IMPORTANT INFORMATION CONCERNING PRE-DELIVERY OF GOLDACRES SPRAYERS

Sprayer Serial No: _____ Date: _____

Reseller Name: _____

Record this information in the Operators Manual.
(Page 2, "General Information and Safety")

Customer: _____

Address: _____

Town: _____ State: _____ P/Code: _____

Remove from book

The correct delivery of a sprayer is important for all concerned. That is the customer, the dealer and GoldAcres.

The following points should be considered by the dealer when quoting a new sprayer to a potential owner:

The cost for the sprayer delivery should be included in the original quote to the buyer;

The sprayer delivery should be performed at owner's property (need to have owner's tractor for correct configuration) or the owner must bring the tractor most often to be used with the sprayer to a place designated by the dealer;

A second inspection and testing should be considered in the original quote to the buyer (also as an act of goodwill);

GoldAcres warranty terms and conditions policy does not cover travelling and diagnosis.

The dealer must complete the required check list for all the relevant following sections pertaining to the sprayer being delivered. This must be done in the presence of the owner and operator.

Tick or write the required number alongside the appropriate section when the relevant check has been satisfactorily completed.

PTO SHAFT

Attach sprayer to tractor and pump:

Tick box when complete ☐

- Locking pins fasten securely
- Safety chains attached and adjusted for length

Alter length of PTO shaft: (clean all burrs and filings)

Tick box when complete ☐

- Inspect maximum clearance between pump and tractor PTO
- Inspect maximum operating length of PTO shaft
- Inspect minimum clearance between pump and tractor PTO
- Inspect minimum operating length of PTO
- Inspect maximum operating joint angle satisfactory (must not exceed 25°)
- Lubricate universal joints.
- Lubricate sliding sections

Calibrate the pump:

Tick box when complete ☐

- Determine where 540 PTO RPM is on tractor dial (maximum pump speed)
- Determine where 400 PTO RPM is on tractor dial (minimum pump speed)
- Oil level visible in bowl (Do not add oil if visible in bowl when pump is operating)

- Check pump mounting bolts
- Set correct air damper chamber pressure

To find the optimum pressure setting, **with the pump not running**, fill the chamber to about 80 PSI (550 kPa). Then operate the pump at the desired operating speed and pressure and release pressure from the damper chamber until the pump is running relatively smoothly (ie. minimum pulsation).

Remove from book

Inspect and adjust the relief valve:

Tick box when complete ☐

- Check relief valve setting (maximum obtainable system operating pressure. (Do not alter until setting is checked)

Close all solenoids and control manifold ball valves so that all pump delivery passes through the relief valve. Run the pump at maximum operating speed (540 PTO RPM) and check that the pressure on the gauge on the sprayer does not exceed **110 PSI**.

Lubricate the machine:

Tick box when complete ☐

- Lubricate all grease points (read operator's manual for locations)

Inspect all hoses, fittings, clamps, bolts & nuts: Tick box when complete ☐

- VERY IMPORTANT! Tighten the 2 hose clamps on the main hose from pump to manifold.
- Check all hoses for leaks and excessive movement
- Check hose clamps for leaks
- Check all filter nuts and o-rings (hand tight only)
- Check nuts on 3-way ball valves (hand tight only)
- Check nut on pump (hand tight only)
- Check all bolts and nuts
- Check wheel nuts

Filters

Tick box when complete ☐

- Clean suction filter
- Clean pressure filters
- Clean flushing filter
- Check all filter nuts and o-rings (hand tight only)

Tyre pressures

- Confirm the tare weight of sprayer:
- Confirm the maximum loaded weight of sprayer:
- Confirm the tyre size and ply fitted:
- Refer to the tyre pressure and loading table on the Reseller website, www.goldacres.com.au/reseller/Goldacres

- Record the sprayer tyre loading specifications for this machine in the Operator Manual, Chapter 10, Page 5.

Tick box when complete ☐

Raven console installation and calibration:

Ensure that:

- Console power wires are connected directly to battery (red wire to positive, white wire to negative)
- Console is mounted securely in the cabin.
- All connectors are securely fastened.
- All the calibration information is recorded into the Raven chapter of the Operators Manual.

Tick box when complete ☐

CALIBRATION INFORMATION:

SI		SP1	
C-SD		BOOM 1 CAL	
BOOM 2 CAL		BOOM 3 CAL	
BOOM 4 CAL		BOOM 5 CAL	
BOOM 6 CAL		BOOM 7 CAL	
SPEED CAL		METER CAL	
VALVE CAL		RATE 1	
TIER 1		TIER 2	
TIER 3		DCI 1	
DCI 2		DCI 3	

Perform self-test:

- Speed
- Pump speed
- Application rate (with all boom switches on)
- Application rate (with at least one boom switch off)
- Maximum application rate (in manual and inc)
- Maximum pressure
- Minimum application rate (in manual and dec)
- Minimum pressure
- Application rate (with all boom switches on)

