and the Product Pump running, rotate the 'Spray/Bypass/Hopper' valve to the 'Hopper' and rinse all the input hoses, hopper, mixing & transfer functions.

Refer to the operating instructions for the Hopper provided earlier in this chapter.

Use the washdown spray gun for cleaning where necessary.

Rotate the 'Spray/Bypass/Hopper' valve to 'Hopper' position for rinsing the hopper, hoses, mixing & transfer functions and to use the spray gun for cleaning.



Raise the 'Tank Rinse' valve handle to 'On' position to rinse the Product tank. Lower it to 'Off' position after rinsing.

- **Main Tank Fill Lines**

Main Tank Fill Lines are rinsed while filling the Product tank with fresh water.

- **Chemical Fill Pump Lines (Option)**

If this option is fitted, rinse the lines following the instructions provided.

Refer to instructions provided earlier in this chapter "To Rinse the Micromatic Hose & Fittings" and "To Rinse the Chemical Probe and Hose".

- **Tank Rinse From Pump**

With the Product Pump running, raise the 'Tank Rinse' valve handle to 'On' position (shown above) to rinse the Product tank. Close the valve after rinsing.

NOTE

The 'Tank Rinse' function may be used to reduce foaming in the Product tank while operating - especially when tank volume is low and an agitated mixture is inclined to foaming.



Press-in the 'Pump Rinse' switch to pump fresh water from the Rinse tank. On completion, press-in the 'Pump Rinse' to stop the pump

- **Tank Rinse From Fill**

Tank Rinse From Fill pump fresh water from the Rinse Tank to rinse the Product tank.

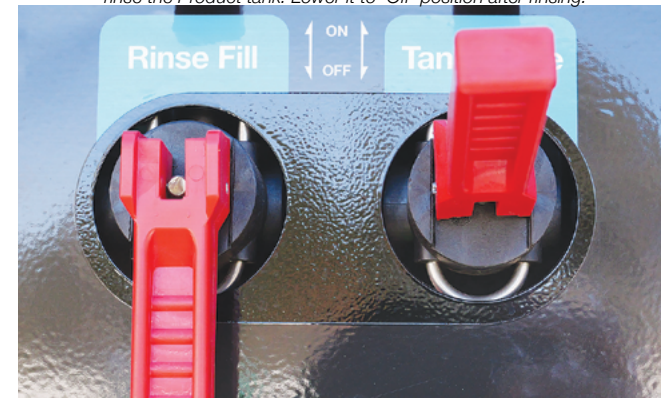
To Tank Rinse from Fill:

(a) Press-in the "Pump Rinse" switch to begin pumping fresh water from the Rinse tank.

(b) Raise the 'Tank Rinse' valve handle to On position to rinse the Product tank.

On rinse completion, switch Off the 'Pump Rinse' and close the 'Tank Rinse' valve.

With Pump Rinse activated, raise the 'Tank Rinse' valve handle to 'On' position to rinse the Product tank. Lower it to 'Off' position after rinsing.





Press the 'Main Tank Drain' push button 'ON' to rinse the small section of suction line. Press the push button again to stop rinsing.

• Main Tank Suction Line

Two small sections of suction line remain unrinsed.

To rinse the small sections of suction line (with the Product pump operating):

(a) Press the 'Main Tank Drain' push button of the External Clean Screen 'On' to rinse the short section of Product tank suction hose.

(b) Press the 'Rinse Tank Drain' push button of the External Clean Screen 'On' to rinse the short section Rinse tank to Product tank suction hose.

On completion, press the push buttons to stop rinsing.

Press the 'Rinse Tank Drain' push button 'ON' to rinse the small section of suction line. Press the push button again to stop rinsing.



Press the 'Boom Master', 'Left Fence Line' & 'Right Fence Line' push buttons 'ON' to rinse the Fenceline Jets. Press the push buttons again to stop rinsing.

• Fenceline Jets

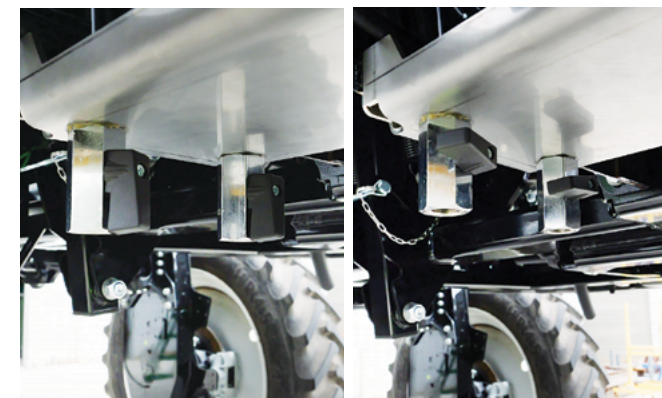
To rinse Fenceline Jets:

(a) With the Product pump operating, press the 'RapidFlow' push button 'On' (shown below). Clean water now flows from the Product tank through the boom pipes & back to the Product tank.

(b) Press the 'Master Switch' push button of the External Clean Screen 'On' to rinse the boom nozzles. 'RapidFlow' stops when the Master Switch is engaged.

(c) With the 'Master Switch' On, press the 'Left & Right Fenceline' push buttons 'On' to rinse the fenceline nozzles.

On completion of rinsing the Fenceline Jets, press the push buttons again to stop rinsing.



Open the 'Drain Gauge' valves (cabin gauge front) (pod gauge rear) to rinse the gauge pressure lines of chemical. Close both valves after rinsing.

• Drain Gauge Pressure Lines

With the Product pump operating, open the 'Drain Gauge' valves (cabin gauge front & pod gauge rear) to rinse the gauge lines of chemical (shown above - cabin gauge [front] & pod gauge [rear]).

Close both drain gauge valves after rinsing, then press-in the 'Pump Product' switch to stop the pump.

• Main Tank Suction Filter

With the Product pump Off:

(a) Open the Product Tank drain valve & completely drain the tank. Close the valve when empty.

Open the Product Tank drain valve by rotating down the yellow handle down & completely drain the tank. Close the drain valve when emptied.



⚠ CAUTION

It is the responsibility of the operator to ensure the sprayer is fully rinsed and decontaminated whenever changing chemicals or storing the sprayer on completion of operation.

Failure to follow instructions provided and fully decontaminate the sprayer may result in crop damage and/or personal injury.

Ready to Spray – Operation



Press the 'Main Tank Drain' push button 'ON' to rinse the small section of suction line. Press the push button again to stop rinsing.

- (b) Press the 'Main Tank Drain' push button of the External Clean Screen 'On' to open the valve to allow liquid to drain.
 - (c) Open the 'Suction Filter' drain valve (shown below) and allow remaining liquid (from Product tank to Suction filter) to drain out.
- On completion, press the 'Main Tank Drain' push button to close the valve & close the Suction Filter drain valve.

- 13 Clean both suction & pressure filters (refer to filter cleaning instructions in this chapter).
- 14 Store & shut-down the Crop Cruiser as required.

Open the Suction Filter drain valve and allow remaining liquid (from Product Tank to Suction Filter) to drain out.



Connect a 3" suction hose to the 'Main Tank Fill', then open the ball valve(s) by moving the handle(s) down.

Total Rinse & Decontamination

Total Rinse & Decontamination of the Crop Cruiser's spraying system is important whenever changing chemical applications and/or at the end of a spraying application.

Total Rinse & Decontamination draws clean water from an external source using the Fill Pump & 3" clean water inlet and uses an appropriate cleaner/decontaminant to clean & neutralise any chemicals within the spraying system.

The procedure requires a minimum of 1000 litres of clean water in the Product Tank and the Rinse Tank must be filled before proceeding.

It is recommended each rinse function listed on the External 'Clean' screen is undertaken, then followed by a clean water flush of the complete spraying system.

CAUTION

It is the responsibility of the operator to ensure the sprayer is fully rinsed and decontaminated whenever changing chemicals or storing the sprayer on completion of operation.

Failure to follow instructions provided and fully decontaminate the sprayer may result in crop damage and/or personal injury.



First, press-in the 'Fill Main Tank' switch to open the valve, then press-in the 'Fill Pump' switch to start filling the tank.

To Totally Rinse & Decontaminate the Spray System:

- 1 Safely park the Crop Cruiser & unfold the boom.
- 2 Open the Product Tank drain valve (located under the tank) by rotating the yellow handle down and completely drain the tank. Close the valve when empty (shown below left).
- 3 Connect a 3" suction hose (not supplied) to the 3" 'Main Tank Fill' inlet with the other end of the hose connected to a clean water source (refer to 'Tank Filling' instructions in this chapter).
- 4 Open the 'Main Tank Fill' ball valve(s) by moving the handle(s) down (shown above left).
- 5 With the Crop Cruiser engine running at low idle, press-in the 'Fill Main Tank' switch to open the valve to the Product Tank (shown above).
- 6 Press-in the 'Fill Pump' switch to start pumping clean water into the Product Tank (shown above).

NOTE

Dispose of chemical & pesticide waste safely.

If possible, reuse the rinsate when preparing the next batch of tank mixture. Make sure all the dirt and debris in the rinsate are filtered out before adding the rinsate to a spray tank. Small amounts of solids left should be dried, then taken to a hazardous waste disposal site or pesticide collection location.



Lower the Chemical Induction Hopper keeping the hopper lid closed.

- 7 Fill the Product Tank with at least 1000 litres of clean water (refer to 'Tank Filling' instructions in this chapter).
- 8 Fill the Rinse Tank full of clean water (refer to 'Tank Filling' instructions in this chapter).
- 9 Press-in the 'Fill Pump' switch to stop pumping clean water into the Product Tank (*shown above left*).
- 10 Lower the Chemical Induction Hopper keeping the hopper lid closed.
- 11 Complete all steps 10 to 19 for 'Basic Rinse' (given earlier in this chapter) to completely rinse the sprayer.
- 12 Add an appropriate chemical decontaminant to the product tank using the Chemical Induction Hopper.
Refer to instructions for the 'Chemical Induction Hopper' provided earlier in this chapter.
- 13 Complete all steps 10 to 19 for 'Basic Rinse' (given earlier in this chapter) to completely decontaminate the sprayer.

CAUTION

The chemicals & rinsate are potentially very hazardous depending on chemical contents. Use recommended personal protective equipment (PPE).
For information specific to your circumstances, the spraying equipment being used and the chemicals being applied, consult your agronomist or chemical supplier.



Open the Product Tank drain valve by rotating down the yellow handle down & completely drain the tank. Close the drain valve when emptied.

- 14 After decontamination is completed, open the Product Tank drain valve & completely drain the tank.
Close the drain valve when empty and proceed to the flushing the system with fresh water.

To Flush the Spray System with Clean Water

Repeat the Basic Rinse process to flush the Spray System with clean water to remove any Rinsate and cleaners.

It is recommended to remove and clean the pressure filter and suction filter after total cleaning & decontamination and the clean water flushing has been completed.

NOTE

It is recommended to remove & clean the Pressure Filter after Quick Rinse, Basic Rinse and Total Rinse & Decontamination procedures are completed.

CAUTION

If operating with Centrifugal spray pump, running the centrifugal spray pump dry will damage it.
The pressure filter must be fully assembled with the red drain valve open before operating the pump to avoid damage.



First remove the red valve at the base of the Pressure Filter, then unscrew the filter collar & remove the filter element for cleaning. After cleaning refit all components.

Pressure Filter Removal & Cleaning

It is recommended to remove & clean the Pressure Filter regularly - before each tank fill.

Frequency of cleaning will depend on the quality of water and chemicals used.

The Pressure Filter receives liquid from either the Product Tank or the Rinse Tank via the Product pump.

To Remove & Clean the Pressure Filter:

- 1 Ensure 'Pump Product & Pump Rinse' switches are Off.
- 2 Remove the red valve at the base of the filter. Be aware some residual chemical may dribble out.
- 3 Loosen the filter bowl nut slowly using the filter spanner supplied, then fully unscrew the filter bowl nut and remove the filter bowl, then filter screen.
Be careful of any chemical and avoid any damage to the O-Rings.
- 4 Clean the filter screen and O-rings, then refit all components making sure the filter bowl & O-rings are correctly placed.
Fully tighten the filter bowl nut, then refit the red valve to the base of the filter. Ensure the red valve (tap) is closed.



Open the drain valve to drain the Suction Filter.



Remove the Suction Filter screen.



G4 Crop Cruiser with 36m boom.

Suction Filter Removal & Cleaning

It is recommended to remove & clean the Suction Filter regularly - before each tank fill. Frequency of cleaning will depend on the quality of water and chemicals used

The Suction Filter receives liquid from either the Product Tank, or the Rinse Tank. All liquid to be sprayed or flushed through the system passes through this filter.

Fluid supply to the suction filter is controlled by an electronically operated valve. The valve operation is controlled by the presets in the G-Hub controller (refer to Chapter 4).

To Remove & Clean the Suction Filter:

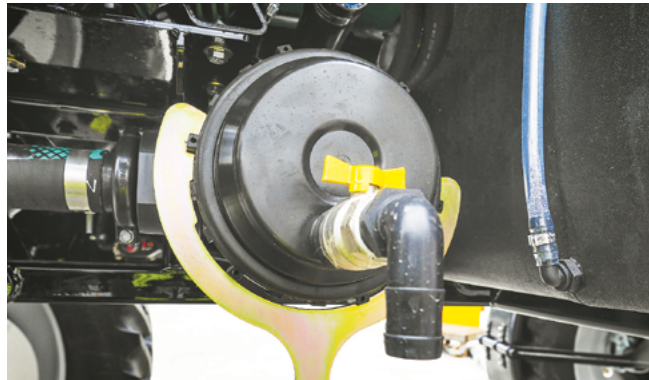
- 1 Ensure 'Pump Product & Pump Rinse switches are Off
- 2 Open the drain valve on the filter & allow the filter to drain fully.
Be sure to collect any hazardous chemical and wear appropriate PPE.
- 3 Close the drain and loosen the filter bowl collar slowly using the spanner provided. Be aware some residual chemical may dribble out.

- 4 After liquid stops flowing from the filter, fully unscrew the filter bowl collar and remove the filter bowl.
Be careful not to damage the O-Rings.
- 5 After removing the filter bowl, carefully remove the filter screen, then clean the filter bowl, body, screen & O-rings.
- 6 After cleaning, refit the components making sure the filter bowl & O-rings are correctly placed.
- 7 Fully tighten the filter bowl collar & close the drain valve.

Unscrew the filter bowl collar to remove the filter bowl.



Fully tighten the filter bowl collar & close the drain valve.



CAUTION

When rinsing is taking place, 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.



Ensure the Crop Cruiser is properly cleaned and stored at the end of day & end of season.



Height adjustable Towbar.

End of Day

At the end of each spraying day, follow the instructions for Basic Rinsing or Total Rinse & Decontamination.

CAUTION

If icing occurs, it is important to ensure any ice has thawed before using the Crop Cruiser.
Failure to thaw ice prior to use will cause damage to the machine.

CAUTION

All chemicals have corrosive properties to some degree. Prevent damage to the machine by always consulting the chemical MSDS or the chemical supplier for advice concerning the corrosive properties of the chemical.
It is the responsibility of the operator to carry out preventative and ongoing maintenance to the machine, particularly while applying chemicals with highly corrosive properties.

CAUTION

Machine components should be coated with a suitable protectant during storage, then washed down, thoroughly, before use.
Consult the supplier of protectants, if you require specific advice about the effectiveness of any particular protectant to prevent premature degradation of machine components.

End of Season

If the Crop Cruiser is to be stored for a long period of time without use, several procedures must be performed.

- 1 Follow the instructions for Total Rinse & Decontamination.
- 2 Thoroughly examine the Crop Cruiser to determine if there is any damage and repair if required.
- 3 Park the Crop Cruiser where it will not be affected by frosts, and preferably out of direct sunlight.
- 4 Ensure all spray tanks are empty.
- 5 If necessary, remove consoles from cabin and store them in a safe & secure location.

NOTE

Store the machine in a suitable location to prevent freezing. If the machine is to be left where freezing may occur, cover the pump & flow meter with a material bag, empty the pump & flow meter of all water (run pump (diaphragm only) dry for 15-20 seconds).
It is recommended a small quantity of anti freeze be added to the main tank and circulated through the machine to minimise the chance of freezing.

Towbar

The Crop Cruiser is fitted with an height adjustable Towbar.

When using the Towbar, ensure the towbar load & speed limits are adhered to at all times:

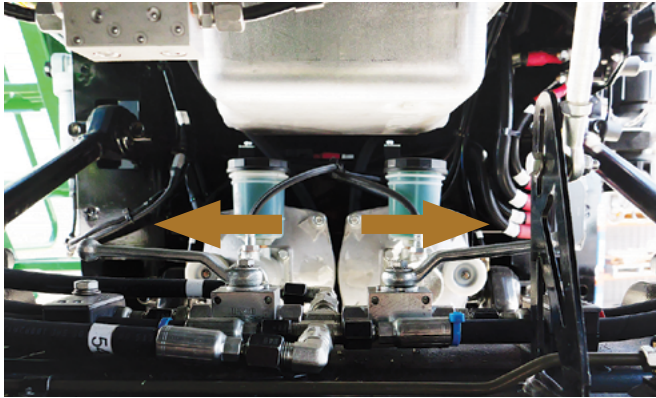
- Maximum vertical load on the towbar is 100kg
- Maximum towing load (unbraked) is 750kg
- Maximum towing load (braked) is 2250kg
- Maximum speed with a trailer attached is 40km/hr.

To Use the Towbar:

- 1 Ensure the boom is fully folded.
- 2 Remove the safety clip from the holding pin.
- 3 Remove the holding pin & drop the towbar down.
- 4 Refit the holding pin & safety clip.
- 5 Attached the trailer, safety chains & light cable.

NOTE

Do not run a centrifugal pump dry as damage will occur to the pump.
Remove the suction filter to drain the line and pump if a centrifugal pump is installed.



Open both Adjustable Axle cylinder valves on the front axle.

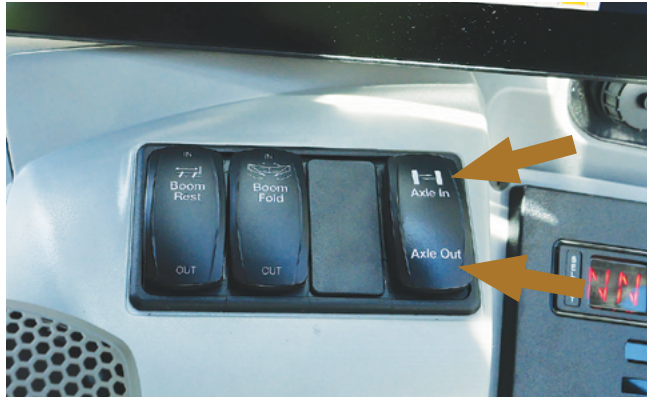
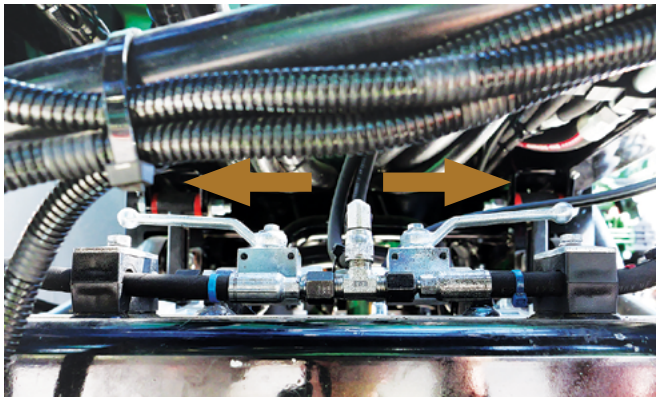
Adjustable Wheel Track

These instructions are only applicable to Cruisers fitted with the Adjustable Wheel Track option.

To Fully Extend or Fully Retract the Adjustable Wheel Track:

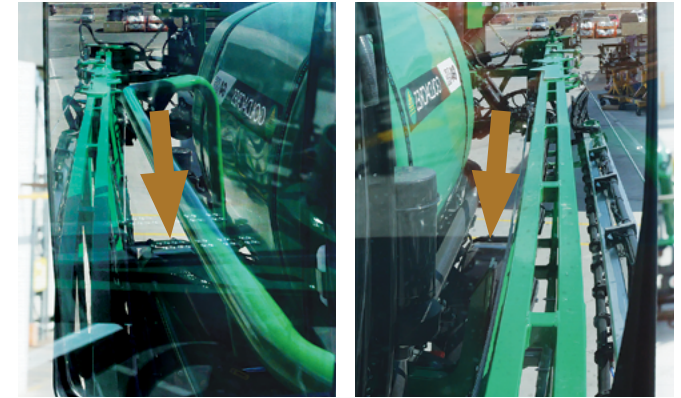
- 1 Before entering the cabin, manually OPEN both valves on the front & rear adjustable axles (2 on each).
- 2 Start the Crop Cruiser, ensure the booms are fully folded & drive the Crop Cruiser (Refer to instructions in the 'Quick Start Guide' at the beginning of this chapter).

Open both Adjustable Axle cylinder valves on the rear axle.



Press & Hold the Adjustable Axle Track rocker switch 'Axle In' (to close up wheel track) OR 'Axle Out' (to extend wheel track) while travelling forward at 10kph.

- 3 Lock the transmission in 1st Gear to achieve the best adjustment operation.
- 4 Maintain a constant speed of 10 Km/h on a relatively flat area, then Press & Hold the Adjustable Axle Track rocker switch:
 - 'Axle In' (to close in) or
 - 'Axle Out' (to extend) the wheel track.
- 5 Press & Hold the rocker switch until all 4 wheels have retracted or extended their full travel In or Out.
Rear wheel axle extension & closing can be watched in the rear vision mirrors.



Rear vision mirror views of rear axles fully closed.

- 6 Drive until the axles are fully closed or extended.

CAUTION

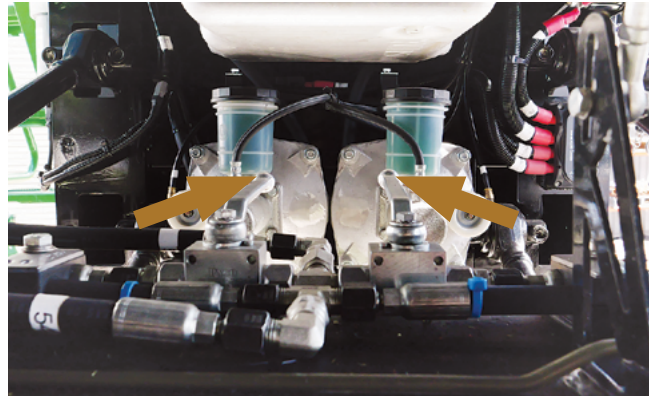
DO NOT attempt to extend or retract the axles while the machine is stationary. Failure to ensure the Cruiser travelling before extending or retracting is attempted will create excessive pressure on the wheel assembly & can cause damage.

NOTE

When cleaning telescoping driveshafts and ONE wheel is lifted OFF the ground, the adjustable axle can be adjusted to the desired width providing the OTHER 3 axle adjustment cylinder valves are CLOSED. Adjust & measure the width and repeat the procedure for each wheel.



Rear vision mirror views of rear axles fully extended.

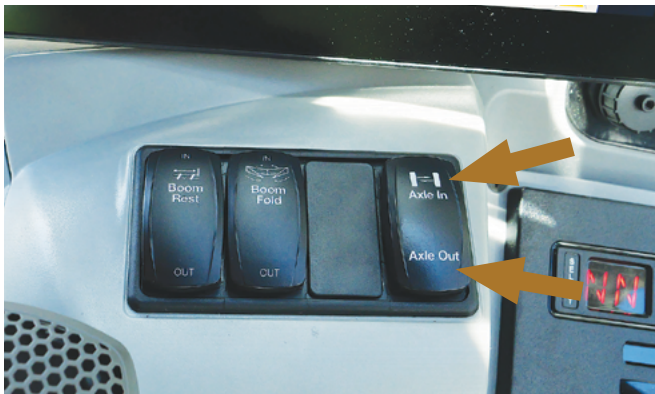


Close both front axle valves.

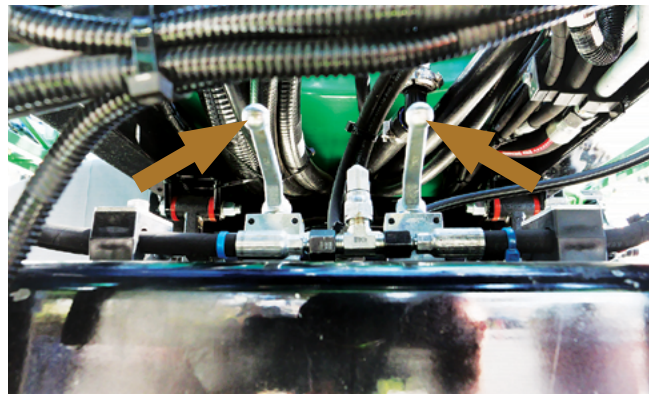
- 7 The the axles are fully closed or extended. Release rocker switch, then Stop & apply the Park Brake.
- 8 Stop driving & apply the Park Brake.

- 9 Exit the cabin & double check the axles are fully closed (2000mm wheel track) OR fully extended (3000mm wheel track) as required, then manually CLOSE both valves on the front & rear adjustable axles (2 valves on each).

Release the Adjustable Axle Track rocker switch 'Axle In' OR 'Axle Out' as required, then stop the driving and apply the Park Brake.



Close both rear axle valves.



CAUTION

For extended road travel, the valves on each cylinder MUST BE CLOSED to prevent unexpected axle movement.
Failure to ensure valves are fully closed for travelling & operation may result in unexpected machine width changes, instability and unsafe operation.



G4 Crop Cruiser.

7 - Boom Settings – Service 159

Boom Settings & Adjustments	160
1 Smiling Forward Setting (24-36m)	160
2 Tilt Angle Setting (24-36m)	162
3 Yaw Alignment	164
4 Yaw Hydraulic Pressure	164
5 Tilt Arm Guide Adjustment	166
6 Three-Way Tip Breakaway	166
7 Boom Fold Alignment	168
8 Boom Cable Settings	168
a) Working Position Cable Tension	169
b) Folded Cable Tension	169
9 Stainles Steel Protection Plates	170
10 Boom Centre Levelling	171
11 Hydraulic Bi-Fold	172
Headland Assist (non XRT)	172



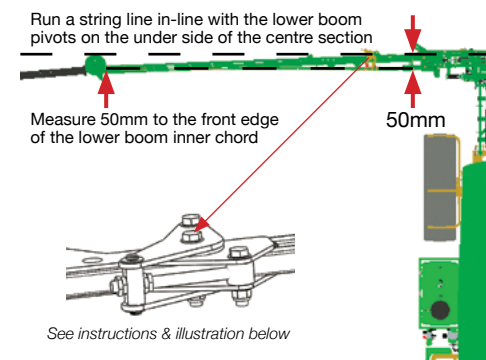
Goldacres Paralift boom control..



On level ground, engage the park brake, chock wheels & have the boom in working position before making adjustments.



'Smiling Forward' view on a 36m boom.



Adjust both 1st boom wing sections forward 50mm.

Boom Settings & Adjustments

Boom Settings & Adjustments include:

- 1 Smiling Forward Settings (24-36m).
- 2 Tilt Angle Settings (24-36m).
- 3 Yaw Alignment.
- 4 Yaw Hydraulic Pressure.
- 5 Tilt Arm Guide Adjustment.
- 6 Three-Way Tip Breakaway.
- 7 Boom Fold Alignment.
- 8 Boom Cable Settings.
- 9 Stainless Steel Protection Plates.
- 10 Boom Centre Levelling.
- 11 Optional Bi-Fold.

Before Making Boom Adjustments:

- Park the sprayer on a flat level surface with the tractor park brake engaged & wheels chocked.
- Place the boom in its working (unfolded) position.
- Close the isolator valves on the Boom Paralift cylinders.

NOTE

It is recommended all relevant adjuster nuts and threads be lubricated prior to making adjustments.

CAUTION

When folding the boom, either manually or automatically, ensure the sprayer chassis is laterally level. If the chassis is sloping laterally, sprayer stability and boom folding can be compromised.

Before adjusting the boom alignment, the hydraulic fold and bi-fold circuit must be free of air. Hydraulic circuits that contain air can make the boom appear that it is too far forward.

Adjustment of the boom without "bleeding" the hydraulic circuit first will result in a boom that becomes misaligned after a short period of use.

1 Smiling Forward Setting (24-36m)

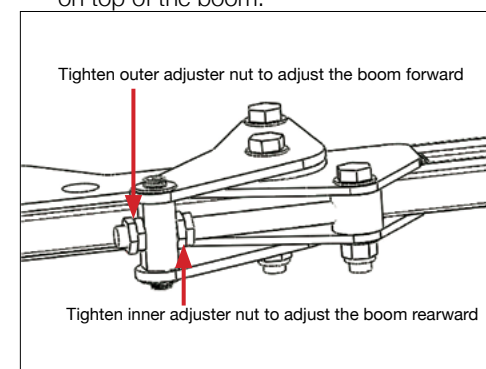
The wings of the 24m - 36m booms comprise two sections and a breakaway end. The first and second sections are adjusted forward at the inner pivot points.

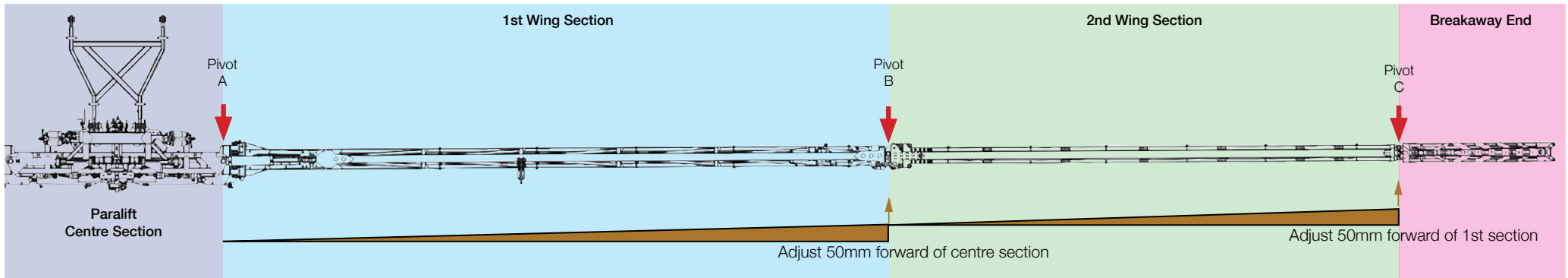
Adjuster bolt used to adjust the 1st boom section forward.



To Adjust the First Section of the Boom Wings:

- 1 Follow the 'Before Making Boom Adjustments' instruction on this page.
- 2 The first wing section adjustment should bring outer end of the section 50mm forward of the centre section.
A string line can be used as a guide. Alternatively, it may be helpful to observe the boom from underneath as the bottom chords are 50mm wide along the section and provide a visual reference for the forward offset.
- 3 If adjustment is required, loosen the two lock-nuts on the boom fold adjuster bolt on top of the boom.





36 metre Boom: Plan view of right hand side boom wing & the 'Smiling Forward' adjustment points (Pivot A & B).

- 4 To adjust the boom forward, loosen the inner adjuster nut, then tighten the outer adjuster nut.
To adjust the boom rearward, loosen the outer adjuster nut, then tighten the inner adjuster nut.
- 5 When the 1st section of the boom is in the required position, tighten the opposite adjuster nut, then both locknuts to securely hold its position.
- 6 Once the correct adjustment is achieved, Repeat the process for the LH side inner boom wing.

After adjustment of first boom sections is completed, proceed to align the second sections of the boom wings.

To Adjust the Second Section of the Boom Wings:

- 1 Using a string line is recommended for achieving correct measurements:
 - 24m - 30m Tritech booms must be 30-50mm forward of the inner boom section.
 - 36m Tritech booms must be 50mm forward of the inner boom section.

- 2 The cable adjusters and boom stopper bolt are used to align the outer booms:

- To adjust the outer boom forward, loosen the lock nut and wind-in the boom stopper bolt.
At the same time, the turnbuckle (connected to the cable damper springs at the front of the boom) must be shortened and the rear turnbuckle must be lengthened to maintain cable tension.

- To adjust the outer boom rearward, loosen the lock nut and wind-out the boom stopper bolt.

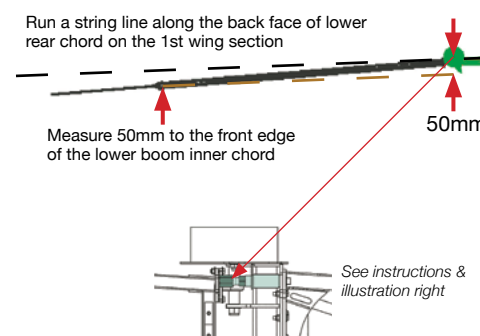
At the same time, the rear turnbuckle (connected to the cable damper springs at the front of the boom) must be shortened and the turnbuckle at the front lengthened to maintain cable tension.

After correct alignment has been achieved on both second wing sections, the cable spring tension must be set so there is a 3mm gap between the coils.

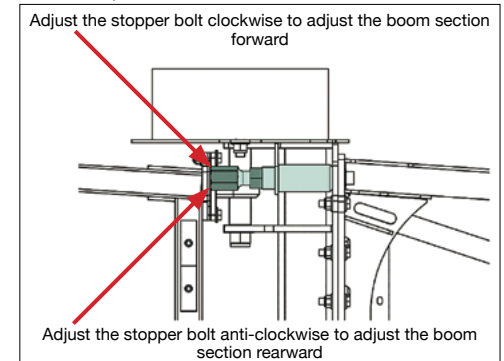
Stopper bolt used to adjust the 2nd boom section forward.



Adjust both 2nd boom wing sections forward 50mm.

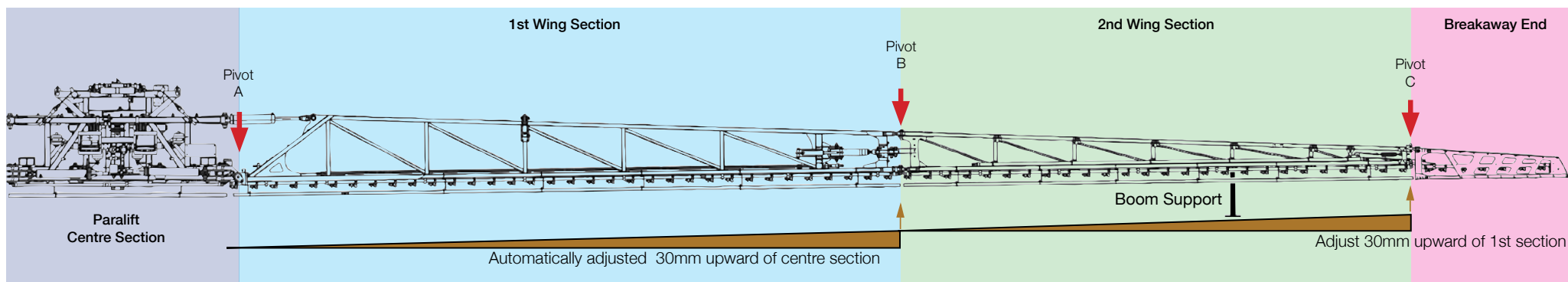


Release the locknut, then adjust the stopper bolt as required to move the 2nd section forward.



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.



36 metre Boom: Rear view of right hand side boom wing Tilt Angle adjustment points (Pivot A & B). Use a solid boom support under 2nd wing section for tilt adjustment.

2 Tilt Angle Setting (24-36m)

The wings of the 24m - 36m booms comprise two sections and a breakaway end. The first & second wing sections are adjusted upward at the inner pivot point.

The first section tilt angle, at pivot A, is factory set and can be adjusted manually if required.

The second stage tilt angle is also factory set and can be adjusted using the clevis joint threads at pivot B if required.

The boom centre section must be level with the chassis before any boom adjustments are made.

The inner booms must be adjusted first so they are the same height as the centre section or slightly increasing in height from the centre section (to allow for boom stretch. These adjustments are made by lengthening or shortening tilt adjustment on the tilt cylinders.

NOTE

It is important that both wings are adjusted the same. If one wing is adjusted higher or lower than the other, the boom may not sit level.

To Adjust the First Section of the RH Wing (Pivot A):

- 1 Follow the 'Before Making Boom Adjustments' instruction at the beginning of this chapter.
- 2 The first wing section adjustment brings the outer end of the section 30mm upward of the centre section. The adjustment is made on the adjustable tilt cylinder rod.

Use a horizontal string line and measure the upward incline of the first boom section.

The 1st section tilt angle of the RH wing is adjusted manually on the RH wing tilt cylinder rod.



- 3 If adjustment is required, use the hydraulic tilt adjustment to lower both outer wings onto supports.
- 4 With both booms safely supported, loosen the locknut on the tilt cylinder rod adjustment
- 5 Loosen the lock nut using a 17/8" spanner, then rotate the cylinder rod using a 1 1/2" spanner:
 - Clockwise (inwards) to raise the end of the wing section, or
 - Anti-clockwise (outwards) to lower the end of the wing section.

Loosen the lock nut using a 17/8" spanner, then rotate the cylinder rod using a 1 1/2" spanner:



- 6 Use the tilt cylinder hydraulics to raise the boom section, remove the support and level the boom. Re-check the outer end of the section is 30mm upward of the centre section (step 2).

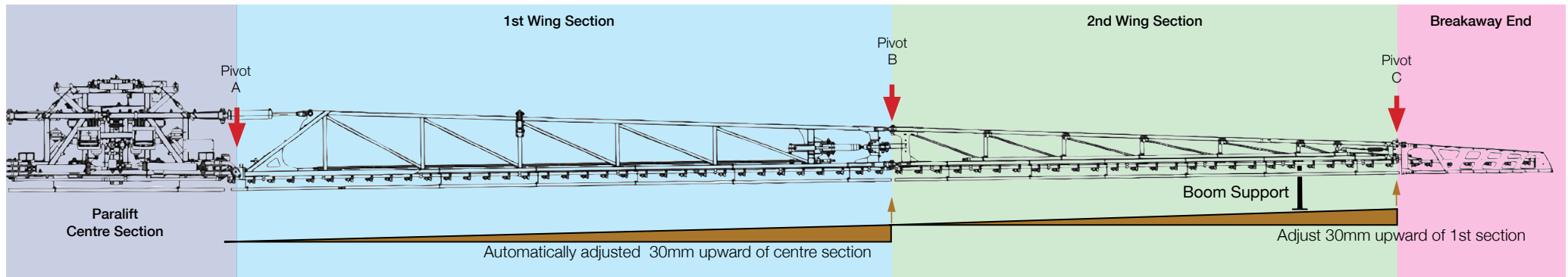
If correct, tighten the locknut using a 17/8" spanner.

If further adjustment is required, repeat steps 3-6 until 30mm upward tilt is achieved.

To Adjust the First Section of the LH Wing:

Repeat the above procedure on the LH wing. After adjustment is completed, tighten the lock nut using a 17/8" spanner,





36 metre Boom: Rear view of right hand side boom wing Tilt Angle adjustment points (Pivot A & B). Use a solid boom support under 2nd wing section for tilt adjustment.

To Adjust the Second Section of the RH Wing (Pivot B):

The height of the outer booms in the working position are adjusted by adding or removing shims at the cable drum (Pivot B).

Boom cables may need to be loosened to enable easier removal of the shims.

- 1 Follow the 'Before Making Boom Adjustments' instruction in this chapter.
- 2 The second wing section adjustment brings the outer end of the section 30 mm upward of the first section.

Use a string line and measure the upward incline of the second boom section. If adjustment is required, proceed to step 3.

- 3 Use the tilt cylinder hydraulic adjustment to lower the end of the second wing section onto a solid wing support.

- 4 With the boom section safely supported, loosen & remove the nuts & bolts from the bracket holding the:
 - Upper joint, if the shims need to added to lower the boom section end, or
 - Lower joint, if the shims need to added to raise the boom section end.
- 6 Add or remove shims as required, then refit and tighten the bolts and nuts.

- 7 Use the tilt cylinder hydraulics to raise the boom section, remove the support and level the boom.

Re-check the outer end of the section is 30mm upward of the first section (step 2).

If further adjustment is required, repeat steps 3-7 until 30mm upward tilt is achieved.

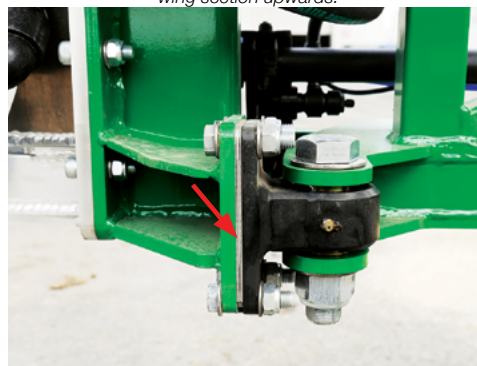
To Adjust Second Section of the LH Wing:

Repeat the above procedure on the LH wing.

Add shims to the upper joint bracket to tilt the end of 2nd wing section downwards.

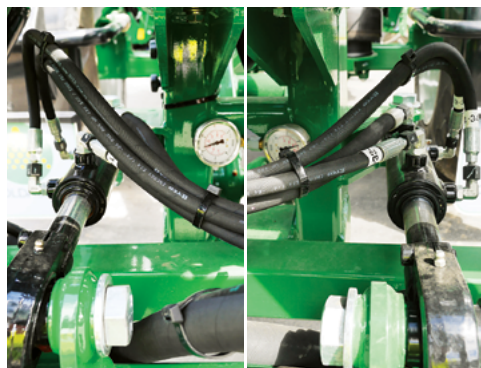


Add shims to the lower joint bracket to tilt the end of 2nd wing section upwards.





Relocate pressure gauges from the hydraulic cylinder circuit to the hydraulic control block



Two Yaw hydraulic cylinders (located on the boom centre section) & an accumulator form the independent pressurised Yaw hydraulic circuit.

3 Yaw Alignment

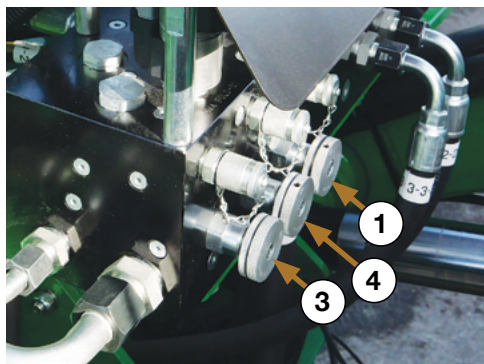
The boom should be positioned parallel to the rear of the sprayer chassis.

To check Yaw Alignment, measure the exposed cylinder rods on both the left & right Yaw hydraulic cylinders.

Each cylinder rod extension should be the same if the boom is running parallel to the end of the chassis.

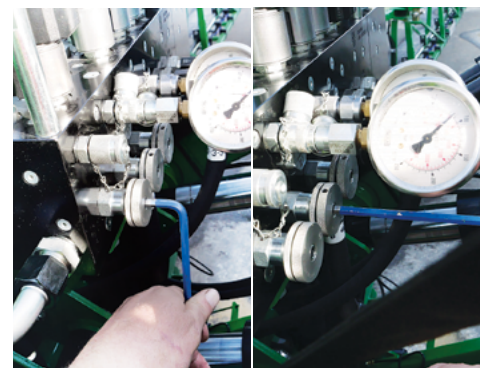
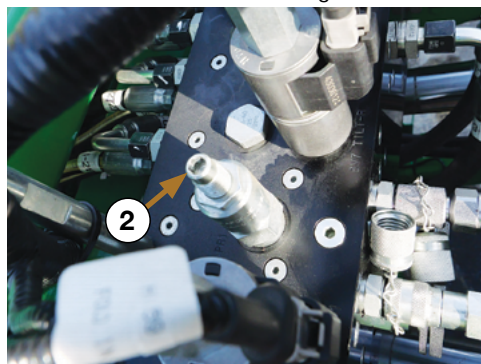
Hydraulic manifold valve Identification (shown below).

- 1 Yaw Bleed Valve
- 3 Yaw A Valve
- 4 Yaw B Valve



Hydraulic manifold valve Identification (shown below).

- 2 Pressure Reducing Valve

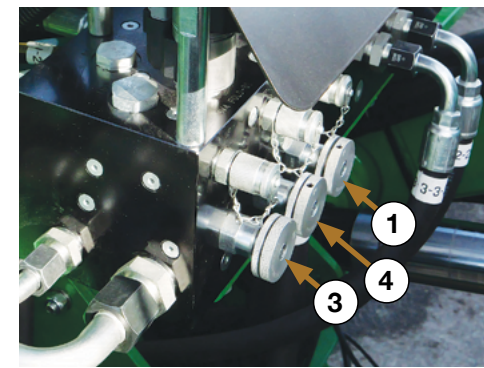


Loosen the locknuts, then wind out (counterclockwise) both 'Yaw A' & 'Yaw B' valves until fully open.

- 4 Loosen the locknuts, then wind out (counterclockwise) both 'Yaw A' and 'Yaw B' valves (items 3 & 4 shown below left) until fully open.
- 5 Move a boom end by hand until the boom is sitting parallel to the chassis line of the machine - each Yaw cylinder rod extension must be the same.
- 6 Close (wind-in [clockwise]) both 'Yaw A' and 'Yaw B' valves (shown below left 3 & 4) until fully closed, then tighten the locknuts.

The default Aligned Yaw position is now set.

Move the boom end by hand to adjust the Yaw Alignment.



Manifold Valve Identification: 1 Yaw Bleed Valve, 3 Yaw A Valve & 4 Yaw B Valve.

4 Yaw Hydraulic Pressure

The Yaw Hydraulic Pressure controls the Yaw suspension

Two hydraulic cylinders and accumulators are charged with hydraulic pressure and closed off creating a closed circuit for the yaw suspension.

The base end of each yaw cylinder is connected to the rod end of the opposite cylinder with one nitrogen charged (70 bar) accumulator connected separately to each.

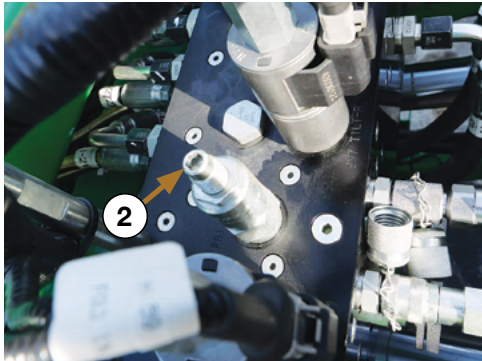
When the rod end of one cylinder compresses, it causes the base end of the opposite cylinder to extend and vice versa.

The accumulators help dampen movement & keep the boom centred.

NOTE

When the hydraulic yaw system is installed or any components are replaced, the Yaw Pressure closed loop hydraulic circuit needs to be bled of any air:

- The maximum pressure needs to be reset
- The system re-charged and
- The booms re-aligned.



Manifold Valve Identification: 2 Pressure Reducing Valve.

Three valves are normally closed to create a closed circuit so oil movement is restricted to the precharged pressure in the accumulator. The precharged pressure restricts the ease of boom yaw movement away from the centered position. This pressure needs to be monitored and maintained.

A pressure gauge on the manifold displays the closed loop hydraulic yaw pressure.

If set too high the boom centre damping will be too stiff and the boom will be prone to damage under normal operating conditions.

If set too low the boom will move too easily and not return to centre properly - making booms more vulnerable to damage.

NOTE

If the pressure is too high then wind out (counterclockwise) the 'Breakaway bleed' valve to reduce it in addition to the pressure reducing valve. Then, close the 'Breakaway bleed' valve and check the maximum pressure achieved again. Pressure will not decrease on the gauge if only the pressure reducing valve is wound out.



Remove the hydraulic manifold cover to access the Yaw reducing valve.

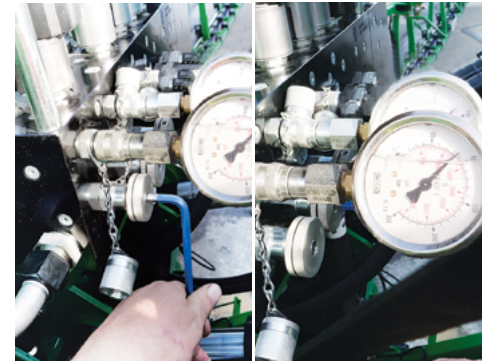
To Set the Yaw Hydraulic Pressure:

The Hydraulic Yaw Pressure determines the effective stiffness of the Yaw damping.

Pressure gauges capable of reading up to 3000 PSI are fitted to the hydraulic manifold and both Yaw hydraulic cylinders.