Tick box when complete ☐

Chemical probe and TransCal

TEST: Transfer a minimum of 30 litres of water in 1 minute @ 700 kPa

Tick box when complete ☐

Induction Hopper

TEST: Transfer a minimum of 50 litres of water in 1 minute @ 500 kPa

Tick box when complete ☐

Boom

- Lubricate all grease points
- Check all bolts and nuts
- Check boom level
- Check boom alignment
- Check boom unfold procedure
- Check boom fold procedure
- Check spring tension on yaw and cable
    - Cable springs 1mm coil gap
    - Horizontal springs 2mm coil gap
- Check all nozzles for leaks

Tick box when complete ☐

Exacta foam marker

Connect alligator clips directly to battery (red to positive, black to negative)
(if tractor has two 12volt batteries in parallel, connect so that 12volts is obtained using both batteries)
Securely mount console in cabin
Check condition of connector and securely fasten connector when testing
Clean compressor air filter
Flush tank
Clean filter screen under tank

TEST: Should fill 20 litres in 1 minute (fill bucket up) @ rate of 1 to 50
(Add 10 litres of clean, soft water and 200ml of **GoldAcres concentrate)**

Flush tank when finished (if not being immediately used)

Tick box when complete ☐

SAFETY DECAL INSPECTION.

An important part of making the machine safe to use is ensuring that all decals are present and easy to read.

Refer to the Chapter "00 General Information and Safety" for a comprehensive list of the decals that must be present on this machine.

I confirm that all decals have been inspected and are present and legible as described by the Operators Manual.

Tick box ☐

Remove from book

HELP US TO BUILD A BETTER SPRAYER!

ATTACH THIS FORM TO THE WARRANTY REGISTRATION
RETURN TO GOLDACRES, 1 NORTH WESTERN ROAD, ST. ARNAUD, VIC. 3478

PRE-DELIVERY FEEDBACK FORM, SERIAL # _____

Was the sprayer damaged during delivery? If so, give details: _____

_____

What parts of the sprayer required adjustment before delivery? _____

_____

_____

What parts of the sprayer required repairs before delivery? _____

_____

_____

How much time was spent on the pre-delivery? _____

Other comments? _____

_____

_____

Pre-delivery signed off as completed: Print Name: _____

Signature: _____

GOLDACRES/PATHWAY INSTALLATION AND WARRANTY REGISTRATION

This warranty registration form must be returned to Goldacres by the owner/operator within 14 days of taking delivery of the product. Only when warranty registration is completed and returned, can Goldacres fulfill all warranty obligations.

Dealer: _____

Address: _____ Postcode: _____

Product Description: _____ Serial No: _____

Predelivered and Inspected by: (Name) _____

(Sign) _____ (Date) _____

WARRANTY TERMS AND CONDITIONS

Goldacres/Pathway Goods described are only available for purchase upon the warranty terms and conditions set out below.

Interpretation

1. In these warranty terms and conditions:
   (1) **"Goldacres"** or **"Pathway"** means Goldacres Trading Pty. Ltd. A.C.N. 061 306 732 of 1-3 North Western Rd., St. Arnaud; trading as Goldacres Agricultural Equipment (its successors and assigns) which is the seller of the Goods;
   (2) **"Purchaser"** means the purchaser of the Goods;
   (3) **"Goods"** means the product and, if nay, the services provided;
   (4) Nothing in these warranty terms and conditions shall be read or applied so as to exclude, restrict or modify or have the effect of excluding, restricting or modifying, any condition, warranty, guarantee, right or remedy implied by law (including the Trade Practices Act 1974) and which by law cannot be excluded, restricted or modified.

General

2. (1) These warranty terms and conditions (which shall only be waived in writing signed by Goldacres/Pathway) shall prevail over all terms and conditions of the purchaser to the extent of any inconsistency.
   (2) This warranty may not be modified or added to without the expressed written consent endorsed hereon of the Managing Director of Goldacres Trading P/L.

Warranty Terms

3. The warranty relating to the Goods and all other products sold and, if any, services sold or provided by Goldacres/Pathway are contained in these warranty terms and conditions.

Specifications, etc: Catalogues, etc: Quantities

4. All specifications, (without limiting the generality of same – including: drawings, particulars of weights, volumes, capacities, dimensions, load factors) are approximate only and any deviation shall not be taken to vitiate any contract with Goldacres/Pathway or form any claim against Goldacres/Pathway. The descriptions, illustrations and performances contained in catalogues, price lists and other advertising matter do not form part of the contract of sale of the Goods. Where specifications, drawings or other particulars are supplied by Purchaser, Goldacres/Pathway' price is made on estimates of quantities required. Should there be any adjustments in quantities above or below the quantities estimated by Goldacres/Pathway and set out in a quotation, then any such increase or decrease shall be adjusted on a unit rate basis according to unit prices set out herein.

Performance, Capacities, Chemicals, Liquids, Application Methods, Environmental Effects

5. Any performance, volumes, and/or capacity figures given by Goldacres/Pathway are estimates only. Goldacres/Pathway shall be under no liability for damages for failure to obtain such figures unless specifically guaranteed in writing and any such written guarantee shall be subject to the recognised tolerances applicable to such figures. The suitability of chemicals and other liquids for any application and the application methods and the environmental effects shall be sole decision and responsibility of the purchaser and the user of the Goods. Goldacres/Pathway gives no warranty as to the suitability of any chemicals or other liquids for any application, nor the application methods nor the environmental effects which may result from the use of the Goods. Goldacres/Pathway shall be under no liability for damages arising out of the use of any chemicals, liquids or mixtures in the Goods nor for any application, nor for the application methods nor for the environmental effects which may result from the use of the Goods.

Limit of Liability

6. (1) Goldacres/Pathway liability for Goods manufactured by it is limited to making good any defects by repairing the same or at Goldacres/Pathway option by replacement within a period not exceeding either 1000 hours or twelve calendar months, whichever comes first, after the Goods have been dispatched provided that:
   (a) the defects have arisen solely from faulty materials or workmanship;
   (b) the Goods have not received maltreatment inattention or interference;
   (c) accessories of any kind used by the purchaser are manufactured or approved by Goldacres/Pathway;
   (d) where applicable, the seals on the Goods remain unbroken;
   (e) there has been no improper adjustment, calibration or operation;
   (f) the use of accessories including consumables, hardware or software (not manufactured by Goldacres/Pathway) has been approved in writing by Goldacres/Pathway;
   (g) no contamination or leakage has been caused or induced;
   (h) any modification to the Goods have been authorised in writing by Goldacres/Pathway;
   (i) there has been no inadequate or incorrect use, storage, handling or application of the Goods;
   (j) there has been no use or operation of the Goods outside of the physical, electrical or environmental specifications of the Goods;
   (k) there has been no inadequate or incorrect site preparations;
   (l) there has been no inadequate or improper maintenance of the Goods;
   (m) it has not been caused by fair wear and tear; and
   (n) firstly the Goods have been thoroughly inspected and any damage (from whatever cause) to the Goods (and in particular – the structure, welding, seams, bolts, booms) has been repaired prior to the Goods being operated, used driven or moved and on each occasion the tanks are filled; and
   (o) there has been no failure to comply with the requirements of all present or future laws or regulations relating to the Goods and/or the use and/or the operation of the Goods; and
   (p) there has been no failure to maintain a record of hours of operation (which record shall contain full details of all inspections, repairs and maintenance) and produce same to Goldacres/Pathway at the time of the warranty claim;
   (q) the defective Goods or any damaged part of the Goods are promptly returned free of cost to Goldacres/Pathway or a representative of Goldacres/Pathway;
   (r) all warranty related repairs have been carried out with the prior authorisation of Goldacres/Pathway;

   (2) if Goods or any part thereof are not manufactured by Goldacres/Pathway, in particular engines, engine accessories, transmissions, transfer cases, differentials, tyres, tubes, batteries and radios and UHFs, the guarantee of the manufacturer thereof shall be accepted by the purchaser and is the only guarantee given to the purchaser in respect of the Goods or that part;
   (3) in the case of hydraulic systems, Goldacres/Pathway shall replace defective parts in accordance with section 6(1) of these conditions, provided that the failure of the part was not related to contamination within the system, Goldacres/Pathway shall not be liable for labour in the case of repairing hydraulic system defects;
   (4) this warranty does not extend to components considered as normal wear items including, but not limited to nozzles, chains, belts, filters, brake pads, polyethylene bushes and liquid pump valves, valve O-rings, diaphragms and seals;
   (5) Goldacres/Pathway shall not be liable for and the purchaser releases Goldacres/Pathway from any claims in respect of faulty or defective design of any Goods supplied unless such a design has been wholly prepared by Goldacres/Pathway and the responsibility for any claim has been specifically accepted by Goldacres/Pathway in writing and in any event Goldacres/Pathway liability hereunder shall be strictly limited to the replacement of defective parts in accordance with paragraph 6 (1) of these conditions;
   (6) except as provided herein, all express and implied warranties, guarantees and conditions under statute or general law as to the merchantability, description, quality, suitability or fitness of the Goods for any purpose or as to design, assembly, installation, materials or workmanship or otherwise are hereby expressly excluded and Goldacres/Pathway shall not be liable for physical or financial injury, loss or damage or for consequential loss or damage of any kind arising out of the supply, layout, assembly, installation or operation of the Goods or arising out of Goldacres/Pathway negligence or in any other way whatsoever;
   (7) this warranty shall only be available to the Purchaser and shall not be transferable by the Purchaser;
   (8) this warranty in no way extends to any used Goods.

7. Goldacres/Pathway liability for a breach of condition or warranty implied by Div. 2 of Pt. 5 of the Trade Practices Act 1974 (other than s 69) is hereby limited to:
   (1) in the case of Goods, any one or more of the following:
      (a) the replacement of the Goods or the supply of equivalent Goods;
      (b) the repair of the Goods;
      (c) the payment of the cost of replacing the Goods or acquiring the equivalent Goods;
      (d) the payment of having the Goods repaired; or
   (2) in the case of services;
      (a) the supplying of the services again; or
      (b) the payment of the cost of having the services supplied again.