- 1 Follow the 'Before Making Boom Adjustments' instruction in this chapter.
- 2 Check the test port gauges are fitted to the hydraulic manifold and both Yaw cylinders.
- 3 Remove the hydraulic manifold cover to access the Yaw reducing valve.

Use the Yaw Pressure gauge when setting Yaw pressure.



Loosen the locknuts, then wind out (counterclockwise) both 'Yaw A' & 'Yaw B' valves until fully open.

- 3 Loosen the locknuts and wind out (counterclockwise) both 'Yaw A' (3) & 'Yaw B' (4) valves on the manifold until fully open. The Yaw bleed valve (1) must be fully closed (clockwise).
- 4 The hydraulic system will build pressure when a boom function is activated. Preferably press 'Boom Fold' OUT button (as the boom is folded out & therefore, will not move in a hazardous way).

Press the 'Boom Fold OUT' button to build pressure.



Set the Yaw Pressure with the Pressure Reducing Valve, then re-tighten the locknut.

- 5 Once pressure has built up fully, use the Pressure Reducing Valve (item 2 above left) to set pressure higher or lower as necessary. Loosen the lock nut, then:
 - Wind in (clockwise) - to increase pressure or
 - Wind out (counterclockwise) - to decrease pressure.
 Target pressure is 103 Bar (1500 psi)
- 6 Re-tighten the lock nut of the pressure reducing valve once correct pressure is achieved, then close & lock valves A & B.

Close (wind-in [clockwise]) both 'Yaw A' & 'Yaw B' valves until fully closed, then tighten both locknuts.





Check rubber bumpers for wear. Replace if worn.

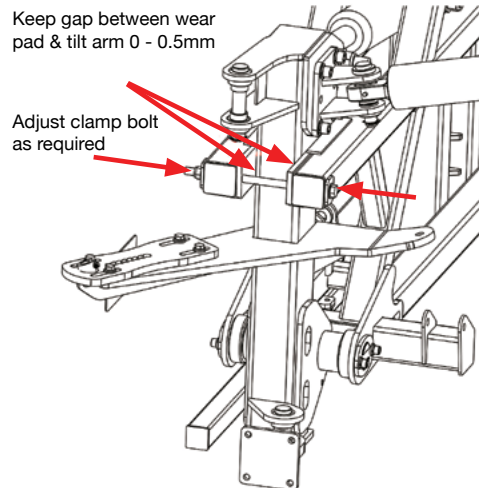
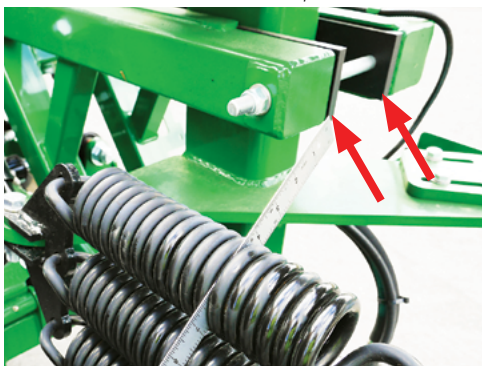
Paralift Rubber Bumpers

Overall Yaw travel is limited by rubber bumpers mounted on the Paralift boom centre section.

If the boom centre section yaws excessively, the centre section will come into contact with the bumpers which will cushion the travel by collapsing the blocks. If the blocks collapse totally, the yaw travel will be stopped.

If the boom is excessively & continually yawed, the bumpers will wear out and require replacement.

Front view of Tilt Arm Guide wear pads - RHS boom.



Ensure Tilt Arm Guide wear pad gap is 0 - 0.5mm.

5 Tilt Arm Guide Adjustment

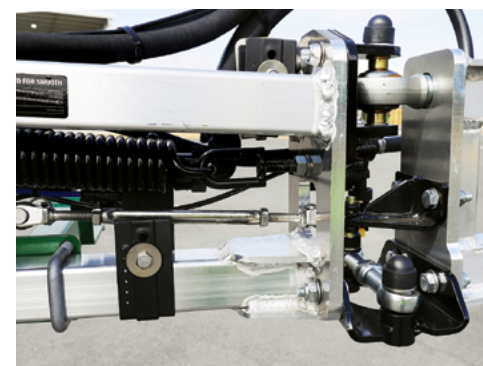
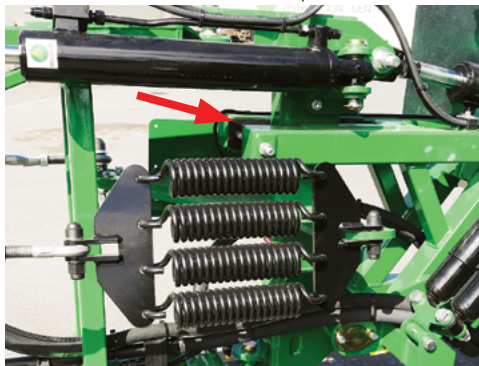
Tilt Arm Guides fitted with wear pads/strips require regular inspection & maintenance.

Keep the gap between the guides & tilt arm between 0 - 0.5mm to ensure the tilt arm cannot twist.

To adjust the clamp pressure, tighten or loosen the clamping bolt.

Perform the adjustment on both LH & RH sides.

Rear view of Tilt Arm Guide wear pads - RHS boom.



Three Way Tip Breakaway mechanism of the Tritech boom.

6 Three-Way Tip Breakaway

Each boom wing tip or end incorporates a three-way tip breakaway hinge which allows the wing tip to break-away:

- Forward,
- Rearward and/or
- Upward
- minimising possible damage to the boom should an obstacle be hit.

It is important the breakaway hinge is properly adjusted for operating (just tightening the spring does not facilitate the breakaway function).

Forward & Upward Breakaway.



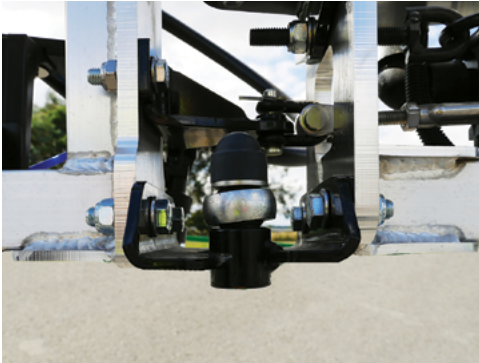
Close the ball valve on each lift cylinder (2) for safety.

To Set-Up the Three-Way Tip Breakaway:

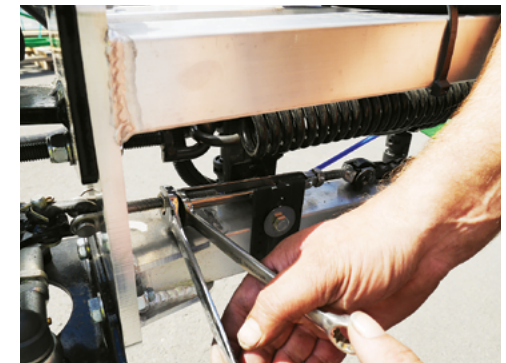
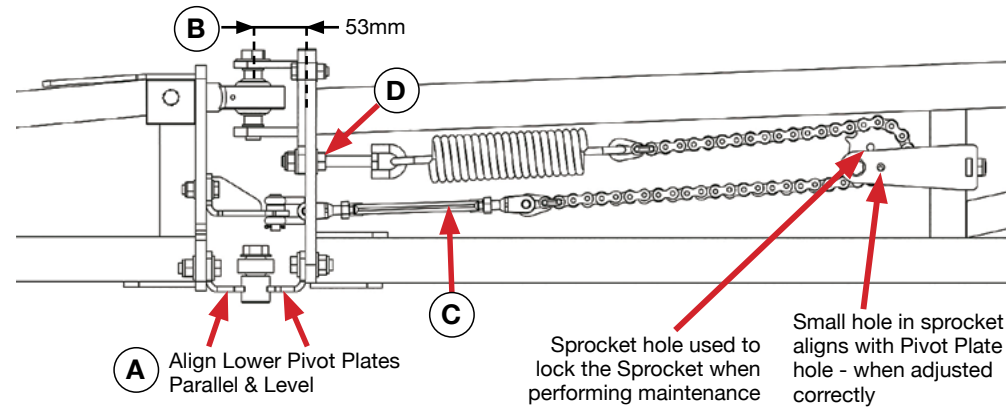
- 1 Follow the 'Before Making Boom Adjustments' instruction in this chapter.
- 2 Lower the boom to a good working height fully opened (working position).
- 3 Close the ball valves of the two hydraulic parallel lift cylinders for safety.
- 4 Check the lower pivot plates are properly aligned [see (A) on diagram next page].
- 5 If the rose end [see (B) on diagram next page] is removed for any reason, anti-seize should be applied to the thread before it is screwed into the boom end.

Rearward & Upward Breakaway.





Check the lower pivot plates are properly aligned.



Check the lower pivot plates are properly aligned.

The rose end should be screwed into the breakaway tip so that it measures 53 mm from the boom end face plate to the centre of the rose end (B) or until correct vertical alignment is achieved.

- 6 The small hole in the sprocket must align with the hole in the pivot plate. This is adjusted by shortening or lengthening the eye bolt (D) position and tightening or loosening the turnbuckle (C).

Adjust spring tension so there is 1-2 mm gaps between spring coils to apply ideal resistance for breaking away. This will vary as springs may stretch over time.

To Adjust the Turnbuckle:

- 1 Use an assistant to pull the boom wing tip back until the large hole in the sprocket aligns with the hole in the pivot side plate, then place a pin (such as an Allan key or screwdriver) through the holes to lock the sprocket position.
- 2 Have the assistant carefully return the wing tip only enough to remove spring tension. Do not fully return the wing tip, otherwise the chain may jump off its sprocket & may cause injury.
- 3 Now, release the locknuts and make the appropriate adjustments to turnbuckle. Re-tighten the turnbuckle locknuts.
- 4 Pull the wing tip back to remove the pin, then release the tip. Check spring tension and alignment of the small hole in sprocket with pivot plate hole.
- 5 Repeat steps 1 - 4 until desired spring tension is achieved and the small hole in the sprocket aligns with the hole in the side plate.

Maintenance

Several things are required to ensure that the breakaway will be functioning properly.

Two things are critical to the breakaway functioning correctly:

- The small hole in the sprocket must align with the hole in the side of the pivot plate, and
- Appropriate spring tension.

Check these on a regular basis and adjust as required.

Place a pin (eg, Allan key or screwdriver) through the aligned holes to lock the sprocket position.



⚠ DANGER

Adjusting the Turnbuckle is a 2 person job:

Firstly, one person is required to pull the wing tip back while the other person places the pin.

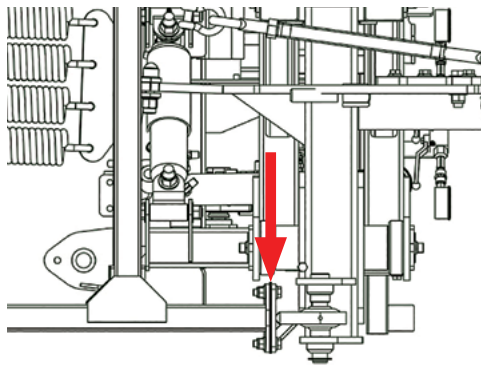
Secondly, one person must hold wing tip to just release the spring tension while the other person adjusts the turnbuckle.

Take great care because the spring & hinge mechanism may move suddenly and inadvertently jam fingers (which can cause serious injury) or other items within the mechanism.

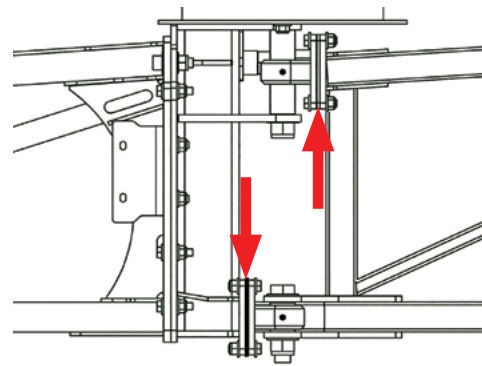
Do not let the wing tip fully return fully while making adjustment, otherwise the chain may jump off its sprocket and cause injury.



Regularly lubricate the Three Way Tip Breakaway mechanisms.



'Diagram A' - Add or subtract shims to the lower pivot point to raise or lower the boom as required.



Add or subtract shims to both the upper & lower cable drum pivots to raise or lower support saddles as required.



Eyebolt Cable Adjusters to tension the boom cables.

Spring will stretch over time and will lose tension. Worn springs & chain should be replaced if there is insufficient tension on the spring to fully retract.

Lubricate the Three-Way Breakaway mechanisms on a regular basis to ensure smooth & long lasting operation:

- **Oil** the sprocket pivot, chain and lower rose joints with a wet lubricant **every 8 hours**.
- **Grease** the upper rose joint **every 8 hours**.

7 Boom Fold Alignment

When the boom is folded into transport position, the full weight of the boom must be supported by the inner boom sections. The outer aluminium section may sit on the boom rest but must not support any weight.

To Align an Inner Boom

If the boom sits level in working position but when folded, one side is lower than the other, shims can be placed at the bottom inner boom mount of lowest boom (Diagram A). This will raise the boom in working position. If a boom is not level in the working position, it is most likely out of balance. Refer to '9 Boom Balance'.

When folded for transport, the full weight of the boom must be supported by inner boom sections resting on the boom rests.



To Align an Outer Boom

When the boom is folded into transport position, the outer boom sections must saddle onto the inner boom. A boom support saddle couples to the inner boom when fully folded. Saddles must slide onto the inner boom freely to prevent damage to the booms.

If alignment of the outer boom does not saddle correctly, it will not be supported in transport.

If an outer boom hangs too low when folding, shims must be added to cable drum pivots. To raise the outer boom, add shims to both the upper & lower pivots. This adjusts the angle of the pivot axis causing the outer boom to fold up higher. One x 1mm shim at upper & lower pivots equals approximately 15mm change in folded height.

To lower the outer boom in the folded position, remove shims from both upper & lower pivots.

Left hand side boom rest.



8 Boom Cable Settings

Boom cables play a critical part in boom function and it is important these cables are correctly adjusted prior to operation for both:

- Working position &
- Folded position.

Loose boom cables may result in unnecessary stress on the boom, lift & chassis and shorten working life.

Cable tension must be checked & adjusted for:

- a) Working position cable tension &
- b) Folded cable tension.

Outer boom saddle support in folded position.





Undo the locknuts of the Cable Eyebolt Adjuster, then rotate the adjuster to tension the cable & retighten the locknuts.

a) Working Position Cable Tension

The Eyebolt Cable Adjuster is used to tension the cable to keep the outer boom aligned in working position.

If too loose, damage may occur if the outer boom sections hang out-of-alignment or 'break away' too easily.

To Adjust Working Cable Tension:

- 1 Follow the 'Before Making Boom Adjustments' instruction at the beginning of this chapter.
- 2 Undo the locknuts of the cable eyebolt.
- 3 Adjust the cable tension to align the outer boom arm.
- 4 Check the tension setting of the boom breakaway by pulling the outer boom rearward.
- 5 Once set correctly, tighten both locknuts of the cable eyebolt.
- 6 Proceed to check Folded Cable Tension.

NOTE

Re-alignment of outer boom sections for folding will be required within the first 6 months of beginning operation as the booms sections stretch and wear-in.



LHS Cable Adjustment Plate.

b) Folded Cable Tension

The Cable Adjustment Plate is used to adjust the outer boom arm in its folded position.

When folding the boom, if the outer boom:

- Does not fold all the way in & contact the boom stop, the Cable Adjustment Plate must be adjusted outwards
- OR
- Contacts the boom stop too early or places too much tension on the boom & cable, then the Cable Adjustment Plate must be adjusted inwards.

⚠ DANGER

Adjusting the Cable Adjuster Plate is a 2 person job:

Firstly, one person is required to pull the outer wing back while the other person removes the cable from the plate.

The second person removes & refits the cable attachment, adjusts the Cable Adjuster Plate and Cable Eyebolt.

Do not let the outer wing return abruptly, otherwise injury may occur from boom or cable whipping.



Use an assistant to pull back the outer boom arm to release tension on the cable.

To Adjust Folded Cable Tension:

The boom must be in its working position to adjust the Cable Adjustment Plate.

- 1 Follow the 'Before Making Boom Adjustments' instruction at the beginning of this chapter.
- 2 Use an assistant to pull back the outer boom arm to release tension on the cable - enables adjustment of the plate.
- 3 Undo the nut and remove the Cable Turnbuckle from the plate.

Undo the nut & remove the end of the Cable Turnbuckle Adjuster.

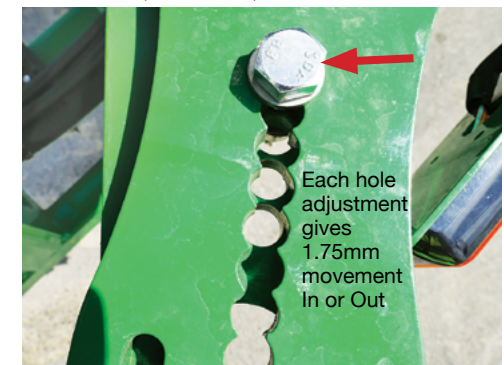


Loosen 4 corner bolts of the Cable Adjuster Plate.

- 4 Loosen 4 x corner bolts of the Cable Adjuster Plate.
- 5 Remove the central locator bolt and move the plate In or Out as required.
- 6 Refit the central locator bolt.
- 7 Tighten the 4 x corner bolts of the Cable Adjuster Plate.
- 8 Use an assistant to pull back the outer boom arm, then refit the end of the Cable Turnbuckle Adjuster and refit the bolt, washer & nut. Tighten the nut.

When adjustment is completed, release the outer boom arm carefully so it does not spring forward dangerously.

Remove central locator bolt, move the plate In or Out as required, then replace locator bolt.



Each hole adjustment gives 1.75mm movement In or Out



Fold the boom to re-check boom alignment in the folded position.



Check there is a 3 mm gap in the spring coils and adjust if required.



Check tension on the left hand folded outer boom section by pulling the end outwards.



The outer boom rest protection plate must be correctly positioned on each side.

- 9 Re-adjust the cable eyebolt to align the outer boom arm, then tighten the locknuts on the cable eyebolt.
- 10 Fold the boom to re-check boom alignment in the folded position.

- 11 Repeat the procedure if necessary, until the outer boom arm assumes the correct alignment for both working and folded positions.
- 12 Coil spring tension may alter when moving the Cable Adjuster Plate.

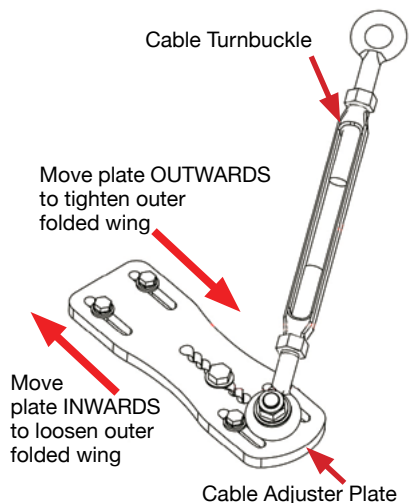
Check there is a 3 mm gap in the spring coils. Adjust if required.

- 13 Check the tension on the left and right hand folded outer boom sections by pulling each end outwards. If too tight or too loose, adjust the tension.

9 Stainless Steel Protection Plates

Stainless steel protection plates fitted to the boom, protect the boom when being folded & when resting in transport position.

It is important to ensure both outer boom rest protection plates and inner boom rest protection plates are correctly positioned.



CAUTION

If an outer boom arm contacts the boom stop too early and too much tension is placed on the cable, then the hydraulic cylinder may fail to bring both arms all the way in or damage the boom arm and cable.

DANGER

Outer boom sections must be firmly held in their mounting. If too loose (not firmly held in position), outer wing sections may dislodge while transporting. Serious damage and/or serious injury may occur if an outer wing dislodges from its mounting while travelling.

Check tension on the right hand folded outer boom section by pulling the end outwards.



Inner boom rest protection plates must be correctly positioned on each side.





Loosen the bolt & nut clamping the top centre level support (on the centre section side the boom is low).



Undo the adjuster locknuts and adjust the support to raise & level the boom. After adjustment retighten the locknuts.

10 Boom Centre Levelling

The Boom Centre Levelling system keeps the boom in the same plane as the sprayer chassis so that the boom folds evenly.

If one side is heavier than the other, the boom will tend to hang lower on the heavy side, therefore, both sides need to be levelled to maintain boom ends at the same height.

If the centre and the booms tilt excessively during folding, the centre level supports may need to be adjusted.

Supports can be adjusted by tightening or loosening the nuts on the end of the chain bolts on either side.

If the centre and the booms tilt excessively during folding, the centre level cables may need to be adjusted. With time & use, cables stretch and will require adjustment.

Cable tension can be adjusted by tightening or loosening the nuts on the end of the cable bolts on either side.

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.



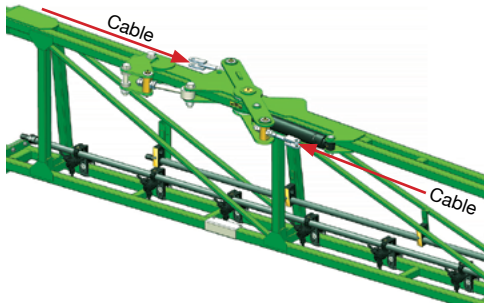
Make adjustment to the Boom Centre Level cable adjusters as required.

To Adjust Cable Tension:

- 1 Follow the 'Before You Begin Making Boom Adjustments' instruction.
- 2 Lower the boom to a suitable working level.
- 3 Loosen the upper nut at each end of the cable (each side).
- 4 Tighten the lower nuts on each end of the cable to set the desired cable tension.
- 5 Tighten the nut firmly against the bracket to hold its position.
- 6 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.
- 7 If necessary, unfold the boom and re-adjust the cable tension to correct any tilt problems.
- 8 Repeat steps 2 - 5 until the boom is level when folding.

NOTE

Adjustment of Boom Centre Levelling chains in folded position only applies if Optional Hydraulic Bifold is fitted. Adjust LH or RH chain tensioner as required to level the boom when being folded.



Hydraulic Bi-Fold.

11 Hydraulic Bi-Fold

The Bi-Fold mechanism incorporates an hydraulic cylinder and cables on each wing.

Follow instructions in Chapter 4 'Setting Up' 'Boom Automation' under 'i) Boom Fold Calibration' to set the desired automatic fold and bifold settings.

Follow instructions for Boom Settings & Adjustments in this chapter to correctly set boom functions.

To operate the Boom Bifold function, follow the Boom Bifold operating instruction in Chapter 6.

Headland Assist (non XRT)

Follow instructions in Chapter 4 'Setting Up' 'Boom Automation' under 'ii) Headland Assist' to select Headland Assist and set 'Headland' & 'Field' positions.

Do not enable the Headland Assist function when the XRT Option is fitted.

8 - Lubrication & Maintenance – Service 173

Pre-Operation Checklist	175
Maintenance	176
First 8 Hours Of Operation	176
1 Torque Settings	176
2 Engine	176
3 Lubrication & Hydraulic Fluids	176
4 Tank Retaining Straps	176
5 Pump Mounting Bolts	176
6 Suspension Bolts	176
7 Lights	176
8 Steering	176
First Service - 50 hours	177
Engine	177
Hydraulic Oil Tank	177
Air Conditioning	177
Transmission & Transfer Case	177
Front Axle	177
Rear Axle	177
Maintenance Schedules	178
Engine	178
Transmission	178
Transfer Gearbox	178
Drive Shafts	179
Suspension System	179
Axles & Drop Leg	179
Chassis	181

Electrical System	181
Service Kits	183
50hr Service Kit	183
250hr & 750hr Service Kit	183
500hr Service Kit	184
1000hr Service Kit	185
Service Parts	186
Lubricants	186
Filters	186
Belts	187
Headlights	187
Service Instructions	187
G-Hub Controller Service Tab	187
Opening the Engine Bonnet	188
Headlights	188
Engine Air Cleaner	189
Fuel Filters	190
Engine Oil & Filter	190
Engine Drive Belt	191
Alternator Drive Belt	192
Cabin Air Cleaner	192
Transmission	193
Transmission Oil Cooler	194
Transfer Case	194
Fixed Drivelines	194

Headings & Sub-headings continue next page

8 - Lubrication & Maintenance – Service ... cont.

Differentials	194
Adjustable Axle Option 2-3m	194
Drop Legs	195
Suspension	196
Steering Toe-In	197
Wheel Camber	198
Wheel Nut Tension	198
Wheel Changing	199
Hydraulic Oil System	199
Hydraulic Oil Tank	199
Return Filter	200
Closed Centre Variable Displacement Pump	200
Mid-Mounted Hydraulic Manifold	200
Hydraulic Pressure Filters	200
Danfoss OSPE Steering Orbital	201
Hydraulic Oil Cooler	201
Rear Manifold	201
Braking System	201
Rotors	202
Brake Calipers & Pads	202
Service Brake Bleeding Procedure	202
Park Brake	203
Manually Releasing the Park Brake	203

Pneumatic System	204
Air Tank	204
Air Compressor	204
Folding Ladder	205
Auxiliary Air Outlet	205
Chemical Transfer Pump	205
Air Bag Ride Height Settings	205
Shock Absorbers	206
Air Conditioner Compressor Belt	206
Grease Points	207
Auto-Greasing System Options	207
1 Driveshaft - 2WD Grease Points	208
2 Driveshaft - 4WD Grease Points	209
3 Paralift/Headstock & Hopper Grease Points	210
4 Boom Centre Grease Points 1	211
5 Boom Centre Grease Points 2	212
6 Boom Rest Grease Points	213
7 Boom Wing 24 - 36m Grease Points	214



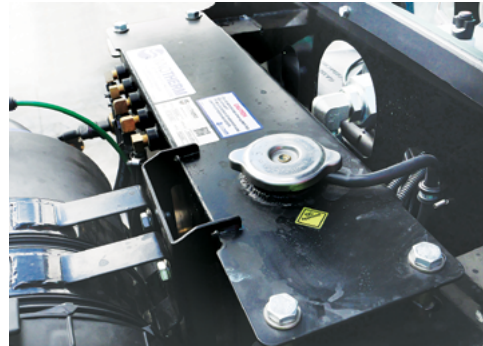
Regularly do the routine checks on the Cruiser while stationary.

Pre-Operation Checklist

Stationary Checks

The following should be routinely done while the Cruiser 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 sway bar bushes & bolt tension
- Check all pump mounting bolt tensions
- Check tension of tank straps
- Check all oil levels:
 - Engine
 - Transmission
 - Transfer case
 - Differentials
 - Drop legs



Regularly check the engine coolant level.

- Check engine coolant level
- Check/change engine inline fuel filter
- Check engine filters for leaks
- Check oil drain plugs for leaks
- Drain water separator
- Check all electrical ground points are clean and tight
- Check all fasteners are tight
- Check & tighten hose clamps on main hose from pump to manifold
- Clean suction filter
- Clean pressure filters
- Check all filter bowl nuts and O-rings
- Check paralink arm mounting bolt tension (300ft/lb)
- Check toe in of steer axle (0-5mm)
- Check boom alignment.



Check & adjust all seat & steering column adjustments for personal comfort.

Running Checks

The following should be routinely done while the Cruiser is running:

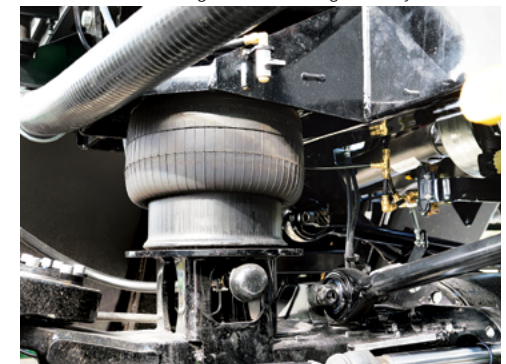
- Check all light functions
- Check all air conditioner controls
- Check radio functions
- Check UHF radio functions
- Check all seat adjustments
- Check all steering column adjustments
- Set-up the engine monitor
- Check all warning sound alarms function correctly



Check all joystick boom switch functions.

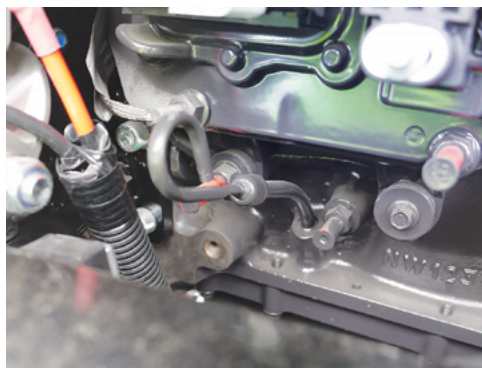
- Check boom switches operate
- Check all hoses for leaks and/or excessive movement
- Check air bag axle ride height
- Check air bag system for air leaks
- Inspect air reservoir & drain any liquid

Check airbags are functioning correctly.





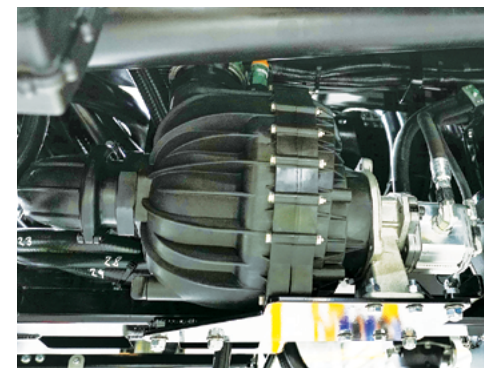
During the first 8 hours of operation, check wheel (shown above) & other retaining nuts frequently - until fully imbedded.



During the first 8 hours of operation, check the engine oil level frequently using the engine oil dip stick.



During the first 8 hours of operation, check drop leg (shown above) & other transmission oil levels.



During the first 8 hours of operation, check mounting bolts of the fill pump (shown above) & other pumps.

Maintenance

Correct & timely service & maintenance of the Crop Cruiser 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'.

First 8 Hours Of Operation

During the first 8 hours of operation, it is important to closely check the following:

1 Torque Settings

- Check the torque on retaining nuts frequently
- Wheel nuts should be checked to ensure 350 ft/lb is maintained.

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 and tighten tank retaining straps of loose.



2 Engine

- Check the engine oil level frequently. Due to the "bedding in" of the engine components and additional friction between connecting parts, expect the oil usage to be higher than normal.
- Avoid excess engine idling
- Inspect the air intake system and check for leaks.

3 Lubrication & Hydraulic Fluids

- Maintain correct hydraulic oil levels and monitor the oil temperature on a regular basis
- Check all transmission oil levels
- Ensure grease points are lubricated effectively
- Inspect for leaks in the hydraulic system.

4 Tank Retaining Straps

- Check tank retaining strap bolts to ensure they are not loose. Tighten if loose.

CAUTION

If the engine has been running, take extra care around hot engine parts such as the exhaust.

Failure to take care with hot componentry may result in severe burns & injury.

5 Pump Mounting Bolts

- Check all pump mounting bolts to ensure they are not loose.

6 Suspension Bolts

- Check all suspension bolts located at each end of parallel links, pan hard rods (300ft/lb) and sway bars to ensure they are not loose. Tighten if loose.

7 Lights

- Check each light around the vehicle for correct function.

8 Steering

- Check front wheel alignment
- Check locknuts on ball joints are tight.

CAUTION

Before doing maintenance on the Cruiser, 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'.

First Service - 50 hours

Engine - Service Item	Type of Service	Part No. Goldacres	Part No. Generic
Engine oil	Drain & Replace	GA5012457 (20L) GA5017913 (200L)	-
Engine oil filter	Replace	GA5051755	LF3970
Fuel filter - Engine	Replace	GA2700193	FF63054NN
Fuel filter - Primary	Replace	GA2700192	FS1098

Hydraulic Oil Tank - Service Item	Type of Service	Part No. Goldacres	Part No. Generic
Hydraulic oil return filter	Replace	GA5069056	-
Hydraulic pressure filter	Replace	GA3501114	-

Air Conditioning - Service Item	Type of Service	Part No. Goldacres	Part No. Generic
Compressor drive belt	Check & re-tension	GA5071435	13A1080

NOTE

Lubricant details are provided under 'Service Parts' which follow the 'Maintenance Schedules'.

NOTE

For more detailed engine maintenance information refer to 'Cummins Operation and Maintenance Manual QSB4.5 and QSB6.7 Engine' supplied with the machine.

First Service - 50 hours cont.

Transmission & Transfer Case - Service Item	Type of Service	Part No. Goldacres	Part No. Generic
Transmission oil	Inspect	GA5006959 (20L) GA5006960 (208L)	-
Transmission external spin-on filter	Inspect	GA5048281	29539579 or HF35296
Transfer case oil	Drain & Replace	GA5072325 (20L)	-

Front Axle - Service Item	Type of Service	Part No. Goldacres	Part No. Generic
Differential oil - Non-LSD	Drain & Replace	GA5047310 (200L)	-
Front wheel bearings	Check Pre-load & Inspect	See Parts Manual	-
Toe in (1-5 mm)	Measure	-	-

Rear Axle - Service Item	Type of Service	Part No. Goldacres	Part No. Generic
Differential Fixed Axle	Drain & Replace	GA5047310	-
Differential Adjustable Axle	Drain & Replace	GA5072325)	-
Drop leg oil	Drain & Replace	GA5047310 (200L)	-
Telescoping drive shafts (2-3m axles)	Clean & Re-grease	Klüberpaste 46 MR 401	-

Maintenance Schedules

Engine - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Engine oil level	Inspect	Inspect	Replace	Replace	Replace	Replace
Engine oil filter	Inspect	Inspect	Replace	Replace	Replace	Replace
Fuel filter - engine	Inspect	Inspect	Replace	Replace	Replace	Replace
Fuel - (separator filter)	Drain	Drain	Replace	Replace	Replace	Replace
Fuel level	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Antifreeze/Coolant - Replace @ 2000 hours	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Fan	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Drive belts	Inspect	Inspect	Inspect	Inspect	Inspect	Replace
Cooling system	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Mounting bolts & isolators	-	Inspect	Inspect	Inspect	Inspect	Inspect
Hoses, lines and clamps	-	Inspect	Inspect	Inspect	Inspect	Inspect
Exhaust system	-	Inspect	Inspect	Inspect	Inspect	Inspect
Air cleaner (Primary filter)	-	Inspect	Inspect	Inspect	Inspect	Replace
Air cleaner (Safety filter)	-	Inspect	-	Inspect	Inspect	Replace
Air intake piping	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Crankcase breather tube	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Belt tensioners	-	Inspect	Inspect	Inspect	Inspect	Inspect
Turbocharger	-	Inspect	Inspect	Inspect	Inspect	Inspect
Air compressor	-	Inspect	Inspect	Inspect	Inspect	Inspect
Harmonic balancer	-	Inspect	Inspect	Inspect	Inspect	Inspect

Maintenance Schedules cont.

Transmission - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Selector Actuator	-	Inspect	Inspect	Inspect	Inspect	Inspect
Bolts	-	Inspect	Inspect Tension	Inspect Tension	Inspect Tension	Inspect Tension
Electrical Harnesses	-	Inspect	Inspect	Inspect	Inspect	Inspect
Cooling System	-	Inspect	Inspect	Inspect	Inspect	Inspect

Transmission**- Filter Change Internal**

Main Filter (Spin-on)	2000 Hours 24 Months	4000 Hours 48 Months
<i>Internal Filter to be replaced on rebuild only.</i>		

Transmission**- Oil Change Internal**

Allison Approved Oils:	3000 Hours 36 Months	6000 Hours 72 Months	9000 Hours
- Castrol TranSynd TES 295 - Valvoline Syn Gard TES 668			
Non-Approved TES 295 Oil*	500 Hours 6 Months	2000 Hours 24 Months	4000 Hours 48 Months

* Less than 100% concentration Allison approved TES 295 fluid is considered a mixture and should utilise Allison approved non-TES295 fluid change intervals.

Transfer Gearbox - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Oil Level	-	Inspect	Inspect	Replace	Inspect	Replace
Input output seals	-	Inspect	Inspect	Inspect	Inspect	Inspect
Breather	-	Inspect	Inspect	Inspect	Inspect	Inspect

Maintenance Schedules cont.

Drive Shafts - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Transmission & at Axle Input, Centre Bearing	-	Inspect	Inspect	Inspect	Inspect	Inspect
Universal Joints	-	Grease Inspect	Grease Inspect	Grease Inspect	Grease Inspect	Grease Inspect
Slip Splines	-	Grease Inspect	Grease Inspect	Grease Inspect	Grease Inspect	Grease Inspect
Centre Bearing	-	Grease Inspect	Grease Inspect	Grease Inspect	Grease Inspect	Grease Inspect

Suspension System - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Polyurethane bushes	-	Inspect	Inspect	Inspect	Inspect	Inspect
Bolts & nuts *	-	Inspect	Tension	Tension	Tension	Tension
Shock absorbers	-	Inspect	Inspect	Inspect	Inspect	Inspect
Ride height valve	-	Inspect	Inspect	Inspect	Inspect	Inspect
Sway bar & ball ends	-	Inspect	Inspect	Inspect	Inspect	Inspect
Torque Rod - Welds	-	Inspect	Inspect	Inspect	Inspect	Inspect

Maintenance Schedules cont.

Axles & Drop Leg - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Differential Oil	-	Inspect	Inspect	Replace	Inspect	Replace
Drop leg Oil	-	Inspect	Inspect	Replace	Inspect	Replace
Clean Dropleg Breathers	-	-	Inspect	Inspect	Inspect	Inspect
Steering Pins/ Bearing	-	Grease Inspect	Grease Inspect	Grease Inspect	Grease Inspect	Inspect Replace
Tie Rod Ends & Ball Joints*	-	Lubricate Inspect	Tension Lubricate Inspect	Lubricate Inspect	Tension Lubricate Inspect	Lubricate Inspect
Universal Joints	-	Grease Inspect	Grease Inspect	Grease Inspect	Grease Inspect	Grease Inspect
Axles		Inspect	Inspect	Inspect	Inspect	Inspect
Toe In (1-5mm)	-	-	Measure	Measure	Measure	Measure
Telescoping Drive Shafts 2-3m Axle Only		Clean & Grease	Clean & Grease	Clean & Grease	Clean & Grease	Clean & Grease

NOTE

Suspension System: * Parallel link bolts are to be torqued to 300 ft/lb.

NOTE

Axles & Dropleg: * Machines fitted with John Deere Autosteer systems need the tie rod ends checked and re-tensioned every 20 hours to prevent excessive toe angle change over time.

Maintenance Schedules cont.

Wheels & Tyres - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Rims	-	-	Inspect	Inspect	Inspect	Inspect
Wheel nuts - 320 ft/lb	Tension	Tension	Tension	Tension	Tension	Tension
Tyre pressure	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Tyres	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect

Braking System - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Brake pads - Replace as required	-	Inspect	Inspect	Inspect	Inspect	Inspect
Hydraulic brake lines/hoses	-	Inspect	Inspect	Inspect	Inspect	Inspect
Brake discs - Min Thickness 20mm	-	Inspect	Inspect	Inspect	Inspect	Inspect
Seals	-	Inspect	Inspect	Inspect	Inspect	Inspect
Brake operation	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Park brake pads - Replace as required	-	Inspect	Inspect	Inspect	Inspect	Inspect
Park brake operation	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Park brake switch	-	Inspect	Inspect	Inspect	Inspect	Inspect
Caliper mountings	-	Inspect	Inspect	Inspect	Inspect	Inspect
Caliper & Rotor	Inspect	Clean	Clean	Clean	Clean	Clean

Maintenance Schedules cont.

Pneumatic System - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Air tanks	Drain	Drain	Drain	Drain	Drain	Drain
Air lines & fittings	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect

Hydraulic System - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Hydraulic oil	-	Inspect	Sample	Sample	Sample	Replace
Hydraulic oil return filter	-	Inspect	Inspect	Replace	Inspect	Replace
Hydraulic pressure filter	-	Inspect	Inspect	Replace	Inspect	Replace
Hydraulic Reservoir Breather	-	Inspect	Inspect	Replace	Inspect	Replace
Hydraulic lines & hoses	-	Inspect	Inspect	Inspect	Inspect	Inspect
Hydraulic cylinders	-	Inspect	Inspect	Inspect	Inspect	Inspect
Hydraulic pumps	-	Inspect	Inspect	Inspect	Inspect	Inspect
Hydraulic pump mountings	-	Inspect	Inspect	Inspect	Inspect	Inspect

NOTE

Braking System: Minimum thickness of the Brake rotor is 20mm. Replacement is required.

Maintenance Schedules cont.

Chassis - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Ladder switch	-	Inspect	Inspect	Inspect	Inspect	Inspect
Ladder folding mechanism	-	Grease	Grease	Grease	Grease	Grease
Ladder mounting bolts	-	Tighten	Tighten	Tighten	Tighten	Tighten
Pump mounting bolts	-	Tighten	Tighten	Tighten	Tighten	Tighten
Cab mount bolts & bushes	-	Inspect	Inspect	Inspect	Inspect	Inspect
Cabin seals	-	-	Inspect	Inspect	Inspect	Inspect
Cabin interior	Clean	Clean	Clean	Clean	Clean	Clean
Tank retaining strap bolts	Tighten	Tighten	Tighten	Tighten	Tighten	Tighten
Para lift link bushes	Grease	Grease	Grease	Grease	Grease	Grease
Tank frame mount bolts	-	Tighten	Tighten	Tighten	Tighten	Tighten
Chassis frame	-	-	Inspect	Inspect	Inspect	Inspect
Induction hopper mounting	-	Grease	Grease	Grease	Grease	Grease
Boom support mounting bolts	-	Tighten	Tighten	Tighten	Tighten	Tighten
Machine exterior	-	Clean	Clean	Clean	Clean	Clean
Windscreen wiper fluid	-	Inspect	Inspect	Inspect	Inspect	Inspect

Maintenance Schedules cont.

Electrical System - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Battery Electrolyte level	-	Inspect	Inspect	Inspect	Inspect	Inspect
Lights	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Leads and wires	-	-	Inspect	Inspect	Inspect	Inspect
Earth Leads	-	-	Inspect	Inspect	Inspect	Inspect
Wires near moving parts	-	-	Inspect	Inspect	Inspect	Inspect
Battery Terminal	-	-	Clean & Protect	Clean & Protect	Clean & Protect	Clean & Protect

Maintenance Schedules cont.

<u>Air-Conditioning System</u> - Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Condensor	Clean	Inspect	Inspect	Inspect	Inspect	Inspect
Air conditioner lines	-	-	Inspect	Inspect	Inspect	Inspect
Refrigerant & dryer	-	-	Inspect	Inspect	Inspect	Replace
HVAC box	-	-	Inspect	Inspect	Inspect	Inspect
Carbon filter (or as required)	-	Inspect	Inspect	Replace	Inspect	Replace
Carbon filter inlet	-	Inspect	Inspect	Inspect	Inspect	Inspect
Compressor drive belt	-	Inspect	Inspect	Adjust	Adjust	Adjust

<u>Spraying Equipment</u> - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Booms	Inspect	Adjust Inspect	Adjust Inspect	Adjust Inspect	Adjust Inspect	Adjust Inspect
Nuts & bolts	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Hinge bushes	Grease	Grease	Grease	Grease	Grease	Grease
Tilt bushes	Grease	Grease	Grease	Grease	Grease	Grease
Sprayer calibration	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Filters (suction, pressure, flush & air compressor filter)	Inspect	Inspect	Inspect or replace	Inspect or replace	Inspect or replace	Inspect or replace

Maintenance Schedules cont.

<u>Spraying Equipment</u> - Service Item	DAILY (10Hrs)	WEEKLY (50Hrs)	250hrs/ 3 mths	500hrs/ 6 mths	750hrs/ 9 mths	1000hrs/ 1 year
Nozzles	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Pump (pre-spray test)	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Pump Oil condition & level	Inspect	Inspect	Replace	Replace	Replace	Replace
Pump Diaphragms	-	-	-	Replace	-	Replace
Pump seals	-	-	-	Replace	-	Replace
Pump valve O-rings	-	-	-	Replace	-	Replace
Pump valve springs & cages	-	-	-	Replace	-	Replace
Hoses and fittings	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Boom secure in boom rests	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Sprayer Pump & lines	Flush	Flush	Flush	Flush	Flush	Flush
Tanks	Inspect	Inspect	Inspect	Inspect	Inspect	Inspect
Flow meter	Inspect Drain	Inspect Drain	Inspect Drain	Inspect Drain	Inspect Drain	Inspect Drain
Ball valves	Open & inspect	Open & inspect	Open & inspect	Open & inspect	Open & inspect	Open & inspect
Fill Pump Safety valve	-	Purge	Remove & clean	Remove & clean	Remove & clean	Remove & clean

Service Kits: G4 Series 2 - MY24 Onwards

50hr Service Kit - Part No GA1100079		
Part Numbers	Description	Qty
GA5069056	Filter element, Hydraulic return to suit tank mounted filter GA5069055, Hydac	1
GA3501114	Filter Element, Hydraulic Pressure Filter, Pro S2, Hydac, 1250491	1
GA5051755	Filter, Oil, Suit Cummins QSB engine	1
GA5048281	Filter, Allison Transmission, Spin On, 2000 Series (Replaces GA5048280)	1
GA2700193	Filter, Fuel, Secondary, Cummins B4.5L, FF63054NN	1
GA2700192	Filter, Fuel, Primary, Cummins B4.5L, FS1098	1
GA5024630	Carton, Cardboard box, Branded, Scores, 311mm x 208mm x 188mm	1
GA8700724	Decal, Next Service Indicator, Self Propelled	1

250hr & 750hr Service Kit - Part No GA1100080		
Part Numbers	Description	Qty
GA5051755	Filter, Oil, Suit Cummins QSB engine	1
GA2700193	Filter, Fuel, Secondary, Cummins B4.5L, FF63054NN	1
GA2700192	Filter, Fuel, Primary, Cummins B4.5L, FS1098	1
GA5009731	Box 250x 175 x70	1
GA8700724	Decal, Next Service Indicator, Self Propelled	1

8 Service – Lubrication & Maintenance

Service Kits: G4 Series 2 - MY24 Onwards cont.

500hr Service Kit - Part No GA1100081

Part Numbers	Description	Qty
GA5069056	Filter element, Hydraulic return to suit tank mounted filter GA5069055, Hydac	1
GA3501114	Filter Element, Hydraulic Pressure Filter, Pro S2, Hydac, 1250491	1
GA5075450	Breather Cap, Oil Reservoir Filler, HYDAC	1
GA5051755	Filter, Oil, Suit Cummins QSB engine	1
GA5048281	Filter, Allison Transmission, Spin On, 2000 Series (Replaces GA5048280)	1
GA2700193	Filter, Fuel, Secondary, Cummins B4.5L, FF63054NN	1
GA2700192	Filter, Fuel, Primary, Cummins B4.5L, FS1098	1
GA5024630	Carton, Cardboard box, Branded, Scores, 311mm x 208mm x 188mm	1
GA8700724	Decal, Next Service Indicator, Self Propelled	1

G4 Crop Cruiser.



Service Kits: G4 Series 2 - MY24 Onwards cont.

1000hr Service Kit - Part No GA1100082		
Part Numbers	Description	Qty
GA5069056	Filter element, Hydraulic return to suit tank mounted filter GA5069055, Hydac	1
GA3501114	Filter Element, Hydraulic Pressure Filter, Pro S2, Hydac, 1250491	1
GA5075450	Breather Cap, Oil Reservoir Filler, HYDAC	1
GA5071700	Filter, Air Cleaner Engine Primary Large AF26120, G3 G4 Series	1
GA5071705	Filter, Air Cleaner Engine Secondary Small AF26121, G3 G4 Series	1
GA5051755	Filter, Oil, Suit Cummins QSB engine	1
GA5048281	Filter, Allison Transmission, Spin On, 2000 Series (Replaces GA5048280)	1
GA2700193	Filter, Fuel, Secondary, Cummins B4.5L, FF63054NN	1
GA2700192	Filter, Fuel, Primary, Cummins B4.5L, FS1098	1
GA5066740	Carbon filter, Replacement insert suit donaldson	1
GA5071435	V Belt, Air Conditioner, 13A1080, G3 G4	1
GA5013535	Carton, Cardboard box, 440 x 320 x 450	1
GA8700724	Decal, Next Service Indicator, Self Propelled	1

Service Parts

Lubricants - Service Item	Service Specification	Capacity (L)	Part No.
Engine	SAE 15W-40 heavy duty engine oil that meets Cummins standard CES20078 API1 & CI-4	15L	GA5012457 (20L) GA5017913 (200L)
Hydraulic oil	46W Dedicated hydraulic oil eg: Valvoline Ultramax HVI 46	90L	GA5017199 (200L)
Transmission	Castrol Allison Transynd - TES295 or Valvolene TES668	20L approx. (dry)	GA5006959 (20L) GA5006960 (208L)
Transfer Gearbox	SYN FE 75W-90	1.7L	GA5072325 (20L)
Differential - Fixed Axle	80W90 EP Gear Oil - Non LSD	9.0L	GA5047310 (200L)
Differential - Adjustable Axle	75W90 API GL-5 SYN	4.5L	GA5072325 (20L)
Driven Drop legs	80W90 EP Gear Oil	10L (fill to level hole)	GA5047310 (200L)
Planetarm Hub	80W90 EP Gear Oil	5.0L	GA5047310 (200L)
Telescoping Drive Shafts	Kluberpaste 46 MR 401	-	-
General Grease pts	Multi-Purpose Grease	-	-
Steering Pivot pts	Molybdenum Based Grease	-	-
Coolant	TEC PG XL Cummins	39L approx.	GA5008311 (205L)
Spray Pump	SAE 15W40	2.68L for Zeta 260	GA5012457 (20L)
Air-conditioning unit	Oil, Sanden SP20	150-160ml	-
	Gas R134a	2kg	-
Auto greaser	NGLI 0	4kg	-
	NGLI 2	4kg	-
Brake Fluid	DOT 4 SYN	0.5L/booster	

Service Parts cont.