8. Goldacres/Pathway liability under s 68A and s 74H of the Trade Practices Act 1974 is expressly limited to a liability to pay to the purchaser an amount equal to:
   (1) the cost of replacing the Goods;
   (2) the cost of obtaining the equivalent Goods; or
   (3) the cost of having the Goods repaired, whichever is the lowest amount.

IMPORTANT:
By executing this Warranty Registration:

1 The Owner
(a) Agrees that the Owner will read the Operator's Manual before using the Product; will follow all procedures in the operator's manual for the use of the Product, and will exercise due care in the use of the Product;
(b) Agrees that Goldacres/Pathway liability for any loss or damage suffered by the Owner in connection with the Owner's use of the Product is limited to the cost of repair or replacement of the Product.
(c) Agrees that the Owner will bear any loss the Owner suffers as a consequence of any failure by the Owner to comply with 1. (a) above;
(d) Acknowledges that the owner is trained and is fully responsible for the safe and correct operation of the Product; and
(e) Agrees that the Owner will fully train any person who might be required to operate the Product as to how to operate the Product in a safe and proper manner.

2 The Dealer undertakes that the Dealership has met the obligations of Product pre-delivery, installation, service and warranty start up.

OWNER:

Owner's Name: (Print) _____

_____

Address: _____

_____ Postcode: _____

Phone: _____ Mobile: _____

Email: _____

Signature of Owner:

_____

Date: _____

❑ Please advise me of updates that relate to my product

DEALERSHIP:

Dealership Name: (Print) _____

_____

Address: _____

_____ Postcode: _____

Phone: _____ Mobile: _____

Email: _____

Signature of Dealer Representative:

_____

Date: _____

GOLDACRES COPY

COMPLETE THIS FORM (after the first 50 hrs of use) AND MAIL TO
"WARRANTY REGISTRATION, GOLDACRES,
1-3 NORTH WESTERN ROAD, ST ARNAUD, VIC. 3478"

POST DELIVERY CHECKLIST – LARGE TRAILING SPRAYER

DATE: _____ **DEALER:** _____

DEALER REPRESENTATIVE: _____

MACHINE TYPE: _____ **SERIAL NUMBER:** _____

ITEMS TO BE INSPECTED AND ADJUSTED:	**COMPLETED & COMMENTS:**
(A) HITCH. (Reseller service points = 20)	
HITCH INSERT, check is the correct size, hardened approx 1/4" larger than pin, damper slightly larger than pin	
SAFETY CHAINS, insure safety chains are fitted and are the correct length.	
HITCH, ensure the rotary hitch is greased.	

(B) CONSOLES (Reseller service points = 50)	
RAVEN CONSOLE FUNCTIONS, ensure that operator knows how to operate in manual and auto.	
CONSOLE CALIBRATIONS, ensure that operator knows all calibration figures, how to re enter figures.	
2TS SETTINGS, ensure that operator knows how to enter tier valves, ensure that operator knows what values mean.	
DATA MENU SETTINGS, ensure that all data menu settings and check they are correct.	
FLOW METER READING, check flow meter reading, ensure that operator knows nozzle test procedure.	
SPEED READING, check speed reading, ensure that operator knows the method of speed calibration.	
SELF TEST, ensure that operator knows the use of self test how to trouble shoot.	
TANK LEVEL SETTING, check value and ensure that operator knows how to enter in tank volume and alarm.	
PRODUCT SELECTION, check location of each product and ensure that operator knows how to select each product.	
MODE AUTO/ MANUAL/ OFF, ensure that operator knows how to switch each product between auto/ man/ off.	
BOOM SWITCHING, check and ensure that operator knows how to switch each boom section on and off.	
CONTROL VALVE, ensure that operator knows how to operate the control valve in manual with booms on to test function.	
PUMP RPM, ensure pump rpm is reading on console, ensure that operator knows importance and adjustment.	

(C) PUMPS (Reseller service points = 20)	
PUMP OIL LEVEL, check colour and oil level is correct	
PUMP PTO SHAFT LENGTH, check the shaft is not vibrating or contacting the pump.	
PUMP PTO SHAFT LUBRICATION, check shaft is correctly lubricated	
PUMP RPM SENSOR, check the pump rpm read out is correct on the console	
PUMP MOUNTING TENSION, check pump mounting bolts are tight	
PUMP HYD MOTOR AND HOSES, check hyd hoses and needle valve adjusted correctly.	