Filters - Service Item	Part No. Goldacres	Part No. Generic
Hydraulic Pressure Filter	GA3501114	
Hydraulic Return Filter	GA5069056	-
A/C Carbon Filter	GA5066740	P277
Air Cleaner Primary Element	GA5071700	AF26120
Air Cleaner Safety Element	GA5071705	AF26121
Engine Oil Filters	GA5051755	LF3970
Transmission Oil Filters	GA5048281 (spin on)	Series 2000 = 29539579 or HF35296
	GA5048285 (internal)	Series 2000 = 29537966 Internal kit
Fuel Filter (primary)	GA2700192	FS1098
Fuel Filter (engine)	GA2700193	FF60354NN
Hydraulic Breather cap	GA5075450	-

Further Lubricant recommendations:

- For differing weather conditions consult the Cummins operator's manual to choose the suitable oil grade.
- Ensure 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. Proper lubrication may be affected by differences in chemical composition.
- Seek advice from the petroleum dealer on the correct use of lubricants & additives.
- At time of manufacture, G15 Anti-Corrosion Spray is applied to all fasteners (bolts, washers & nuts) and zinc plated components.
- G15 Anti-Corrosion Spray should also be applied to the machine both pre & post season.
- As a guide, application of G15 Anti-Corrosion Spray is recommended to the following (but not limited to) areas: Pump mounting bolts, boom rests, left hand pod, mudguard mounting bolts, induction hopper bolts & latches, hydraulic manifold, boom hinge bolts, airbag hose fittings and hydraulic hose crimp fittings, etc.

Service Parts cont.

Belts - Service Item	Part No. Goldacres	Part No. Generic
V Belt, Air Conditioner Compressor	GA5071435	13A1080
Belt, Serpentine, Water Pump, Alternator	GA5075275	8PR - 1725 8PR - 1732
Belt, Serpentine, Bilberry	GA2700163	8PR - 1075

Headlights - Service Item	Part No. Goldacres	Part No. Generic
Headlight globe - Low beam - LED	GA3000492	HB3-LED
Headlight globe - High beam - LED	GA3000492	HB3-LED

Service Instructions

G-Hub Controller Service Tab

The G-Hub Controller provides quick reference to service intervals and service history.

To Access the Service Screen:

Press 'Settings' touch button, then the 'Service' tab touch button to open the Hardware tab screen which displays 4 tab screens:

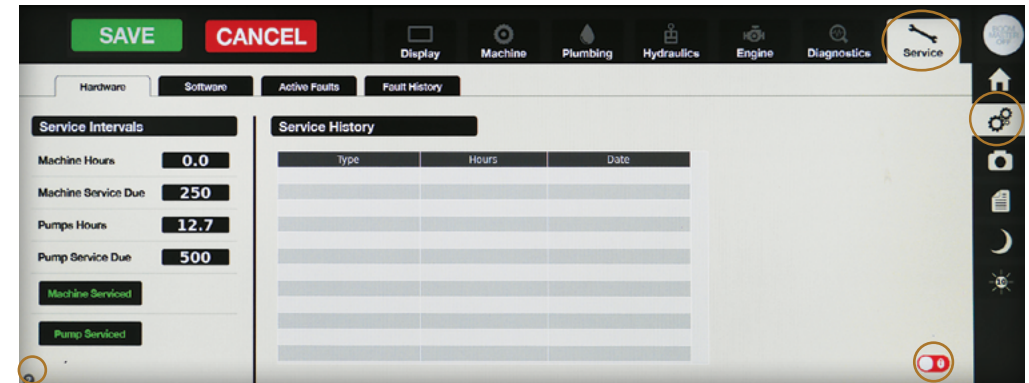
- Hardware
- Software (see chapter 3 for instructions)
- Active Faults (see chapter 9 for instructions).
- Fault History (see chapter 9 for instructions).

The 'Hardware' screen is locked for protection from uninformed or accidental alteration.

The screen must be unlocked before any setting or alterations can be made.

To unlock the screen, follow the instructions previously provided in chapter 4 & 6.

A 'Help (?)' touch button in the lower left hand corner of the screen can be pressed for further information.



Press the Setting tab, then the 'Service' tab to open the Hardware tab screen.
Press the 'Help (?)' touch button for more information.

Hardware

The 'Hardware' screen shows two menus:

- 1 Service Intervals
- 2 Service History.

1 Service Intervals

Required 'Service Intervals' are set for the Machine & Pump. Each service should be recorded after servicing is completed.

To Record Service Intervals:

Machine Service Due

Complete the Machine Service as required,

then press the 'Machine Serviced' touch button to record the service.

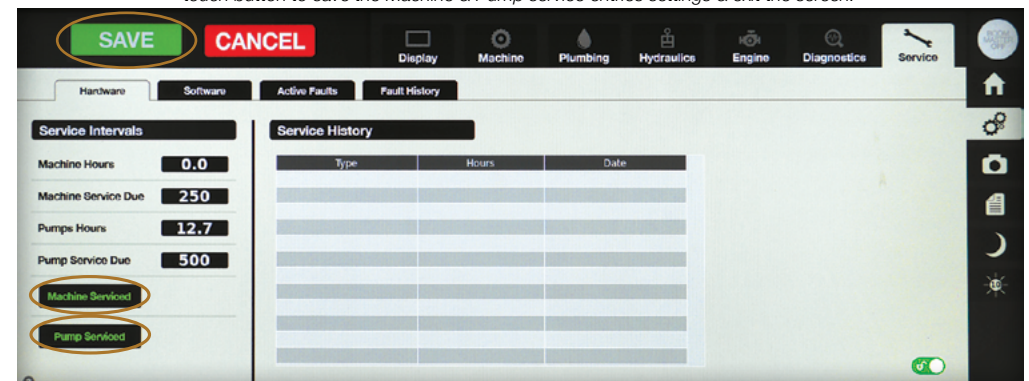
The Machine hour reading is automatically recorded and the next service requirement ('Machine Service Due') is updated.

Pump Service Due

Complete the Pump Service as required, then press the 'Pump Serviced' touch button to record the service.

The Pump hour reading is automatically recorded and the next service requirement ('Pump Service Due') is updated.

Press the 'Machine Service Due' & 'Pump Service Due' touch buttons, respectively, to enter each service. Press the SAVE touch button to save the Machine & Pump service entries settings & exit the screen.





Unclip the bonnet latch located on the left hand side near the cabin.



Unclip the bonnet latch located on the right hand side near the cabin.

Opening the Engine Bonnet

To open the bonnet, unclip the bonnet latches located on either side of the bonnet near the cabin, then lift & move the bonnet forwards. Don't let the bonnet fall forwards under its own weight.

Once opened, the bonnet remains open by its over-centre weight.

Be sure to close the bonnet & refasten the latches on both sides before driving the Cruiser.

Strap tension can be adjusted, if necessary.

Ensure strap tension is tight when the bonnet is closed.

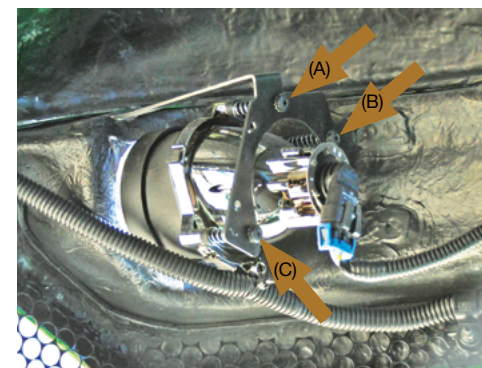


G4 Crop Cruiser headlights & work lights.

Headlights

To replace a globe, unclip the engine bonnet latches on both sides of the bonnet, then lift & move the bonnet forwards. Don't let the bonnet rotate forwards under its own weight.

Ensure the engine is cold, then lean across to unclip the loom from the globe, then unclip the globe from the headlight housing and remove it.



Align the headlight by adjusting three screws (A, B & C) located around the headlight body.

Replace the globe with a new globe, then, reconnect the loom.

Headlight alignment is made by adjusting three screws located around the headlight body.

Make a small adjustment to the screws, then check to see if movement is in the correct direction.

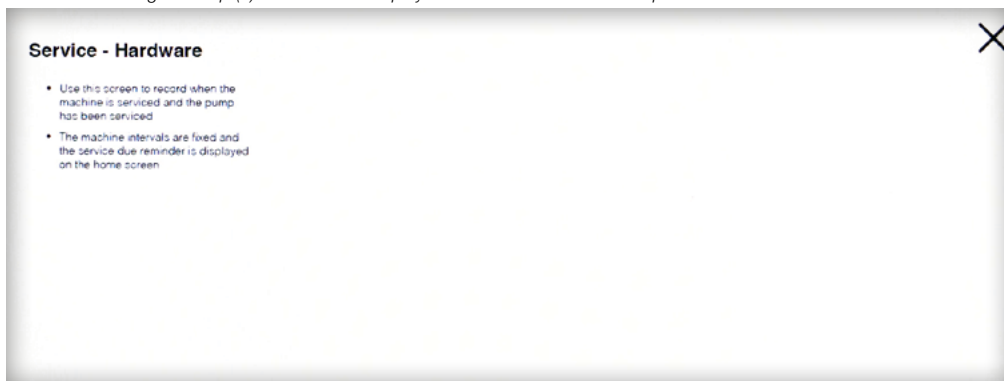
Repeat screw adjustments until the headlight is properly aligned.

Ensure the bonnet is closed and latches re-fastened before driving.

The headlight uses an HB3 globe type globe (see details left).

Refer to Globe specification provided in the 'Service Parts' of the 'Maintenance Schedules' of this chapter.

Pressing the Help (?) touch button displays the 'Service Hardware' Help information screen shown below.



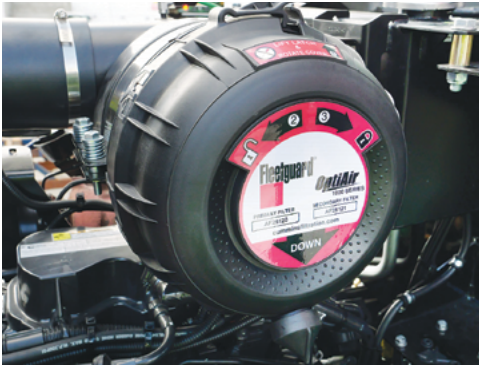
CAUTION

When the bonnet is closed, ensure the latches are properly attached and tight before driving the Cruiser.

CAUTION

If the engine has been running, take extra care around hot engine parts such as the exhaust.

Allow the engine to cool down before doing maintenance and repairs.



Engine air cleaner.

Engine Air Cleaner

The engine air cleaner is located under the engine bonnet, at the top front right hand side of the engine.

A vacuum gauge (located the right hand side of the hydraulic oil tank frame) is used to detect blockage of the air filter. The vacuum gauge is visible from the cabin.

In middle range, the gauge indicates normal function but in the 'RED' zone, shows filter blockage and the primary air filter must be removed and replaced.

NEVER attempt to clean the secondary filter, (located behind the primary air filter). The filter must be replaced when it is contaminated or damaged.

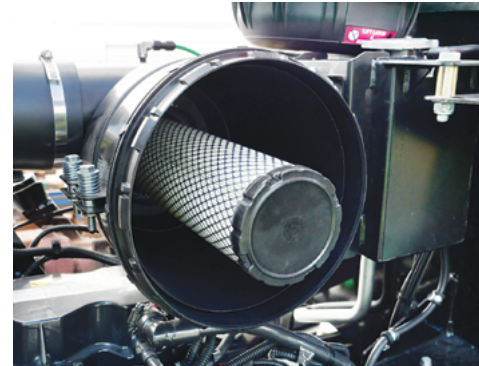
Inspection of filters is recommended when the Cruiser is new and inspection of the primary air filter at each service interval and when the vacuum gauge indicates filter change.



Release the cover from the air cleaner, then remove the primary and secondary filters.

To Change the Air Filter:

- 1 Open the the engine bonnet (refer to instructions on the previous page).
- 2 Release the cover clips on top & bottom of the air cleaner.
- 3 Remove the cover, then remove the primary and secondary filters.



Remove and fit new secondary air filter.

- 4 Fit new primary & secondary air filters.
- 5 Carefully refit the air cleaner cover.
- 6 Reconnect & fasten the cover clips on top of the air cleaner. This completes the primary air filter change.
- 7 Close the the engine bonnet

Refer to Air Filter specification provided in the 'Maintenance Schedules' of this chapter.



The engine radiator & radiator cap.

Engine Coolant

The engine radiator is fitted with a header tank which allows for expansion of coolant as the engine warms up.

The radiator cap allows excess fluid to drain out of the over flow as coolant expands.

Radiator coolant level must be checked DAILY.

Ensure the engine is cool before checking. Do not open the radiator cap if the engine is hot.

The coolant level must be visible when the cap is removed. Coolant should be no more than 50mm below the opening when the engine is cool.

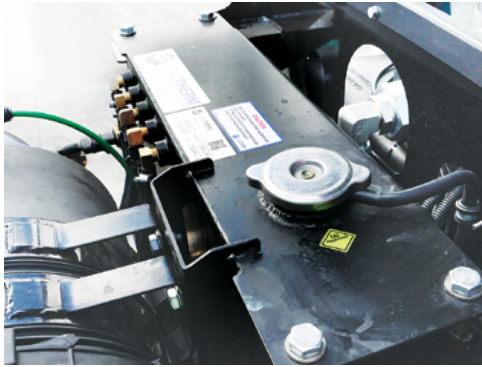
The header tank is fitted with a level sensor so that if coolant drops below the sensor, the engine controller initiates an alarm via the G-hub controller & shuts the engine down.

The coolant condition must be checked at regular service intervals. Refer to 'Engine Maintenance Schedules' in this chapter.

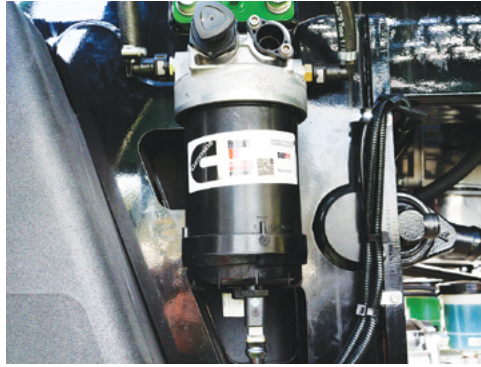
Coolant test kits are available from Cummins.

CAUTION

Never remove the radiator cap when the engine is hot. Failure to follow this instruction may result in severe injuries.



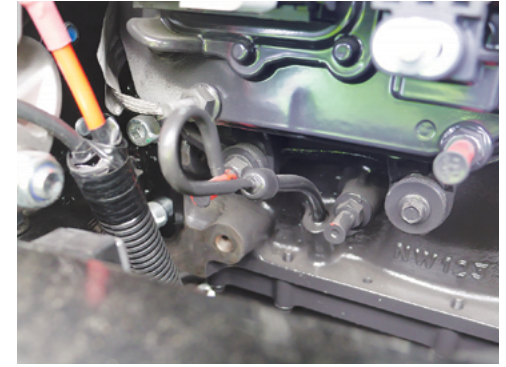
Replace engine coolant every 2000 hours.



Unscrew & pump the plunger to prime the fuel on the primary filter. Retighten the plunger after fuel is primed.



The secondary fuel filter located on the left hand side of the engine.



Engine oil dip stick.

Coolant Replacement

Coolant must be replaced every 2000 hours. Follow the instructions on top of the radiator. Quantity & coolant type as shown in the 'Maintenance Schedules' of this chapter.

Ball valves (located on heater hoses on RHS rear of the engine & header tank) may be isolated during hotter weather to allow air conditioning to operate more efficiently.

When replacing the coolant, these ball valves must be opened so that all the air is bled from the coolant lines.

Fuel Filters

Three fuel filters are located on the left hand side of the Cruiser engine area:

- Primary fuel filter with water separator & manual hand pump, mounted on the left hand chassis.
- Secondary fuel filter, locate on the left hand side above the engine oil dip stick (fine pressure filter).

The primary filter is the first point from the fuel tank, it separates any water from the fuel and also filters contaminants.

The water trap at the base of the filter cylinder should be drained daily.

It has a sensor at its base which triggers an alarm when excessive amounts of water are detected in the fuel.

Unscrew & pump the plunger to prime the fuel. Retighten the plunger after the fuel is primed.

The primary filter should be replaced within the first 50 hours of use, then every 250 hours of engine operation.

Refer to Fuel Filter specification provided in the 'Maintenance Schedules' of this chapter.

Engine Oil & Filter

Follow the recommended service schedules for engine oil and filter.

Check engine oil level DAILY.

To Check the Engine Oil:

- 1 Stop the engine.
- 2 Remove the engine oil dipstick from the engine tube and wipe it clean of oil.
- 3 Replace the engine dipstick, then remove it to measure the engine oil level.

The oil level must be between the 'ADD' and 'FULL' marks on the dipstick.

If the oil level is below the 'ADD' mark, top-up the oil level with the appropriate oil.

Refer to Lubricant specification provided in the 'Maintenance Schedules' of this chapter.

NOTE

Required Fuel Filter maintenance is provided under 'Engine Maintenance Schedules & Filter' specifications in this chapter.



Engine oil filler cap in the rocker cover on top of the engine.

Engine Oil & Filter Change

The engine oil & oil filter must be changed within the first 50 hours of engine use. Refer to the 'Maintenance Schedules' in this chapter

To Change the Engine Oil & Oil Filter:

- 1 Place a container (at least 30 litre capacity) under the remote drain plug, located on the left hand side of the front cross rail in front of the fuel tank.
- 2 Remove the drain plug.
The engine oil filler cap can be loosened to allow the oil to drain more freely.
- 3 Remove the spin-on external engine oil filter by rotating it in the counter-clockwise direction. A standard strap-type wrench may be used.

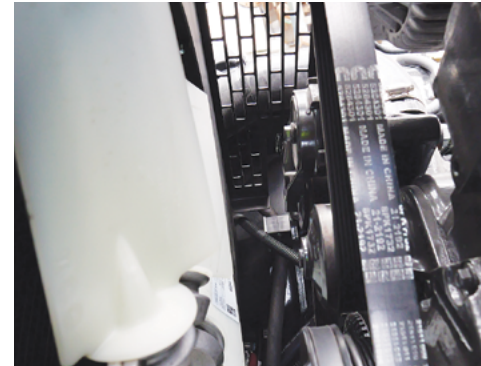


Engine oil filter located on the right hand side of the engine.

- 4 Replace the filter with new filter. Lubricate the filter gasket with film of engine oil.
- 5 Install the filter by hand, until the gasket tightens onto the engine (hand tight only).
- 6 After the engine oil is fully drained, refit the oil drain plug.
- 7 Fill the new engine oil via the filler cap in the rocker cover on the top of the engine or via the filler cap located by the dipstick on the left hand side of the engine.
- 8 Check the oil level using the dipstick on the left hand side of the engine.
- 9 On completion, ensure the oil filler caps drain plug and oil filter are fitted correctly and wipe any oil spills from the machine.

NOTE

Refer to 'Engine Maintenance Schedules' in this chapter for Engine Oil & Oil Filter specifications.



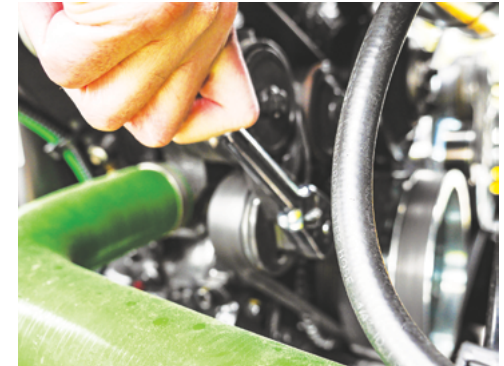
Engine drivebelt & belt tensioner.

Engine Drive Belt

The Engine Drive Belt (located on the front of the engine) uses a spring tensioner which requires no manual adjustment, but requires inspection at regular service intervals.

If the tensioner loses tension, belt slip will occur and the tensioner must be replaced.

Check the belt regularly, as it may become slippery, frayed or cracked over time. The belt should be replaced at minimum every 1000 hours.



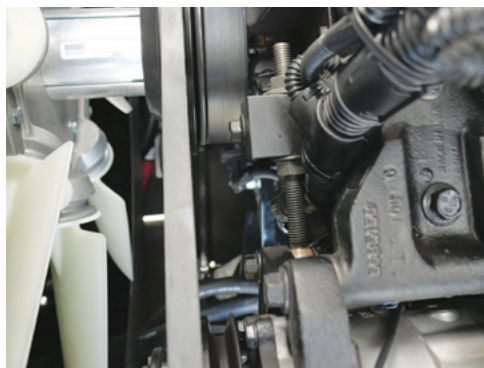
Use a breaker bar with a 1/2" socket to release the engine belt tensioner.

To Replace the Engine Drive Belt:

- 1 Remove the drive belt using a breaker bar with a 1/2" socket to release the tensioner before slipping the belt off.
Slowly & smoothly release bar to avoid snap back injury.
- 2 Replace the drive belt using the breaker bar with a 1/2" socket to release the tensioner.
Slip new belt on & ensure the belt ribs are aligned correctly with the pulleys.
Slowly & smoothly release bar to avoid snap back injury.

CAUTION

Ensure the engine is completely switched off before accessing the drive belt. Failure to follow this instruction may result in severe injuries.



Alternator drivebelt & belt tensioner.



Cabin Air Cleaner on the rear right hand side of the cabin.



Unscrew the carbon filter retaining nut & remove the filter element from the filter housing.

Alternator Drive Belt

The alternator Drive Belt (located on the front of the engine) uses a threaded tensioner which requires manual adjustment.

Check the belt regularly, as it may become loose, frayed or cracked over time. The belt should be replaced at minimum every 1000 hours.

To Replace the Alternator Drive Belt:

- 1 Remove the drive belt by loosening the threaded tensioner then slipping the belt off.
- 2 Replace the drive belt, then tighten the belt with the threaded tensioner.

Cabin Air Cleaner

The Cabin Air Cleaner is externally located at the rear right hand side of the cabin.

The filter cleans impurities from air entering the cabin. Air is drawn in through the carbon filter by a fan which pressurises the cabin preventing impure air entering the cab from gaps or possible seal leaks.

Filter elements include a:

- Pre-cleaner &
- Carbon filter.

The Pre-cleaner is a foam element which must be cleaned regularly.

The Carbon filter must be checked regularly and changed when necessary.

Carbon balls within the Carbon filter capture air impurities from the air passing through the filter.

A colour indicator on the end of the filter shows when the filter needs replacement (or recharging by a certified agent).

To Service the Cabin Air Filter:

Carbon Filter

- 1 Unscrew the top housing retaining band.
- 2 Remove the top of the housing.
- 3 Unscrew the carbon filter retaining wing nut
- 5 Remove the filter element from the housing.
- 6 Check the carbon ball colour guide:
 - Purple - Active
 - Brownish Orange - Active
 - Brownish Red - Filter must be replaced (or recharged by a certified agent).

When the indicator shows Brownish Red, replace/renew the carbon filter.

- 7 Fit the filter element into the housing.
- 8 Refit the filter retaining wing nut & tighten.
- 9 Refit the top of the housing & retaining band and tighten the band.

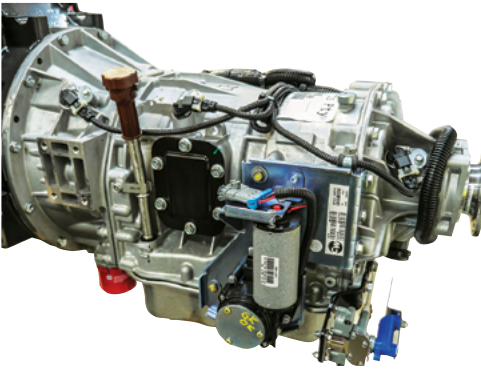
Refer to Filter specification provided in the 'Maintenance Schedules' of this chapter.

Foam Element

Clean the grey foam element of the Cabin Air Cleaner regularly.

NOTE

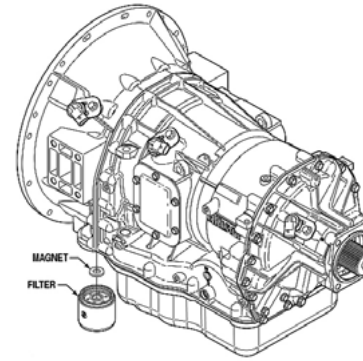
Carbon Filter specification is provided in the 'Service Parts' & 'Filters' section in this chapter.



Allison 6 Speed Automatic Transmission.



Transmission oil dipstick.



The oil filter & magnet is located on the bottom left hand side of the transmission.



Transmission oil filter.

Transmission

The Allison 6 Speed Automatic Transmission oil level must be checked regularly.

Follow the transmission oil & oil filter service schedules specified in the 'Maintenance Schedules' of this chapter.

Check the transmission oil level using the dipstick located on the left hand side in front of the cabin. Oil level must be checked with the engine running.

If oil is cold (less than 70 degrees Celsius) the oil level must be in the lower range on the dipstick.

If oil temperature is warm (above 70 degrees Celsius) the oil level must be in the upper range on the dipstick.

CAUTION

Avoid any skin contact with used transmission oil. Beware that draining transmission oil may be hot. Failure to follow these cautions may result in personal injuries.

To Replace the Transmission Oil:

- 1 Park the Crop Cruiser on a flat level surface.
- 2 Place a suitable container under the transmission to collect draining oil.
- 3 Remove the drain plug from the bottom of transmission oil pan. Warm oil will drain more easily.
- 4 Remove & replace the transmission oil filter according to the following instructions.
- 5 Allow the oil to drain out fully, then re-fit the drain plug & sealing washer. Tighten drain plug to 30-40 Nm (22-30 lb ft)
- 6 Refill the transmission with fresh oil via the dip stick tube (located on the left hand side in front of the cabin) until the oil level on the dipstick is correct.
- 7 Start the engine. The oil level will drop as it fills the oil lines running from the transmission.
- 7 Top up the oil level until it again reads correctly on the dip stick.
- 8 Replace the dipstick & stop the engine.

To Replace the Transmission Filter:

- 1 Remove the spin-on external filter by rotating it in the counter-clockwise direction. A standard strap-type wrench may be used.
- 2 Remove the magnet from the filter attachment tube or the top of the filter element.
- 3 Clean any metal debris from the magnet. Any metal pieces found larger than dust needs to be further investigated.
- 4 Re-install the magnet onto the filter attachment tube.

- 5 Lubricate the gasket on the filter with a thin film of transmission fluid.
- 6 Install the filter by hand, until the gasket touches the housing.
Turning the filter more than one full turn after gasket contact will damage it. Turn the filter ONE FULL TURN ONLY after gasket contact.
- 8 Refill transmission with oil.
Refer to the oil & filter specification provided in the 'Maintenance Schedules' of this chapter.

NOTE

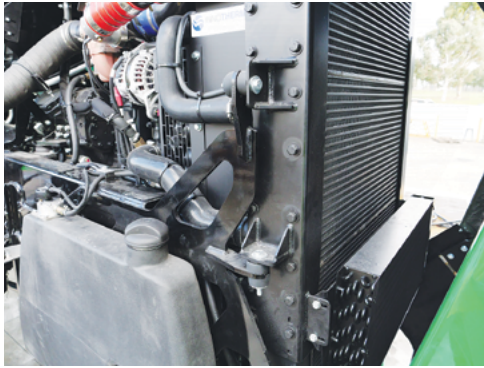
Refer to the Allison Transmission Operation & Codes Manual (supplied) for any information on the operation and/or troubleshooting of the Allison transmission.

NOTE

Transmission Maintenance Schedules and transmission fluid specification can be found in the 'Maintenance Schedules' of this chapter.

NOTE

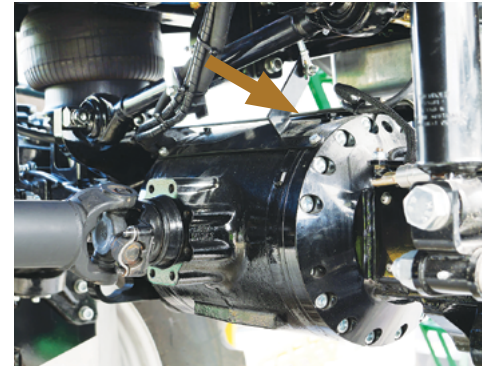
Driveline & Differential Maintenance Schedules are provided in the 'Maintenance Schedules' of this chapter.



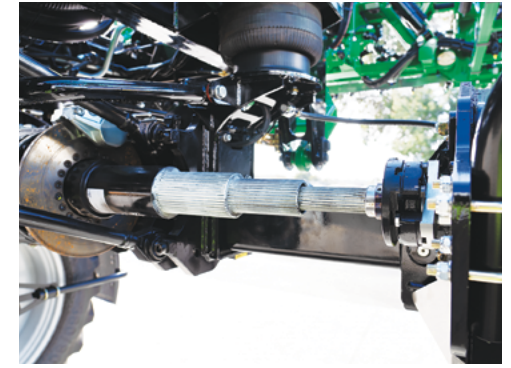
Integrated transmission oil cooler.



Inspect & grease fixed drivelines regularly.



Clean the breather of differentials regularly.



Inspect & lubricate adjustable axle drivelines regularly.

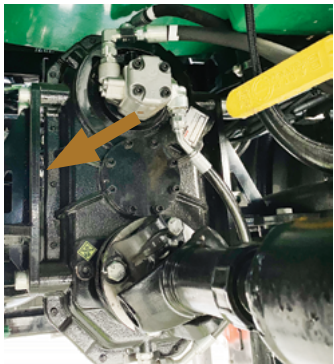
Transmission Oil Cooler

The transmission oil cooler is integrated within the engine radiator.

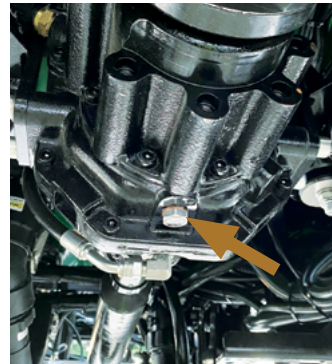
Transfer Case

The single speed Transfer Case directs drive from the transmission to differentials & wheels. Oil level is checked by removing the oil level plug located on the side of the transfer case. For service & lubricant details, refer to the Lubrication & Maintenance schedules in this chapter.

The transfer case oil level plug located on the side of the case.



The transfer case oil drain plug located on the base of the unit.



The transfer case oil cooler located on the RHS next to the suction filter.



Fixed Drivelines

Fixed Drivelines transmit drive between the transmission and the differentials.

Each driveline has greasable universal joints at each end & centre bearings on the shafts.

The rear shaft also has a telescopic spline which requires greasing.

All fixed drivelines should be inspected for wear & greased at regular service intervals.

Refer to the 'Grease Points' & 'Maintenance Schedules' in this chapter.

Differentials

Differentials run in an oil bath sump.

The oil level can be checked by removing the level plug on the side of the differential housing.

The oil should be replaced at the first service to remove manufacturing contamination. The oil must be replaced every 500 hours.

Refer to the specification provided in the 'Maintenance Schedules' of this chapter.

A breather, located on the top of the differential, allows oil to expand and contract without creating a vacuum or pressurising the differential housing.

Differential breathers must be cleaned at regular service intervals.

Adjustable Axle Option 2-3m

The rear axle of the 2-3m adjustable axle option is fitted with splined telescoping drives shafts between the differential centre and dropleg inputs.

These shafts do not have a shield or guard so they must be cleaned and greased regularly.

When performing maintenance on the adjustable axles, 3 of the needle valves can be closed allowing controlled extending and retracting of the axle being serviced.

Before extending or retracting an axle, ensure that the wheel is raised sufficiently off the ground using a rated axle stand or jack.

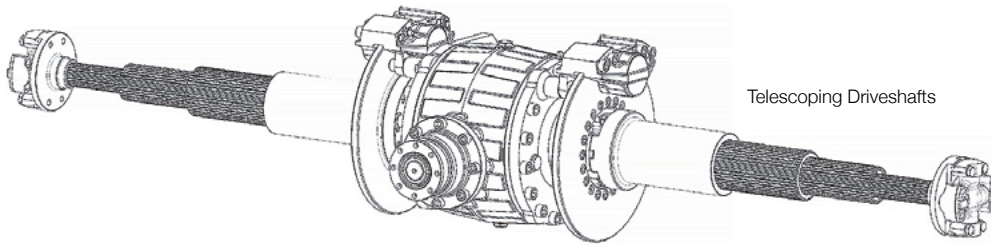
Keep clear of moving components at all times.

NOTE

Rear differentials are fitted with an LSD. Some chattering noise may be present during first use, but will subside over time. This is normal.

NOTE

When cleaning telescoping driveshafts and ONE wheel is lifted OFF the ground, the adjustable axle can be adjusted to the desired width providing the OTHER 3 axle adjustment cylinder valves are CLOSED. Adjust & measure the width. Repeat the procedure for each wheel.



Telescoping Driveshafts

Extend the Adjustable Axles and clean the telescoping driveshafts.

To Clean & Re-apply Grease

- 1 Fully extend the axles using the procedure explained in Chapter 6, 'Operation'.
- 2 Turn engine off and chock all wheels
- 3 Using a strong degreaser or wax & grease remover, generously coat the splines. Use a brush to loosen the grease and dirt.
- 4 Use compressed air to clean splines. Ensure safety glasses or a face shield are worn.
- 5 Once clean, apply a generous coat of grease to all surfaces of the splines.

Recommended grease: Kluberpaste 46 MR 401.

- 6 Reset the desired axle width using the procedure explained in Chapter 6, 'Operation'.

CAUTION

DO NOT attempt to extend or retract axle while the extending or retracting axle wheel is On the ground. Failure to ensure the wheel is Off the ground before extending or retracting is attempted will create excessive pressure on the wheel assembly & can cause damage.

NOTE

When cleaning telescoping driveshafts and ONE wheel is lifted OFF the ground, the adjustable axle can be adjusted to the desired width providing the OTHER 3 axle adjustment cylinder valves are CLOSED. Adjust & measure the width. Repeat the procedure for each wheel.



Differential oil drain & fill/oil level plugs.



Check dropleg oil level.

Drop Legs

Dropleg oil levels should be checked regularly.

Replace dropleg oil at the first 50 hour service to remove manufacturing contamination. Thereafter, replace oil every 500 hours.

Refer to the specification provided in the 'Maintenance Schedules' of this chapter.

Dropleg Oil

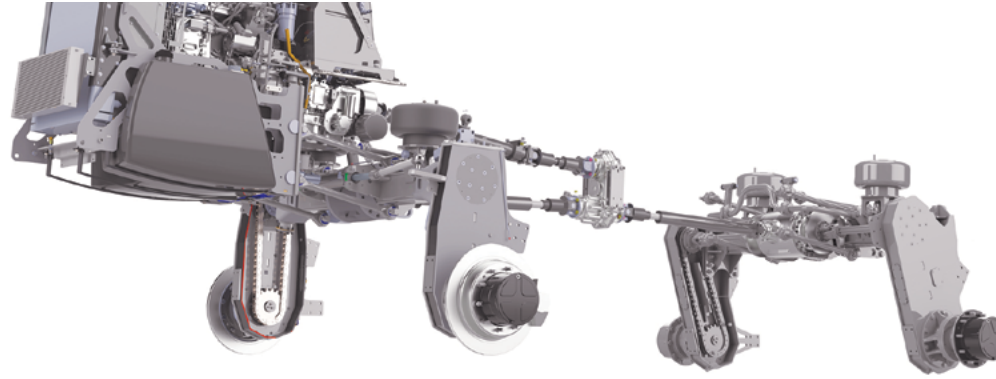
Drop legs incorporate an oil bath sump in which chains run & carry oil for the chains, sprockets & bearings. .

To Check Dropleg Oil Levels:

- 1 Remove the dropleg oil level/fill plug.
- 2 Check the oil level. Oil level must be just below the level/fill plug.
- 3 If required, add more oil.
- 4 Refit & tighten the level/fill plug.
- 5 Repeat the procedure for each dropleg.

To Change Dropleg Oil:

- 1 Place a container below the drain plug at the base of the dropleg to collect the draining oil.
- 2 Remove the drain plug to empty old oil.
- 3 After the oil is completely drained, refit and properly tighten the drain plug.
- 4 Refill the dropleg with recommended oil. Refer to the specification provided in the 'Maintenance Schedules' of this chapter.
- 5 Repeat the procedure for each dropleg.



Driveline illustration showing dropleg drive chains.

Dropleg Breathers

Breathers on top of the drop legs allow oil to expand & contract without pressurising or creating a vacuum in the drop leg housings.

Each dropleg breather must be cleaned at regular service intervals.

Refer to the specification provided in the 'Maintenance Schedules' of this chapter.

Dropleg Drive Chains

Drive chains of highest quality & designed for long trouble free life are used in the droplegs. Ensure proper dropleg care & maintenance is followed to maximise chain & sprocket life.

Drive chain uses Tsubaki 120 Super HT chain. Refer to the specification provided in the 'Maintenance Schedules' of this chapter.

Even the best chains will eventually stretch over time & loosen. Maximum allowable chain stretch is 1.5%. When this occurs the chains must be replaced.

Chain service life is gauged by total stretch. There is no tensioning mechanism. As chains stretch beyond 1.5%, the chains will no longer align correctly with the drive teeth. Therefore proper replacement is mandatory to prevent excessive wear of the drive sprocket teeth.

Stretch gauges to check chains are available from Goldacres.

Condition of Drop Chains

Chains do not have a specific service life. Chain condition is determined by observing metal particles in the oil & on the sump plug.

Larges numbers of metal particles larger than 1mm indicate the dropleg must be opened for inspection. Possible chain & bearing failure may be imminent and the dropleg should be overhauled.

As preventative mainenance measure, chains should be replaced whenever a dropleg is opened.



Airbag component of the 5 point suspension system.

Suspension

The Crop Cruiser's five point axle suspension system comprises:

- Four trailing arm torque rods,
- One Panhard rod
- Two air bags on each axle - allowing axles to oscillate
- Rear axle anti-roll sway bar.



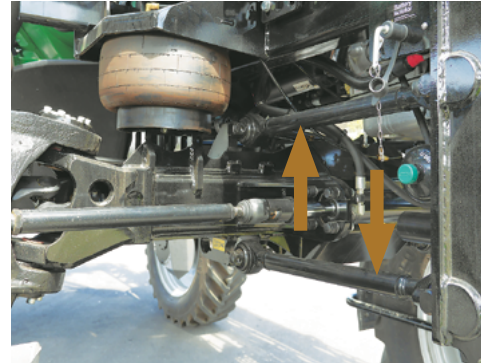
Panhard rods.

Panhard Rods

Panhard rods hold the axle centred in the chassis and to prevent any sideways movement holding axles central to the chassis.

Panhard rods are attached to the top of the axle & bottom of the chassis with two polyurethane bushes and 3/4" high tensile bolts.

Bolts and bushes should be checked each time that the vehicle is serviced.



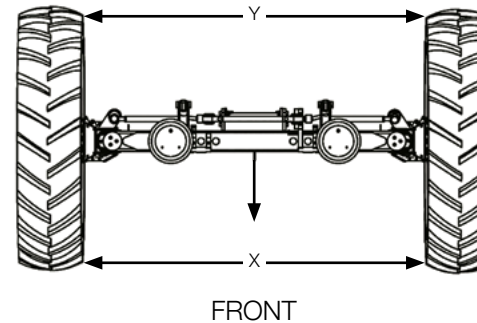
Trailing arm torque rods.

Trailing Arm Torque Rods

Trailing arm torque rod links hold axles in place on the chassis. The rods allow the axle to distort or twist fore & aft when wheels come an obstruction such as pot holes, logs, rocks or embankments, etc.

Any oscillation is absorbed by polyurethane bushes in each end of the links. Each end of the parallel link is attached to the chassis and differential with polyurethane bushes & 3/4" high tensile bolts.

Bolts & bushes should be checked each time that the vehicle is serviced. Refer to the specification provided in the 'Maintenance Schedules' of this chapter..



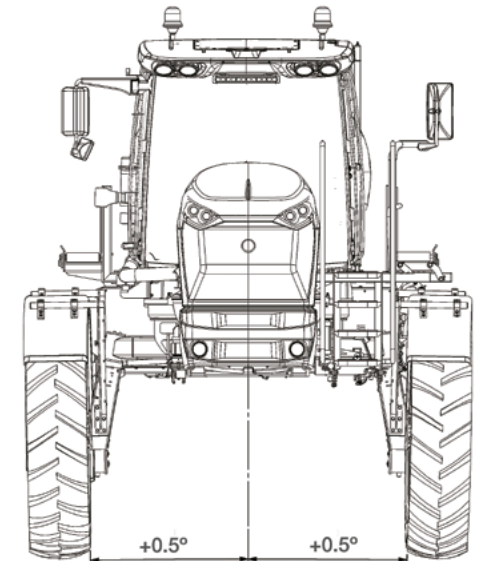
Steering Toe-In distance 'X' should be 1-5 mm less than distance 'Y'.

Steering Toe-In

Steering Toe-In should be set to 1-5 mm.

To check Steering Toe-In:

- 1 Park the Cruiser on a flat level surface, apply the parking brake & remove the ignition key
- 2 Measure up 900mm from the ground on the right hand side front steer tyre & mark the front part of the tyre.
- 3 Measure up 900mm from the ground on the right hand side front steer tyre & mark the rear part of the tyre.
- 4 Repeat steps 2 & 3 on the left front steer tyre.



Front wheel camber is set to +0.5°.

- 5 Measure between the front marks (previously made) on the left & right front steer tyres and record the distance.
- 6 Measure between the rear marks (previously made) on the left & right front steer tyres and record the distance.
- 7 The front measurement must be 1-5 mm less than the rear measurement.
- 8 To make an adjustment, loosen the tie rod locknuts, then rotate the rod to extend or shorten the rod, until the toe-in measurement is correct.
- 9 When correct, re-tighten the locknuts.

NOTE

Wheel alignment should be only carried out by a qualified service person.



Regularly check tyre pressure & wheel nut tension.

Wheel Camber

Wheel Camber is factory set and cannot be adjusted. At the time of manufacture the wheel camber is set to +0.5°. Apart from the 2WD front axles this cannot not be altered.

Tyre Maintenance

The Cruiser has three tyre options and it is very important that tyres are properly maintained.

Tyre pressure is the most important factor for maintaining correct load rating of the tyre. Correct tyre pressure should be maintained at all times.

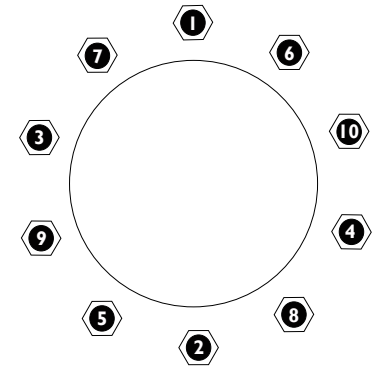
Tyre pressure should be checked regularly - every 8 to 12 hours of operation.

Inflation above or below recommended pressures may cause damage to the tyres.

High road speeds & heavy loads may cause tyres to wear prematurely.



Regularly check tyre pressure and wheel nut tension.



Follow the wheel nut tightening sequence (above) to ensure even wheel nut torque distribution (320 ft/lb).

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 Cruiser.

Protect the tyres as much as possible to minimise wear and deterioration. Chemical sprays & insecticides are harmful to the rubber in the tyres and should be washed off immediately after use.

Wheel Nut Tension

Wheel nuts must be tensioned daily when the machine is new and whenever wheel nuts are removed and refitted.

Once wheel nuts hold their tension, inspection can be lengthened to approximately 50 hours.

Wheel nut tension specification on the Cruiser front & rear wheels is 320 ft/lb.

Follow the wheel nut tightening sequence (shown above) to ensure even wheel nut torque distribution.

⚠ DANGER

Do not chock or support the machine using materials that may crumble.
Use only load rated supports.

⚠ 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.



Recommended wheel nut torque tension is 320 ft/lb.



Chock opposite wheels of the Cruiser before lifting.

Wheel Changing

Changing of wheels should only be done by an experienced person working with the correct equipment.

To change a wheel:

- Ensure the Cruiser is on hard, flat level ground and wheels are chocked at the opposite end of lifting.
- Remove the isolator key and ignition key.
- Ensure the boom is fully closed before raising the machine off the ground.

- Empty the spray tank if possible before lifting the machine.
- Place a rated jack securely under the jacking point, then gently raise the machine until the weight is taken off the wheel being changed.

⚠ DANGER

When the tank is fully loaded each wheel supports a weight up to approximately 5 tonnes.
Always ensure that the jack is designed to operate under this pressure.

⚠ DANGER

Do not work under the machine when supported solely by a jack.

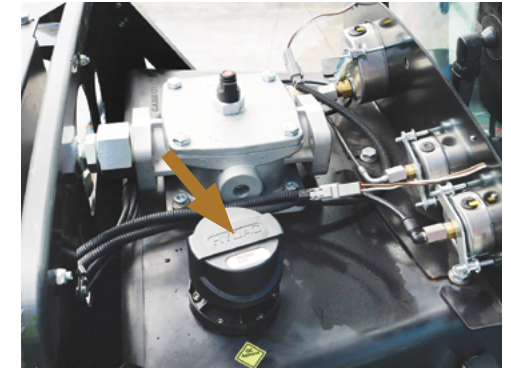


Oil pressure gauge of the closed centre pump.

Hydraulic Oil System

The Hydraulic Oil System uses pressure filters for maintaining oil cleanliness in every circuit.

Electronic filter blockage indicators monitor filter health and valves include manual overrides where possible.

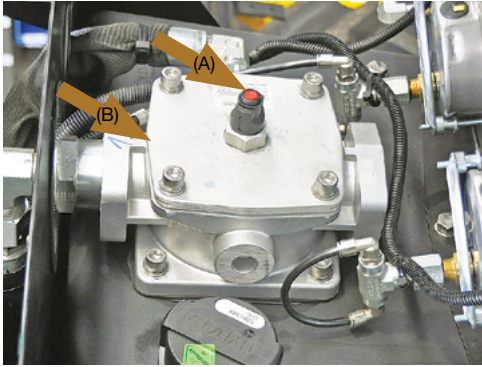


Oil tank fill point.

Hydraulic Oil Tank

The Hydraulic Oil Tank is located under the bonnet at the back of the engine and:

- All hydraulic systems operate from this common hydraulic reservoir.
- The reservoir has a sight tube mounted on the side. The oil level must always be visible in top third of the tube.
- Optimal oil operating temperature range is 50-70 degrees Celsius.
- Digital temperature and low oil level sensors connect into the G-Hub system for real time hydraulic oil temperature and low oil level alarm.
- The visual oil level display window includes a red float for quick oil level checks.
- The gauge layout on top of tank shows closed centre variable displacement hydraulic pump pressure through the cabin windscreen.
- The dedicated case drain return ports are at front of tank.



Filter Indicator (A) & Return Filter (B).

Return Filter

The Return Filter is fitted to the top of the hydraulic reservoir tank in front of the cabin. Filters returned oil to the reservoir.

This filter should be replaced after the first 50 hours of use and there after every 500 hours.

A red indicator is located on the top of the filter. If the indicator pops out, the filter must be replaced because it is blocked and causing back pressure in the system.

The filter indicator should be checked once the oil has reached operating temperature as cold oil can cause a false reading on the indicator.

Refer to the specification provided in the 'Maintenance Schedules' of this chapter.