(D) WORK STATION FUNCTIONS (Reseller service points = 20)	
WORK STATION FUNCTIONS, check that all ball valves work each function correctly	
RELIEF VALVE PRESSURE, check that the system relief is set to 110psi.(130psi for 8000 litre)	
SUCTION FILTER CONDITION, remove and clean the suction screen check o'rings and install	
PRESSURE FILTER CONDITION, remove and clean the pressure screens, check o'rings and install	
FILL FILTER CONDITION, remove and clean the fill screen and sock, check o'rings and install	
TRANSCAL FUNCTION, check and ensure that operator knows function of Transcal. 30l/min of water, Including rinse system	
HOPPER FUNCTION, check and ensure that operator knows function of hopper. . 50l/min of water. Including rinse system	
PROBE FUNCTION, check and ensure that operator knows function of the probe, 30l/ min of water. Including rinse system	
FILL MANIFOLD, check and ensure that operator knows the fill manifold, ensure that operator knows venting foam tank when filling.	

(E) TANK. (Reseller service points = 20)	
TANK, check condition of tank and ensure that operator knows care and maintenance	
TANKS STRAP TENSION, check straps are firm and routed correctly.	
TANK STOP POSITION, check tank stops are firm against tanks	

(F) WHEELS AND AXLE (Reseller service points = 40)	
WHEEL BOLT TENSION, check wheel bolt tension, ensure that operator knows these must be checked daily.	
TYRE PRESSURES, check tyre pressures and ensure that operator knows to inspect daily	
AXLE RETAINING HARDWARE, check and ensure that operator knows to check tension regularly.	
AXLE, inspect and instruct operator how to adjust wheel bearings	
AIR BAG RIDE HEIGHT, check ride height and ensure that operator knows how to adjust.	
AIR BAG COMPRESSOR PRESSURE, check cut in and out pressures, ensure that operator knows how to adjust.	
AIR LEAKS, check for any air leaks	
COMPRESSOR FILTER, remove and clean compressor filter element.	
AIR BAG RESERVOIR, drain and ensure that operator knows to drain daily to expel condensation.	

(G) BOOMS (Reseller service points = 50)	
Inspect & adjust, BOOM FOLD, does the boom fold with the bottom chords parallel	
Inspect & adjust, BOOM LEVEL, does the boom sit level in the working position	
Inspect & adjust, BOOM SADDLE POSITION, does the boom sit on the boom rests correctly	
Inspect & adjust, BOOM ALIGNMENT, are the booms aligned in front of the centre section and inners	
Inspect & adjust, BOOM CABLE TENSION, are the cables adjusted to give correct spring tension, and boom alignment	
Inspect & adjust, YAW SPRING TENSION, are the springs adjusted to give minimum 4mm clearance.	
Inspect & adjust, BOOM TILT ARM ALIGNMENT. Are the tilt arms adjusted so they sit parallel with the main frame	
Inspect & adjust, PARA LIFT GREASE JOINTS, are the joints greased	
Inspect & adjust, LOWER LIMIT VALVE ADJUSTMENT, is the lower limit valve adjusted so 40mm of cylinder is out.	

Inspect & adjust, DELTA LINK GREASE JOINTS, are the joints greased	
Inspect & adjust, BOOM TILT PIVOT GREASE JOINTS, check tilt pins are greased	
Inspect & adjust, 3D BREAK AWAY, check the length of the turn buckle and spring tension.	
Inspect & adjust, 3D BREAK AWAY LUBRICATION, check the ball joints and pivot plates are lubricated.	
Inspect & adjust, CABLE DRUM BEARINGS GREASED, are the cable drum bearings greased	
Inspect & adjust, CABLE DRUM PIVOT BOLT TENSION, are the bolts tensioned to 300 ft lb.	

(H) FOAM MARKER (Reseller service points = 30)	
FOAM MARKER FUNCTIONS, check and ensure that operator knows all solenoids and system functions of foam marker.	
FOAM CONCENTRATE SETTINGS, check and ensure that operator knows needle valve adjustments	
WATER SETTINGS, check and ensure that operator knows needle valve adjustments	
Inspect & adjust, FOAM MARKER FILTRATION, remove and clean foam and water screens, check o'rings and install.	
Inspect & adjust, COMPRESSOR FUNCTION, check compressor and ensure that operator knows operation of air flow.	
Inspect & adjust, COMPRESSOR AIR CLEANER, remove and clean compressor filter element.	

(I) DIRECT CHEMICAL INJECTION (Reseller service points = 50)	
DCI DELIVERY FUNCTIONS, check and ensure that operator knows DCI delivery tap, recirculate, calibrate, off and booms	
DCI INDUCTION FUNCTIONS, check and ensure that operator knows DCI induction functions	
DCI RINSE FUNCTIONS, check and ensure that operator knows the rinse function of the DCI.	
DCI CALIBRATIONS, check and ensure that operator knows how to calibrate the DCI pumps and entry of cal figure.	
Inspect & adjust, DCI BREATHER FILTER, remove and clean the DCI breather element, ensure that operator knows function when filling.	