Closed Centre Variable Displacement Pump

The Closed Centre Variable Displacement Pump With Load Sensing (located at the front of the engine) powers the:

- Boom functions (boom lift, boom tilt, boom fold & boom rest)
- High flow fill pump and
- Steering system.

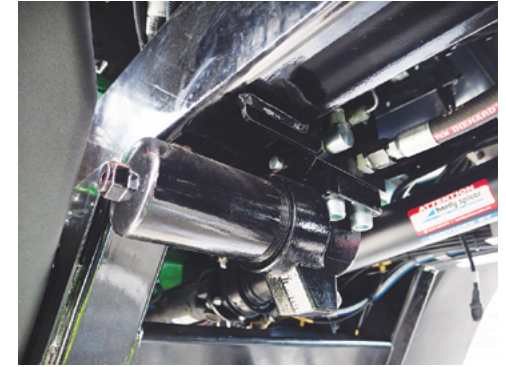
The 90 cc pump delivers relatively high flow at low engine RPM. Oil flow is on demand.

Mid-Mounted Hydraulic Manifold

The Mid-Mounted Hydraulic Manifold (located on the LHS behind the front axle) controls the:

- Spray pump speed (electric control with soft start/stop)
- Adjustable boom rest activation
- Fill pump & load sensing for the variable displacement hydraulic pump
- Steering priority.

Dual pressure filters keep the flowing oil clean. A pressure relief valve is built into the manifold with an opening pressure of 2750 PSI.



Hydraulic Oil Filter.

Hydraulic Pressure Filters

The hydraulic pressure filters filter oil before it is pumped through the manifolds.

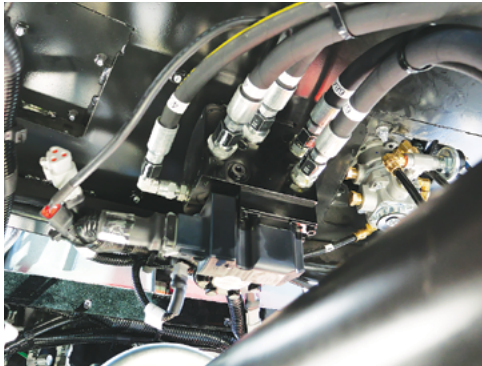
The filtration elements are rated at 10 micron.

The filters are fitted with electronic condition sensors which report to the G-Hub integrated system. A warning shows on the controller display when replacement is necessary.

The pressure filters have a general usage life expectancy of 500 hours.

NOTE

Refer to the specification provided in the 'Maintenance Schedules' of this chapter.



The Danfoss OSPE Steering Orbital under the cabin.

Danfoss OSPE Steering Orbital

The Danfoss OSPE Steering Orbital, located under the cabin, is a high performance steering unit with a fully integrated GPS ready steering ready system which removes need to add any extra hydraulic valves to the machine.

The steering valve is powered on via the 'Spray mode/Road mode' switch on the side console in the cabin.

The valve is disabled when in 'Road mode'.

Auto steer ready AgLeader, Trimble, Raven & Topcon applications can be steered directly from the Nav controller via CAN BUS network.

For John Deere applications, a separate 'CAN Bridge' is required & supplied from Agra GPS or Solsteer (dealer to supply).

Wheel angle and steering manual override sensors are factory fitted.



The Hydraulic Oil Cooler behind the spray tank

Hydraulic Oil Cooler

The Hydraulic Oil Cooler, located on the chassis behind the spray tank, incorporates a large hydraulic oil cooler core, variable fan speed fan & an auto fan reverse system to blow out dirt build-up and debris.

A thermal bypass allows oil to rise to optimum operating temperature as quickly as possible. The oil cooler engages when the oil temperature reaches 55°C.

A warning is given in the cabin when the hydraulic oil may be overheating. The warning activates if oil temperature reaches 95°C.

If the warning sounds, cease operating the Cruiser immediately and assess whether the cooler is operating correctly or ambient temperature is too high for operating.



Rear Manifold at the front of the boom centre section.

Rear Manifold

The Rear Manifold with compact cartridge style valves, located on the front of the boom centre section, controls all boom functions including lift, fold, tilt, bi-fold, centre level and hydraulic yaw.

The hydraulic block is divided into left and right sections with hydraulic hoses directed to each side of the boom.

Manual overrides are fitted to the solenoids.

Operate manual controls of the rear manifold with extreme caution when adjustment is required.



Cabin foot brake.

Braking System

The Braking System is hydraulically operated with disc brakes on all 4 wheels. Hydraulic accumulators are used to ensure an operator can still safely stop the Cruiser in the event of engine failure.

CAUTION

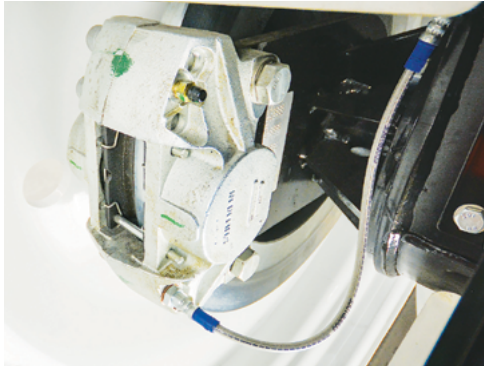
Do not use this machine in ambient temperatures exceeding 40°C.
Significant damage may occur where machine is operated continuously in very hot conditions.

DANGER

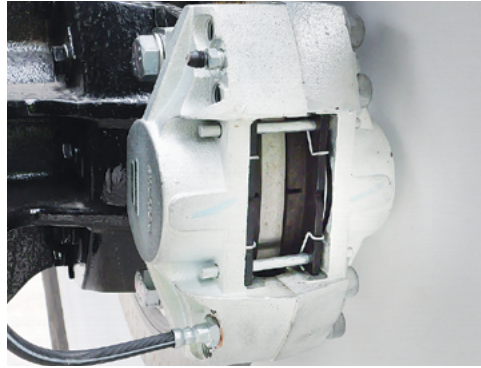
Operate manual controls of the rear manifold with extreme caution as unexpected movement may result from adjustments made. Failure to follow instructions may result in serious injury or death!

NOTE

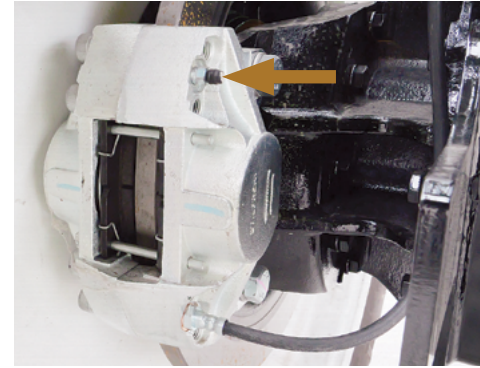
Refer to the specification provided in the 'Maintenance Schedules' of this chapter.



600mm diameter rotors (discs) are fitted to the hub on the inside of each wheel.



Brake caliper & pads.



Connect a clear plastic tube to the bleed screw on the service brake caliper.



Brake fluid reservoirs located at the rear of the engine.

Rotors

600mm diameter rotors are fitted to the hub on the inside of each wheel. Rotor thickness is 22mm new. Minimum rotor thickness is 20 mm.

Rotor with a thickness of less than 20mm must be replaced.

Rotors used on the Cruiser are a customized construction and replacements must be purchased from your local Goldacres dealer.

Brake Calipers & Pads

The calipers used on the machine have two brake pads on each caliper which clamp onto the rotor when the brakes are applied.

These pads must be inspected regularly for wear. When the pads wear down to the indicator groove they must be replaced. Build up of mud and debris will cause the brake pads to wear prematurely for this reason the brake calipers must be kept clean at all times.

Service Brake Bleeding Procedure

To Bleed the Service Brakes

- 1 Park the Cruiser on a flat level surface and chock the wheels (engine running).
- 2 Place approximately 30mm of hydraulic oil into a container for use for bleeding the brakes and place the container below the one of the brakes. Each brake caliper must be bled separately.
- 3 Connect a clear plastic tube to the bleed screw on the service brake caliper.
- 4 Place the opposite end of the tube into the oil container and submerge the end of the plastic tube in it.

This is important to stop air being drawn back through the system.

- 5 Loosen the bleed screw & ask the cabin assistant to slowly depress the brake pedal & hold the pedal down.
Oil will flow continuously. Repeat the procedure of slowly depressing the brake pedal to fully bleed the system - until no more air bubbles appear in the container.
- 6 Re-tighten the bleed screw only when no air bubbles are visible in the oil leaving the bleed screw.
- 7 Repeat this procedure on each service brake caliper.

CAUTION

During the brake bleeding process, the person bleeding the brakes must wear suitable eye protection and gloves. Do not expose skin to brake fluid. If exposed, rinse immediately with water. Failure to follow this caution may result in personal injury.



The Park Brake (a drum brake) is located at the rear of the gearbox.

Park Brake

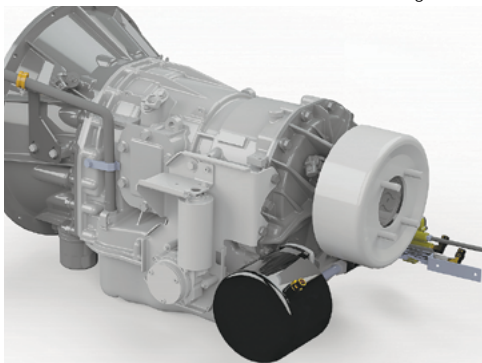
The Park Brake is a drum brake mounted at the rear rear of the gearbox for powerful holding capacity. It operates with spring pressure to apply and air pressure to release the brake. The Park Brake is automatically applied when the engine is not running.

Normal Park Brake operation is via the electric switch mounted on side console.

An alarm sounds & a warning illuminates, if the transmission is moved into a gear other than Neutral when the Park Brake is engaged.

The Park Brake will automatically activate, if air pressure too low.

Drum Park brake & actuator located at the rear of the gearbox.



Chock all wheels of the Cruiser

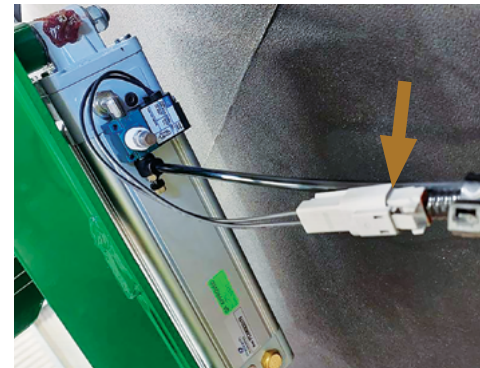
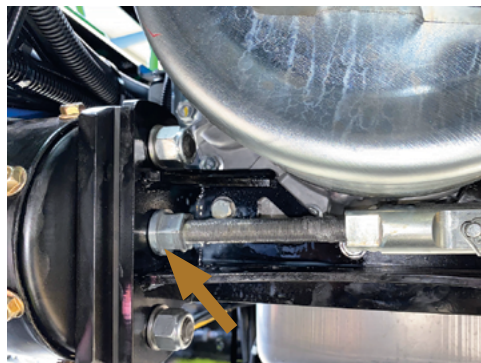
Manually Releasing the Park Brake

If required, the Park Brake can be manually released to move the Cruiser.

To Manually Release the Park Brake:

- 1 Chock all the wheels of the Cruiser before attempting to release the Park Brake.
- 2 Loosen the 5/8" Locknut on the park brake actuator clevis using a 15/16" spanner.
- 3 Wind the Locknut across to the brake actuator housing (shown above).

Loosen & wind the 5/8" Locknut from the clevis to the actuator housing, then tighten it against the housing until



Disconnect the ladder control solenoid electrical connector (shown above) to keep the ladder lowered.

- 4 Tighten the Locknut against the brake actuator housing extending the rod until the Park Brake drum disengages.
- 5 Move the Cruiser as required.

After releasing the brake & moving the Cruiser, the Park Brake must be reset.

To Manually Reset the Park Brake:

To enable access to the cabin, disconnect the ladder control solenoid connector to keep the ladder lowered while engaging & disengaging the Park Brake. For further information, refer to Chapter 3 'Cabin' under 'Folding Ladder'.

⚠ DANGER

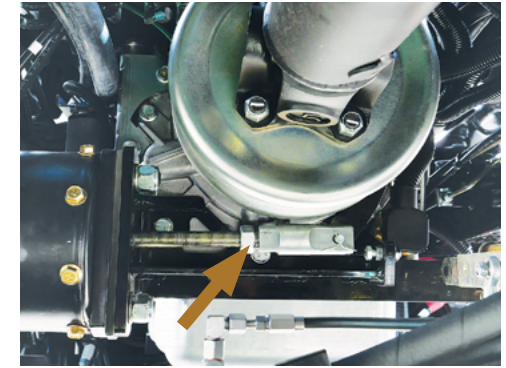
Do not chock or support the machine using materials that may crumble.

Failure to follow instructions may result in serious injury or death!

⚠ CAUTION

Do not rotate the threaded rod in the booster as this could damage the booster.

If the clevis needs to be adjusted, disconnect it from the brake lever arm.



Return the locknut to the actuator clevis of the park brake but do not tighten.

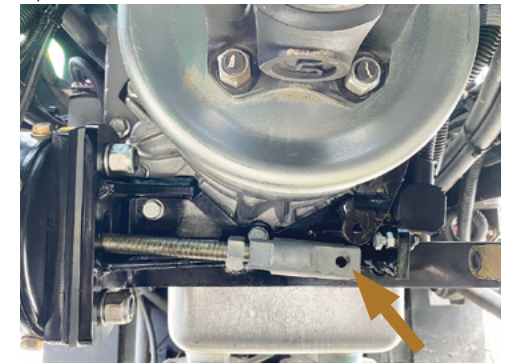
- 1 Disengage Park Brake & return the locknut to the clevis of the park brake actuator.
- 2 Apply the park brake to test whether the the brake is properly applied.

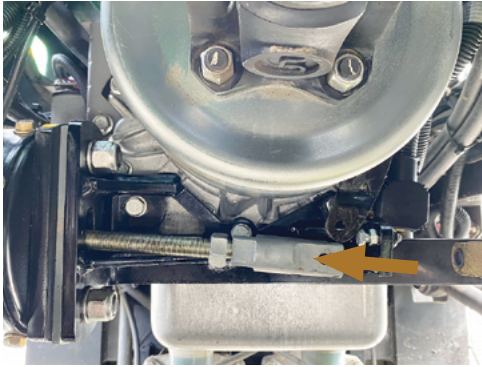
If applying & releasing correctly, tighten the clevis locknut and reconnect the ladder control solenoid connector.

If not applying & releasing correctly, proceed to steps 3 - 9.

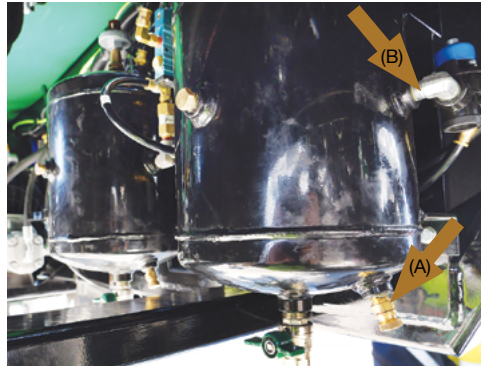
- 3 With the Park Brake released, loosen clevis pin locknut, then remove the split pin & clevis pin and remove the actuator clevis from the brake lever.

Loosen clevis pin locknut, then remove the split pin & clevis pin and remove the actuator clevis from the brake lever.

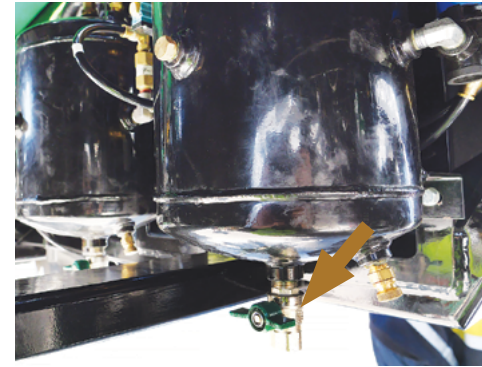




Apply the Park Brake and ensure the actuator clevis is fully wound onto the threaded rod.



The Air Tank showing the Pressure Relief Valve (A) & Air Outlet (B).



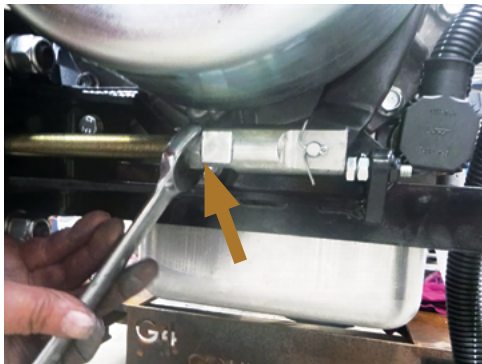
Manual drain tap at the base of the Air Tanks.

WARNING
Keep clear folding ladder

GA8701129

- 5 Apply the park brake and ensure the clevis is wound fully onto the threaded rod. The rod can be pulled down and away from the brake drum for clearance but ensure the threaded rod does not turn/rotate.
- 7 Release the Park Brake, then re-attach the actuator clevis to the brake lever - refitting the clevis pin and using a new split pin.
- 8 Apply the Park Brake to test the brake drum applies correctly - does not rotate.
- 9 When correctly adjusted, tighten the clevis locknut and re-connect the ladder control solenoid connector.

When correctly adjusted, tighten the clevis locknut.



Pneumatic System

The Pneumatic System is used to operate the:

- Air bags
- RapidFire system
- Cabin access ladder
- Engage & disengage centre differential lock on 4WD models.

Pressure Relief Valve

A Pressure Relief Valve incorporated on the Air Tank tank prevents air pressure within the system acceptable limits.

The valve is set to open if 150 PSI is reached.

Low Pressure Sensor

A Low Pressure Sensor is fitted to the tank so that if the air pressure within the tank goes down to 55 PSI or lower, an alarm will sound in the cabin to warn the operator.

Air Tank

The Air Tank, located on the right hand side near the batteries, is a reservoir of compressed air from the compressor used to supply pneumatic functions on the Cruiser.

A manual drain tap, placed in the bottom of the air tank, can be used to decompress the pneumatic system or check for presence of any moisture and debris.

Air Compressor

The Air Compressor is attached to the timing gear case on the rear of the engine.

A governor is attached to the side of the compressor to regulate the amount of air being generated by the compressor. A sense line connects the governor to tank.

The governor enables the compressor to continue pumping until the required tank pressure is achieved, then stops the compressor.

The governing pressure is set to 120 PSI.

CAUTION

Beware when releasing air from the air tank, there can be dangerous particles being released at high-speed.
Be aware due to the rapid expansion of air, the tank release valve may become very cold.



The pneumatic cylinder raises & lowers the Folding Ladder for cabin access.

Folding Ladder

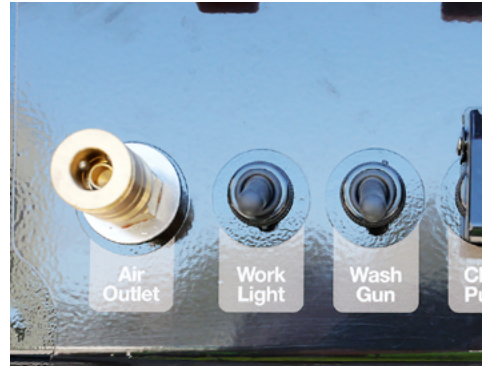
A pneumatic ram is used to raise & lower the cabin access Folding Ladder.

The folding speed of the ladder is factory set. If adjustment needs to be made, a flow control needle valve on the inlet of the cylinder is used to control its speed of the lift & fall.

To Adjust the Ladder Folding Speed:

- 1 Screw the flow control needle valve Inwards to decrease the lifting/falling speed.
- 2 Screw the flow control needle valve Out to increase lifting/falling speed.

Air inlet of the ladder folding cylinder.



Auxiliary Air Outlet located on the Quick Fill pod.

Auxiliary Air Outlet

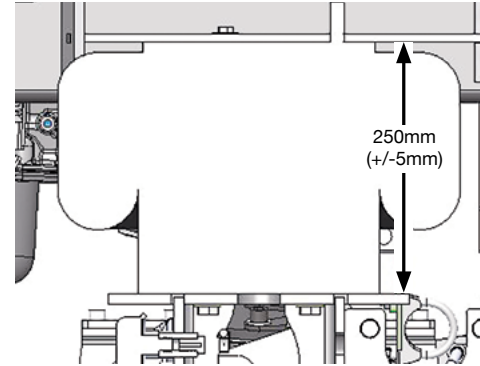
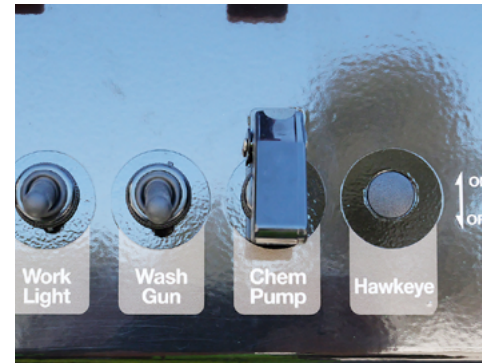
A quick release air coupling, located on the Quick Fill pod provides an Auxiliary Air Outlet for cleaning filters, nozzles & other uses.

Chemical Transfer Pump

The optional Chemical Transfer Pump is a 12 volt pump ideal for direct chemical transfer.

A switch located on the Quick Fill pod is used to turn it On & Off.

The 'Chem Pump' switch located on the Quick Fill pod.



Height setting of inflated air bags.

Air Bag Ride Height Settings

The Cruiser suspension system incorporates Airbags to maintain a comfortable and stable ride in the machine.

Front & rear air bag height should be set at 250mm (+ or -5mm) .

If the correct ride height setting is not maintained, the angle of the drive shaft will change which can cause vibration and possible damage to the drive train.

Air bag height measurement is from the inside of the top mount to the bottom of the plastic skirt of the air bag.

Ride height valves are used to adjust the air pressure within the air bags to maintain the correct ride height.

Two ride height valves are located on each side of the rear axle and one located in the centre of the front axle.

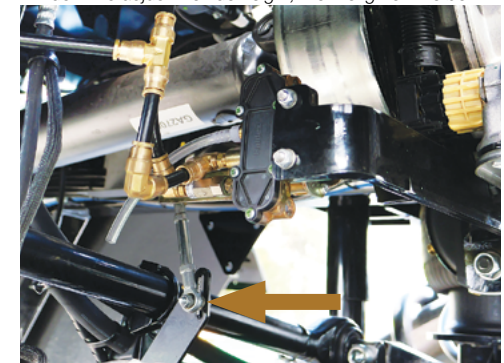


250mm Air bag ride height measurement.

To Adjust the Front Ride Height

- 1 Park the Cruiser on a flat level surface.
- 1 Park the Cruiser on a flat level surface.
- 2 Loosen the bolt of the adjustor plate which attaches the vertical rod to the chassis.
- 3 Move the rod up or down in the plate to achieve the correct ride height. The plate has notches to use as a guide.
- 4 Re-tighten the bolt.

Loosen the bolt on the adjustor plate & move the rod up or down to adjust the ride height, then retighten the bolt.





Loosen the bolt on the adjuster plate & move the rod up or down to adjust the ride height, then retighten the bolt.



Open the dump valve air bag for trailer transport.

To Adjust the Rear Ride Height

- 1 Park the Cruiser on a flat level surface.
- 2 Loosen the bolt of the adjuster plate which attaches the vertical rod to the chassis.
- 3 Move the rod up or down in the plate to achieve the correct ride height. The plate has notches to use as a guide.
- 4 Re-tighten the bolt.
- 5 Repeat the procedure for the other side of the rear axle.

To Deflate Air Bags for Trailer Transport:

- 1 Load and park the Cruiser on transport platform.
- 2 Open the drain valve on the air tank and let the air empty out.
- 3 Open the air dump valves:
 - One on LHS of the front airbag
 - One on each rear airbag.
- 4 The air bags will lower on to the bump stops.
- 5 Once the Cruiser is on the bump stops, close the air tank dump valves.

NOTE

When the Cruiser has been unused for a period of time, the air bags may deflate. This is normal. The airbags will re-inflate after the engine is started.

CAUTION

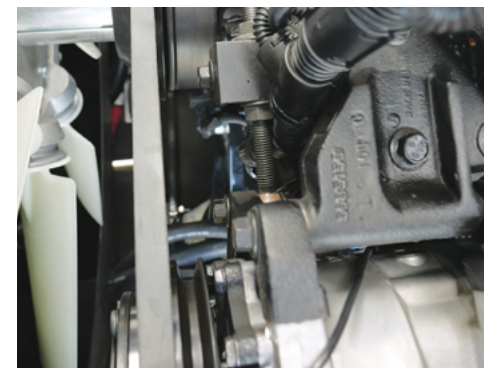
When deflating the air bags, keep clear of all chassis parts as the machine can move suddenly downwards. Failure to heed this caution may result in personal injury.

Shock Absorbers

Four shock absorbers are fitted to the Cruiser, one fitted to each side of the front and rear axles. The shockers absorb movement of the air bags & prevent recoil.

Shockers absorbers should be regularly checked for damaged rubbers or oil leaks.

Refer to the specification provided in the 'Maintenance Schedules' of this chapter.



Air Conditioner Compressor.

Air Conditioner Compressor Belt

The Air Conditioner Compressor Belt requires manual adjustment. Check the belt regularly.

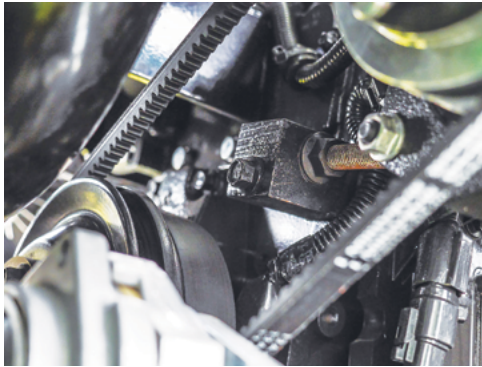
A deflection of no more than 12mm is present in the belt when it is tensioned correctly.

The belt should be replaced at minimum every 1000 hours.

Refer to the specification provided in the 'Maintenance Schedules' of this chapter.

To Tension the Compressor Belt:

- 1 Loosen the compressor mounting & adjuster bolts
- 2 Use the locknuts on the adjuster to pivot the compressor and pull the belt tight.
- 3 When the belt is correctly tensioned, tighten the mounting and adjuster bolts.



Use the locknuts on the adjuster to pivot the compressor and tension the belt.

To Replace the Compressor Belt:

- 1 Loosen the compressor mounting & adjuster bolts
- 2 Remove the old belt.
- 3 Fit a new belt.
- 4 Use the locknuts on the adjuster to pivot the compressor and tension the belt.
- 5 When the belt is correctly tensioned, tighten the mounting and adjuster bolts.



'Remote Grease Bank' with a 'Grease Decal' are used to simplify greasing access.

Grease Points

The location & greasing schedules of the Crop Cruiser grease nipples are shown in the following illustrations:

- 1 Driveshaft Grease Points - 2WD
- 2 Driveshaft Grease Points - 4WD
- 3 Boom Rest Grease Points
- 4 Boom Paralift Grease Points
- 5 Boom Centre Grease Points 1
- 6 Boom Centre Grease Points 2
- 7 36m Boom Wing Grease Points
- 8 48m Boom Wing Grease Points.

'Grease' Decals are used to assist in locating each grease point.

'Remote Grease Banks' with a Grease Decal are also used to simplify greasing access.

Additionally, a Cruiser may be optionally fitted with either of two different auto-greasing systems.



A Groeneveld Auto-Greasing System centre (option).

Auto-Greasing System Options

Two optionally fitted auto-greasing systems include either:

- Groeneveld Auto-Greasing System
- Alemlube Auto-Greasing System.

Groeneveld Auto-Greasing System

The Groeneveld Auto-Greasing System, well suited to cool to moderate climates, includes:

- 48 grease points
- 4 Litre grease capacity
- NLGI0 type grease.

If fitted, refer to the manufacturer's website for detailed product instructions & maintenance:

- <https://www.groeneveld-lubrication-solutions.com>



An Alemlube Auto-Greasing System centre (option).

Alemlube Auto-Greasing System

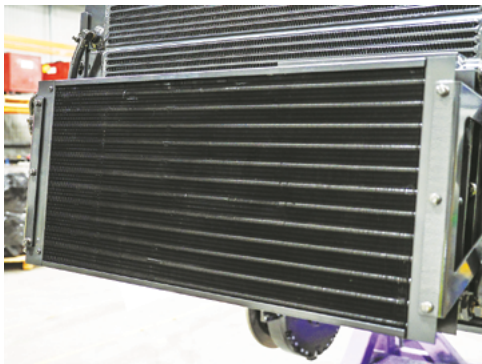
The Alemlube Auto-Greasing System, well suited to cool to warmer climates, includes:

- 48 grease points
- 4 kg grease capacity
- NLGI2 type grease

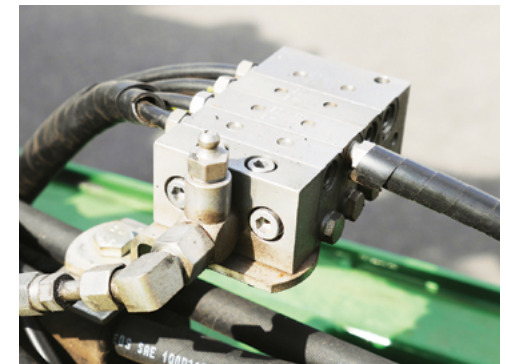
If fitted, refer to the manufacturer's website for detailed product instructions & maintenance:

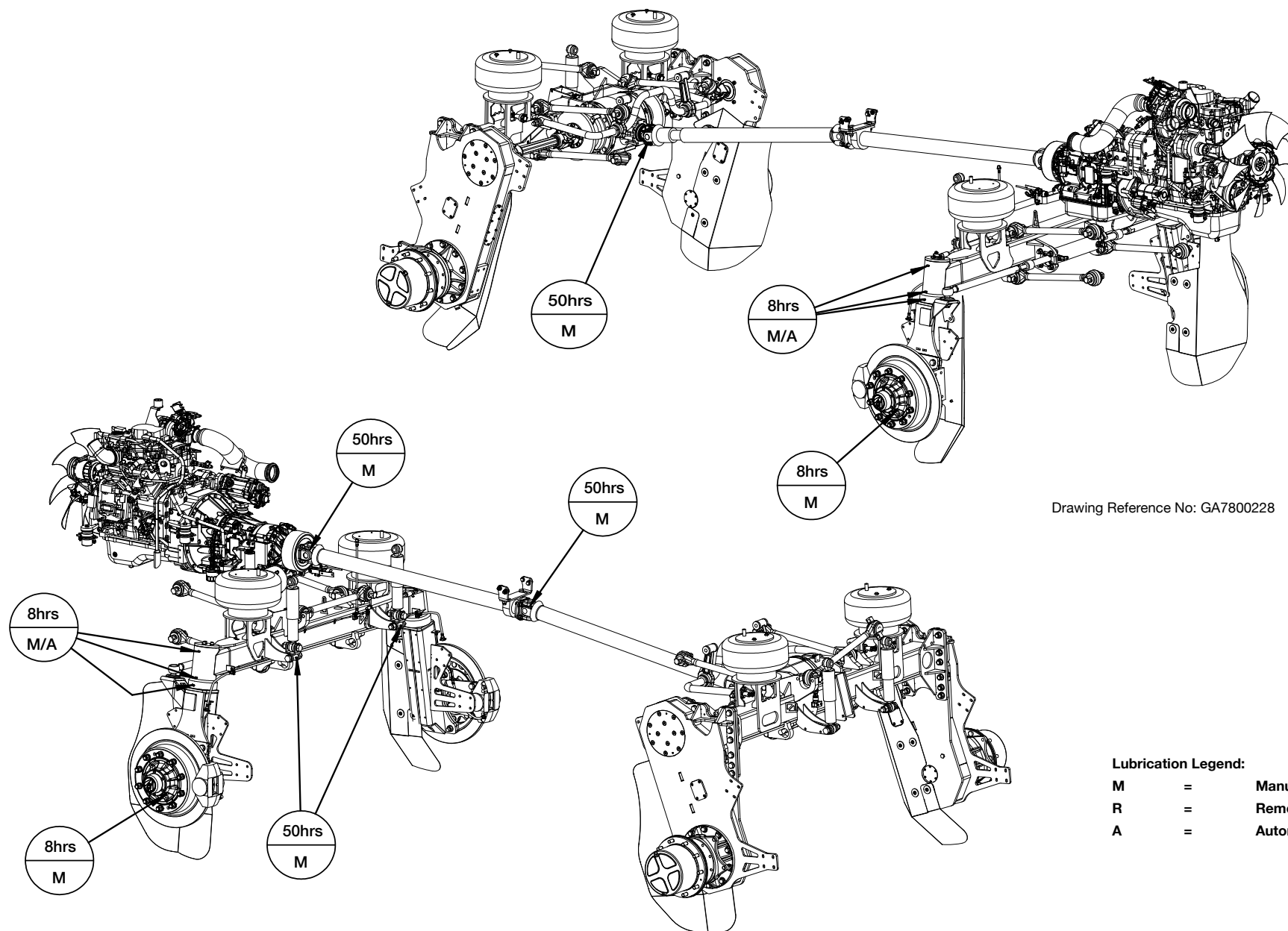
- <https://alemlube.com.au/web/>

Air Conditioner condenser.



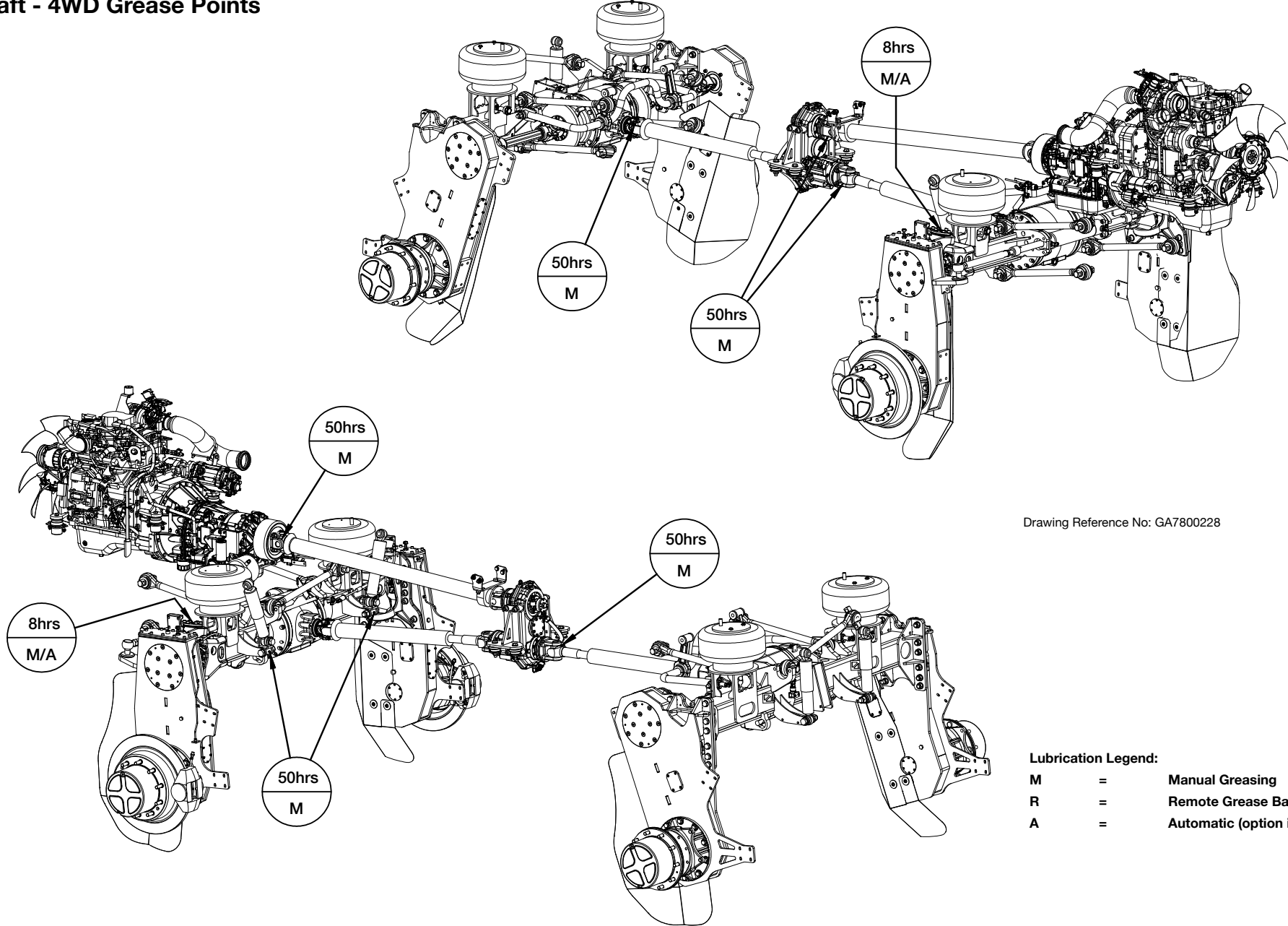
Auto-Greasing section on a boom (optional).

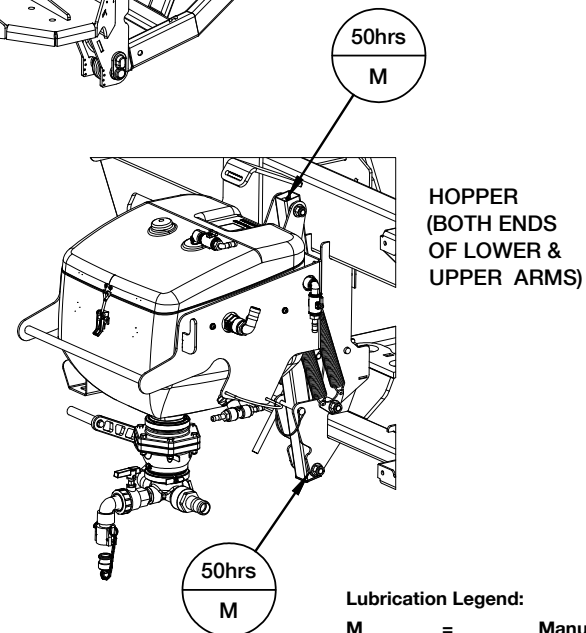
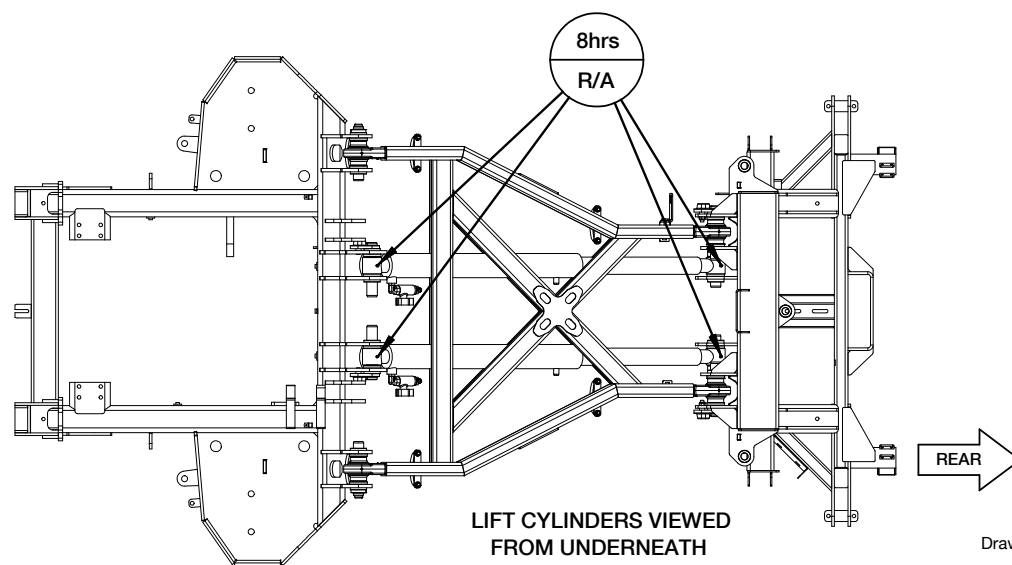
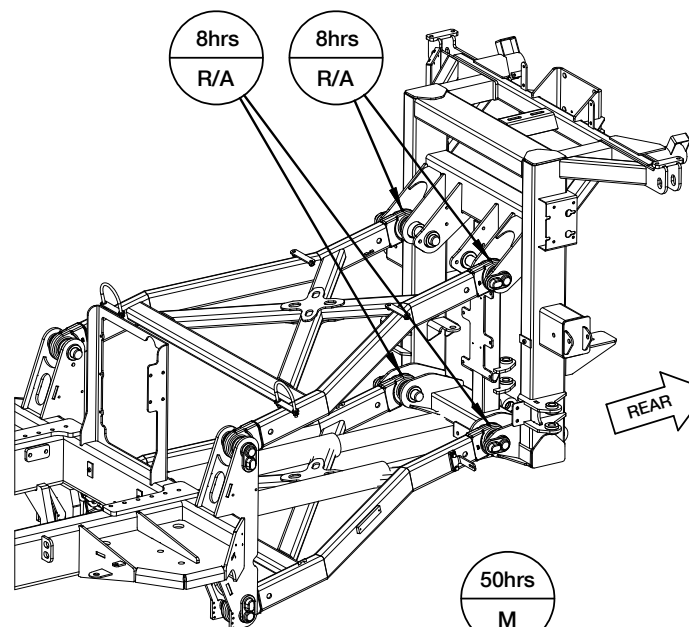
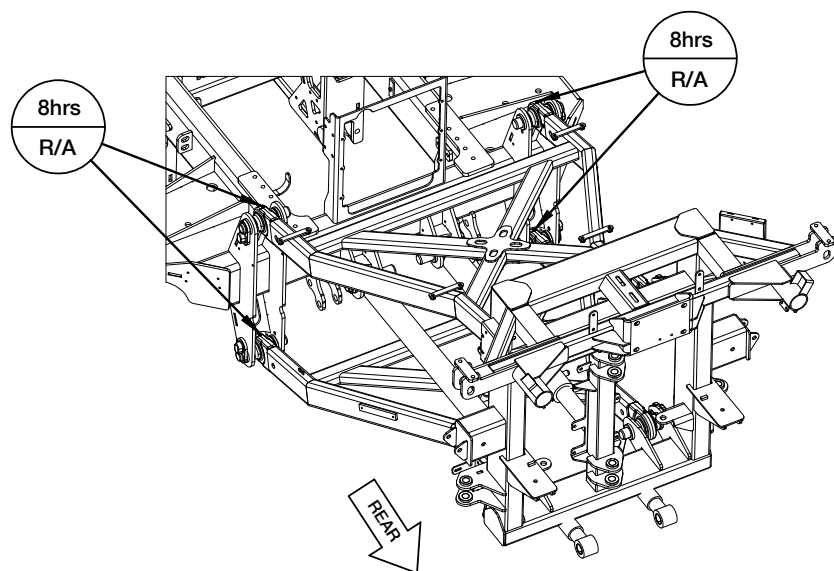


1 Driveshaft - 2WD Grease Points**Lubrication Legend:**

M	=	Manual Greasing
R	=	Remote Grease Bank or
A	=	Automatic (option if fitted)

2 Driveshaft - 4WD Grease Points

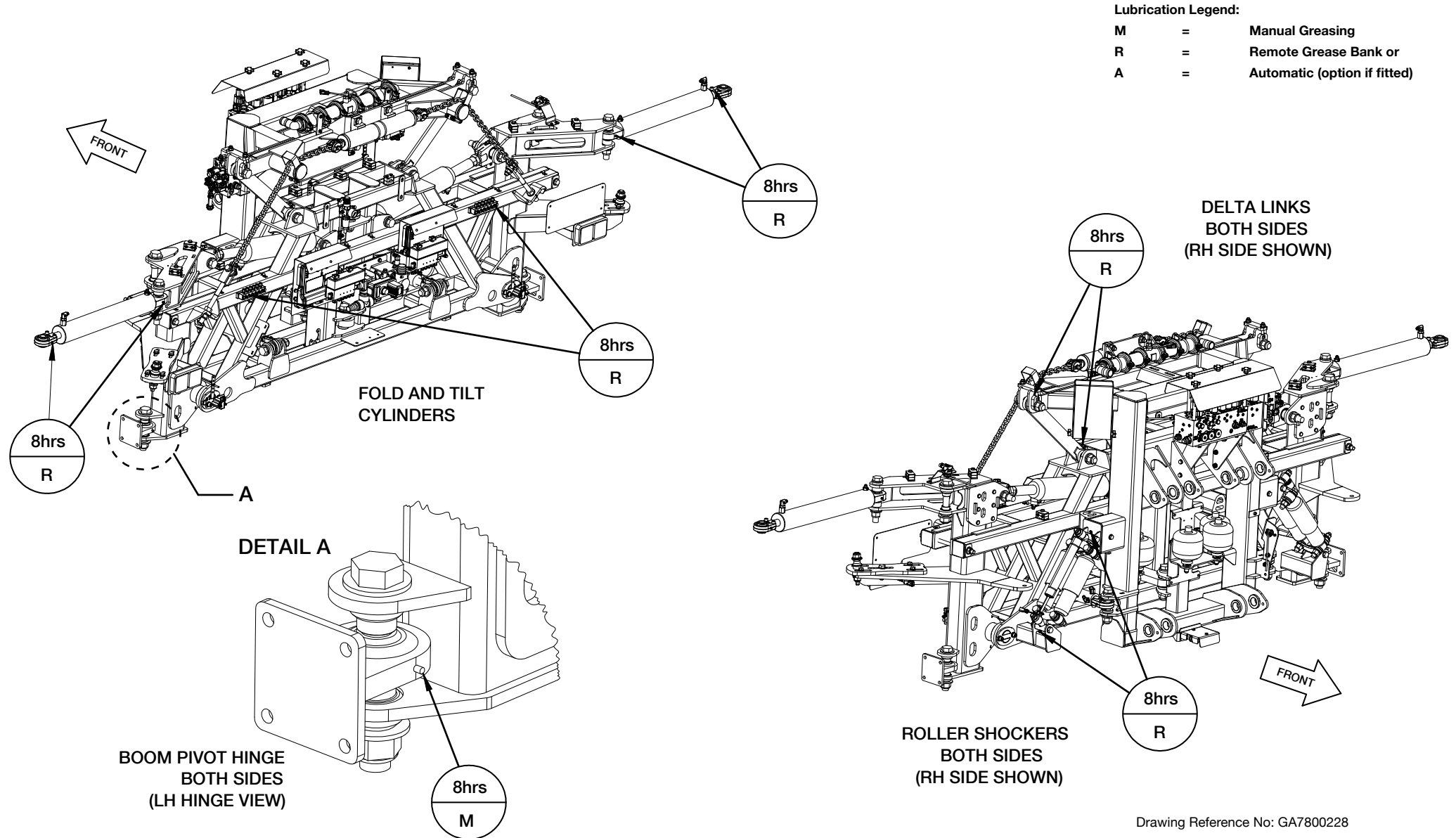


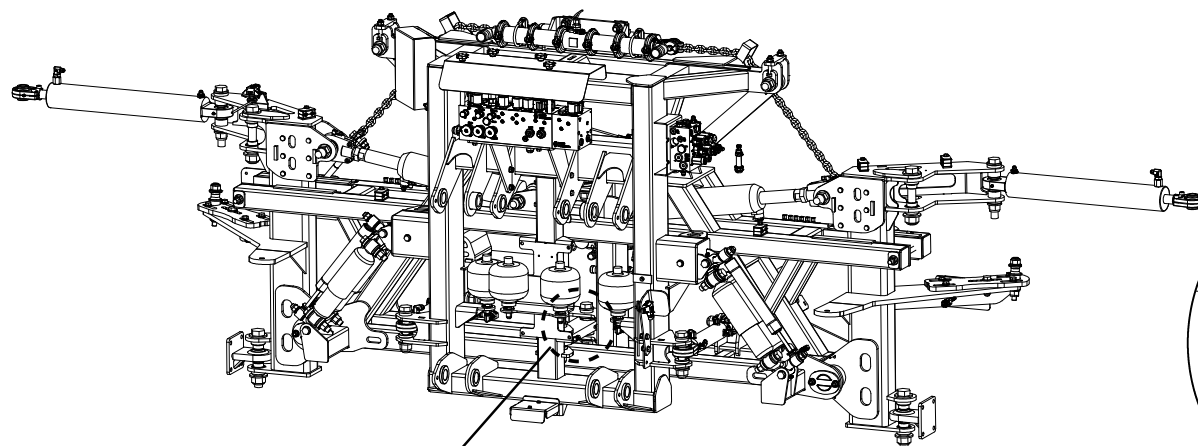
3 Paralift/Headstock & Hopper Grease Points**Lubrication Legend:**

M	=	Manual Greasing
R	=	Remote Grease Bank or
A	=	Automatic (option if fitted)

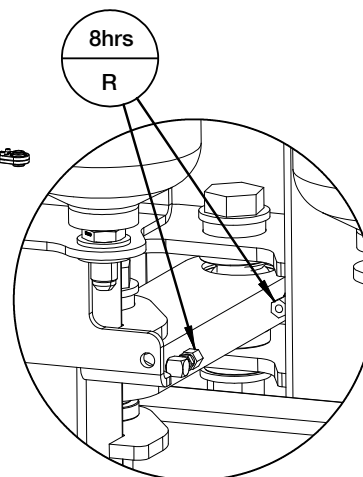
Drawing Reference No: GA7800228

4 Boom Centre Grease Points 1

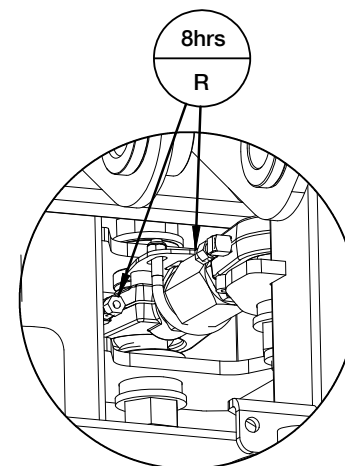


5 Boom Centre Grease Points 2

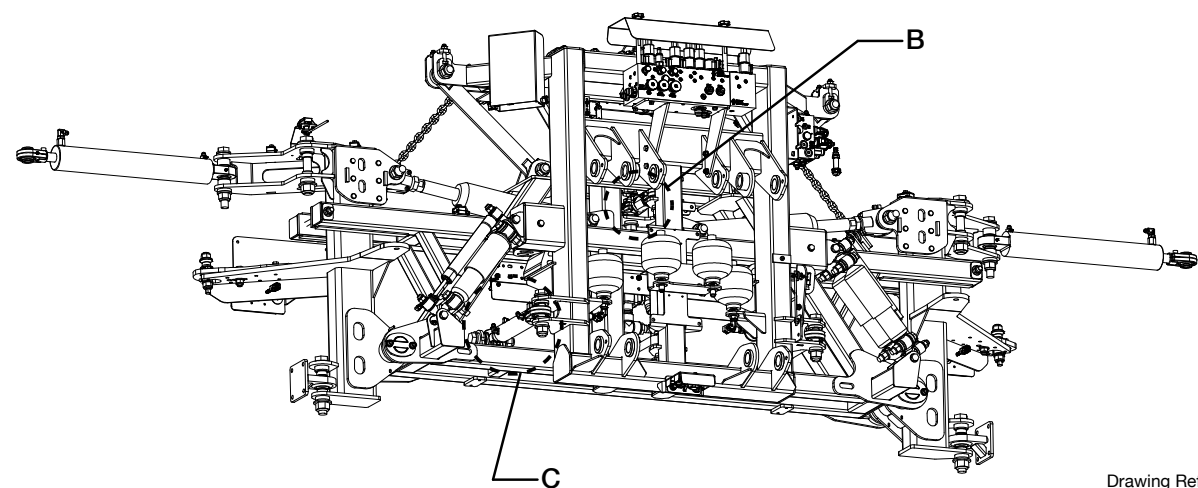
A



DETAIL A
DELTA LINK LOWER

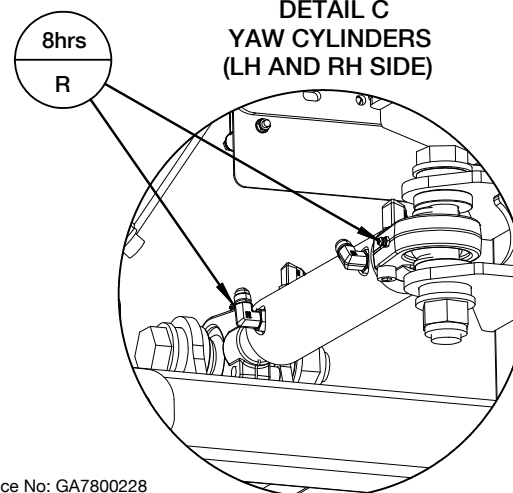


DETAIL B
DELTA LINK UPPER



B

C



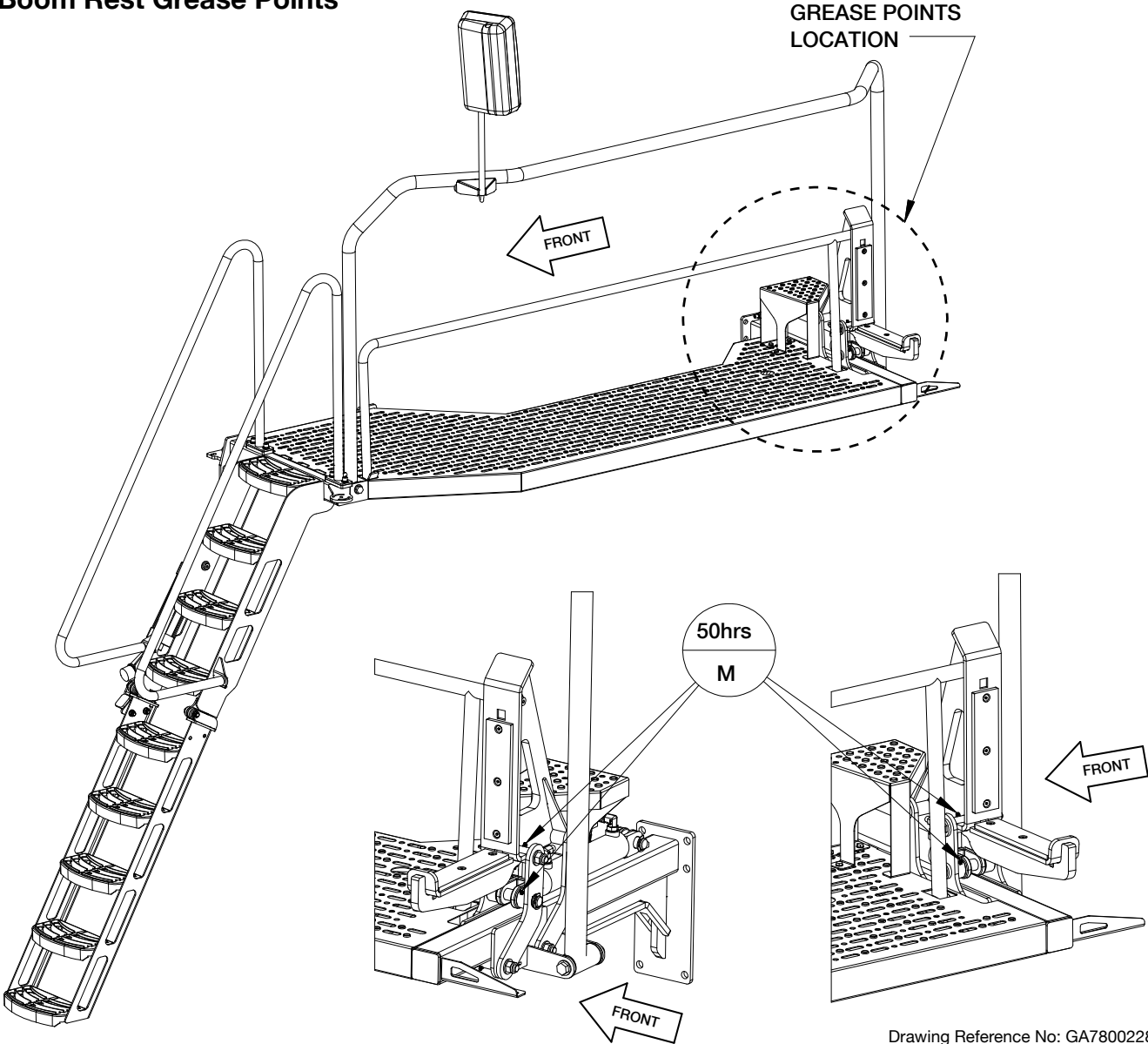
DETAIL C
YAW CYLINDERS
(LH AND RH SIDE)

Lubrication Legend:

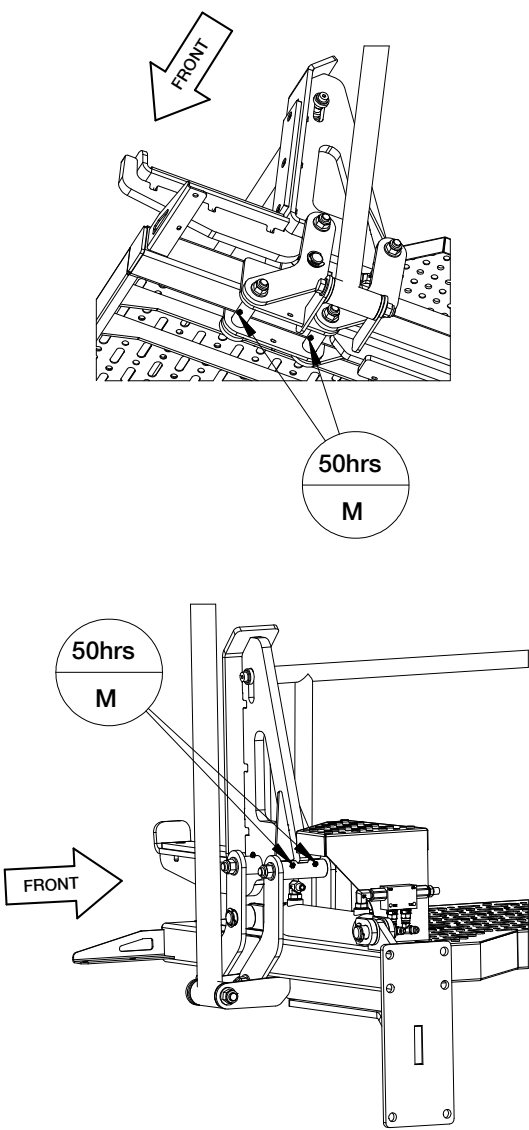
M	=	Manual Greasing
R	=	Remote Grease Bank or
A	=	Automatic (option if fitted)

Drawing Reference No: GA7800228

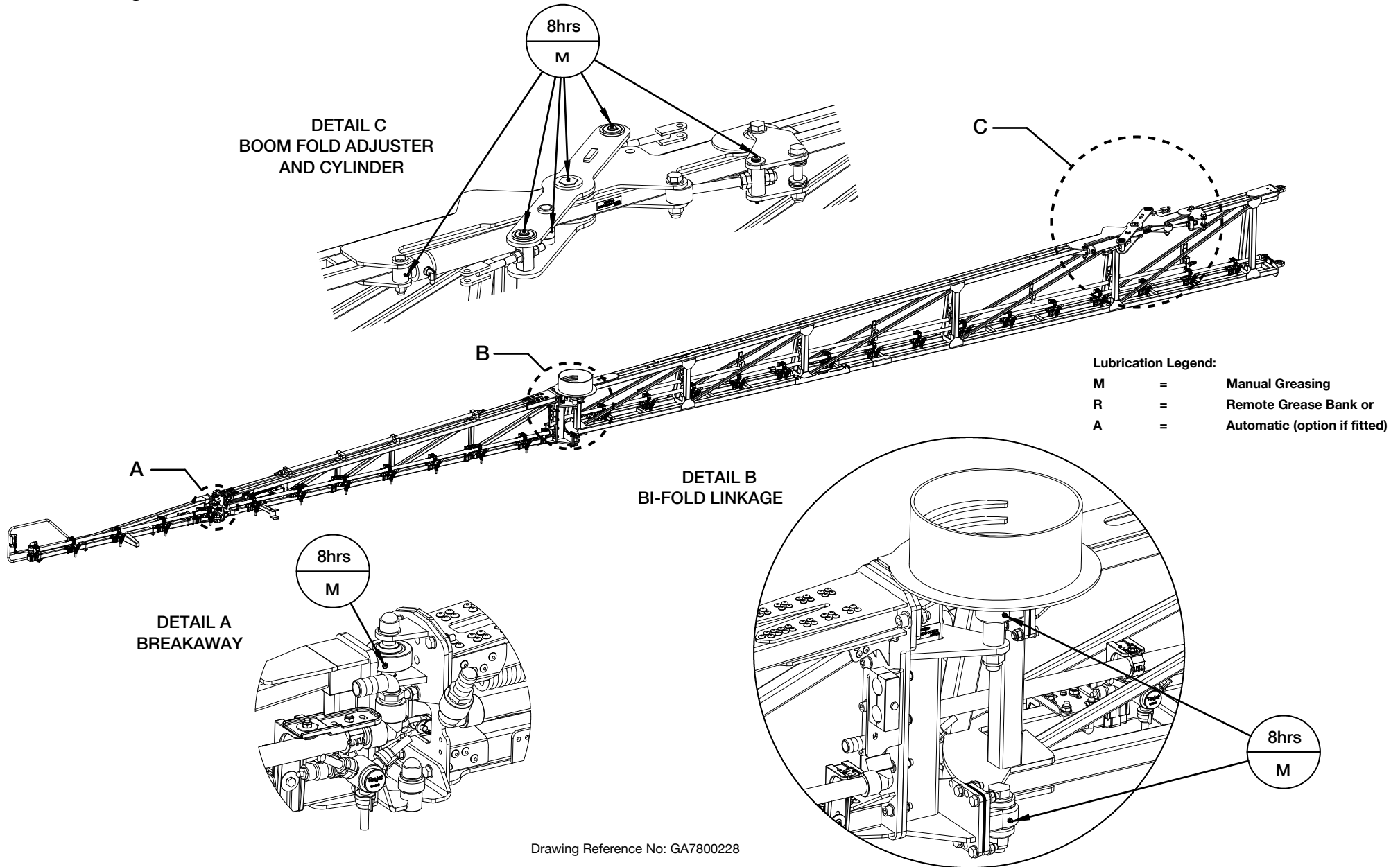
6 Boom Rest Grease Points



Drawing Reference No: GA7800228



- Lubrication Legend:
- M = Manual Greasing
 - R = Remote Grease Bank or
 - A = Automatic (option if fitted)

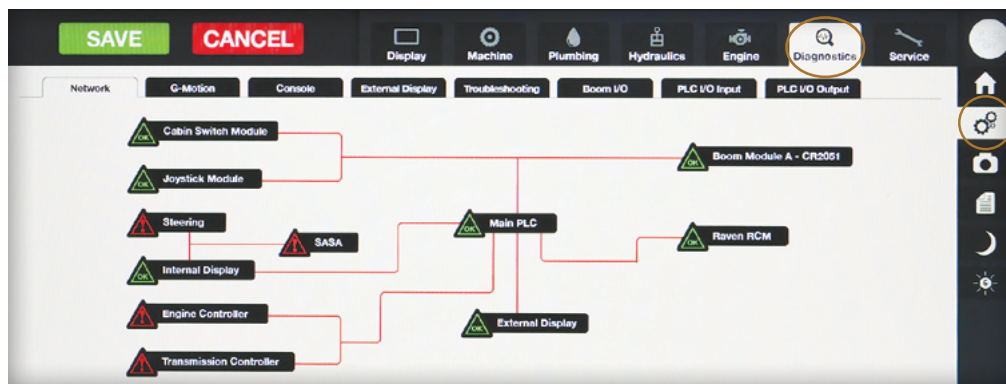
7 Boom Wing 24 - 36m Grease Points

9 - Trouble Shooting – Fast Tracking Problems 215

Trouble Shooting Preface	216
Integrated G-hub System	216
1 Network	216
2 G-Motion	216
3 Console	218
4 External Display	219
5 Troubleshooting	220
6 Boom I/O	220
7 PLC I/O Input	221
8 PLC I/O Output	221
Active Faults	222
Fault History	222
G-Hub Main PLC Controller	222
Spray Pump	224
Flow Meter & Controller	225
Spray Nozzles	225

Boom	226
Plumbing	226
Induction Hopper	226
Brakes	226
Hydraulic & Pneumatic	227
Transmission Shifter	228
Transmission Fault Warning	228
Loss of J1939	228
Range Inhibit Indicator	228
Air Conditioner Fault Codes	228
Towing & Transporting a Disabled Cruiser	229
Document Centre	229
QR Codes	230

9 Fast Tracking Problems – Trouble Shooting



Press the Setting tab, then the 'Diagnostics' tab to open the 'Diagnostics screen which opens with the 'Network' tab screen.

Trouble Shooting Preface

The following troubleshooting information is provided as a reference if your machine is not functioning correctly.

To ensure 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.

Integrated G-hub System

Goldacres Integrated G-hub System offers full system diagnostics, including warnings and operation states.

Pop up on-screen dialogs will display any system information and warnings.

Some problems may simply be resolved by cycling the G-Hub system Off and On again.

It is recommended to try this first before resorting to more advanced troubleshooting.

All valves will be reset to their initial position on

the G-Hub System start up.

The G-Hub 'Diagnostics' screens provide detailed information on all system components.

To access the 'Diagnostic' screens, press 'Settings' touch button, then the 'Diagnostics' touch button to open the Diagnostics screen displaying the Network screen - with a total of 8 tab screens (areas) for trouble shooting:

- 1 Network
- 2 G-Motion
- 3 Console
- 4 External Display
- 5 Troubleshooting
- 6 Boom I/O
- 7 PLC I/O In
- 8 PLC I/O Out.

Start with the 'Network' screen to make sure all CAN components are online and



Press the Setting tab, then the 'Diagnostics' tab to open the 'Diagnostics screen which opens with the 'Network' tab screen. Press the 'Help (?)' touch button for more information.

operational, then move onto targeted areas of any faults.

1 Network

The CAN-link between the PLC and the main display are critical for the system to function correctly.

The 'Network' screen gives a quick overview of the whole G-Hub connectivity system:

- If an item displays Green it is connected & working.
 - If an item displays Red, it is not connected or not working.
- Go to the next relevant G-Hub diagnostic page to further check the item.

Always start with the 'Network' screen to to

ensure all CAN components are online and operational, then move onto the targeted area of any faults.

2 G-Motion

The 'G-Motion' screen is used to test and troubleshoot the G-Motion joystick operation.

Press the G-Motion tab touch button to display the G-Motion screen

The G-Motion display screen provides two testing functions:

- To check the function of each push button and rocker switch on the Joystick.
- To operate each function in Virtual Mode.

In Virtual mode, the Joystick is disabled & the screen touch buttons can be used to operate the various joystick push button & rocker switch functions.

NOTE

If a CAN component has been replaced, it is important to:

- Upload the correct software, and
- Set the correct CAN address for it to function correctly.



Press the 'G-Motion' touch button tab to display the 'G-Motion' screen to check the functions of the Joystick push buttons/switches. Press a Joystick push button (eg, 'Fence Nozzles L'), then its corresponding switch on the G-Motion screen will light up Green, if functioning correctly.

This is useful for example, if the Joystick fails - the boom can be folded & Cruiser moved temporarily without the Joystick being functional.

To Check the Function of Each Switch:

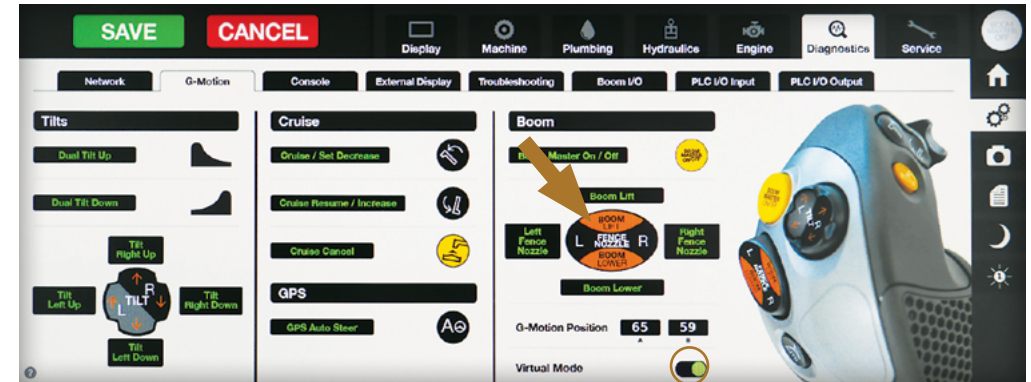
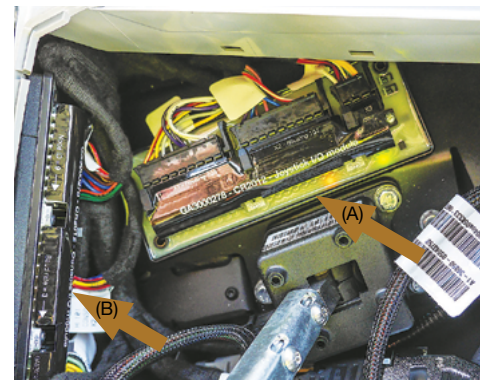
- While in the 'G-Motion' diagnostic screen, press the relevant push button/switch on the Joystick:
 - If a push button/switch is working, its corresponding touch button on the G-Motion screen will light up 'Green' each time the push button or switch is pressed.
 - If a Joystick push button/switch is not working, its corresponding touch button on the G-motion screen will not light up.
- If the corresponding touch button on the G-Motion screen button fails to light up, then go to the Joystick Control Module which is located under the control console in the cabin (shown right [A]).
- Remove the top cover of the console &

check the connectors .

The Cabin Switch Module is also located under the control console (shown right [B]).

- After checking the Joystick Module connectors, re-check the function of the relevant push buttons/switches using the Joystick & the G-Motion Diagnostic

The Joystick Module (A) & Console Switch Module (B) located under the cabin control console below the Joystick.



The screen is used to operate the Joystick functions in Virtual Mode. Enable 'Virtual Mode', then press a Joystick push button (eg, 'Boom Lift'). If working the boom will rise when the push button is held & stop when the button is released.

screen.

- If the function continues to not light up it will be necessary check the relevant function in Virtual Mode.

To Check a Function in Virtual Mode:

- Press the Virtual Mode touch button to engage/disengage the Virtual Mode.
The touch button displays Green when engaged & Grey when disengaged.

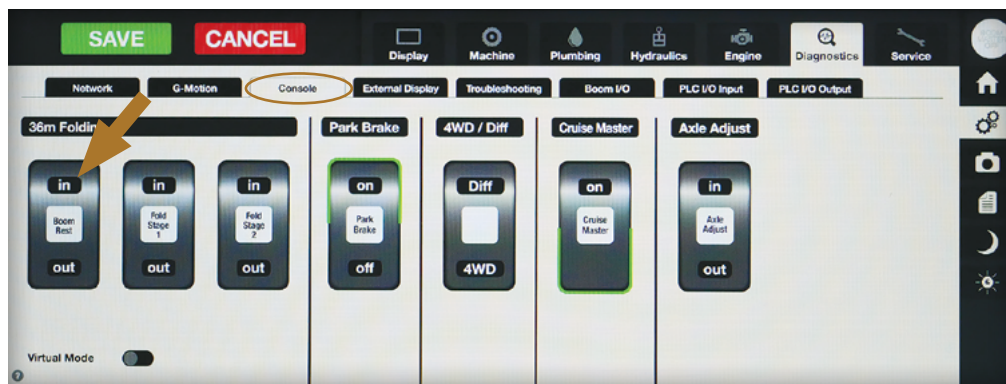
- Press the relevant screen button to test its function (eg, 'Boom Lift').

If working, the boom will raise while the push button is being pressed and stop when the push button is released.

NOTE

The G-Motion Position display gives a digital reading within a range of 60 -112 when the Joystick is moved forwards and backwards.

9 Fast Tracking Problems – Trouble Shooting



Press the 'Console' tab to open the 'Console screen. Press a Console push button/switch (eg, Boom Rest In), then its corresponding touch button on the Console screen will light up Green, if functioning correctly.

- When testing is completed, press the Virtual Mode touch button to disengage Virtual Mode.

The touch button displays Grey when disengaged & Green when engaged.

3 Console

The 'Console' screen is used to test and troubleshoot the Console operation.

Press the Console tab touch button to display the Console screen which provides two testing functions:

- To check the function of each switch along the top of the cabin switch panel
 - To operate switches in Virtual Mode
- When Virtual Mode is enabled, cabin

switches are disabled

If any switches fail, Virtual Mode push buttons can be used to operate the cabin switch functions.

Press the 'Help (?)' touch button for more information.

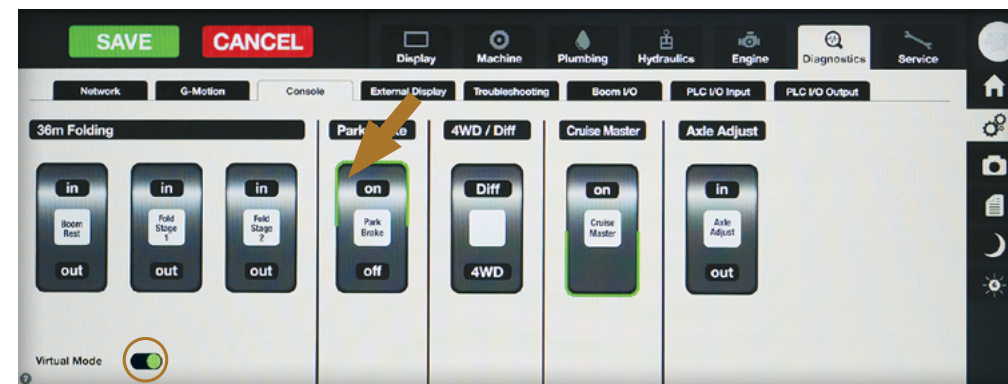
To Check the Function of Each Switch:

- While in the diagnostic 'Console' screen, press a switch on the Cabin console switch panel:
 - If a cabin console switch is working, its corresponding touch button on the Console screen will light up 'Green' each time the push button or rocker switch is pressed.
 - If a cabin console switch is not working, its corresponding touch

NOTE

Variations in the Console screens shown above can occur because there are different Cruiser models:

- 'Fold Stage 3' switch only appears with 48m booms.
- 'Fold Diff Lock' switch only appears with 4WD Cruisers.



Enable Virtual Mode, then press & hold a Console push button (eg, Fold Stage 2 In), then the outer boom will fold-in while the touch button is held. Release the touch button to stop the function.

- button on the Console Diagnostic screen will not light up.
- If a touch button on the Console diagnostic screen fails to light up, then locate the Console Control Module (shown right) and check that connectors are fitted correctly.
- Remove the top cover of the console (shown below) and check the connectors.
- After checking the console Module Connectors, re-check the function of the switches using the control console switches & the diagnostic Console screen.
- If the function continues to not light up, it will be necessary check the relevant function in Virtual Mode.

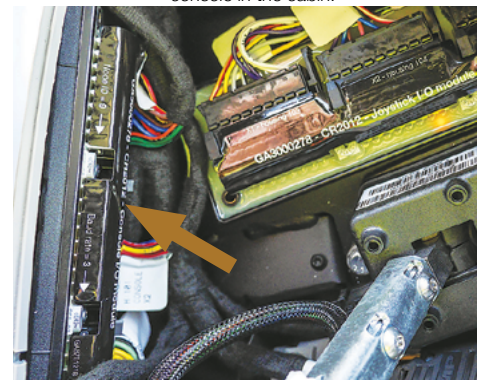
To Check a Function in Virtual Mode:

- Press the Virtual Mode touch button to enable/disable the Virtual Mode.
The touch button displays Green when enabled & Grey when disabled.
- Press a screen touch button to test its function (eg, In Fold Stage 2).

NOTE

The Park Brake cannot be enabled/disabled in Virtual Mode.

The Console Control Module located under the Joystick console in the cabin.





Press the 'External Display' tab to open the 'External Display' screen. Press an External Display push button, eg, 'Tank Inc', then its corresponding switch on the Console screen will light up Green, if functioning correctly.



With 'Virtual Mode' enabled, press an External Display touch button, eg, 'Tank Inc', then the "Tank Inc" function will increase the tank volume.

If working, the boom will fold while the switch is being pressed and stop when the switch is released.

- When testing is completed, press the Virtual Mode touch button to disable Virtual Mode.

The touch button displays Grey when disabled & Green when enabled.

4 External Display

The 'External Display' screen is used to test and troubleshoot the external display & key pad.

Press the 'External Display' tab touch button to display the External Display which provides diagnostic & virtual control functions:

- To check the function of each touch button and push button of the external

control functions

- To operate Fill only touch buttons in Virtual Mode.

In Virtual mode, the RPM Raise, Pump Product, Fill Product, Agitator, Hopper, Pump Rinse, Fill Rinse, Fill Pump and Rinse Nozzle push button switches are used operate the fill functions.

Press the 'Help (?)' touch button for more information.

To Check Function of Each Push Button:

- While in the 'External Display' screen, press the relevant touch button on the External Controller:
 - If a push button switch is working, its corresponding switch on the 'External Display' diagnostic screen will light up 'Green' or 'Blue' each time the push

NOTE

Checking Switch functions on the External Display requires 2 persons, one in the cabin observing the External Display Diagnostic screen and one outside operating the External Display.

NOTE

If a push button is not working, its Only 'Fill' screen functions can be operated or checked in Virtual Mode.
'Clean' & 'Faults' screen cannot be checked or operated in Virtual Mode.

corresponding touch button on the diagnostic External Display screen will not light up.

- If a corresponding touch button on the External Display diagnostic screen fails to light up, then go to the External Display Module (located in the left hand side of the Quick Fill Toolbox [shown right]) and check that connectors are fitted correctly.

- Open the door of the toolbox and check the connectors.
- After checking the External Display Module connectors, re-check the function of the relevant External Display push buttons and the External Display diagnostic screen touch buttons.
- If a function continues to not light up it may be necessary check the relevant function in Virtual Mode.

To Check Functions in Virtual Mode:

- Press the Virtual Mode touch button to enable/disable 'Virtual Mode'.

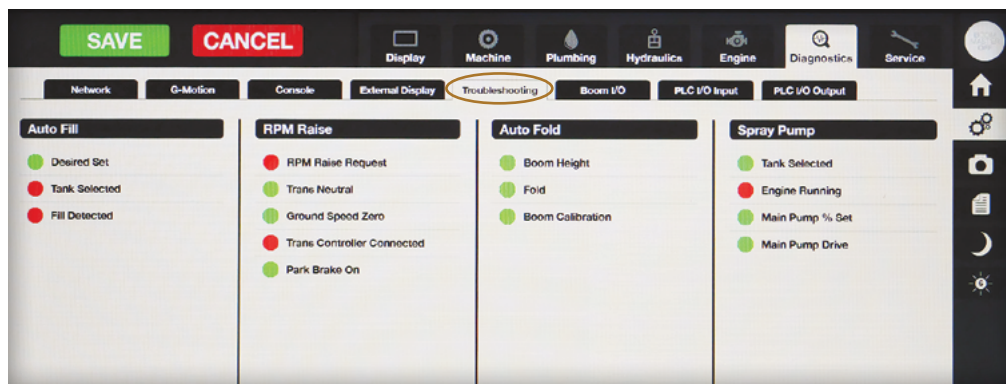
The External Controller is part of the Chassis Controller or Main PLC located inside the left hand side Quick Fill Area Toolbox.



NOTE

All functions should be turned off when leaving this screen.

9 Fast Tracking Problems – Troubleshooting



Press the 'Console' tab to open the 'Console screen which is used to check Console switch functions & operate Console switch functions in Virtual Mode if needed.

5 Troubleshooting

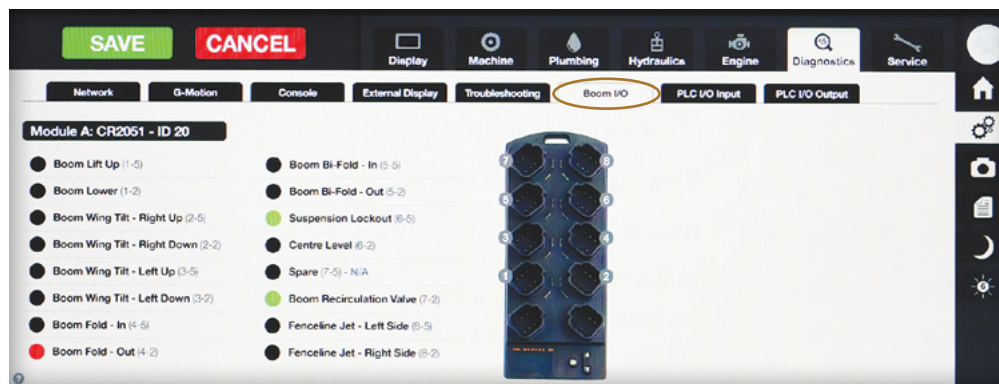
The 'Troubleshooting' screen is used to troubleshoot the sprayer functions.

Press the 'Troubleshooting' Display tab touch button to display the screen.

The 'Troubleshooting' screen provides function

- 1 The touch button displays Green when enabled & Grey when disabled.
- 2 Press a Tank Increase volume touch button (on the left hand side of the screen) eg, 'Tank Inc' to test its function.
If working, the tank volume will increase.
- 3 When testing is completed, press the Virtual Mode touch button to disable Virtual Mode.

The touch button displays Grey when disabled & Green when enabled.



Press a Console push button (eg, Boom Rest In), then its corresponding switch on the Console screen will light up Green, if functioning correctly. Press the 'Help (?)' touch button for more information.

checklists for:

- Auto Fill
- RPM Raise
- Auto Fold
- Spray Pump.

If an indicator displays Green it is connected & working.

If an indicator displays Grey, it is Off

If an indicator displays Red, it is not working

If Red, go to the relevant control module or

setting and check the connections.

6 Boom I/O

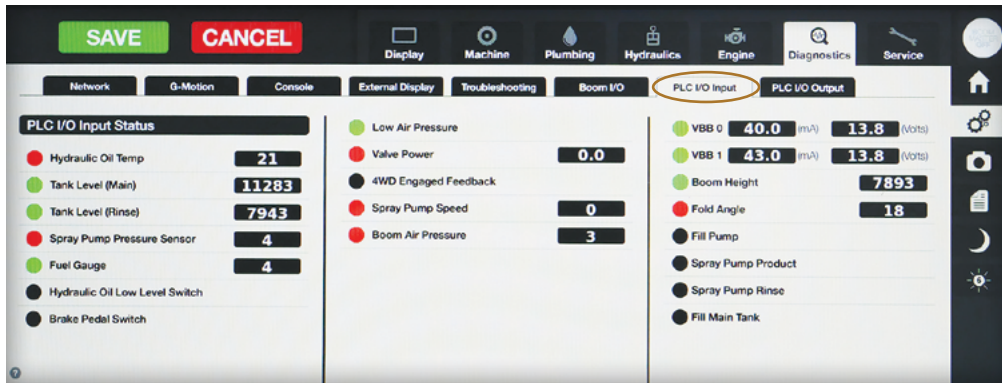
The 'Boom I/O' screen is used to test and troubleshoot boom inputs & outputs.

Press the 'Boom I/O' Display tab touch button to display the screen.

The 'Boom I/O' screen provides checklists and readouts for the boom functions operating through Boom Module A & Boom Module B located on the right hand side of the boom

Boom Module A located on LHS boom centre section (cover removed).





Press the 'PLC I/O In' tab to display the screen and check inputs. Press the 'Help (?)' touch button for more information.

centre section.

Press the 'Help (?)' touch button for more information.

Fields display the raw sensor data for inputs and the PWM value for outputs of the system.

Circular indicator lights for inputs & outputs:

- Black = Off
- Green = Input is working ok & in range
- Red = Sensor is out of range or disconnected - see fault log for more details.

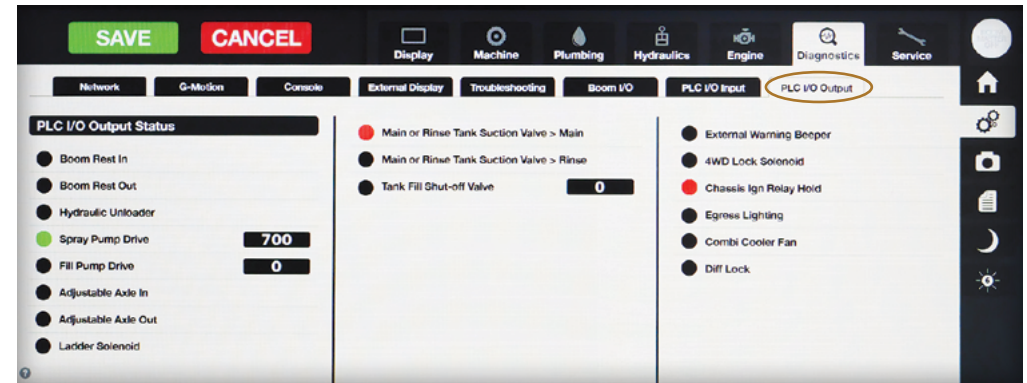
Go to the Boom Module A & Boom Module B and check connections.

7 PLC I/O Input

The 'PLC I/O Input' screen is used to test and troubleshoot boom inputs.

Press the 'PLC I/O In' Display tab touch button to display the screen.

The 'PLC I/O In' screen provides checklists & readouts for all Inputs to the Chassis Controller or Main Control Module (located in the left hand side Fill Area toolbox).



Press a 'PLC I/O Out' push button to display the screen and check outputs. Press the 'Help (?)' touch button for more information.

Fields display the raw sensor data for inputs and the PWM value for outputs of the system.

Press the 'Help (?)' touch button for more information.

Circular indicator lights for inputs:

- Black = Off
- Green = Input is working ok & in range
- Red = Sensor is out of range or disconnected - see fault log for more details.

Also go to the Chassis Controller or Main Control Module and check the Input connections.

8 PLC I/O Output

The 'PLC I/O Output' screen is used to test and troubleshoot boom inputs.

Press the 'PLC I/O Out' Display tab touch button to display the screen.

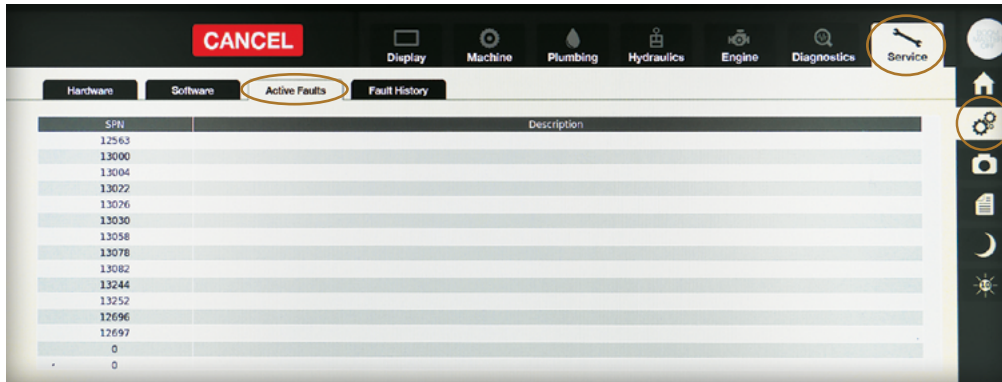
The 'PLC I/O Out' screen provides checklists & readouts for all Outputs to the Chassis Controller or Main Control Module (located in

NOTE

The number indicators shown on the PLC I/O Out screen above, namely:

- Spray Pump Drive '350' and
 - Tank Fill Shut Off Valve '650'
- are the PWM outputs. Numbers range from 0 to 1000 where 0 is Off & 1000 is fully On.

9 Fast Tracking Problems – **Trouble Shooting**



Press the "Active Faults" tab to open the 'Active Faults' screen which can be used to check faults.

the left hand side Fill Area toolbox).

Fields display the raw sensor data for inputs and the PWM value for outputs of the system.

Press the 'Help (?)' touch button for more information.

Circular indicator lights for outputs:

- Black = Output is Off
- Green = Output is On and working ok
- Red = Error fault – see fault log for more details

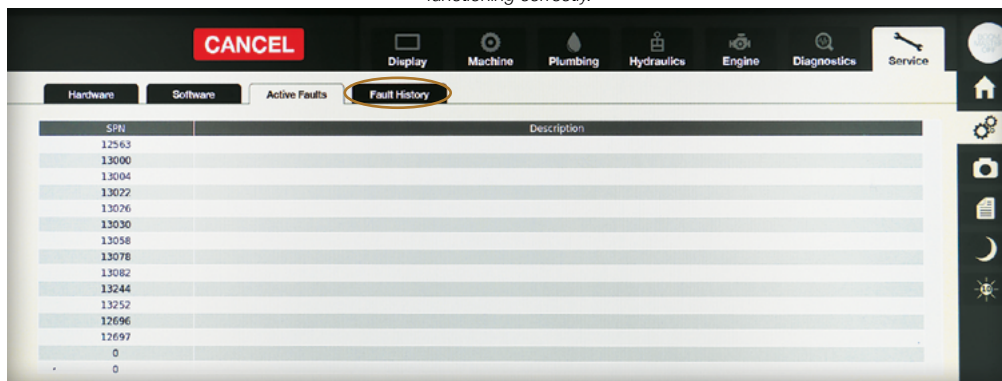
Also, go to the Chassis Controller or Main Control Module and check the Input connections.

Active Faults

Another G-Hub screen, useful in trouble shooting, is 'Active Faults' accessed in the Service tab screen.

Press 'Settings' touch button, then the

Press a Console push button (eg, Boom Rest In), then its corresponding switch on the Console screen will light up Green, if functioning correctly.



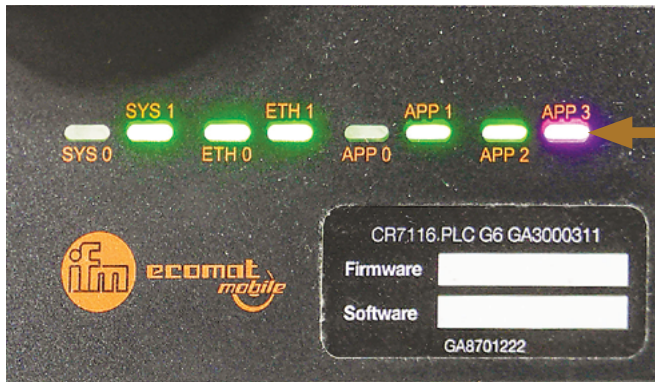
The ISOBus Module (also known as the Chassis Controller or Main Control Module) located in the storage box of Quick Filling Station.

'Service' touch button, then press the 'Active Faults' tab touch button to open a screen displaying all active faults.

Only active faults are displayed.

Once corrected the fault code automatically clears.

Fault History



LED lights & keys on the ISOBus Module

LED KEY	LED COLOUR	DESCRIPTION
SYS0	Red	PLC Error, PLC not running
	Green (Flashing)	PLC OK, running
	Off	No PLC power
SYS1	Green	Not used (second PLC)
ETH0	Off	No Ethernet connection
ETH1	Off	No Ethernet connection
APP0	Off	Error
	Blue	G-Hub online
APP1	Red	No HMI settings transfer
	Green	HMI Settings transferred ok
APP2	Blue	No HMI settings changed
	Green	HMI Settings changed ok
	Red	HMI Settings changed failed
APP3	Green	CAN OK, online
	Red	CAN RAW fault
	Blue	CAN open fault
	Yellow	CAN ISOBUS fault
	Magenta	CAN J1939 fault

NOTE

When nothing appears on the G-Hub screen, first, check the lights of the PCL Controller (located in the filling station storage box) for more information. Check the LED colours and if problem is showing according to the LED lights Description, contact you local Dealer for service.

9 Fast Tracking Problems – Trouble Shooting

Spray Pump

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Pressure & Flow rate are too low	Centrifugal pump speed	Check pump speed is 4000 - 4200 RPM
	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
	Suction line air leak	Check suction line for air leak.
	Suction blockages	Check the tank sump, suction line & suction filter for blockage
	Nozzle wear	Measure the flow per minute coming out of one nozzle, then check the nozzle chart for the corresponding flow.
	Regulator valve function	Check the regulator valve is rotating the full 90 degrees when the boom valves are switched Off
	Excessive bypass on pressure manifold	Verify the Console calibration settings
Pressure & Flow rate are too high	Supply to pump is restricted	Check the pressure relief valve setting on the pump.
	Bypass line is restricted or blocked.	Verify console calibration settings Check for restriction in bypass line Check pump speed is not too fast Check if Bypass valve is turned On

Spray Pump

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Pressure gauge reads higher than the nozzle flow indicates	Blocked filters of nozzles	Check and clean all pressure and nozzle filters
	Flow loss due to resistance in lines, valves & filters.	Re-calibrate console to allow for pressure loss
Pressure fluctuation	Air leak on suction side of pump	Check suction pump for air leaks.
	Incorrect pump speed	Adjust pump speed: • Centrifugal pump: 4000 - 4200 RPM • Diaphragm pump: 400 - 540 RPM.
	Faulty pump valves	Replace pump valves
Pump pressure pulsating	Incorrect pump speed	Adjust pump speed: • Centrifugal pump: 4000 - 4200 RPM • Diaphragm pump: 400 - 540 RPM.
	Air leak on suction side of pump	Check pump suction for air leaks
Pump oil is becoming milky	Cracked diaphragm	Replace all diaphragms
Pump 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

Flow Meter & Controller

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 using manual increase/decrease flow control
Speed sensor display is inaccurate, unstable or zero	Incorrect speed calibration	Re-calibrate console speed
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
Control valve has failed	Faulty cable	Replace control valve
	Faulty valve	Temporary solutions: Remove the motor from the 3 way ball valve and manually adjust the flow by turning the shaft with a spanner

If the 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 as shown on the pressure gauge on the machine.
- Drive the machine at a constant speed in order to apply the required application volume as determined by the nozzle selection chart.
- The machine should then be operated to empty the tank. Once the machine is empty of chemical, partially fill the tank with fresh water so that test can be performed in order to correct the problem. Repair or replace the flow meter as soon as possible.

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.

9 Fast Tracking Problems – Trouble Shooting

Boom

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 mounts have moved	Adjust fold cylinder mounts
Boom unfold 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.
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
Booms are showing signs of bending components and welds cracking	Folding or unfolding of booms is too fast	Reduce the hydraulic flow to the folding cylinders
	Folding or unfolding of booms while the machine is still moving	Do not fold or unfold the boom while the machine is still moving
	Tilt operation	Tilt operation should be kept to a minimum. If the tilt operation is too fast, reduce the oil flow

NOTE

By nature, booms fitted with flow dividers don't fold 100% evenly.
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.

Plumbing

PROBLEM	COMMON CAUSES	COMMON SOLUTION
No water at boom.	No Tier valve value entered or is at 0	Enter value greater than 0

Induction Hopper

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Induction hopper is not performing as well as it should	Insufficient flow to venturi in the hopper bottom	Check the pressure supplied to the hopper bottom is around 550 kPa (80 PSI).
	Air leaks on induction system	Check all hoses, clamps, and cam lever fittings are sealed

Brakes

PROBLEM	COMMON CAUSES	COMMON SOLUTION
Brakes are spongy	Air in brake lines	Bleed brakes as outlined in maintenance chapter
Machine is stopping inconsistently	Grease or oil on the brake discs	Clean the discs with a clean cloth and methylated spirits.
	Warped brake discs	Inspect the discs to ensure they are straight. If warped, they must be replaced.
The brakes are screeching or squealing.	Insufficient friction material on brake pads and/or rotors worn.	Inspect brake pads and rotors. Replace immediately if worn beyond wear indicators. Rotor min. thickness 20 mm.
	Brake pad rubbing on piston	Fit Anti-squeal liners on pads

Hydraulic & Pneumatic

PROBLEM	COMMON CAUSES	COMMON SOLUTION
No hydraulic pressure	Low hydraulic oil level	Check the oil level in the hydraulic reservoir and top up if necessary
	Fill pump is engaged	Switch the hydraulic fill pump off
The air bags are not inflating	Low system pressure	The bags will not inflate until the pressure in the system is above 75 PSI, check system pressure.
	Compressor not working properly	Check that the compressor is working correctly
Vehicle sits unevenly	Incorrectly adjusted ride height valves.	Adjust the ride height valves as per the instructions in the Lubrication and Maintenance chapter.
Air conditioning not cooling effectively	Condenser blocked	Check the condenser for a build up of dirt and plant matter, clean if required
	Compressor belt loose	Inspect the belt to see if it is tensioned correctly. If belt is showing signs of wear, replace
	A/C system needs re-gassing	If this is the case, only allow a qualified air conditioning technician to work on the system. R134a refrigerant must not be allowed to escape to the atmosphere
	Evaporator blocked	Build up of dirt and plant matter, clean if required. Be careful not to damage any of the components

9 Fast Tracking Problems – Trouble Shooting



If the SERVICE indicator is illuminated, then a fault in the shift by wire system has occurred.