Maximum Reseller service point value = 300	Reseller service points claimed =	

ANY OTHER AREAS NOT LISTED ABOVE	

SIGNED OFF AS COMPLETE BY DEALERS REPRESENTATIVE: _____

SIGNED OFF AS COMPLETE BY CUSTOMER: PRINT NAME: _____

SIGNATURE: _____

Goldacres Accounts Payable Please process payment for Post-delivery inspection – Prairie Special

Using Dealer invoice number _____

MAIL TO ADDRESS ON PAGE 1

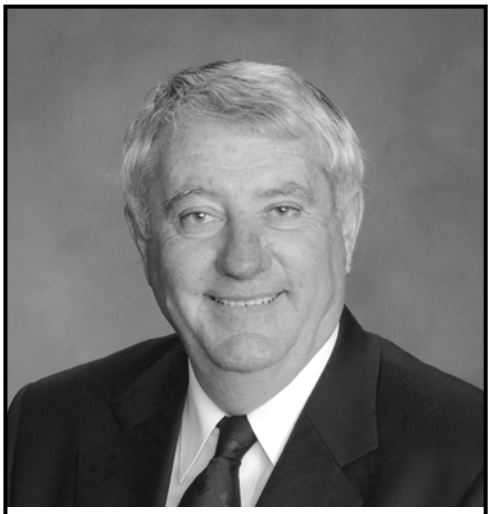
Dear Customer,

I am proud of the reputation that GoldAcres has established for providing technologically advanced Spraying Equipment to the Agricultural Industry.

This manual has been designed to ensure that you will be as happy with the performance of your sprayer as possible. Please read it, and use the index below to quickly find sections when you need assistance.

John Richards

Managing Director



John Richards

GOLDACRES OPERATOR'S MANUAL

Congratulations on purchasing a GoldAcres sprayer.

GoldAcres would appreciate any comments or suggestions from operators that may lead to improved sprayer performance.

Please address your correspondence to:

Product Services Manager
GoldAcres Trading Pty. Ltd.
1 North Western Road, St. Arnaud
Victoria, Australia. 3478

Caution! - Goldacres sprayers are engineered to perform correctly within the following limitations:

1	**Sprayers cannot be used in ambient temperatures above 40˚C,**
2	**The maximum spraying pressure is 8 Bars,**
3	**With clean filters fitted, any individual boom section can deliver a maximum of 35 litres per minute,**
4	**With clean filters fitted, the maximum combined flow of all boom sections is limited to 140 litres per minute, or 50% of the pump flow, whichever is the lesser amount.**
IMPORTANT WARNING!	**Any GoldAcres sprayers ordered or operated outside these limitations are not warranted by GoldAcres for successful spray performance.** **Operators working outside these limitations do so at their own risk, unless specific advice has been sought from, and provided by, GoldAcres, in writing.**

For warranty purposes and service records, please return the warranty registration card within 14 days of purchase.

BEFORE READING THE REST OF THIS OWNERS MANUAL, PLEASE TAKE A MOMENT TO RECORD THE FOLLOWING IMPORTANT INFORMATION	
Please record the serial number of your sprayer	
Please record the purchase date of your sprayer	
What is the name of your Goldacres Dealer	

STANDARD PAINT COLOURS USED ON YOUR SPRAYER:	
WHEELS:	**N23 Neutral Grey**
GREEN:	**G13 Dark Green**

00 PR GENERAL INFORMATION AND SAFETY- INDEX:

(Reproduced from the Victorian WorkCover Authority website)

www.workcover.vic.gov.au

NOTE:

REGULATIONS GOVERNING FARM SAFETY AND CHEMICAL HANDLING MAY VARY FROM STATE TO STATE. ENSURE THAT YOU ARE FAMILIAR WITH THE REGULATIONS THAT APPLY IN YOUR STATE, AND ADHERE TO THEM WHEN USING THIS SPAYER.

A Farm Safety Checklist

Harmful chemicals

Safety checklist

Too many farmers take risks on their farms. Make your farm a safe place to work by checking that:

- you have a register of harmful chemicals used
- the least toxic substance or the least harmful form is used for the job
- the safety information on the label and the material safety data sheet is followed
- the risk of using a chemical is assessed and safe ways of using it determined
- appropriate personal protective clothing and equipment is worn
- training and supervision is provided for employees using chemicals
- dispensing and mixing is done as recommended and in ventilated areas
- out of date or unused chemicals are disposed off properly
- all containers are correctly labelled and stored securely
- chemicals are transported safely to prevent spills and exposure

There may be other dangers from using chemicals on your farm. You can make your farm safe by:

- **walking around the farm and looking at every job involving chemicals**
- **listing what could go wrong to cause an injury or illness**
- **thinking about ways of preventing it**
- **doing something about it**

WorkCover Safety *. . . think it, talk it, work it*

(Reproduced from the Victorian Workcover Authority website)
www.workcover.vic.gov.au

Victorian WorkCover Authority

Rural safety advisors
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Geelong office
Tel: 5223 2300
Mobile: 0401 142 368
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Bendigo office
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On-line contacts
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Farmsafe Alliance

Farmsafe Alliance Manager
Farrer House
24 - 28 Collins Street
Melbourne VIC 3000
Tel: 9207 5509
Fax: 9207 5500
email: drich@vff.org.au