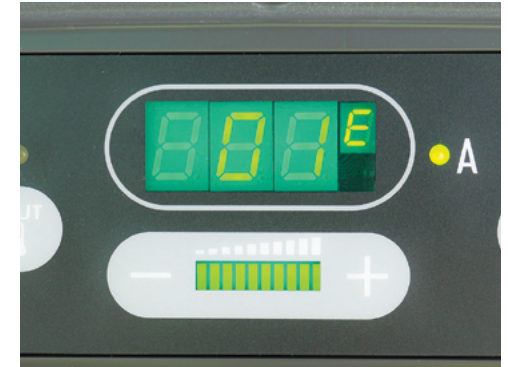


When the transmission shifter displays 'D-\' (loss of J1939), press 'D' and/or consult a qualified technician.



The 'Select' display flashes if restricted transmission shifting occurs. If so, consult a qualified technician.

If loss of J1939 occurs, consult a qualified technician.



Air conditioner display showing '01' HVAC Fault Code.

Transmission Shifter

Transmission Fault Warning

If the SERVICE indicator is illuminated, then a fault in the shift by wire system has occurred.

A qualified technician should inspect the system as soon as possible.

Loss of J1939

Loss of the J1939 to or from the shifter will result in an error indicated on the display as 'D-\'.

The SELECT display works as normal except that in drive, only the error 'D-\' is displayed.

Up shift and down shift commands are sent on the J1939 link and can not function in this mode.

The vehicle transmission will not be able to hold any of the forward gears unless the loss of J1939 occurred while a lower range than currently selected. If this is the case, the selected range will be the max range.

Press 'D' (Drive) during this situation to enable shifting to all 6 gears.

Range Inhibit Indicator

Certain conditions may cause the Allison transmission control module (TCM) to restrict shifting.

The range inhibit indicator alerts the operator that such a condition exists when the 'SELECT' display (the left digit) begins flashing & the 'MONITOR' Display (the right digit)

remains constant.

Please consult a qualified technician in this situation.

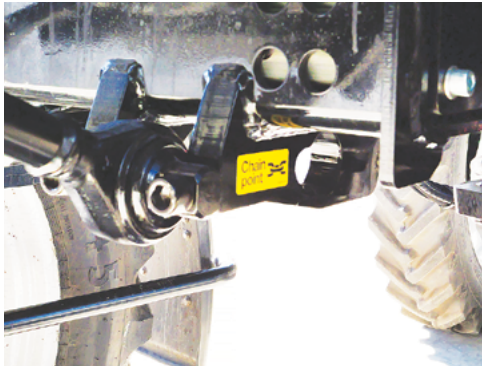
Air Conditioner Fault Codes

The overhead display of Air Conditioner in the cabin may show one of the following HVAC Fault Codes if a problem occurs:

- 01 HVAC High Pressure fault
- 02 HVAC Low Pressure fault
- 03 HVAC Control Panel Blower Potentiometer fault
- 04 HVAC Control Panel Temperature Potentiometer fault
- 07 HVAC Cab Temperature Sensor fault

WARNING

Operating the machine with the wrench icon flashing is not recommended. It may indicate a loss of safety back up systems. The operator should use extra caution when shifting to ensure that the transmission is performing properly.



Front left tie-down attachment & towing point.



Front right tie-down attachment & towing point.

- 08 HVAC Evaporator Sensor fault
- 09 HVAC Outlet Temperature Sensor fault
- 19 HVAC Communication fault.

Towing & Transporting a Disabled Cruiser

- A disabled Cruiser is best transported

on a drop deck trailer.

Use chains to secure the machine via the tie-down attachment point located under the front and rear axles.

- The Cruiser must not be towed unless the engine is running (as the steering and brakes require engine power to operate).

Before towing, the front tail shaft should be disconnected, due to the risk of damaging the transmission.



Rear left tie-down attachment point.



Rear right tie-down attachment point.



Use the touch buttons & content pages to quickly access further information if required.

Document Centre

Copies of Operators & Parts manuals in PDF format can be accessed and viewed via the 12" G-Hub screen screen in the cabin.

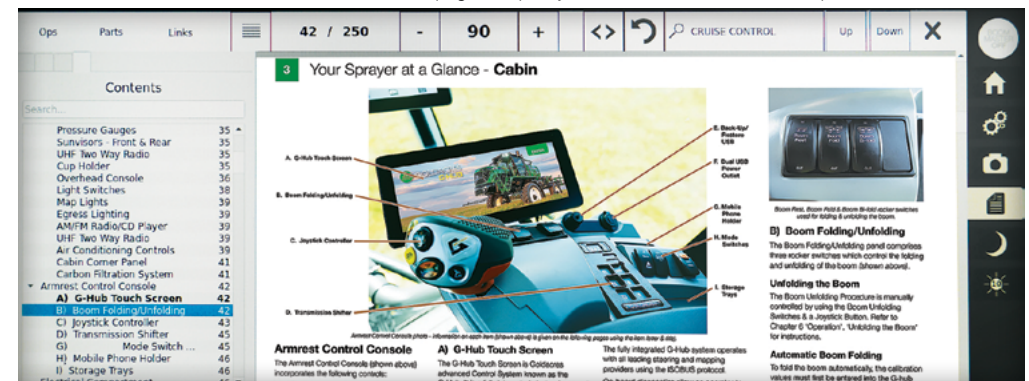
Use the touch buttons and contents page to quickly access the information you require.

Please note manuals on the G-Hub are accurate at time of loading and are subject to change.

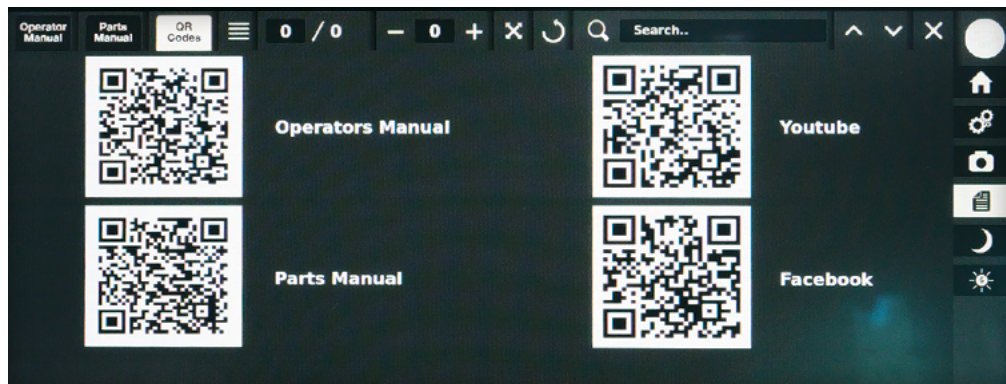
For the most recent and accurate versions of all manuals refer to the Goldacres website -

www.goldacres.com.au

Use the touch buttons & content pages to quickly access further information if required.



9 Fast Tracking Problems – **Trouble Shooting**



The 'QR Codes' screen provides quick access to the most up to date information from Goldacres website.

QR Codes

'QR Codes' give quick online access to the most up-to-date versions of the Operator's and Parts manuals on the Goldacres website.

10 - Integrated Systems – Appendix 231

G-Hub - Goldacres Integrated Control System	232
Internal Controller Display:	232
External Screen	232
Main PLC	233
Cabin I/O Modules	233
Boom I/O Modules	233
Valves & Solenoids	233
CANBUS	234
G-Hub Settings Backup	234
Software Updates	234
CANBUS Network Schematics	235
CANBUS Network Schematics cont.	236
Electrical Layout	236
Electrical System	237
Batteries	237
Battery Isolator	237
Chassis Power Points	237
Fuses & Relays in the Cabin	238
Chassis Mounted Components	238
Cabin Electrical Compartment	238
Fuses & Relays on the Chassis	239

Liquid Application System	240
Filling & Cleaning System	240
Spraying System	240
3 Tier System - 3TS & 3TS Pro (Options)	242
XRT Auto Boom Height Control (Optional)	243
Air Conditioning System	244
Compressor	244
Condenser	244
Receiver Dryer	244
Heating System	245
Plumbing Schematic - Diaphragm Pump 260 L/min	246
Plumbing Schematic - Weedetect Bilberry 3TS Option	248
Plumbing Schematic - Centrifugal Pump 260 L/min	250
Plumbing Schematic - Weedetect Bilberry 3TS Option	252
Plumbing Schematic - Weedetect Hawkeye PWM Option	254
Pneumatic Schematic	256
Hydraulic Schematic - Fixed Axle Option	258
Hydraulic Schematic - Adjustable Fixed Axle Option	259
Hydraulic Schematic - Boom Manifold	260
Hydraulic Schematic - Steering & Adjustable Axle	261
Hydraulic Schematic - Tank & Pumps	262
Hydraulic Schematic - Boom Raven XRT	263

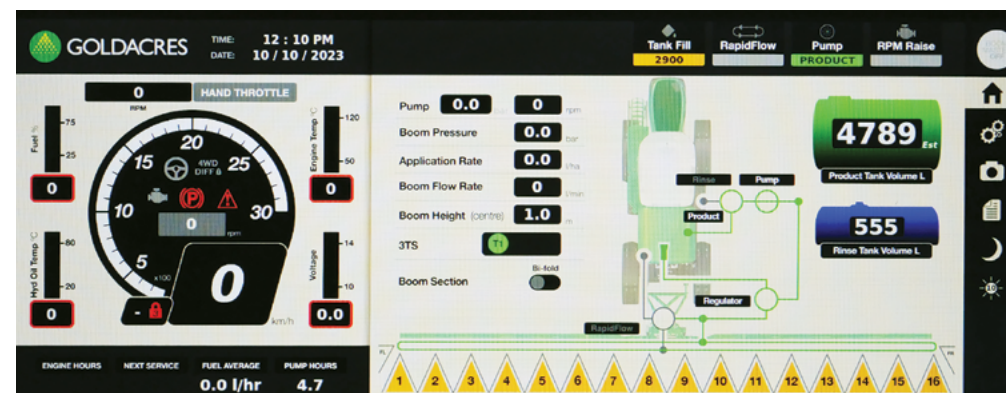


G-Hub - Goldacres Integrated Control System console.

G-Hub - Goldacres Integrated Control System

G-Hub Glossary of Terms:

CANBUS	- Controller Area Network which allows devices to communicate
Crash	- PLC code run failure; Requires restart
Ethernet	- Network technology like CANBUS but 100 times the bandwidth
G-hub	- Goldacres integrated machine control system
HC	- High current
ifm	- Company brand name of PLC hardware used
I/O	- Input/output
PDM	- Power distribution module
PLC	- Programmable logic controller
RCM	- Raven control module used for product rate control
XRT	- Raven boom height control system (replaces Norac).



In cabin - G-Hub Controller Display/Touch Home Screen.

Internal Controller Display:

- Full colour, 12" 8:3 ratio Touch screen, running embedded Linux OS, IP 67 which displays important machine data to the operator from all connected systems
- Full system diagnostics, including warnings and operation states "Right to repair ready"
- Displays all relevant machine data for the operator
- Goldacres have custom designed the user interface with inbuilt help
- The system has been designed to keep going even if individual components fail.
- Responsible for sending the steering safety information to the Danfoss steering valve (*Auto steer will not operate if this display is disconnected*)
- Full virtual controls in case of component failures with input switches and joystick.
- Full virtual control of external display in case of external display failure.
- Interface to change settings and configure the system.

External Screen:

- Full colour, 5" Non Touch screen, running embedded Linux OS, IP 67
- External CAN push buttons with function indicator LED's, 7 push buttons
- Tank fill functions.

External Screen.





Main Control Module located in the storage box of the

Main PLC:

- Main 'brain' of the control system, contains all the chassis I/O for sensors and control
- The diagnostic lights on the PLC tell inform the user if software is loaded and if there are any problems (see PLC LED table in Chapter 11 'Troubleshooting')
- The software has been written to allow continued operation even when sensors fail, if a sensor is faulty it can be disconnected. But please note that some system functionality may be lost until the sensor can be replaced.
- Links via CAN to the Raven RCM to get sprayer information and transfer tank volume
- Links via CAN to Raven XRT for control and sense when in operation
- Links to engine and transmission CAN to exchange information and control cruise control
- Correct operation of the PLC is critical to machine operation.

Cabin I/O Modules:

- There are two basic I/O modules inside the cabin side console that convert the input from the console switches and joystick into CAN bus messages
- The CAN bus messages are then sent to and interpreted by the PLC to operate machine functions
- The I/O modules are not programmed, rather they are configured with mechanical selectors that set the CAN address and the CAN data speed. If not set correctly they will not be detected on the network.
- Each module has built in power and input status lights for each input allowing quick and easy diagnostics.

NOTE

The Park Brake is not controlled by the Main PLC for safety reasons.



Boom I/O module.

Boom I/O Modules:

- In order to reduce the amount of wires running to the rear of the machine, a smaller I/O modules does the work for the PLC at the rear
- The module has a unique CAN bus address as displayed on the screen
- The CAN bus address and data rate can be manually set and adjusted as required with the buttons
- The module houses diagnostic LEDs to assist troubleshooting
- The indicator lights display when the output is on and flash if there is an output disconnected. The small screen displays the node address and the status of the CAN bus connection.
- The module does not contain software and does not require updating.

Valves & Solenoids:

- Most of the plumbing valves have a built in light, red or green, that primarily indicates the valve position but also the fact that they have power connected
- Note that the main suction valve has three positions and is normally in the centered OFF position. There will be no light on in this position but it may still have power connected as normal.
- The main plumbing valves have a breakout harness for easy assembly and diagnostics if required with the use of a break in tee harness
- The main hydraulics also have a breakout harness for easy assembly and diagnostics
- The rear I/O modules will also flash a red LED when a solenoid is disconnected (they run a small amount of current into the output to detect presence of connections).

CANBUS

The machine control systems use six independent CANBUS networks & these are critical to complete operation of the G-Hub:

- 1 Goldacres CAN network (PLC to displays)
- 2 Goldacres CAN control (PLC to I/O modules)
- 3 J1939 CAN (Engine and Transmission)
- 4 ISOBUS CAN (RCM, Raven XRT and GPS, etc)
- 5 GA steering CAN (Steering Orbital, SASA sensor, GPS, Display)
- 6 Goldacres CAN open (Keypad to external display screen).

Raven & Hawkeye run their own sub-CANBUS networks. These networks are separate and must not be joined.

They must be fully installed before they will operate, ie, fully installed including installation of terminators (see CANBUS layout schematics on the following pages).

G-Hub Settings Backup

The internal controller display gives the operator the ability to back up the G-Hub settings, this can save information such as the machine setup and the tank calibration values to an external USB drive for future use if required.

Software Updates

The three components that can be updated include:

- Main PLC
- Internal display
- External display.

The customer can enjoy improvements and added functionality from future software updates as it is designed and released.

Software updates are performed using:

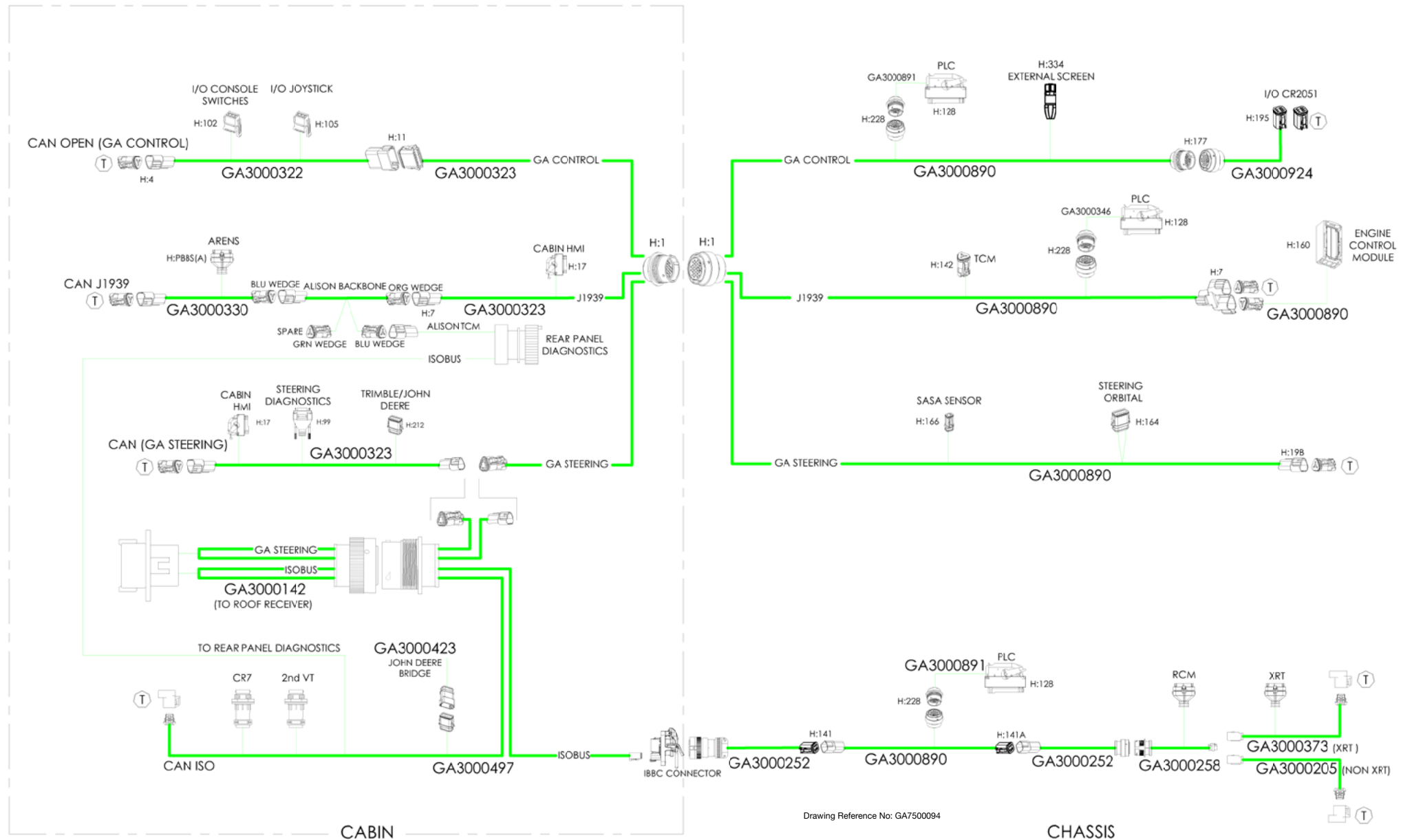
- USB port to the internal controller display in the cabin (G-hub Controller updates [see instructions at the end of chapter 3 'Cabin']) and
- IFM maintenance tool (PLC updates).

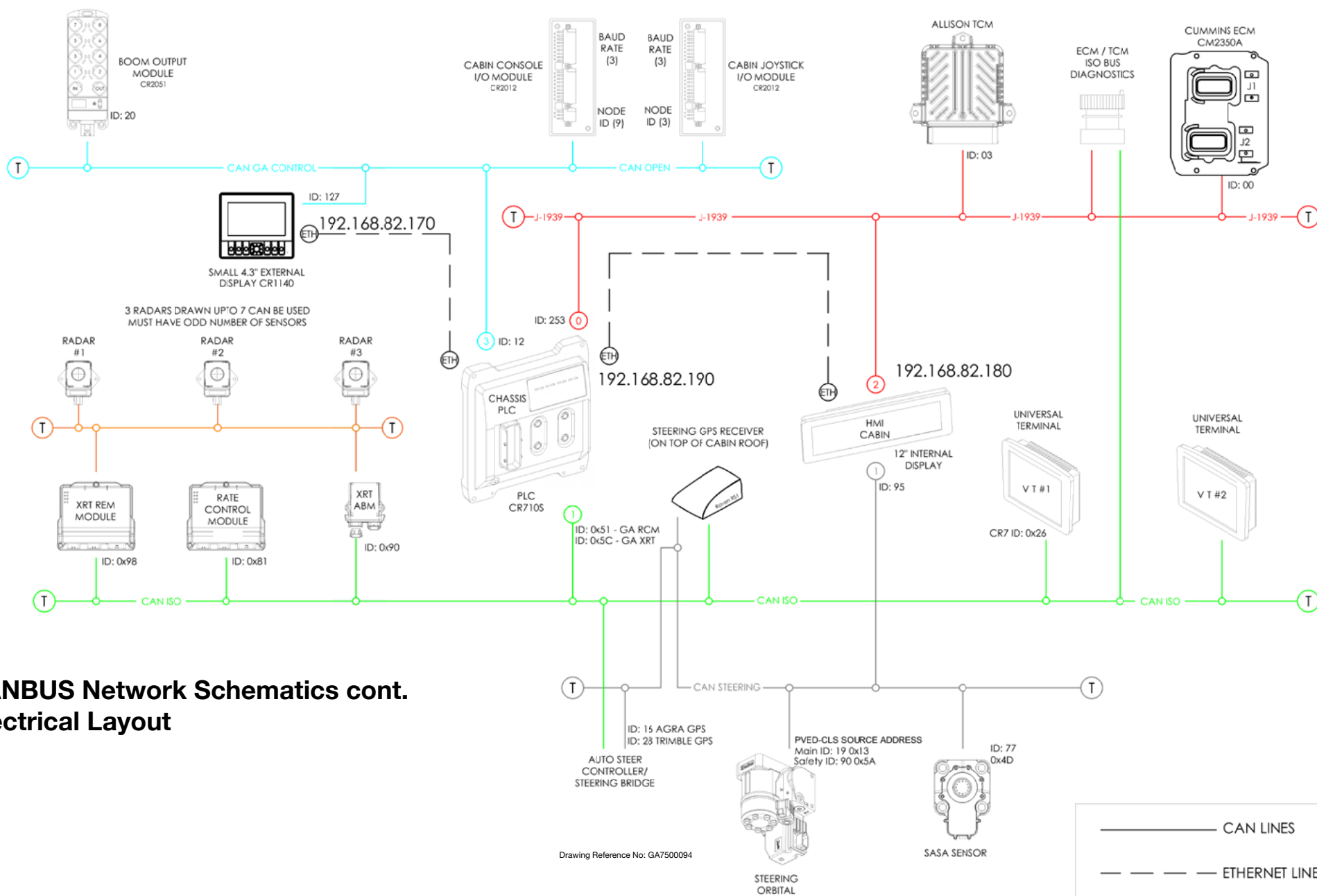
Further information on how to perform updates will be provided with each software update release.

It is highly recommended that all settings are backed up before performing a software update in case of issues.

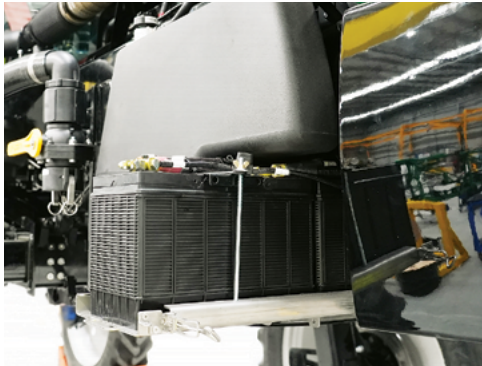
CANBUS Network Schematics

CANBUS NETWORKS





CANBUS Network Schematics cont. Electrical Layout



Two 12 volt supply batteries located under the chassis.

Electrical System

Batteries

The electrical system operates on 12 volts. To provide a 12 volt supply with sufficient current, two 12 volt batteries are used in parallel.

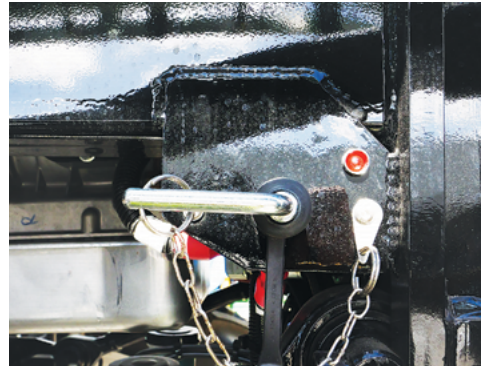
- Before carrying out any repairs to the electrical system turn the Battery Isolator switch to the 'Off' position.

The battery isolator is located just behind the fuel tank on the right hand side.

- When welding, connect the ground terminal directly to the part being welded and ensure that the batteries are disconnected.

Disconnect any electronic controls such as the engine controller, transmission controller, G-hub controllers, PLC, RCM, etc.

- When welding on the machine ensure, if fitted, that all weed seeker controllers are totally removed from the machine.



The Battery Isolator located on the right hand side of the engine with LED indicator.

Battery Isolator

The battery isolator is located just behind the fuel tank on the right hand side.

The battery isolator switches power flow from the batteries to the machine.

The isolator switch is a 250 Amp unit which cuts all power to the machine except for the radio back up power.

The isolator switch must be isolated when the machine is not in use to prevent battery leakage or power faults.

CAUTION

The Battery Isolator switch does NOT function as an emergency engine stop.
Shut down the engine using the On/Off Ignition key in the cabin.

NOTE

The isolator key should only be removed after more than 30 seconds from stopping the engine - so that there is sufficient time for data to be written & saved to the ECU.



Power connection points located under the chassis.

Chassis Power Points

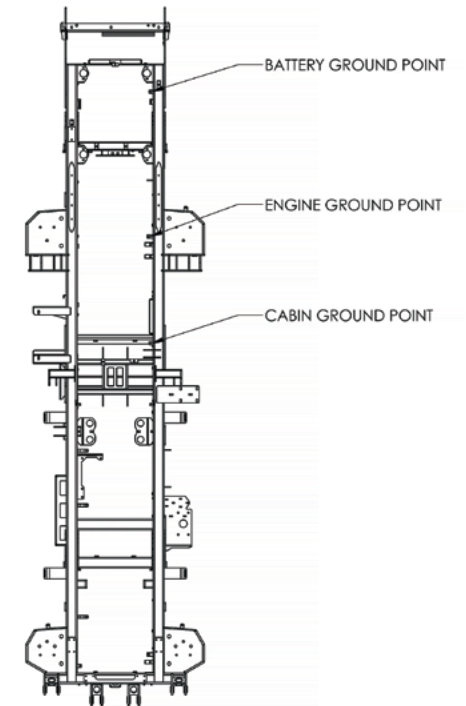
General

Auxiliary power connection points (12V, 30A maximum) are fitted to the side of the left hand pod.

They can be used as a battery charging point or to power electrical attachments, but NOT to be used for jump starting.

Lighting

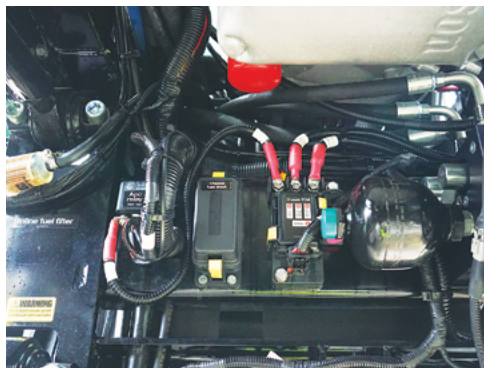
A switched and fused power stud (12V, 500W maximum) is provided for customer fitted lighting accessories under the front axle area just under the hydraulic manifold.



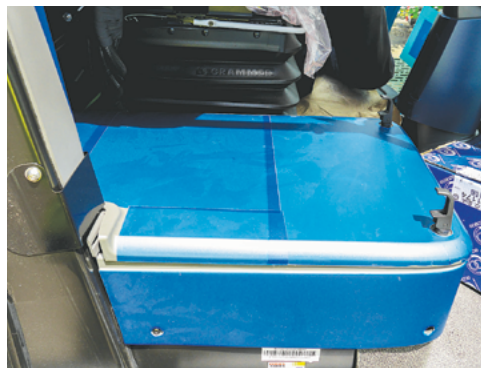
Three ground/connection points located on the chassis

Chassis Ground Points

There are four ground points located on the chassis to assist with connection of optional equipment.



Chassis mounted ACC Relay, Fuse box & Chassis PDM.



The Electrical Compartment located under the armrest controls in the cabin.

Chassis Mounted Components

Some electrical components are mounted under the chassis in the front axle area.

These include the;

- ACC relay,
- Chassis fuse block &
- Chassis PDM.

Cabin Electrical Compartment

The electrical compartment is located under the armrest controls in the cabin. To access the electrical compartment, refer to instructions on page 52 of this manual.

The electrical compartment contains two main fuse boxes and various fuses and relays to activate the machine circuitry.

The fuses have been placed in the system to protect the system against electrical faults and incorrect connections.

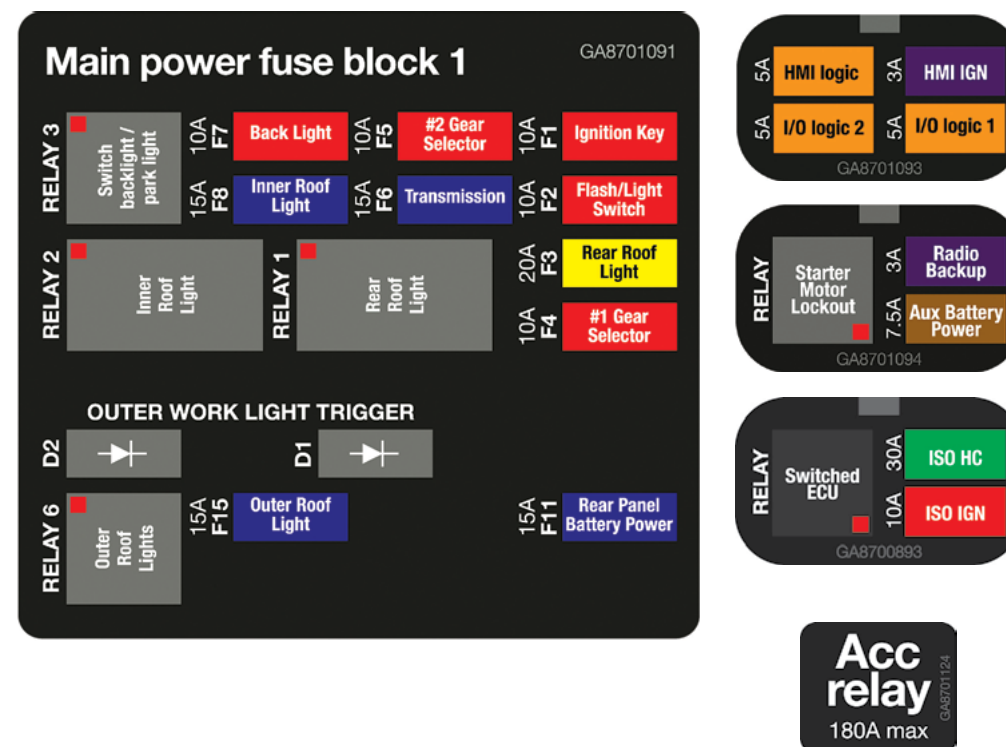
In the case of incorrect connections or faults, a fuse will blow and disconnect the related circuit.

If a fuse has blown, identify the corresponding components in the circuit and investigate the cause before reconnecting with a new fuse.

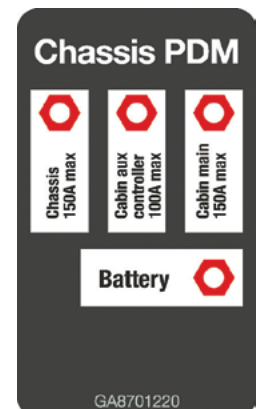
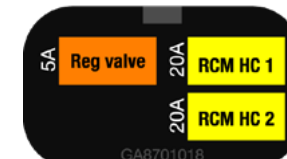
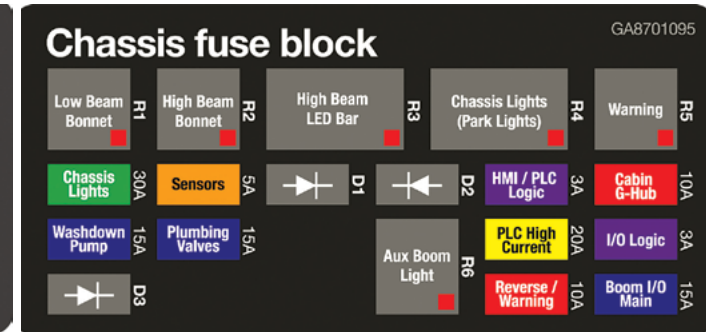
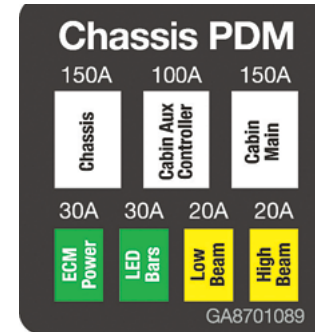
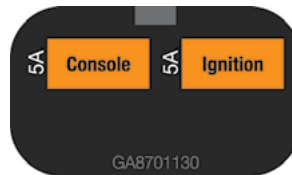
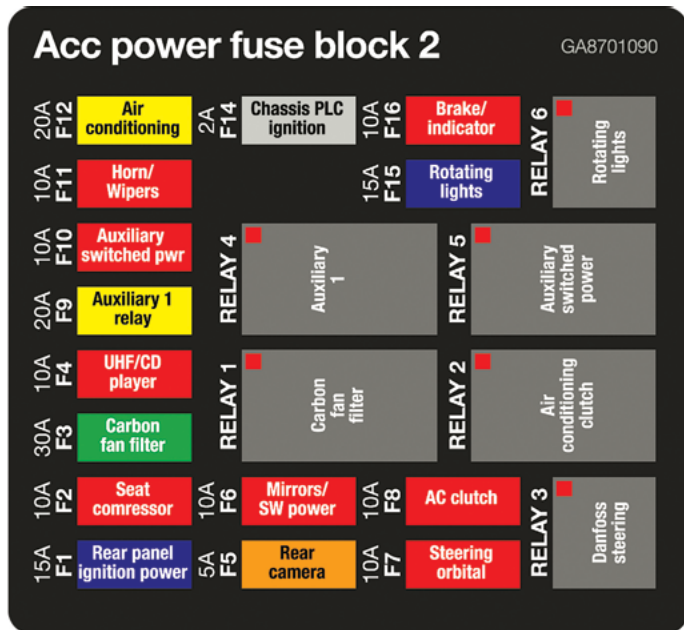
When a fuse is replaced it is important that the fuse is replaced with another fuse of the same rating.

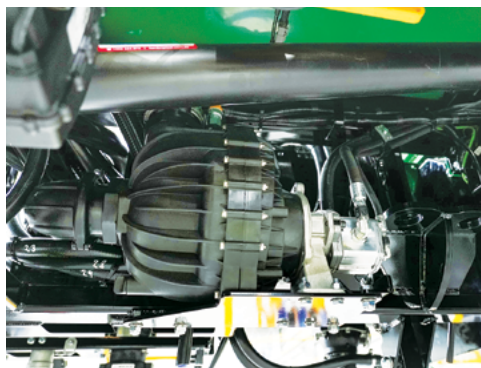
Do NOT use a higher rated fuse in an attempt to correct an electrical fault.

Fuses & Relays in the Cabin



Fuses & Relays on the Chassis





Liquid Application System

The Liquid Application System comprises the liquid & chemical:

- Filling & Cleaning system
- Spraying system

Filling & Cleaning System

Filling & Cleaning functions of the Cruiser are primarily controlled and monitored on the External G-Hub Controller & Filling Station Pod of the Quick Filling Station on the left hand side of the Cruiser. Refer to chapter 6 'Operation - Ready to Spray' for operating details.

Primary components include:

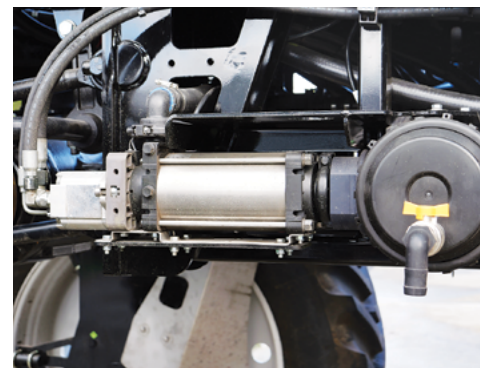
- Fill pump
- Chemical transfer pump.

Fill Pump

A 3" high-capacity fill pump combined with high flow fluid plumbing and hydraulics is capable of filling the sprayer at rates of up to 1150 l/min. The pump & distribution valves are controlled by the G-Hub system to regulate fill rate & tank level soft shut-off .

Chemical Transfer Pump

A chemical transfer pump (up to 40 l/min) ideal for high viscosity chemicals allows neat chemical to be delivered directly to the main product tank or diverted to the induction hopper to be measured before being transferred



Spraying System

Optimum droplet sizing, pressure, nozzle flow rate and spray uniformity across the boom width are all critical to accurate chemical application.

Goldacres Rapid flow, boom recirculation, 3 tiered nozzle system (3TS, 3TS-Pro) options and Hawkeye Pulse Width Modulated (PWM) system option offer many application benefits.

All Spraying application functions of the Cruiser are controlled and monitored on the G-Hub Controller in the cabin. Refer to chapter 6 'Operation - Ready to Spray' for operating details.

Primary components include:

- Spray pump, filters & valves
- Rate Control Module (RCM)
- Spray pump & liquid controls
- RapidFlow & RapidFire
- Boom sections & height control
- Driveline & speed control



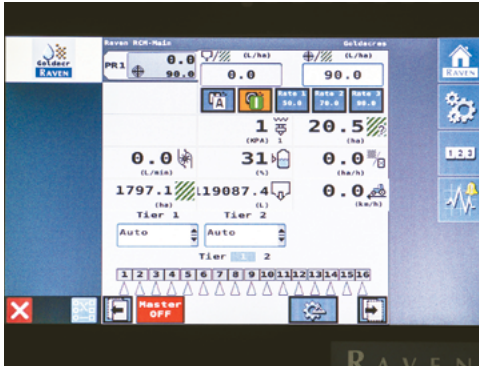
Spray Pump

The Cruiser is optioned with a diaphragm or centrifugal spray pump:

- A Udor Zeta 260 l/min diaphragm pump with nearly 85% of the pump capacity available to the spray line. This increased capacity allows spray application rates of up to 140 l/ha @ 25km/h to be achieved (220 l/min total flow rate across a 36m boom) OR
- A five-stage centrifugal pump can deliver up to 400 l/min at 8 bar of pressure. The multi-stage pump technology proved far more linear relationship between flow and pressure which is crucial in keeping large volumes of chemical in solution whilst spraying at relatively high pressures.

The centrifugal pump is standard with all 48m booms and when the Hawkeye PWM option is fitted.

Both pumps are protected by a large suction filter as well as rpm and run-dry sensors for peace of mind spraying.



RCM screen.

Rate Control Module (RCM)

The Raven Control Module (RCM) fitted as standard. It uses innovative control algorithms for precise application including 16 section boom control to eliminate expensive skips and overlaps.

The RCM is compatible with many ISOBUS universal terminals on the market, including the CR7 from Raven - ISOBUS compliant CAN channel, plus 3 available CAN subnets. Compatible with ISOBUS Universal Terminal and Task Controllers Integrated Bluetooth providing long range line-of-sight wireless connectivity for control, monitoring & testing.

It has multi-language support including English, French, Russian, Spanish and Portuguese. IP 67 environmental rating for the harshest of environmental conditions.

Refer to the Raven RCM operation manual supplied for detailed setup and calibration information.

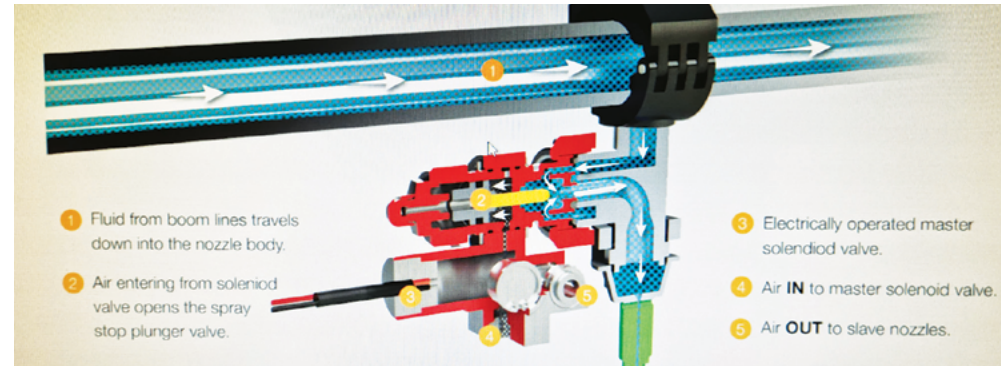


Illustration of the RapidFlow and RapidFire nozzle technologies.

RapidFlow

RapidFlow boom recirculation, fitted as standard, allows the sprayer boom lines to be fully primed without spraying a single drop, significantly reducing wastage at the start of spraying, changing chemicals and cleaning. RapidFlow is used to thoroughly flush out the boom lines without the need to physically spray on the ground.

Boom recirculation can also be controlled through the G-Hub system and can be set to be either manual or automatic in its operation.

RapidFire - Air Solenoid Nozzles

The Cruiser is fitted standard with 16 section boom section and RapidFire nozzle control.

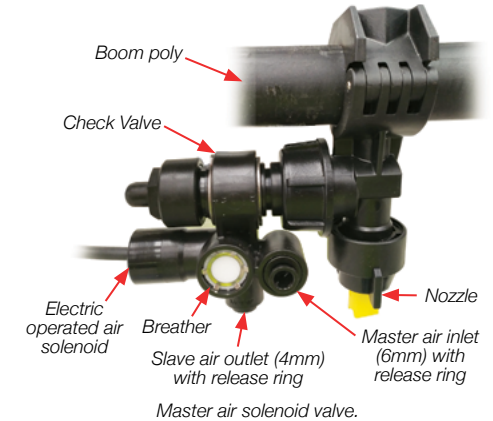
The nozzle system contains a master and slave arrangement for each section. One master air solenoid per section is electrically operated, which sends air to activate a number of slave cylinders which are pneumatic only.

Master cylinders have dual or single nozzle bodies, depending on the spacing option at time of purchase, but operate in the same way.

In the event of nozzles not operating as expected, there are checks to help diagnose and solve the problem.

First check the electrical connections to the master air solenoids. There should be power at the connector when the nozzles are activated from the cabin and the connectors should be securely plugged in to the nozzle.

Secondly, check the air lines for secure fitment and presence of air pressure in the 6 mm supply lines to the masters when the machine is running.



RapidFire - Nozzle & Air Check

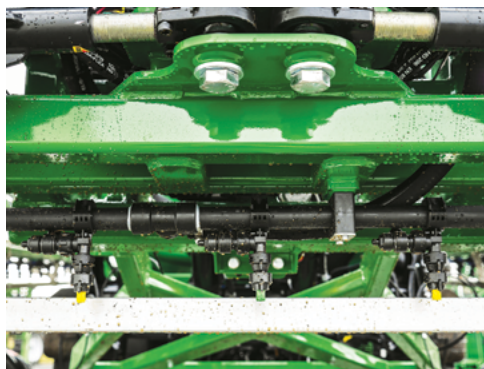
Test the air check nozzles for instantaneous response at the nozzle tip. With the lines at spraying pressure switch the nozzles On & Off. Each nozzle must respond quickly without dribbling, as the pressure builds up or subsides.

The air checks Close under a spring tension of 140 PSI. This traps the liquid in the spray line at the same pressure that it was being applied.

When the booms are turned On, air pressure (acting against the 140 PSI springs) instantly opens flow to the nozzle applying the boom line liquid pressure at the rated pressure and droplet size with full fan angle.

The air check valve is located on the side of the nozzle, it has 2 O-rings in it. Over time, the O-ring may swell or be damaged. This may result in the nozzle dripping or being slow to shut when it has been turned off.

If the nozzle leaks the outer O-ring requires replacement. If the air shut off has poor or delayed response, the inner O-ring requires replacement.



Centreline plumbed boom with optional 3TS single nozzles at 250mm spacing.



3 Tier System - 3TS & 3TS Pro (Options)

The 3 Tier System (3TS) provides a wider range of flexibility with application rates and spraying speed. The 3TS effectively gives a much wider operating band whilst still maintaining optimum droplet size.

The 3TS might be described as a three step gearbox or in the case of the 3TS Pro, a seven step gearbox.

3TS Option

Each nozzle type on 2 tiers has an operating pressure band for a given droplet size. As the first nozzle set or tier reaches the top of its pressure band, the next larger size nozzle tier is activated.

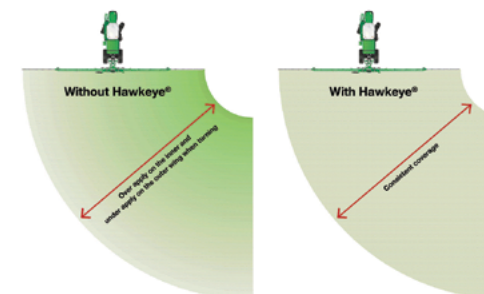
When the second tier reaches the top of its pressure band, the first tier will be reactivated to spray at the same time. This effectively gives three operating bands.

3TS Pro Option

The 3TS Pro option is an extension of this idea using three different nozzle sizes and gives seven effective bands of operation for even greater application control.

It requires an unlock code for the Raven RCM which is provided when the feature is optioned.

The Raven RCM controls the 3TS system. For specific calibration and operating instructions, see Raven RCM operation manual supplied.



Nozzle by nozzle turn compensation with the Hawkeye option.

Hawkeye (Option)

The optional Raven Hawkeye is a Pulse Width Modulated (PWM) spray system. Known as Hawkeye 2.0, this PWM is offered on 36m and 48m booms with nozzle spacing at 250mm (& 500mm on request). This system provides:

- Nozzle by nozzle turn compensation. Each nozzle features its own microprocessor which can perform diagnostic functions.
- Up to 16 virtual sections or individual nozzle control.

The system runs at 10Hz with blended pulse application & is controlled through the ISO BUS terminal.



Flow Control Valve.

Speed Sensors

The Raven Automatic Rate Controller utilises a speed reading from the transmitted GPS speed over ISOBUS network.

The GPS system must be configured to transmit the ground speed over the ISOBUS network.

Flow Control Valve

The flow control valve (mounted in the Quick Fill pod) regulates the amount of liquid going to the boom sections as directed by the console. It controls the flow to the boom by regulating the amount of liquid which bypasses and flows back to tank.

The flow control valve is a positive ball valve which means it can control flow infinitely to the boom from 0 L/min to the maximum pump output, dependant on the system pressure.

The flow control valve can be operated in manual mode from the console for boom priming, flushing & troubleshooting.



AutoBoom XRT radar sensor.

XRT Auto Boom Height Control (Optional)

Boom height control is automated using the Raven AutoBoom XRT radar sensor system. This system is standard on 48 metre equipped machines and optional for 36-42 metre boom machines.

Centre section stability is physically managed using variable rate roll dampeners.

Variable rate dampeners are used to stiffen the centre section roll action which allows the boom wing tilts to be operated much faster without effecting the boom stability.

The XRT operating status is displayed on the G-Hub internal screen whilst the setup is configured through the ISO BUS terminal.

The XRT height sensors are radar based. They enable a larger height measurement range over ultrasonic types and can detect both ground and crop canopy and are less affected by spray drift, dust and mud.

The sensors are also very compact, allowing simple fitment along the boom.

The Raven XRT system uses extra sensors to monitor:

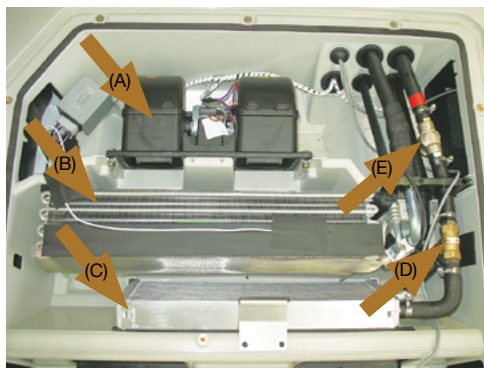
- The machine chassis rate of roll
- The boom centre position relative to the chassis &
- Boom wing tilt angle.

These extra sensors allow the computer to predict how the boom will react well before the radar sensors even see the change in boom height. The end result is a more stable boom in uneven terrain.

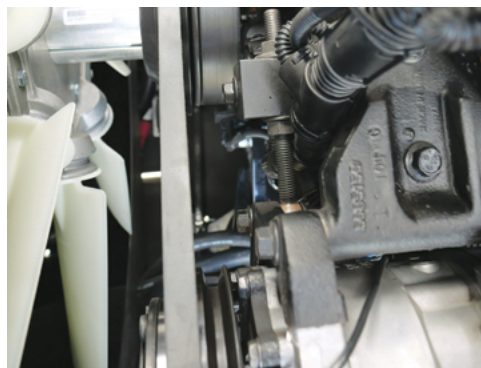
More detailed and specific information can be found in the product documentation from the Goldacres and Raven websites.

www.goldacres.com.au

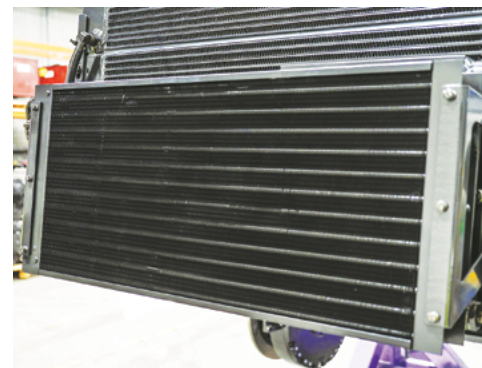
www.ravenprecision.com



In cab roof: Blower Fan (A), AC Evaporator (B), Heater Core (C), Heater Control Valve (D) & Heater Water Filter (E).



The air conditioner Compressor.



The air conditioner Condenser.



The air conditioner Receiver Dryer.

Air Conditioning System

The Air Conditioning System provides all heating, ventilation & cooling of the cabin.

A separate pressurising fan draws clean air into the cabin through the carbon filter - pressurising the cabin with clean air and forcing air out through any holes or leaking seals in the cabin ensuring no impurities can be drawn into the operator's clean environment.

A blower fan pulls air through the air conditioning evaporator & heating evaporator and pushes air to the demist & roof vents.

When the air conditioning compressor is engaged, the air conditioner evaporator will cool the air.

If the heater thermostat is turned to heat, the air will warm again as it passes through. If the heater is off, the cool air passes through to the vents.

Compressor

The air conditioning compressor is located on the front side of the engine. This compressor is driven by an engine V-belt.

The function of the compressor is **controlled by the air conditioning controller unit in the cabin.**

A thermostat will cycle the air compressor if the evaporator gets too cold.

Condenser

The air conditioning Condenser is located in front of the engine radiator. The condenser is cooled by air being drawn through from the engine fan.

The condenser requires regular cleaning of dust and any debris.

Receiver Dryer

The air conditioning Receiver Dryer unit is fitted to the right hand side chassis rail under the cabin.

This unit captures any moisture circulating within the air conditioner system. Moisture within the air conditioning system will freeze & cause blockages.

The Receiver Dryer must be replaced every time the air conditioning system is opened or serviced.

NOTE

Take care not to damage the condenser coils or fins when cleaning the condenser.

Heating System

Coolant from the engine flows through the heater core causing it to radiate heat into the cabin when the engine is up to temperature.

The volume of the water travelling through the system, and therefore the amount of heat transferred, may be adjusted by setting the temperature on the A/C head unit.

To enable the heating core to be isolated from the engine two taps have been installed.

The first tap is located on the right hand side of the engine at the rear of the exhaust manifold.

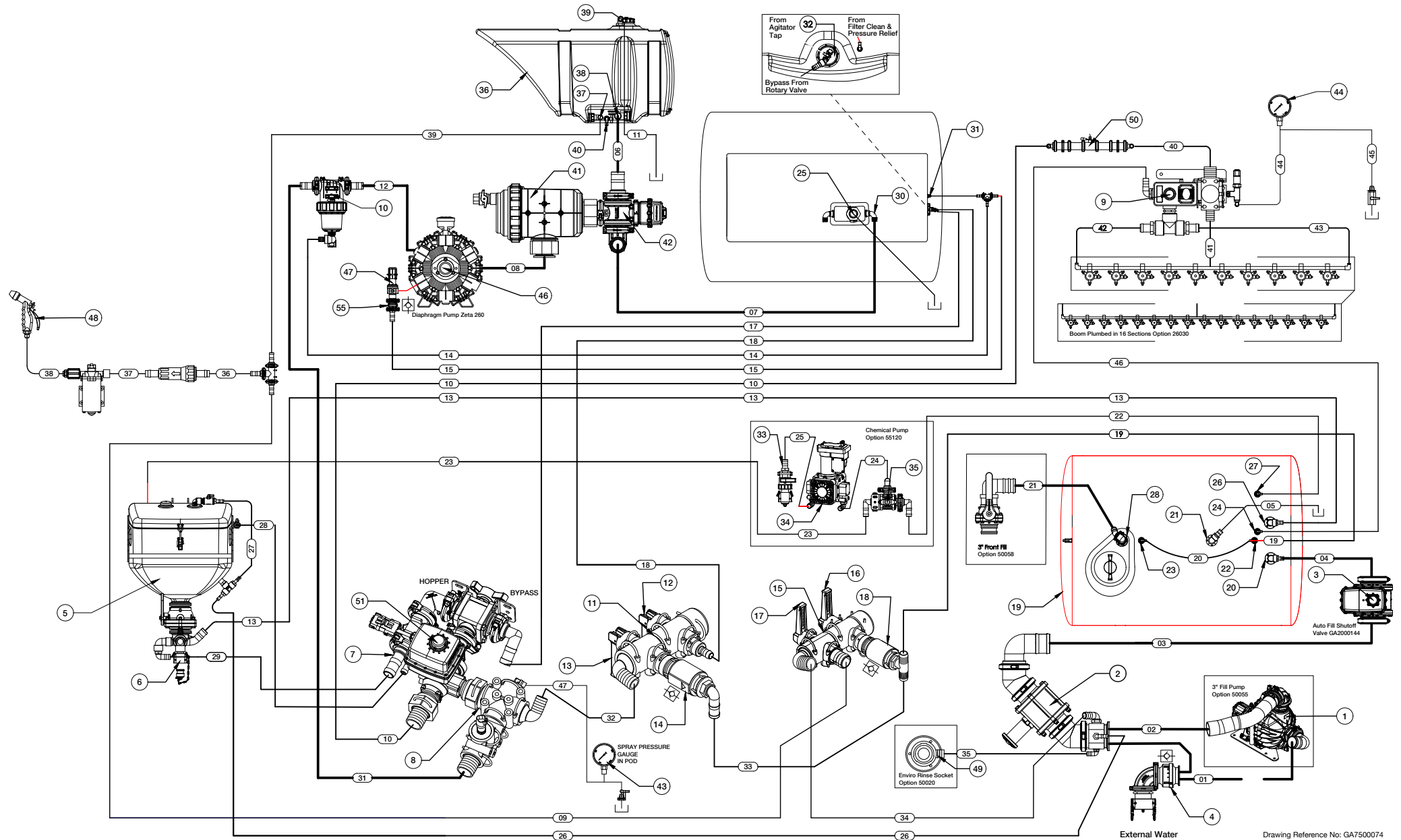
The second isolating tap is located on the left hand side on top of the engine near the header tank.

NOTE

If the heating is not working when the engine is warm, ensure that the isolating taps are allowing coolant to flow through to the heater core.

10 Appendix – Integrated Systems

Plumbing Schematic - Diaphragm Pump 260 L/min



X Feature Descriptions

ITEM	GA NUMBER	DESCRIPTION
1	GA4952200	FILL PUMP 3" HYPRO
2	GA4952645 or GA4952660	FILL VALVE MANIFOLD ASSEMBLY
3	GA2000144	3" TANK FILL 2 WAY ELECTRIC BALL VALVE PROPORTIONAL
4	GA2000088	3" CHECK VALVE
5	GA6101681	HOPPER
6	- 1"	CHEMICAL INDUCTION PROBE ON HOPPER
7	-	HOPPER TEE
8	GA4952195	SPRAY PRESSURE CONTROL MANIFOLD
9	GA4949455	FLOW DISTRIBUTOR AND BOOM RECIRCULATION VALVE
10	GA4952045	PRESSURE FILTER
11	GA4952205	PRESSURE RINSE VALVE MANIFOLD
12	-	AGITATOR RINSE FLIP VALVE
13	-	MAIN TANK RINSE FLIP VALVE
14	GA5002473	1" CHECK VALVE
15	GA4952655	FILL RINSE VALVE MANIFOLD
16	-	MAIN TANK RINSE FLIP VALVE
17	-	RINSE TANK FILL FLIP VALVE
18	GA5002473	1" CHECK VALVE
19	GA6101710	MAIN TANK
20	GA4914190	MAIN TANK, TANK FILL INLET
21	GA4907845	MAIN TANK, TANK OVERFLOW OUTLET
22	GA4901285-2	MAIN TANK, TANK RINSE NOZZLE A
23	GA4901285-1	MAIN TANK, TANK RINSE NOZZLE B
24	GA4909035	MAIN TANK, BOOM RECIRCULATION TANK INLET
25	-	MAIN TANK, PUMP OUTLET
26	GA4909045	MAIN TANK, HOPPER INLET
27	GA4909035	MAIN TANK, CHEMICAL INDUCTION PUMP TANK INLET
28	GA4914195	MAIN TANK, FRONT FILL TANK INLET
29	GA5052690	MAIN TANK, CENTRIFUGAL PUMP VENT INLET
30	GA5078204	MAIN TANK, DRAIN OUTLET
31	-	MAIN TANK, PRESSURE FILTER INLET
32	GA4908705	MAIN TANK AGITATOR
33	GA4952080	1" CHEMICAL INDUCTION PROBE BALL VALVE (CHEM PUMP)
34	GA4909225	CHEMICAL PUMP
35	GA4952210	CHEMICAL PUMP, 3 WAY BOTTOM ENTRY BALL VALVE
36	GA4952565	RINSE TANK
37	-	RINSE TANK, FILL INLET
38	-	RINSE TANK, PUMP OUTLET
39	-	RINSE TANK, OVERFLOW

ITEM	GA NUMBER	DESCRIPTION
40	GA5018315	RINSE TANK, DRAIN VALVE
41	GA2000101	SUCTION FILTER
42	GA2000143	SPRAY PUMP, SUPPLY SUCTION VALVE
43	GA3500693	SPRAY PRESSURE GAUGE - LOCATED IN PLUMBING
44	GA5075420	SPRAY PRESSURE GAUGE - LOCATED IN CONTROL COWL
45	GA4949420	CENTRIFUGAL PUMP
46	N/A	DIAPHRAGM SPRAY PUMP
47	N/A	RELIEF VALVE (ONLY FITTED WITH DIAPHRAGM PUMP)
48	GA4950925	WASH DOWN GUN
49	GA5018800	MICROMATIC RINSE SOCKET
50	GA4908545	BOOM FLOW METER ASSEMBLY
51	GA2000065	BOOM SPRAY CONTROL VALVE, 3 WAY ELECTRIC BALL VALVE PROPORTIONAL
52	GA5077899	BOOM SPRAY BYPASS VALVE, 3 WAY BOTTOM LOAD BALL VALVE
53	GA5018321	GAUGE DRAIN VALVE - POD

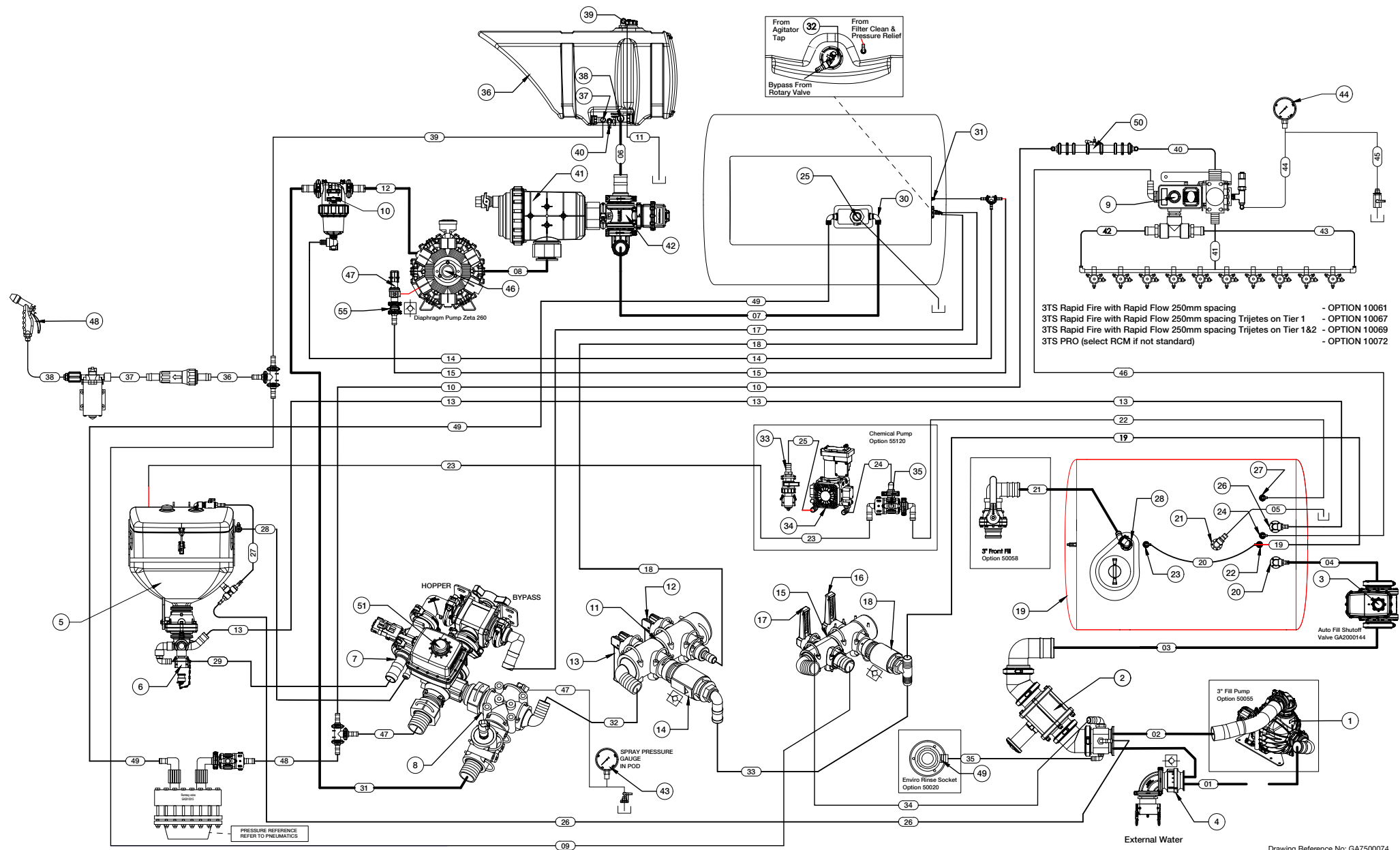
X Hose List

HOSE	SIZE	DESCRIPTION	LENGTH
01	3" P	MAIN TANK FILL FROM CAMLOCK TO FILL PUMP OPTION 50055	500
02	3" P	MAIN TANK FILL FROM PUMP TO FILL VALVE OPTION 50056	Blue Hose
03	3" P	MAIN TANK FILL FROM FILL VALVE TO FILL SHUTOFF VALVE	2300
04	3" P	MAIN TANK FILL FROM FILL SHUTOFF VALVE TO TANK	2000
05	3" P	MAIN TANK OVERFLOW 3500	
06	2" S	WIRE RINSE TANK TO PUMP SUPPLY CONTROL VALVE	970
07	2" S	WIRE MAIN TANK TO PUMP SUPPLY CONTROL VALVE	390
08	2" S	WIRE SUCTION FILTER TO SPRAY PUMP	N/A
09	1 1/4" P	FILL RINSE MANIFOLD TO RINSE LINE TEE	100
10	1 1/2" P	SPRAY CONTROL VALVE TO FLOW METER	5300
11	1 1/2"	PVC RINSE TANK OVERFLOW TO GROUND	1000
12	1 1/2" P	SPRAY PUMP TO PRESSURE FILTER	1000
13	1 1/2"	PVC HOPPER OUTLET TO MAIN TANK	6500
14	1" P	PRESSURE FILTER DRAIN TO MAIN TANK	2200
15	1 1/4" P	PRESSURE RELIEF VALVE TO MAIN TANK (GA7500074 ONLY)	N/A
16	8mm	NYLON CENTRIFUGAL PUMP PRESSURE RELIEF VALVE TO TANK	6000

HOSE	SIZE	DESCRIPTION	LENGTH
17	1-1/4" P	HOPPER/BYPASS VALVE TO MAIN TANK AGITATOR	2100
18	1/2"	AGITATOR FLIP VALVE TO AGITATOR JET	2200
19	3/4" P	PRESSURE RINSE MANIFOLD TEE TO TANK RINSE NOZZLE A	4000
20	3/4" P	TANK RINSE NOZZLE A TO TANK RINSE NOZZLE B	850
21	3" P	FRONT FILL 3" BALL VALVE TO MAIN TANK (WHERE FITTED)	4500
22	1" P	CHEM PUMP 3 WAY BALL VALVE TO MAIN TANK	4000
23	1" P	CHEM PUMP 3 WAY BALL VALVE TO HOPPER (WHERE FITTED)	2900
24	1" P	CHEM PUMP TO 3 WAY BALL VALVE (WHERE FITTED)	240
25	1"	WIRE CHEM BALL VALVE TO CHEM PUMP (WHERE FITTED)	260
26	1/2" P	FILL ASSEMBLY TO HOPPER DRUM RINSE TEE	3000
27	1/2" P	HOPPER DRUM RINSE TEE TO HOPPER RINSE VALVE - LID	850
28	1/2" P	HOPPER PRESSURE TEE TO HOPPER MIXING JET BALL VALVE	3500
29	1" P	HOPPER PRESSURE TEE TO HOPPER BOTOM VENTURI PORT	3500
30	-		
31	1 1/2" P	PRESSURE FILTER TO PRESSURE MANIFOLD	1000
32	1" P	PRESSURE MANIFOLD TO PRESSURE RINSE MANIFOLD	165
33	3/4" P	FILL RINSE FLIP VALVE TO PRESSURE RINSE= MANIFOLD TEE 105	
34	1 1/4" P	FILL ASSEMBLY TO FILL RINSE MANIFOLD	400
35	3/4" P	FILL RINSE MANIFOLD TO MICROMATIC RINSE SOCKET (WHERE FITTED)	500
36	1/2" P	RINSE LINE TEE TO WASH DOWN GUN FILTER	320
37	1/2" P	WASH DOWN GUN FILTER TO WASHDOWN GUN PUMP	80
38	1/2" P	WASHDOWN GUN PUMP TO WASHDOWN GUN	3700
39	1 1/4" P	RINSE LINE TEE TO RINSE TANK	3100
40	1 1/2" P	FLOW METER TO BOOM FLOW DISTRIBUTOR	1100
41	1" P	BOOM FLOW DISTRIBUTOR TO BOOM POLY CENTRE	0
42	1" P	BOOM FLOW DISTRIBUTOR TO LEFT BOOM POLY END	***
43	1" P	BOOM FLOW DISTRIBUTOR TO RIGHT BOOM POLY END	***
44	6MM	NYLON BOOM RECIRCULATION VALVE TO PRESSURE GAUGE 10000	***
45	6MM	NYLON PRESSURE GAUGE TO DRAIN VALVE	5000
46	1" P	BOOM RECIRC VALVE TO MAIN TANK	5500
47	1 1/2" P	SPRAY CONTROL VALVE TO PRESSURE TEE	1500
48	1 1/2" P	SPRAY PRESSURE TEE TO RAMSEY VALVE	1500
49	1" P	RAMSEY VALVE TO MAIN TANK	1500

Note: Boom Length Dependent ***

Plumbing Schematic - Diaphragm Pump (260L/min) Weedetect Bilberry 3TS Option



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41	GA2000101	SUCTION FILTER
42	GA2000143	SPRAY PUMP, SUPPLY SUCTION VALVE
43	GA3500693	SPRAY PRESSURE GAUGE - LOCATED IN PLUMBING
44	GA5075420	SPRAY PRESSURE GAUGE - LOCATED IN CONTROL COWL
45	GA4949420	CENTRIFUGAL PUMP
46	N/A	DIAPHRAGM SPRAY PUMP
47	N/A	RELIEF VALVE (ONLY FITTED WITH DIAPHRAGM PUMP)
48	GA4950925	WASH DOWN GUN
49	GA5018800	MICROMATIC RINSE SOCKET
50	GA4908545	BOOM FLOW METER ASSEMBLY
51	GA2000065	BOOM SPRAY CONTROL VALVE, 3 WAY ELECTRIC BALL VALVE PROPORTIONAL
52	GA5077899	BOOM SPRAY BYPASS VALVE, 3 WAY BOTTOM LOAD BALL VALVE
53	GA5018321	GAUGE DRAIN VALVE - POD

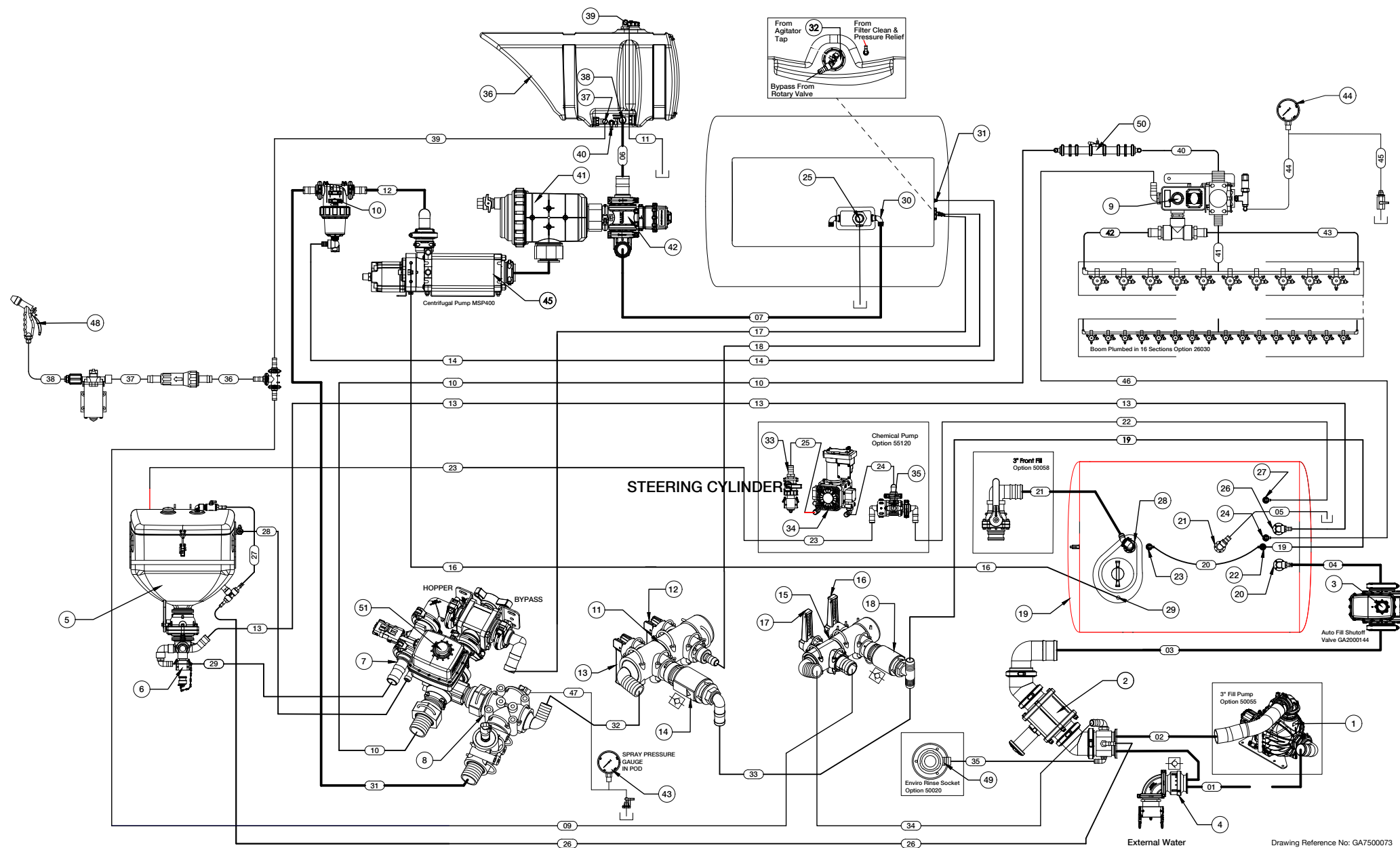
X Hose List

HOSE	SIZE	DESCRIPTION	LENGTH
01	3" P	MAIN TANK FILL FROM CAMLOCK TO FILL PUMP OPTION 50055	500
02	3" P	MAIN TANK FILL FROM PUMP TO FILL VALVE OPTION 50056	Blue Hose
03	3" P	MAIN TANK FILL FROM FILL VALVE TO FILL SHUTOFF VALVE	2300
04	3" P	MAIN TANK FILL FROM FILL SHUTOFF VALVE TO TANK	2000
05	3" P	MAIN TANK OVERFLOW 3500	
06	2" S	WIRE RINSE TANK TO PUMP SUPPLY CONTROL VALVE	970
07	2" S	WIRE MAIN TANK TO PUMP SUPPLY CONTROL VALVE	390
08	2" S	WIRE SUCTION FILTER TO SPRAY PUMP	N/A
09	1 1/4" P	FILL RINSE MANIFOLD TO RINSE LINE TEE	100
10	1 1/2" P	SPRAY CONTROL VALVE TO FLOW METER	5300
11	1 1/2"	PVC RINSE TANK OVERFLOW TO GROUND	1000
12	1 1/2" P	SPRAY PUMP TO PRESSURE FILTER	1000
13	1 1/2"	PVC HOPPER OUTLET TO MAIN TANK	6500
14	1" P	PRESSURE FILTER DRAIN TO MAIN TANK	2200
15	1 1/4" P	PRESSURE RELIEF VALVE TO MAIN TANK (GA7500074 ONLY)	N/A
16	8mm	NYLON CENTRIFUGAL PUMP PRESSURE RELIEF VALVE TO TANK	6000

HOSE	SIZE	DESCRIPTION	LENGTH
17	1-1/4" P	HOPPER/BYPASS VALVE TO MAIN TANK AGITATOR	2100
18	1/2"	AGITATOR FLIP VALVE TO AGITATOR JET	2200
19	3/4" P	PRESSURE RINSE MANIFOLD TEE TO TANK RINSE NOZZLE A	4000
20	3/4" P	TANK RINSE NOZZLE A TO TANK RINSE NOZZLE B	850
21	3" P	FRONT FILL 3" BALL VALVE TO MAIN TANK (WHERE FITTED)	4500
22	1" P	CHEM PUMP 3 WAY BALL VALVE TO MAIN TANK	4000
23	1" P	CHEM PUMP 3 WAY BALL VALVE TO HOPPER (WHERE FITTED)	2900
24	1" P	CHEM PUMP TO 3 WAY BALL VALVE (WHERE FITTED)	240
25	1"	WIRE CHEM BALL VALVE TO CHEM PUMP (WHERE FITTED)	260
26	1/2" P	FILL ASSEMBLY TO HOPPER DRUM RINSE TEE	3000
27	1/2" P	HOPPER DRUM RINSE TEE TO HOPPER RINSE VALVE - LID	850
28	1/2" P	HOPPER PRESSURE TEE TO HOPPER MIXING JET BALL VALVE	3500
29	1" P	HOPPER PRESSURE TEE TO HOPPER BOTOM VENTURI PORT	3500
30	-		
31	1 1/2" P	PRESSURE FILTER TO PRESSURE MANIFOLD	1000
32	1" P	PRESSURE MANIFOLD TO PRESSURE RINSE MANIFOLD	165
33	3/4" P	FILL RINSE FLIP VALVE TO PRESSURE RINSE= MANIFOLD TEE 105	
34	1 1/4" P	FILL ASSEMBLY TO FILL RINSE MANIFOLD	400
35	3/4" P	FILL RINSE MANIFOLD TO MICROMATIC RINSE SOCKET (WHERE FITTED)	500
36	1/2" P	RINSE LINE TEE TO WASH DOWN GUN FILTER	320
37	1/2" P	WASH DOWN GUN FILTER TO WASHDOWN GUN PUMP	80
38	1/2" P	WASHDOWN GUN PUMP TO WASHDOWN GUN	3700
39	1 1/4" P	RINSE LINE TEE TO RINSE TANK	3100
40	1 1/2" P	FLOW METER TO BOOM FLOW DISTRIBUTOR	1100
41	1" P	BOOM FLOW DISTRIBUTOR TO BOOM POLY CENTRE	0
42	1" P	BOOM FLOW DISTRIBUTOR TO LEFT BOOM POLY END	***
43	1" P	BOOM FLOW DISTRIBUTOR TO RIGHT BOOM POLY END	***
44	6MM	NYLON BOOM RECIRCULATION VALVE TO PRESSURE GAUGE 10000	***
45	6MM	NYLON PRESSURE GAUGE TO DRAIN VALVE	5000
46	1" P	BOOM RECIRC VALVE TO MAIN TANK	5500
47	1 1/2" P	SPRAY CONTROL VALVE TO PRESSURE TEE	1500
48	1 1/2" P	SPRAY PRESSURE TEE TO RAMSEY VALVE	1500
49	1" P	RAMSEY VALVE TO MAIN TANK	1500

Note: Boom Length Dependent ***

Plumbing Schematic - Centrifugal Pump 260 L/min



X Feature Descriptions

ITEM	GA NUMBER	DESCRIPTION
1	GA4952200	FILL PUMP 3" HYPRO
2	GA4952645 or GA4952660	FILL VALVE MANIFOLD ASSEMBLY
3	GA2000144	3" TANK FILL 2 WAY ELECTRIC BALL VALVE PROPORTIONAL
4	GA2000088	3" CHECK VALVE
5	GA6101681	HOPPER
6	- 1"	CHEMICAL INDUCTION PROBE ON HOPPER
7	-	HOPPER TEE
8	GA4952195	SPRAY PRESSURE CONTROL MANIFOLD
9	GA4949455	FLOW DISTRIBUTOR AND BOOM RECIRCULATION VALVE
10	GA4952045	PRESSURE FILTER
11	GA4952205	PRESSURE RINSE VALVE MANIFOLD
12	-	AGITATOR RINSE FLIP VALVE
13	-	MAIN TANK RINSE FLIP VALVE
14	GA5002473	1" CHECK VALVE
15	GA4952655	FILL RINSE VALVE MANIFOLD
16	-	MAIN TANK RINSE FLIP VALVE
17	-	RINSE TANK FILL FLIP VALVE
18	GA5002473	1" CHECK VALVE
19	GA6101710	MAIN TANK
20	GA4914190	MAIN TANK, TANK FILL INLET
21	GA4907845	MAIN TANK, TANK OVERFLOW OUTLET
22	GA4901285-2	MAIN TANK, TANK RINSE NOZZLE A
23	GA4901285-1	MAIN TANK, TANK RINSE NOZZLE B
24	GA4909035	MAIN TANK, BOOM RECIRCULATION TANK INLET
25	-	MAIN TANK, PUMP OUTLET
26	GA4909045	MAIN TANK, HOPPER INLET
27	GA4909035	MAIN TANK, CHEMICAL INDUCTION PUMP TANK INLET
28	GA4914195	MAIN TANK, FRONT FILL TANK INLET
29	GA5052690	MAIN TANK, CENTRIFUGAL PUMP VENT INLET
30	GA5078204	MAIN TANK, DRAIN OUTLET
31	-	MAIN TANK, PRESSURE FILTER INLET
32	GA4908705	MAIN TANK AGITATOR
33	GA4952080	1" CHEMICAL INDUCTION PROBE BALL VALVE (CHEM PUMP)
34	GA4909225	CHEMICAL PUMP
35	GA4952210	CHEMICAL PUMP, 3 WAY BOTTOM ENTRY BALL VALVE
36	GA4952565	RINSE TANK
37	-	RINSE TANK, FILL INLET
38	-	RINSE TANK, PUMP OUTLET
39	-	RINSE TANK, OVERFLOW

ITEM	GA NUMBER	DESCRIPTION
40	GA5018315	RINSE TANK, DRAIN VALVE
41	GA2000101	SUCTION FILTER
42	GA2000143	SPRAY PUMP, SUPPLY SUCTION VALVE
43	GA3500693	SPRAY PRESSURE GAUGE - LOCATED IN PLUMBING
44	GA5075420	SPRAY PRESSURE GAUGE - LOCATED IN CONTROL COWL
45	GA4949420	CENTRIFUGAL PUMP
46	N/A	DIAPHRAGM SPRAY PUMP
47	N/A	RELIEF VALVE (ONLY FITTED WITH DIAPHRAGM PUMP)
48	GA4950925	WASH DOWN GUN
49	GA5018800	MICROMATIC RINSE SOCKET
50	GA4908545	BOOM FLOW METER ASSEMBLY
51	GA2000065	BOOM SPRAY CONTROL VALVE, 3 WAY ELECTRIC BALL VALVE PROPORTIONAL
52	GA5077899	BOOM SPRAY BYPASS VALVE, 3 WAY BOTTOM LOAD BALL VALVE
53	GA5018321	GAUGE DRAIN VALVE - POD

X Hose List

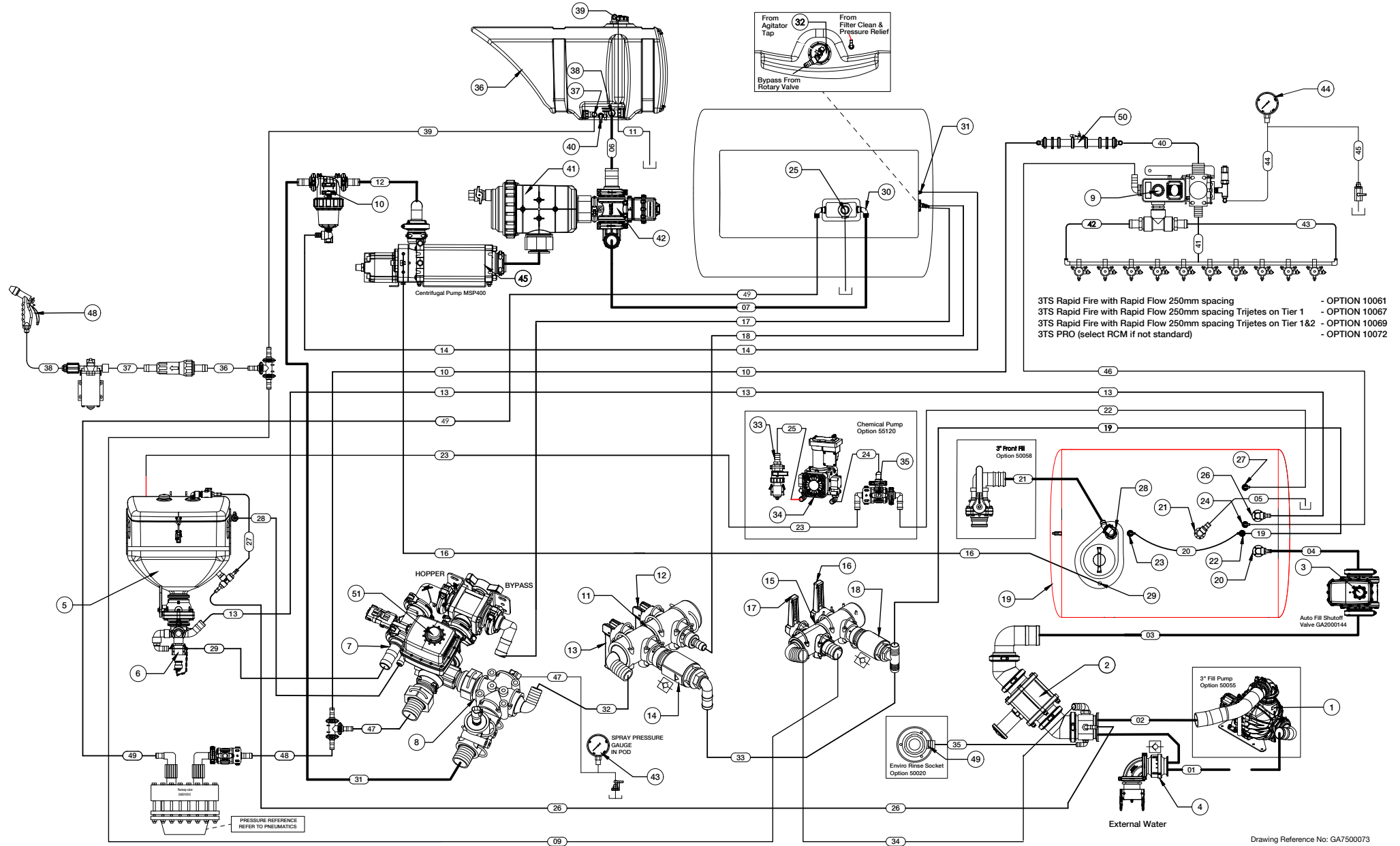
HOSE	SIZE	DESCRIPTION	LENGTH
01	3" P	MAIN TANK FILL FROM CAMLOCK TO FILL PUMP OPTION 50055	500
02	3" P	MAIN TANK FILL FROM PUMP TO FILL VALVE OPTION 50056	Blue Hose
03	3" P	MAIN TANK FILL FROM FILL VALVE TO FILL SHUTOFF VALVE	2300
04	3" P	MAIN TANK FILL FROM FILL SHUTOFF VALVE TO TANK	2000
05	3" P	MAIN TANK OVERFLOW 3500	
06	2" S	WIRE RINSE TANK TO PUMP SUPPLY CONTROL VALVE	970
07	2" S	WIRE MAIN TANK TO PUMP SUPPLY CONTROL VALVE	390
08	2" S	WIRE SUCTION FILTER TO SPRAY PUMP	N/A
09	1 1/4" P	FILL RINSE MANIFOLD TO RINSE LINE TEE	100
10	1 1/2" P	SPRAY CONTROL VALVE TO FLOW METER	5300
11	1 1/2"	PVC RINSE TANK OVERFLOW TO GROUND	1000
12	1 1/2" P	SPRAY PUMP TO PRESSURE FILTER	1000
13	1 1/2"	PVC HOPPER OUTLET TO MAIN TANK	6500
14	1" P	PRESSURE FILTER DRAIN TO MAIN TANK	2200
15	1 1/4" P	PRESSURE RELIEF VALVE TO MAIN TANK (GA7500074 ONLY)	N/A

HOSE	SIZE	DESCRIPTION	LENGTH
16	8mm	NYLON CENTRIFUGAL PUMP PRESSURE RELIEF VALVE TO TANK	6000
17	1-1/4" P	HOPPER/BYPASS VALVE TO MAIN TANK AGITATOR	2100
18	1/2"	AGITATOR FLIP VALVE TO AGITATOR JET	2200
19	3/4" P	PRESSURE RINSE MANIFOLD TEE TO TANK RINSE NOZZLE A	4000
20	3/4" P	TANK RINSE NOZZLE A TO TANK RINSE NOZZLE B	850
21	3" P	FRONT FILL 3" BALL VALVE TO MAIN TANK (WHERE FITTED)	4500
22	1" P	CHEM PUMP 3 WAY BALL VALVE TO MAIN TANK	4000
23	1" P	CHEM PUMP 3 WAY BALL VALVE TO HOPPER (WHERE FITTED)	2900
24	1" P	CHEM PUMP TO 3 WAY BALL VALVE (WHERE FITTED)	240
25	1"	WIRE CHEM BALL VALVE TO CHEM PUMP (WHERE FITTED)	260
26	1/2" P	FILL ASSEMBLY TO HOPPER DRUM RINSE TEE	3000
27	1/2" P	HOPPER DRUM RINSE TEE TO HOPPER RINSE VALVE - LID	850
28	1/2" P	HOPPER PRESSURE TEE TO HOPPER MIXING JET BALL VALVE	3500
29	1" P	HOPPER PRESSURE TEE TO HOPPER BOTOM VENTURI PORT	3500
30	-		
31	1 1/2" P	PRESSURE FILTER TO PRESSURE MANIFOLD	1000
32	1" P	PRESSURE MANIFOLD TO PRESSURE RINSE MANIFOLD	165
33	3/4" P	FILL RINSE FLIP VALVE TO PRESSURE RINSE= MANIFOLD TEE 105	
34	1 1/4" P	FILL ASSEMBLY TO FILL RINSE MANIFOLD	400
35	3/4" P	FILL RINSE MANIFOLD TO MICROMATIC RINSE SOCKET (WHERE FITTED)	500
36	1/2" P	RINSE LINE TEE TO WASH DOWN GUN FILTER	320
37	1/2" P	WASH DOWN GUN FILTER TO WASHDOWN GUN PUMP	80
38	1/2" P	WASHDOWN GUN PUMP TO WASHDOWN GUN	3700
39	1 1/4" P	RINSE LINE TEE TO RINSE TANK	3100
40	1 1/2" P	FLOW METER TO BOOM FLOW DISTRIBUTOR	1100
41	1" P	BOOM FLOW DISTRIBUTOR TO BOOM POLY CENTRE	0
42	1" P	BOOM FLOW DISTRIBUTOR TO LEFT BOOM POLY END	***
43	1" P	BOOM FLOW DISTRIBUTOR TO RIGHT BOOM POLY END	***
44	6MM	NYLON BOOM RECIRCULATION VALVE TO PRESSURE GAUGE 10000	***
45	6MM	NYLON PRESSURE GAUGE TO DRAIN VALVE	5000
46	1" P	BOOM RECIRC VALVE TO MAIN TANK	5500

Note: Boom Length Dependent ***

10 Appendix – Integrated Systems

Plumbing Schematic - Centrifugal Pump (400L/min) Weedetect Bilberry 3TS Option



X Feature Descriptions

ITEM	GA NUMBER	DESCRIPTION
1	GA4952200	FILL PUMP 3" HYPRO
2	GA4952645 or GA4952660	FILL VALVE MANIFOLD ASSEMBLY
3	GA2000144	3" TANK FILL 2 WAY ELECTRIC BALL VALVE PROPORTIONAL
4	GA2000088	3" CHECK VALVE
5	GA6101681	HOPPER
6	- 1"	CHEMICAL INDUCTION PROBE ON HOPPER
7	-	HOPPER TEE
8	GA4952195	SPRAY PRESSURE CONTROL MANIFOLD
9	GA4949455	FLOW DISTRIBUTOR AND BOOM RECIRCULATION VALVE
10	GA4952045	PRESSURE FILTER
11	GA4952205	PRESSURE RINSE VALVE MANIFOLD
12	-	AGITATOR RINSE FLIP VALVE
13	-	MAIN TANK RINSE FLIP VALVE
14	GA5002473	1" CHECK VALVE
15	GA4952655	FILL RINSE VALVE MANIFOLD
16	-	MAIN TANK RINSE FLIP VALVE
17	-	RINSE TANK FILL FLIP VALVE
18	GA5002473	1" CHECK VALVE
19	GA6101710	MAIN TANK
20	GA4914190	MAIN TANK, TANK FILL INLET
21	GA4907845	MAIN TANK, TANK OVERFLOW OUTLET
22	GA4901285-2	MAIN TANK, TANK RINSE NOZZLE A
23	GA4901285-1	MAIN TANK, TANK RINSE NOZZLE B
24	GA4909035	MAIN TANK, BOOM RECIRCULATION TANK INLET
25	-	MAIN TANK, PUMP OUTLET
26	GA4909045	MAIN TANK, HOPPER INLET
27	GA4909035	MAIN TANK, CHEMICAL INDUCTION PUMP TANK INLET
28	GA4914195	MAIN TANK, FRONT FILL TANK INLET
29	GA5052690	MAIN TANK, CENTRIFUGAL PUMP VENT INLET
30	GA5078204	MAIN TANK, DRAIN OUTLET
31	-	MAIN TANK, PRESSURE FILTER INLET
32	GA4908705	MAIN TANK AGITATOR
33	GA4952080	1" CHEMICAL INDUCTION PROBE BALL VALVE (CHEM PUMP)
34	GA4909225	CHEMICAL PUMP
35	GA4952210	CHEMICAL PUMP, 3 WAY BOTTOM ENTRY BALL VALVE
36	GA4952565	RINSE TANK
37	-	RINSE TANK, FILL INLET
38	-	RINSE TANK, PUMP OUTLET
39	-	RINSE TANK, OVERFLOW

ITEM	GA NUMBER	DESCRIPTION
40	GA5018315	RINSE TANK, DRAIN VALVE
41	GA2000101	SUCTION FILTER
42	GA2000143	SPRAY PUMP, SUPPLY SUCTION VALVE
43	GA3500693	SPRAY PRESSURE GAUGE - LOCATED IN PLUMBING
44	GA5075420	SPRAY PRESSURE GAUGE - LOCATED IN CONTROL COWL
45	GA4949420	CENTRIFUGAL PUMP
46	N/A	DIAPHRAGM SPRAY PUMP
47	N/A	RELIEF VALVE (ONLY FITTED WITH DIAPHRAGM PUMP)
48	GA4950925	WASH DOWN GUN
49	GA5018800	MICROMATIC RINSE SOCKET
50	GA4908545	BOOM FLOW METER ASSEMBLY
51	GA2000065	BOOM SPRAY CONTROL VALVE, 3 WAY ELECTRIC BALL VALVE PROPORTIONAL
52	GA5077899	BOOM SPRAY BYPASS VALVE, 3 WAY BOTTOM LOAD BALL VALVE
53	GA5018321	GAUGE DRAIN VALVE - POD

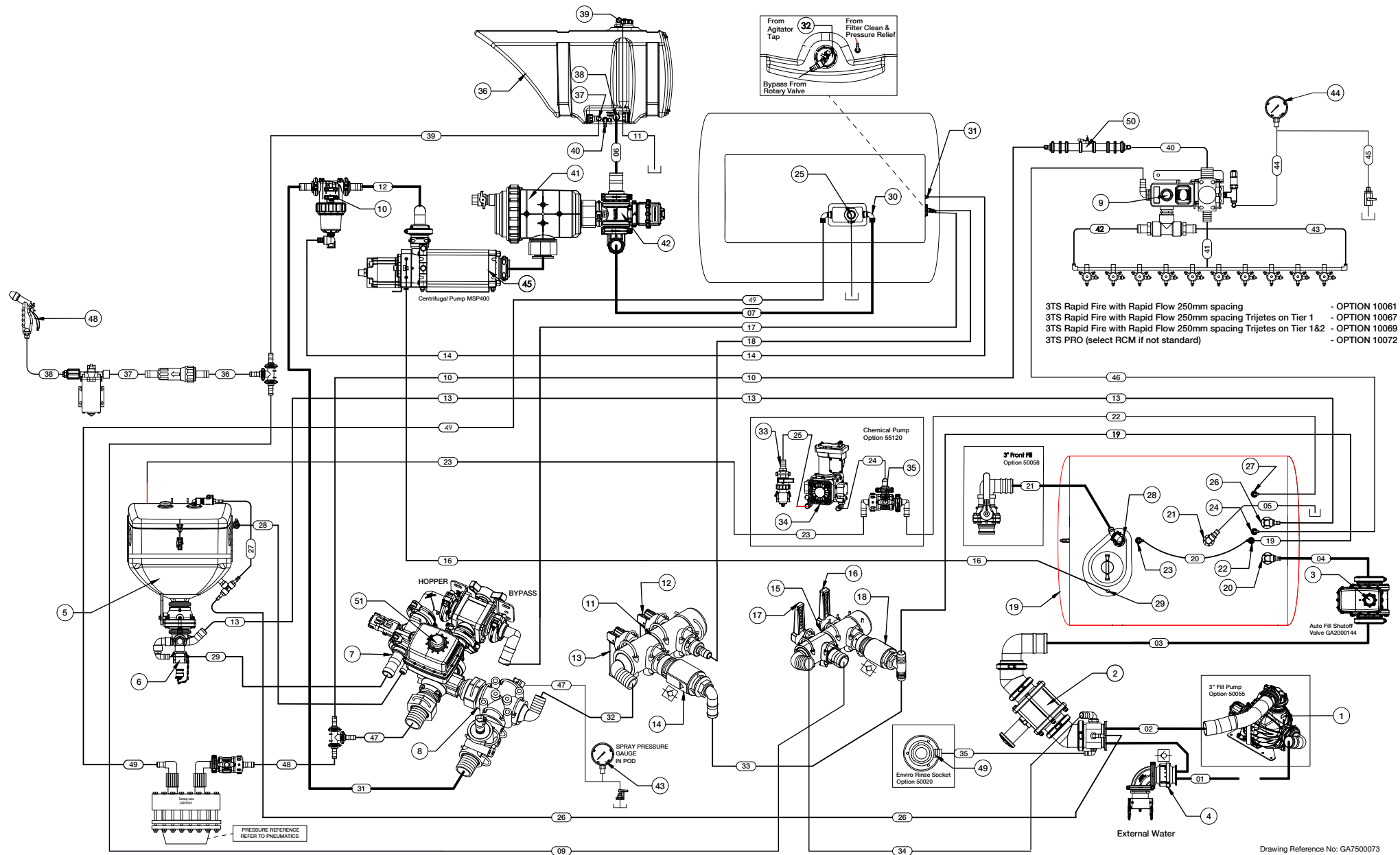
X Hose List

HOSE	SIZE	DESCRIPTION	LENGTH
01	3" P	MAIN TANK FILL FROM CAMLOCK TO FILL PUMP OPTION 50055	500
02	3" P	MAIN TANK FILL FROM PUMP TO FILL VALVE OPTION 50056	Blue Hose
03	3" P	MAIN TANK FILL FROM FILL VALVE TO FILL SHUTOFF VALVE	2300
04	3" P	MAIN TANK FILL FROM FILL SHUTOFF VALVE TO TANK	2000
05	3" P	MAIN TANK OVERFLOW 3500	
06	2" S	WIRE RINSE TANK TO PUMP SUPPLY CONTROL VALVE	970
07	2" S	WIRE MAIN TANK TO PUMP SUPPLY CONTROL VALVE	390
08	2" S	WIRE SUCTION FILTER TO SPRAY PUMP	N/A
09	1 1/4" P	FILL RINSE MANIFOLD TO RINSE LINE TEE	100
10	1 1/2" P	SPRAY CONTROL VALVE TO FLOW METER	5300
11	1 1/2"	PVC RINSE TANK OVERFLOW TO GROUND	1000
12	1 1/2" P	SPRAY PUMP TO PRESSURE FILTER	1000
13	1 1/2"	PVC HOPPER OUTLET TO MAIN TANK	6500
14	1" P	PRESSURE FILTER DRAIN TO MAIN TANK	2200
15	1 1/4" P	PRESSURE RELIEF VALVE TO MAIN TANK (GA7500074 ONLY)	N/A