Victorian Farmers Federation

Farrer House
24 - 28 Collins Street
Melbourne VIC 3000
Tel: 9207 5555
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email: vff@vff.org.au

Farmsafe Victoria

Executive Officer
c/- Victorian Farmers Federation
Farrer House
24 - 28 Collins Street
Melbourne VIC 3000
Tel: 9207 5555
Fax: 9207 5500

Australian Centre for Agricultural Health and Safety (and Farmsafe Australia)

PO Box 256
Moree NSW 2400
Tel: 02 6752 8210
Fax: 02 6752 6639
email: kylies@dlh.health.nsw.gov.au

Kidsafe Victoria

Level 1
222 Church Street
Richmond VIC 3121
Tel: 9427 1008
Fax: 9421 3831
email: ed@kidsafe.org.au

Managing Farm Safety - A two day health and safety training course

Victorian Farm Safety Training Centre
Rural Studies Department
University of Ballarat
Tel: 5339 3477
Fax: 5339 3177

NOTE:
GOLDACRES INCLUDE THIS INFORMATION ONLY AS A GUIDE TO OPERATORS. GOLDACRES ACCEPT NO RESPONSIBILITY FOR THE ACCURACY OF THIS CONTACT INFORMATION.

Risk assessment report for spraying pesticides.

(Reproduced from the Victorian WorkCover Authority website)
www.workcover.vic.gov.au

The type of pesticides you use – insecticides, weedicides, herbicides, fungicides etc – and the way that you use or handle them may harm your workers' health.

Under the new *Occupational Health and Safety (Hazardous Substances) Regulations 1999* you have to do a risk assessment to work out if there is a risk to workers' health from using hazardous substances such as pesticides. You also have to keep a record of the assessment.

This form will help you do an assessment. To assist you with this form, get the *Using Farm Chemicals Safely* poster from WorkCover. The poster will help you identify which chemicals are classified as hazardous, how to work out if there is a risk to heath and how to avoid or minimise any risk. If you need more help with this form, contact your local WorkCover office or refer to the *Code of Practice for Hazardous Substances*, available from WorkCover. The code has an example that should help you with your own assessment.

Don't confuse the hazardous substances regulations with the *Dangerous Goods (Storage and Handling) Regulations 1989*. The Hazardous regulations are aimed at protecting people's health while the dangerous goods regulations are aimed at preventing such things as fire, explosion or corrosion.

Using this form

The form divides the job of using pesticides into its different tasks, such as mixing and spraying. You need to look at each part of the job separately to work out if pesticides can harm your workers' health, because some tasks may be more dangerous than others. Work through the form by ticking the boxes. Record any relevant information in the comment section. At the end of each task you have to decide whether there is a risk to health. To help you do this you need to follow the highlighted guidance notes.

Risk assessment report for spraying pesticides:

Workplace/company _____ Date _____

This assessment can apply to more than one workplace or work area as long as the same pesticides are used in the same way.

Assessor(s) _____

What form are these pesticides in? liquid ☐ powder ☐ granular ☐

Product names:

_____ _____

_____ _____

_____ _____

Are all the pesticides labelled[1]? Yes ☐ No ☐

Do you have Material Safety Data Sheets (MSDSs) for these pesticides[2]? Yes ☐ No ☐

Are these pesticides listed in the chemicals register[3]? Yes ☐ No ☐

Who uses or who may be exposed to these pesticides?

mixers/sprayers ☐ thinners/pruners ☐ pickers ☐

How often are these pesticides used?

Seasonal? From _____ to _____

Approximate number of days per week _____ Other _____

Have users of these pesticides been trained[4]? Yes ☐ No ☐

If yes, what course? FCUC[5] Other _____

1. **All containers of pesticides must be labelled.**
2. **You can get MSDSs from the manufacturer, importer or supplier of the pesticide.**
3. **All the pesticides used must be listed in a register (see WorkCover poster *Using Farm Chemicals Safely*).**
4. **Information and training needs to be provided to those who use or who may be exposed to the pesticides.**
5. **Farm Chemical Users Course**

Mixing

Comments

Mixing can be the most dangerous part of the job because the chemical is concentrated and many pesticides can affect or go through the skin.

	Yes	No	
What is the method of mixing?			
• Manual decanting/mixing	☐	☐	_____
• Chemical is poured into the spray unit at or above head height	☐	☐	_____

If yes, have you thought about other ways of mixing (see below) that are less dusty or minimise the chance of spills or splashes?

• Pump/bung/tap fitted on drum	☐	☐	_____
• Closed transfer system	☐	☐	_____
• Other, e.g. dissolvable packs	☐	☐	_____
• Container size(s):_____			_____

• Dilution rate:

As per label_____

Other_____

Smaller containers are easier to pour from and a more concentrated chemical presents a greater risk.

• Have any leaks, spills or splashes occurred when mixing?	☐	☐	_____
• Is dust generated when mixing powders?	☐	☐	_____

If yes, look for a safer way of mixing.