HOSE	SIZE	DESCRIPTION	LENGTH
16	8mm	NYLON CENTRIFUGAL PUMP PRESSURE RELIEF VALVE TO TANK	6000
17	1-1/4" P	HOPPER/BYPASS VALVE TO MAIN TANK AGITATOR	2100
18	1/2"	AGITATOR FLIP VALVE TO AGITATOR JET	2200
19	3/4" P	PRESSURE RINSE MANIFOLD TEE TO TANK RINSE NOZZLE A	4000
20	3/4" P	TANK RINSE NOZZLE A TO TANK RINSE NOZZLE B	850
21	3" P	FRONT FILL 3" BALL VALVE TO MAIN TANK (WHERE FITTED)	4500
22	1" P	CHEM PUMP 3 WAY BALL VALVE TO MAIN TANK	4000
23	1" P	CHEM PUMP 3 WAY BALL VALVE TO HOPPER (WHERE FITTED)	2900
24	1" P	CHEM PUMP TO 3 WAY BALL VALVE (WHERE FITTED)	240
25	1"	WIRE CHEM BALL VALVE TO CHEM PUMP (WHERE FITTED)	260
26	1/2" P	FILL ASSEMBLY TO HOPPER DRUM RINSE TEE	3000
27	1/2" P	HOPPER DRUM RINSE TEE TO HOPPER RINSE VALVE - LID	850
28	1/2" P	HOPPER PRESSURE TEE TO HOPPER MIXING JET BALL VALVE	3500
29	1" P	HOPPER PRESSURE TEE TO HOPPER BOTOM VENTURI PORT	3500
30	-		
31	1 1/2" P	PRESSURE FILTER TO PRESSURE MANIFOLD	1000
32	1" P	PRESSURE MANIFOLD TO PRESSURE RINSE MANIFOLD	165
33	3/4" P	FILL RINSE FLIP VALVE TO PRESSURE RINSE= MANIFOLD TEE 105	
34	1 1/4" P	FILL ASSEMBLY TO FILL RINSE MANIFOLD	400
35	3/4" P	FILL RINSE MANIFOLD TO MICROMATIC RINSE SOCKET (WHERE FITTED)	500
36	1/2" P	RINSE LINE TEE TO WASH DOWN GUN FILTER	320
37	1/2" P	WASH DOWN GUN FILTER TO WASHDOWN GUN PUMP	80
38	1/2" P	WASHDOWN GUN PUMP TO WASHDOWN GUN	3700
39	1 1/4" P	RINSE LINE TEE TO RINSE TANK	3100
40	1 1/2" P	FLOW METER TO BOOM FLOW DISTRIBUTOR	1100
41	1" P	BOOM FLOW DISTRIBUTOR TO BOOM POLY CENTRE	0
42	1" P	BOOM FLOW DISTRIBUTOR TO LEFT BOOM POLY END	***
43	1" P	BOOM FLOW DISTRIBUTOR TO RIGHT BOOM POLY END	***
44	6MM	NYLON BOOM RECIRCULATION VALVE TO PRESSURE GAUGE 10000	***
45	6MM	NYLON PRESSURE GAUGE TO DRAIN VALVE	5000
46	1" P	BOOM RECIRC VALVE TO MAIN TANK	5500

Note: Boom Length Dependent ***

Plumbing Schematic - Centrifugal Pump (400L/min) Weedetect Hawkeye PWM Option



X Feature Descriptions

ITEM	GA NUMBER	DESCRIPTION
1	GA4952200	FILL PUMP 3" HYPRO
2	GA4952645 or GA4952660	FILL VALVE MANIFOLD ASSEMBLY
3	GA2000144	3" TANK FILL 2 WAY ELECTRIC BALL VALVE PROPORTIONAL
4	GA2000088	3" CHECK VALVE
5	GA6101681	HOPPER
6	- 1"	CHEMICAL INDUCTION PROBE ON HOPPER
7	-	HOPPER TEE
8	GA4952195	SPRAY PRESSURE CONTROL MANIFOLD
9	GA4949455	FLOW DISTRIBUTOR AND BOOM RECIRCULATION VALVE
10	GA4952045	PRESSURE FILTER
11	GA4952205	PRESSURE RINSE VALVE MANIFOLD
12	-	AGITATOR RINSE FLIP VALVE
13	-	MAIN TANK RINSE FLIP VALVE
14	GA5002473	1" CHECK VALVE
15	GA4952655	FILL RINSE VALVE MANIFOLD
16	-	MAIN TANK RINSE FLIP VALVE
17	-	RINSE TANK FILL FLIP VALVE
18	GA5002473	1" CHECK VALVE
19	GA6101710	MAIN TANK
20	GA4914190	MAIN TANK, TANK FILL INLET
21	GA4907845	MAIN TANK, TANK OVERFLOW OUTLET
22	GA4901285-2	MAIN TANK, TANK RINSE NOZZLE A
23	GA4901285-1	MAIN TANK, TANK RINSE NOZZLE B
24	GA4909035	MAIN TANK, BOOM RECIRCULATION TANK INLET
25	-	MAIN TANK, PUMP OUTLET
26	GA4909045	MAIN TANK, HOPPER INLET
27	GA4909035	MAIN TANK, CHEMICAL INDUCTION PUMP TANK INLET
28	GA4914195	MAIN TANK, FRONT FILL TANK INLET
29	GA5052690	MAIN TANK, CENTRIFUGAL PUMP VENT INLET
30	GA5078204	MAIN TANK, DRAIN OUTLET
31	-	MAIN TANK, PRESSURE FILTER INLET
32	GA4908705	MAIN TANK AGITATOR
33	GA4952080	1" CHEMICAL INDUCTION PROBE BALL VALVE (CHEM PUMP)
34	GA4909225	CHEMICAL PUMP
35	GA4952210	CHEMICAL PUMP, 3 WAY BOTTOM ENTRY BALL VALVE
36	GA4952565	RINSE TANK
37	-	RINSE TANK, FILL INLET
38	-	RINSE TANK, PUMP OUTLET
39	-	RINSE TANK, OVERFLOW

ITEM	GA NUMBER	DESCRIPTION
40	GA5018315	RINSE TANK, DRAIN VALVE
41	GA2000101	SUCTION FILTER
42	GA2000143	SPRAY PUMP, SUPPLY SUCTION VALVE
43	GA3500693	SPRAY PRESSURE GAUGE - LOCATED IN PLUMBING
44	GA5075420	SPRAY PRESSURE GAUGE - LOCATED IN CONTROL COWL
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48	GA4950925	WASH DOWN GUN
49	GA5018800	MICROMATIC RINSE SOCKET
50	GA4908545	BOOM FLOW METER ASSEMBLY
51	GA2000065	BOOM SPRAY CONTROL VALVE, 3 WAY ELECTRIC BALL VALVE PROPORTIONAL
52	GA5077899	BOOM SPRAY BYPASS VALVE, 3 WAY BOTTOM LOAD BALL VALVE
53	GA5018321	GAUGE DRAIN VALVE - POD

X Hose List

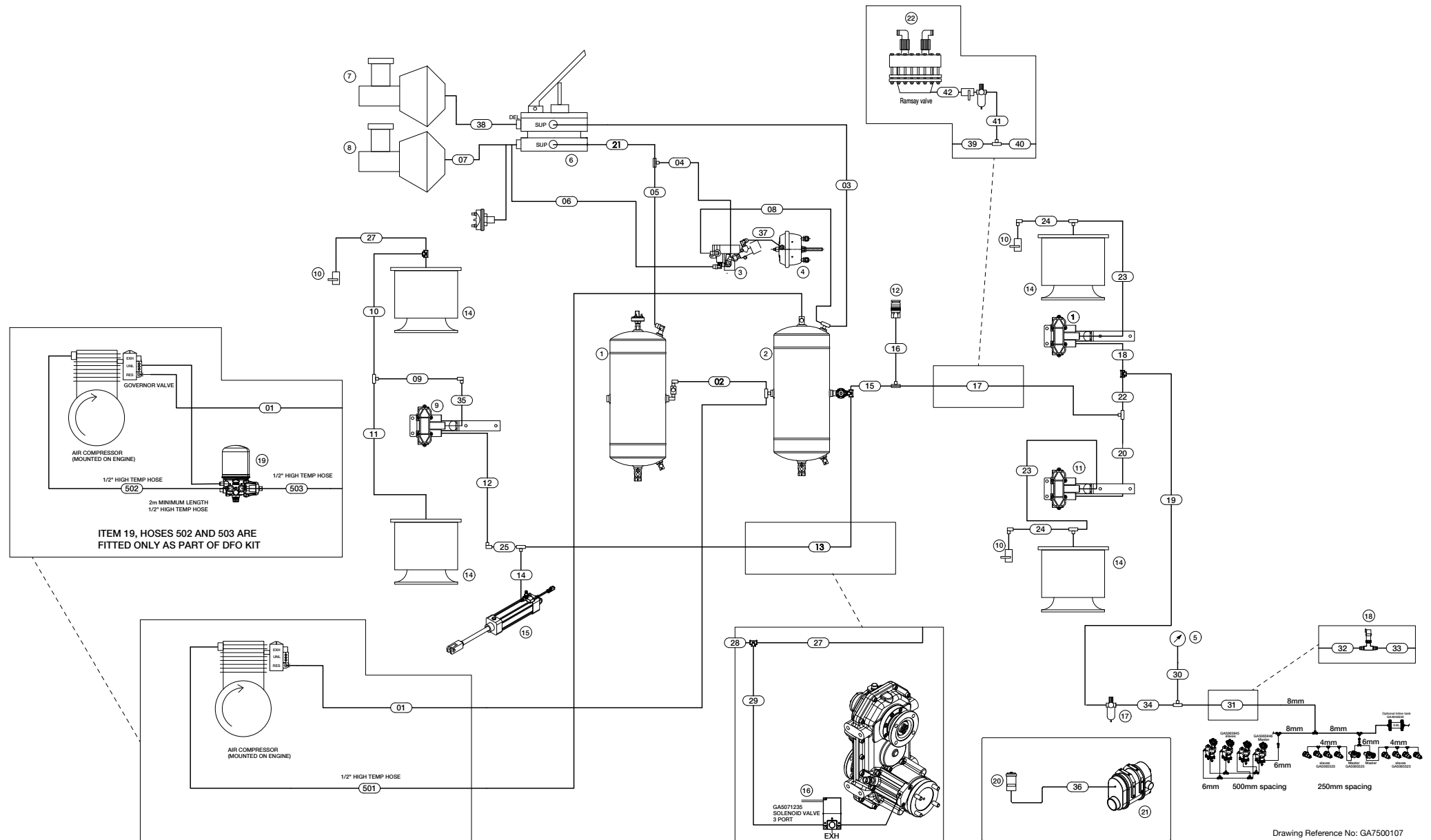
HOSE	SIZE	DESCRIPTION	LENGTH
01	3" P	MAIN TANK FILL FROM CAMLOCK TO FILL PUMP OPTION 50055	500
02	3" P	MAIN TANK FILL FROM PUMP TO FILL VALVE OPTION 50056	Blue Hose
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05	3" P	MAIN TANK OVERFLOW 3500	
06	2" S	WIRE RINSE TANK TO PUMP SUPPLY CONTROL VALVE	970
07	2" S	WIRE MAIN TANK TO PUMP SUPPLY CONTROL VALVE	390
08	2" S	WIRE SUCTION FILTER TO SPRAY PUMP	N/A
09	1 1/4" P	FILL RINSE MANIFOLD TO RINSE LINE TEE	100
10	1 1/2" P	SPRAY CONTROL VALVE TO FLOW METER	5300
11	1 1/2"	PVC RINSE TANK OVERFLOW TO GROUND	1000
12	1 1/2" P	SPRAY PUMP TO PRESSURE FILTER	1000
13	1 1/2"	PVC HOPPER OUTLET TO MAIN TANK	6500
14	1" P	PRESSURE FILTER DRAIN TO MAIN TANK	2200
15	1 1/4" P	PRESSURE RELIEF VALVE TO MAIN TANK (GA7500074 ONLY)	N/A

HOSE	SIZE	DESCRIPTION	LENGTH
16	8mm	NYLON CENTRIFUGAL PUMP PRESSURE RELIEF VALVE TO TANK	6000
17	1-1/4" P	HOPPER/BYPASS VALVE TO MAIN TANK AGITATOR	2100
18	1/2"	AGITATOR FLIP VALVE TO AGITATOR JET	2200
19	3/4" P	PRESSURE RINSE MANIFOLD TEE TO TANK RINSE NOZZLE A	4000
20	3/4" P	TANK RINSE NOZZLE A TO TANK RINSE NOZZLE B	850
21	3" P	FRONT FILL 3" BALL VALVE TO MAIN TANK (WHERE FITTED)	4500
22	1" P	CHEM PUMP 3 WAY BALL VALVE TO MAIN TANK	4000
23	1" P	CHEM PUMP 3 WAY BALL VALVE TO HOPPER (WHERE FITTED)	2900
24	1" P	CHEM PUMP TO 3 WAY BALL VALVE (WHERE FITTED)	240
25	1"	WIRE CHEM BALL VALVE TO CHEM PUMP (WHERE FITTED)	260
26	1/2" P	FILL ASSEMBLY TO HOPPER DRUM RINSE TEE	3000
27	1/2" P	HOPPER DRUM RINSE TEE TO HOPPER RINSE VALVE - LID	850
28	1/2" P	HOPPER PRESSURE TEE TO HOPPER MIXING JET BALL VALVE	3500
29	1" P	HOPPER PRESSURE TEE TO HOPPER BOTOM VENTURI PORT	3500
30	-		
31	1 1/2" P	PRESSURE FILTER TO PRESSURE MANIFOLD	1000
32	1" P	PRESSURE MANIFOLD TO PRESSURE RINSE MANIFOLD	165
33	3/4" P	FILL RINSE FLIP VALVE TO PRESSURE RINSE= MANIFOLD TEE 105	
34	1 1/4" P	FILL ASSEMBLY TO FILL RINSE MANIFOLD	400
35	3/4" P	FILL RINSE MANIFOLD TO MICROMATIC RINSE SOCKET (WHERE FITTED)	500
36	1/2" P	RINSE LINE TEE TO WASH DOWN GUN FILTER	320
37	1/2" P	WASH DOWN GUN FILTER TO WASHDOWN GUN PUMP	80
38	1/2" P	WASHDOWN GUN PUMP TO WASHDOWN GUN	3700
39	1 1/4" P	RINSE LINE TEE TO RINSE TANK	3100
40	1 1/2" P	FLOW METER TO BOOM FLOW DISTRIBUTOR	1100
41	1" P	BOOM FLOW DISTRIBUTOR TO BOOM POLY CENTRE	0
42	1" P	BOOM FLOW DISTRIBUTOR TO LEFT BOOM POLY END	***
43	1" P	BOOM FLOW DISTRIBUTOR TO RIGHT BOOM POLY END	***
44	6MM	NYLON BOOM RECIRCULATION VALVE TO PRESSURE GAUGE 10000	***
45	6MM	NYLON PRESSURE GAUGE TO DRAIN VALVE	5000
46	1" P	BOOM RECIRC VALVE TO MAIN TANK	5500

Note: Boom Length Dependent ***

10 Appendix – Integrated Systems

Pneumatic Schematic



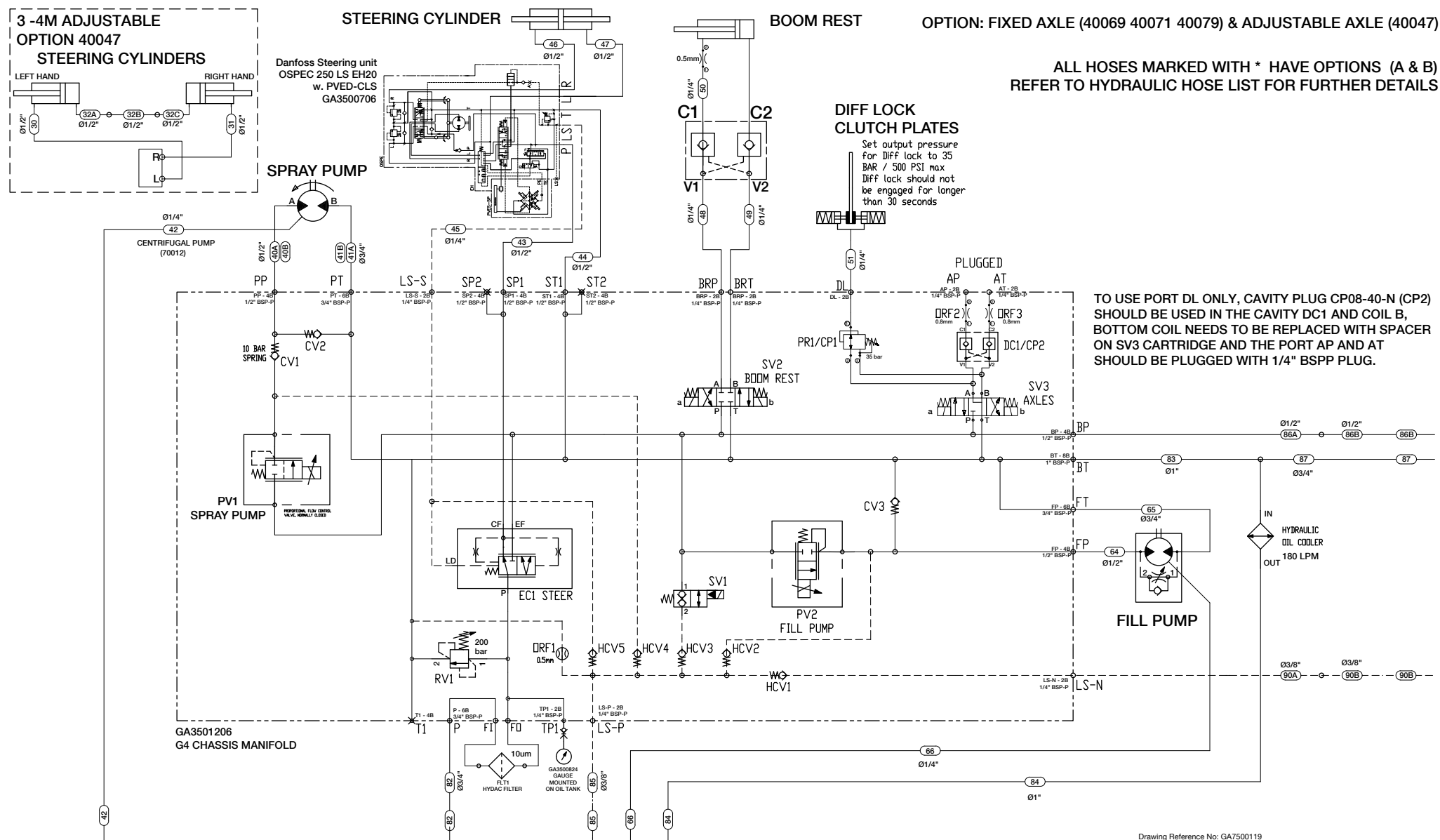
X Part List

Hose List X

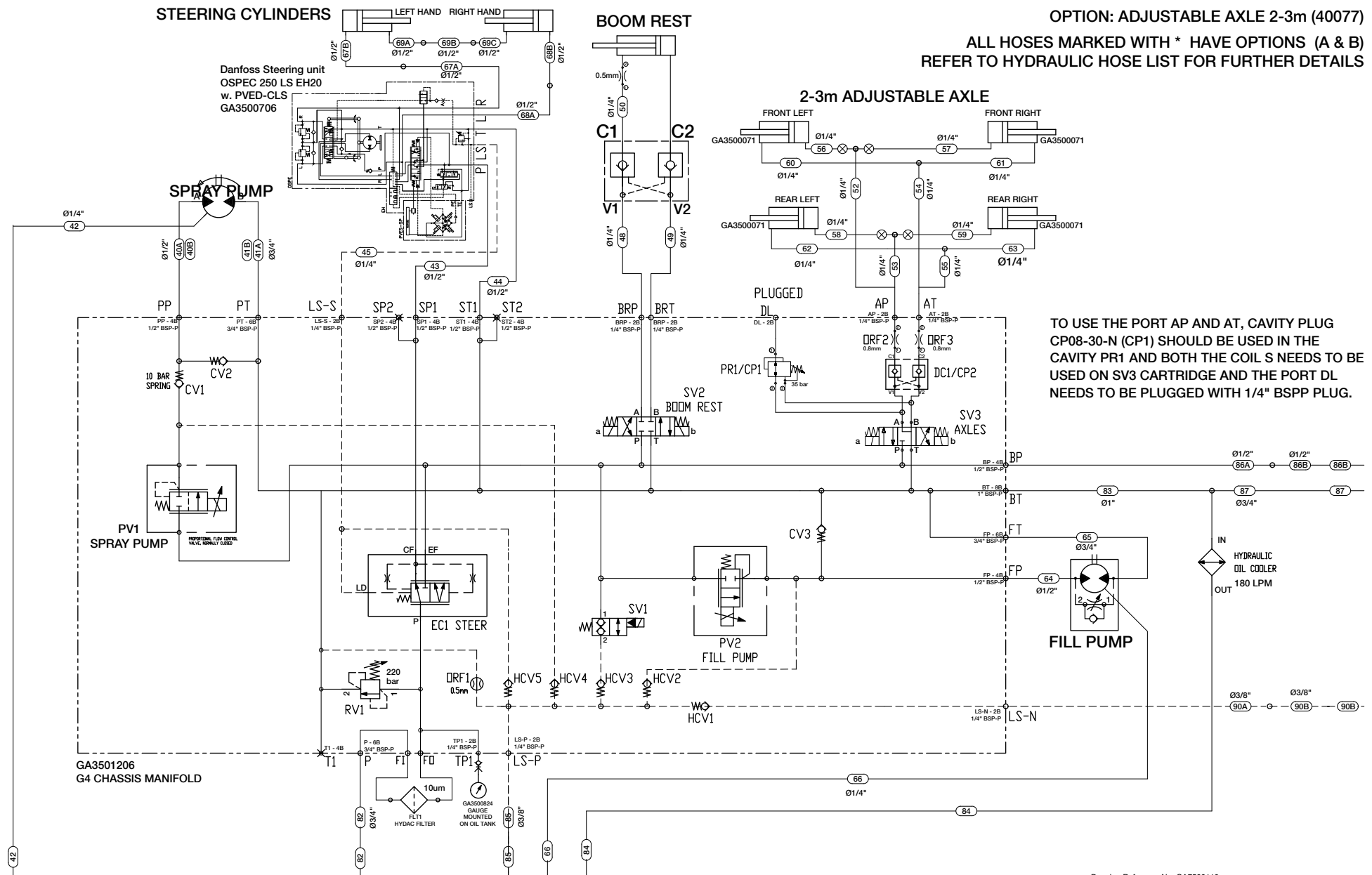
Item	Part No	Description	Qty
1	GA4951830	AIR TANK, PRIMARY, FRONT AND PARK BRAKE, G4 S2	1
2	GA4951835	AIR TANK, SECONDARY, REAR BRAKE AND ACCESSORIES, G4 S2	1
3	GA4952545	PARK BRAKE, PNEUMATIC, SR1 CONTROL VALVE, G4 S2	1
4	GA7000088	BRAKE BOOSTER, PARKING BRAKE, HALDEX, SPRING PULL TYPE R, KSMOPT40, G4 S2	1
5	GA3500693	Gauge, 63mm, 1/4" BSP Rear Port, Small, 160 PSI 10 Bar HYDAC	1
6	GA4951870	BRAKE FOOT VALVE ASSY, CROP CRUISER	1
7	GA5070890	REAR BRAKE BOOSTER CATAI 2013 CROP CRUISER	1
8	GA5070890	FRONT BRAKE BOOSTER CATAI 2013 CROP CRUISER	1
9	GA4951695	PRODUCTION DRAWING ONLY, RIDE HEIGHT CONTROL VALVE, FRONT AXLE, G4, S2	1
10	GA5018321	VALVE, BALL, 1/4 FEMALE, BLACK LEVER HANDLE, CHROMED	1
11	GA4949465	RIDE HEIGHT CONTROL VALVE, ASSEMBLY, REAR LEFT, G6 MY20	1
12	GA5076620	COUPLING, AIR, 1/4" BSPP FEMALE X FEMALE, 200	1
13	GA4949460	RIDE HEIGHT CONTROL VALVE, ASSEMBLY, REAR RIGHT, G6 MY20	1
14	GA5005311	Air spring HT230 single air stud	4
15	GA4949445	CYLINDER, PNEUMATIC, LADDER, ASSEMBLY	1
16	GA4914365	Production Drawing Only, Transfer Case Assembly, G4, S2	1
17	GA5078550	Air Filter Regulator, G1/4, Semi Auto Drain, c/w Bracket, Legris 6700.04.13	1
18	GA4949990	Air line pressure sensor, suit 8mm line, Rapid fire monitor	1
19	GA5078551	Air Dryer, Single Canister, Wabco 432 413 003 10, c/w 3/8" Hex Head Plug and Silencer	1
20	GA5010525	Service Indicator kit 25, Suit Crop Cruiser and G3 G4	1
21	GA5069030	Air cleaner, Powercore suit QSB 6.7L, includes elements, Donaldson	1
22	GA4914405	RAMSAY VALVE AND REGULATOR KIT	1

Hose No	Hose Size	Hose Length	End Fitting 1		End Fitting 2		Description	Qty
501	1/2" BLUE		GA3500417	T207-0817	GA3500415	T207-0812	AIR FEED FROM COMPRESSOR TO AIR TANK CHECK VALVE	1
1	3/8" BLACK	3000	GA3500412	T207-0812	GA3500415	T207-0812	GOVERNOR VALVE TO SECONDARY AIR TANK TEE	1
502	1/2" BLUE		GA3500417	T207-0817	GA3500415	T207-0812	AIR COMPRESSOR TO AIR DRYER (PORT 1)	1
503	1/2" BLUE		GA3500412	T207-0812	GA3500415	T207-0812	AIR DRYER TO SECONDARY AIR TANK CHECK VALVE	1
2	3/8" BLACK	230	GA5078521	AQ72-DOTS-6X4	GA5078518	AQ69-DOTS-6X4	PRIMARY TO SECONDARY AIR TANK BRIDGE	1
3	3/8" BLACK	2300	GA5078521	AQ72-DOTS-6X4	GA5078516	AQ64-DOT-6	SECONDARY AIR TANK TEE TO REAR BRAKE BOOSTER	1
4	3/8" BLACK	230	GA5078516	AQ64-DOT-6	GA5078676	AQ69-PS-6X6	PRIMARY AIR TANK TEE TO PARK BRAKE CONTROL VALVE (SOLENOID)	1
5	3/8" BLACK	270	GA5078517	AQ68-DOT-6x4	GA5078516	AQ64-DOT-6	PRIMARY AIR TANK TO TEE	1
6	3/8" BLACK	3000	GA5078676	AQ69-PS-6X6	GA5078518	AQ69-DOTS-6X4	FRONT BRAKE FOOT VALVE TO PARK BRAKE CONTROL VALVE (CONTROL SIGNAL)	
7	3/8" BLACK	2200	GA5078676	AQ69-PS-6X6	GA5078518	AQ69-DOTS-6X4	FRONT BRAKE FOOT VALVE TO FRONT BRAKE BOOSTER	1
8	3/8" BLACK	350	GA5078521	AQ72-DOTS-6X4	GA5078518	AQ69-DOTS-6X4	SECONDARY AIR TANK TEE TO PARK BRAKE CONTROL VALVE (TANK PRESSURE SIGNAL)	1
9	3/8" BLACK	70	GA5078526	AQ65-DOT-6	GA5078521	AQ72-DOTS-6X4	HEIGHT CONTROL ELBOW TO TEE	2
10	3/8" BLACK	450	GA5078516	AQ64-DOT-6	GA5078515	AQ72-DOT-6X4	TEE TO FRONT RIGHT AIR TEE	1
11	3/8" BLACK	1400	GA5078516	AQ64-DOT-6	GA5078518	AQ69-DOTS-6X4	TEE TO FRONT LEFT AIR BAG ELBOW	1
12	3/8" BLACK	950	GA5078526	AQ65-DOT-6	GA5078525	AQ69-DOTS-6X2	ELBOW TO FRONT RIDE HEIGHT VALVE	1
13	3/8" BLACK	1300	GA5078521	AQ72-DOTS-6X4	GA5078514	AQ77-DOTS-6X4	SECONDARY AIR TANK PRESSURE PROTECTION TO LADDER & FRONT HEIGHT CONTROL TEE	1
14	6mm BLACK	1800	GA5078887	MAQ69-DOT-6X4	GA7000013	JSC6-01B	LADDER & FRONT HEIGHT CONTROL TEE TO LADDER PNEUMATIC RAM	1
15	3/8" BLACK	1500	GA5078521	AQ72-DOTS-6X4	GA5078516	AQ64-DOT-6	SECONDARY AIR TANK PRESSURE PROTECTION TO AIR COUPLING TEE	1
16	3/8" BLACK	1500	GA5078516	AQ64-DOT-6	GA5078518	AQ69-DOTS-6X4	AIR COUPLING TEE TO AIR COUPLING	1
17	3/8" BLACK	1900	GA5078516	AQ64-DOT-6	GA5078516	AQ64-DOT-6	AIR COUPLING TEE TO REAR RIDE HEIGHT TEE	1
18	3/8" BLACK	350	GA5078516	AQ64-DOT-6	GA5078525	AQ69-DOTS-6X2	BOOM SECTION TEE TO RIDE R/H HEIGHT VALVE	1
19	3/8" BLACK	3500	GA5078516	AQ64-DOT-6	GA5078517	AQ68-DOT-6x4	BOOM SECTION TEE TO BOOM REGULATOR VALVE	1
20	3/8" BLACK	600	GA5078516	AQ64-DOT-6	GA5078516	AQ64-DOT-6	REAR RIDE HEIGHT TEE TO BOOM SECTION TEE	1
21	3/8" BLACK	2400	GA5078516	AQ64-DOT-6	GA5078676	AQ69-PS-6X6	PRIMARY AIR TANK TEE TO FRONT BRAKE FOOT VALVE	1
22	3/8" BLACK	350	GA5078516	AQ64-DOT-6	GA5078525	AQ69-DOTS-6X2	RIDE HEIGHT TEE TO RIDE L/H HEIGHT CONTROL VALVE	1
23	3/8" BLACK	670	GA5078525	AQ69-DOTS-6X2	GA5078515	AQ72-DOT-6X4	REAR L/R HEIGHT VALVE TO REAR L/R AIR BAG TEE	2
24	3/8" BLACK	160	GA5078515	AQ72-DOT-6X4	GA5078518	AQ69-DOTS-6X4	REAR L/R AIR BAG TEE TO REAR L/H DUMP VALVE	2
25	3/8" BLACK	50	GA5078514	AQ77-DOTS-6X4	GA5078526	AQ65-DOT-6	LADDER & FRONT HEIGHT CONTROL TEE TO ELBOW	1
26	3/8" BLACK	360	GA5078515	AQ72-DOT-6X4	GA5078518	AQ69-DOTS-6X4	RH FRONT AIRBAG TEE TO FRONT DUMP VALVE	1
27	3/8" BLACK	100	GA5078521	AQ72-DOTS-6X4	GA5078516	AQ64-DOT-6	SECONDARY AIR TANK PRESSURE PROTECTION TO TEE (4X4 OPTION)	1
28	3/8" BLACK	1170	GA5078516	AQ64-DOT-6	GA5078514	AQ77-DOTS-6X4	TEE TO LADDER & FRONT HEIGHT CONTROL TEE (4X4 OPTION)	1
29	3/8" BLACK	1950	GA5078516	AQ64-DOT-6	GA5078525	AQ69-DOTS-6X2	TEE TO TRANSFER CASE SOLENOID (4X4 OPTION)	1
30	8mm	9500	GA5067010	PM0208E	GA7000015	3192.08.13	BOOM REGULATOR VALVE TEE TO OIL TANK 160PSI GAUGE	1
31	8mm		GA5067010	PM0208E	GA5067010	PM0208E	BOOM REGULATOR VALVE TEE TO BOOMS	1
32	8mm	180	GA5067010	PM0208E	GA5052695	RM010812	BOOM REGULATOR VALVE TEE TO PRESSURE TRANSDUCER TEE (TRANSDUCER OPTION)	1
33	8mm	80	GA5052695	RM010812	GA5067010	PM0208E	PRESSURE TRANSDUCER TEE TO BOOMS (PRESSURE TRANSDUCER OPTION)	1
34	8mm	80	GA5052690	MPL-0802	GA5067010	PM0208E	BOOM REGULATOR VALVE TO BOOM REGULATOR VALVE TEE	1
35	3/8" BLACK	50			GA5078526	AQ65-DOT-6	FRONT HIDE HEIGHT VALVE TO FRONT AIR BAGS ELBOW	
36	6mm GREEN		GA5070450	PM450611E	GA5045145	RM090611	AIR FILTER TO SERVICE INDICATOR	1
37	3/8" BLACK	1430	GA5078518	AQ69-DOTS-6X4	GA5078517	AQ68-DOT-6x4	PARK BRAKE VALVE TO PARK BRAKE BOOSTER	1
38	3/8" BLACK	2200	GA5078676	AQ69-PS-6X6	GA5078518	AQ69-DOTS-6X4	REAR BRAKE FOOT VALVE TO REAR BAKE BOOSTER	1
39	3/8" BLACK	1600	GA5078516	AQ64-DOT-6	GA5078516	AQ64-DOT-6	AIR COUPLING TEE TO RAMSAY VALVE TEE	1
40	3/8" BLACK	300	GA5078516	AQ64-DOT-6	GA5078516	AQ64-DOT-6	RAMSAY VALVE TEE TO REAR RIDE HEIGHT TEE	1
41	3/8" BLACK	2500	GA5078516	AQ64-DOT-6	GA5078518	AQ69-DOTS-6X4	RAMSAY VALVE TEE TO RAMSAY VALVE REGULATOR	1
42	8mm	350	GA5052690		GA5052690		RAMSAY VALVE REGULATOR TO RAMSAY VALVE	1

Hydraulic Schematic - Fixed Axle Option



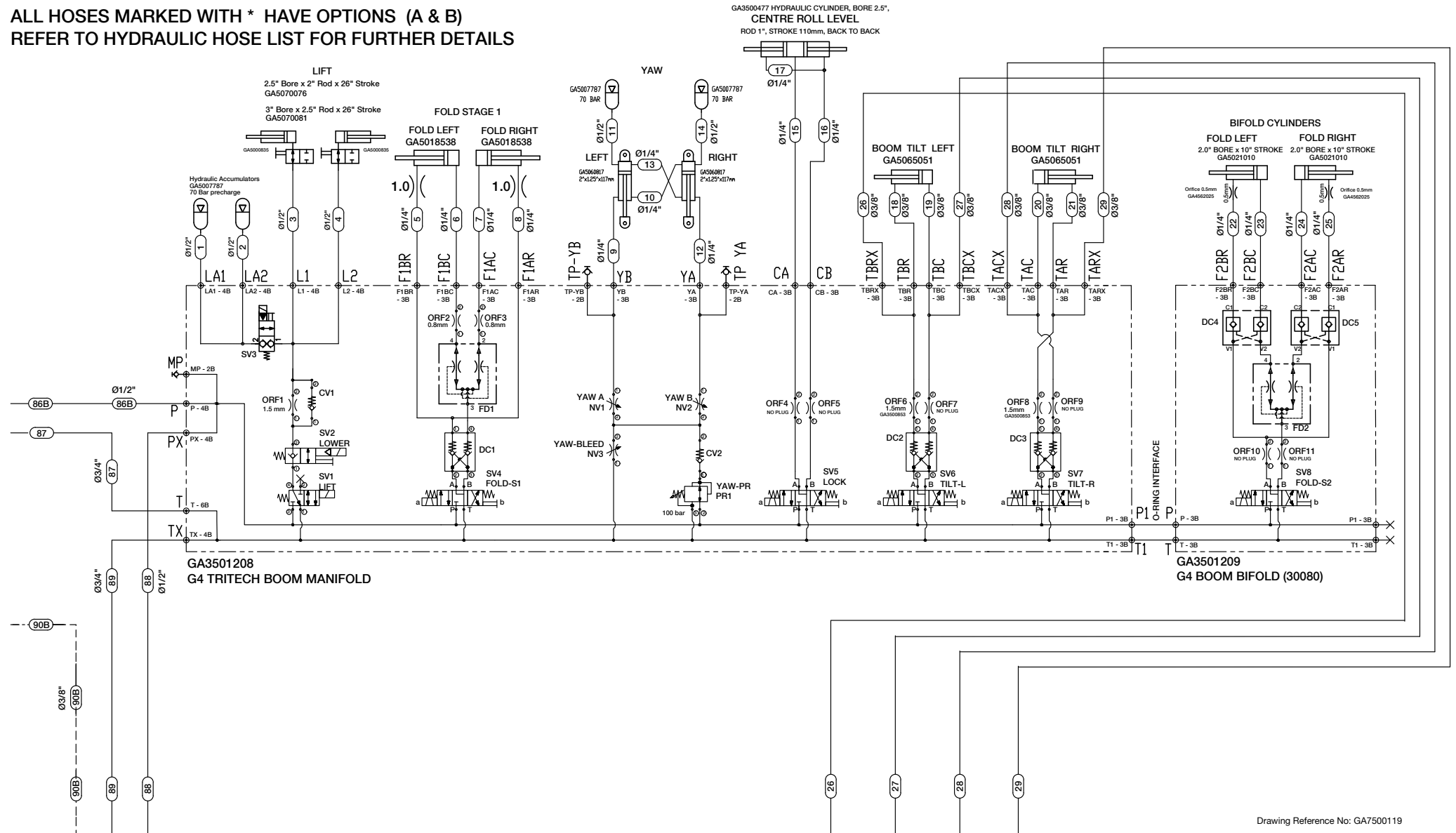
Hydraulic Schematic - Adjustable Fixed Axle Option



Drawing Reference No: GA7500119

Hydraulic Schematic - Boom Manifold

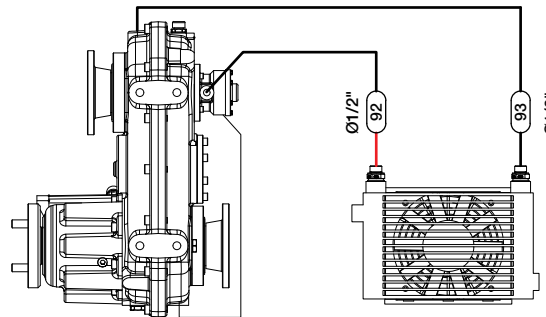
ALL HOSES MARKED WITH * HAVE OPTIONS (A & B)
REFER TO HYDRAULIC HOSE LIST FOR FURTHER DETAILS



Drawing Reference No: GA7500119

Hydraulic Schematic - Steering & Adjustable Axle

ALL HOSES MARKED WITH * HAVE OPTIONS (A & B)
REFER TO HYDRAULIC HOSE LIST FOR FURTHER DETAILS

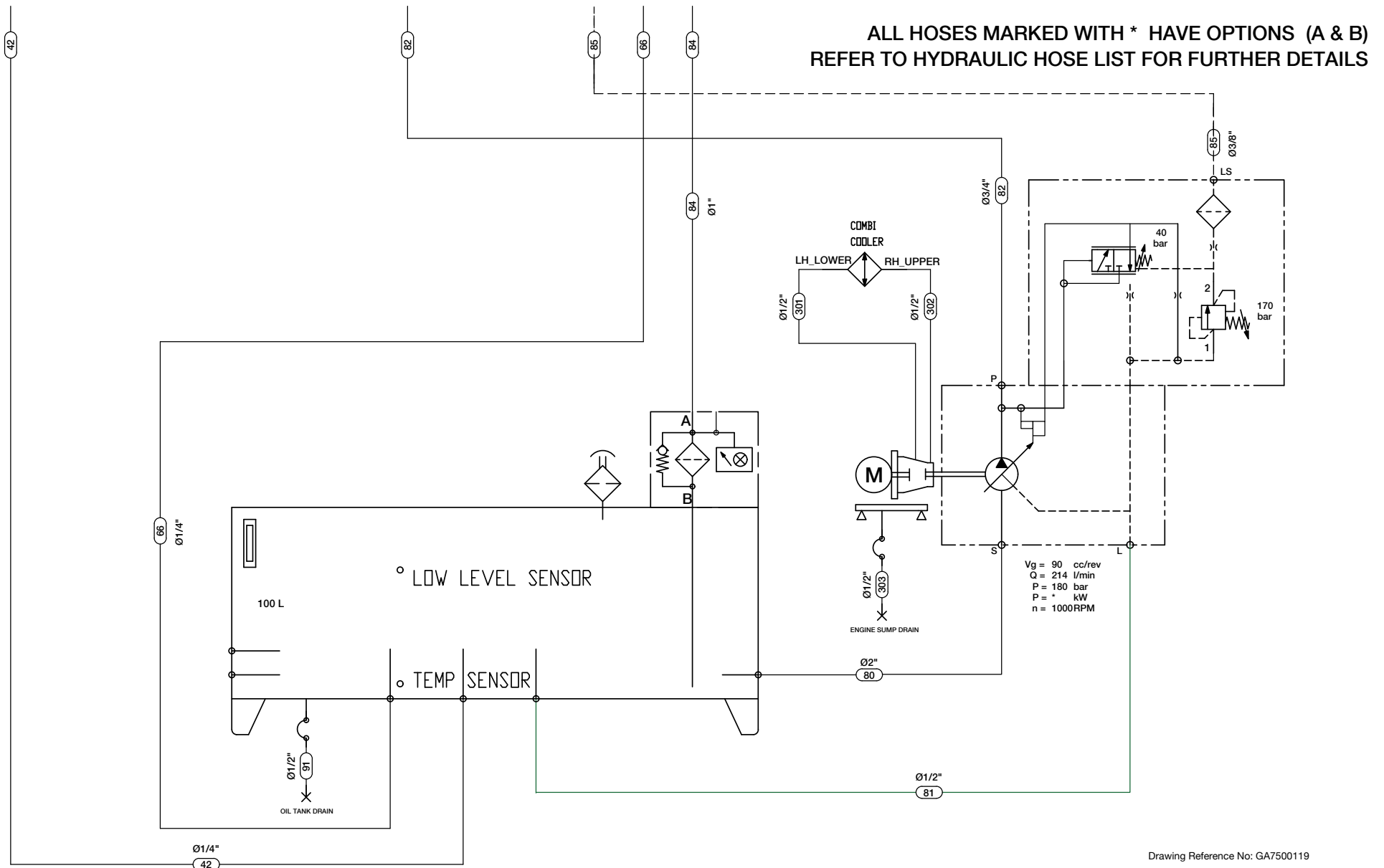


4WD TRANSFER CASE COOLER

Drawing Reference No: GA7500119

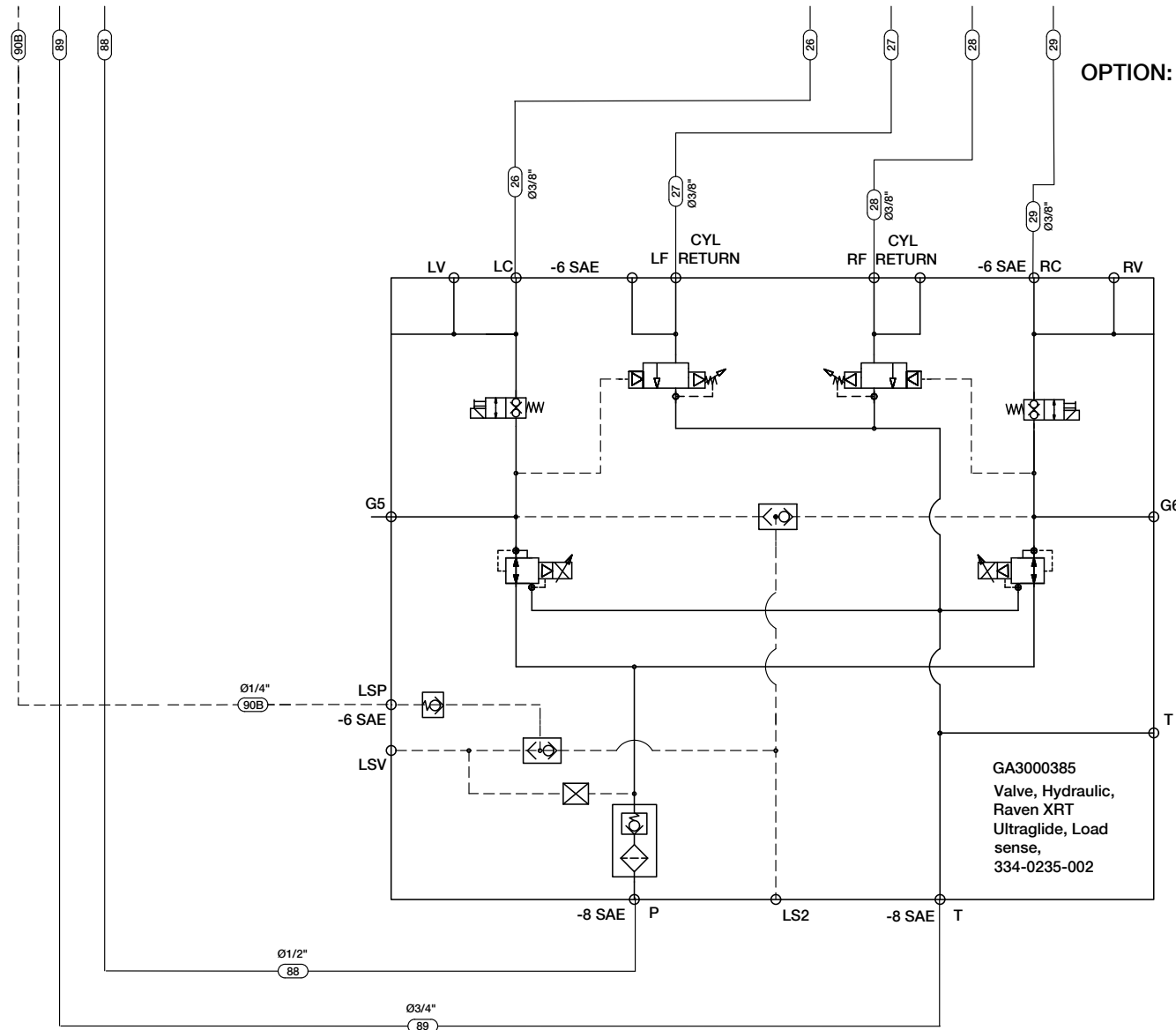
10 Appendix – Integrated Systems

Hydraulic Schematic - Tank & Pumps



Drawing Reference No: GA7500119

Hydraulic Schematic - Boom Raven XRT



Drawing Reference No: GA7500119



G4 Crop Cruiser G-Hub start up screen.