Safe work procedures used:

• Are pesticides mixed in an area with good lighting and ventilation?	☐	☐	_____
• Are washing facilities provided?	☐	☐	_____

Mixing (cont'd)

	Yes	No	Comments
• Are spills cleaned up immediately and properly?	☐	☐	_____
• Is measuring equipment rinsed after use?	☐	☐	_____
• Do workers wash hands after mixing?	☐	☐	_____
• Do workers wash hands before eating, drinking or smoking?	☐	☐	_____

If no to any of the above, there may be a risk to workers' health.

• Are people not involved in mixing kept away?	☐	☐	_____
• Are pesticides locked away from children and animals?	☐	☐	_____

If no, there may be a risk to others nearby.

Is personal protective equipment (PPE) worn?

• Gloves	☐	☐	Type:_____
• PVC apron	☐	☐	_____
• Gumboots	☐	☐	_____
• Face shield	☐	☐	_____
• PVC pant and jacket	☐	☐	_____

Respirator

• Disposable dust mask	☐	☐	_____
• Chemical type (charcoal)	☐	☐	_____
• Other, e.g. overalls	☐	☐	_____
• Is PPE in good condition?	☐	☐	_____

If only relying on PPE and mixing is dusty or there is a possibility of leaks, spills or splashes, there may be a risk to workers' health. You must look at other ways of avoiding or minimising exposure so that you are not totally relying on PPE in case something goes wrong.

Mixing (cont'd)

	Yes	No	Comments
• Is PPE stored properly away from chemicals?	☐	☐	_____
• Is PPE cleaned, maintained and checked for holes or damage?	☐	☐	_____

If no to any of the above, there may be a risk to workers' health.

While the use of PPE has its place, PPE is considered to be the least effective way of avoiding or minimising exposure to chemicals.

• Any accidents, near misses or illnesses when using the pesticides?	☐	☐	_____

If yes, there is a risk to workers' health. Think of ways of making sure these accidents, near misses or illnesses do not happen.

Result of assessment

Could there be a risk to workers' health?
If there is a risk, is it because the pesticides can;

• Get onto the skin?	☐	☐	_____
• Be breathed in?	☐	☐	_____
• Be swallowed through contact with dirty hands?	☐	☐	_____

If there is a risk to health you need to take action to avoid or minimise exposure.

Spraying

	Yes	No	Comments
Type of equipment used: • Tractor-drawn air blast sprayer	☐	☐	_____
• Boom spray	☐	☐	Type:_____
• Other, (e.g. knapsack)_____			

The equipment or spray technique used can affect how much spray can be breathed in or get onto the skin.

How do you avoid or minimise exposure to the spray?

• By using a tractor cabin?	☐	☐	_____
Is the cabin air filtered?	☐	☐	_____
Is a container of clean water carried for washing?	☐	☐	_____
Is a clean pair of gloves carried?	☐	☐	_____
• By using a safer spray technique?	☐	☐	_____
Coarser spray, i.e. bigger droplets	☐	☐	_____
More directed spray technique	☐	☐	_____
Spray low to the ground	☐	☐	_____
• Other ways?_____			

If you are not using a tractor cabin or a safer spray technique you should think about doing so.

Safe work procedures used:

• Are you avoiding spray by spraying one way while driving into cross wind?	☐	☐	_____
• Do you avoid spray drift by not spraying on very windy days?	☐	☐	_____
• Do you spray when it's cooler if wet weather gear has to be worn?	☐	☐	_____

Spraying (cont'd)

	Yes	No	Comments
• Are people not involved in spraying kept away?	☐	☐	_____
• Do you only prepare enough chemical to do the job?	☐	☐	_____
• Do workers wash hands after spraying.	☐	☐	_____
• Do workers wash hands before eating, drinking or smoking?	☐	☐	_____
• Is contaminated clothing washed separately?	☐	☐	_____

If no to any of these, there may be a risk to workers doing the job or others nearby. Don't just rely on people working safely – avoid or minimise exposure in other ways as much as possible.

Is personal protective equipment (PPE) worn?

• Gloves	☐	☐	Type:_____
• Cotton hat	☐	☐	_____
• Long sleeve overalls	☐	☐	_____
• Gumboots	☐	☐	_____
• Leather boots	☐	☐	_____
• PVC pants and jacket	☐	☐	_____
• Respirator	☐	☐	_____
Disposable dust mask	☐	☐	_____
Combined chemical/dust mask	☐	☐	_____

If you are only relying on PPE and there is a possibility for workers to be exposed to spray drift, there may be a risk to their health. If so, you must try to avoid or minimise exposure in other ways as much as possible.

• Is PPE in good condition?	☐	☐	_____

Spraying (cont'd)

	Yes	No	Comments
• Is PPE stored properly away from the pesticides?	☐	☐	
• Is PPE cleaned, maintained and checked for damage or holes?	☐	☐	

If no to any of these, there may be a risk to health.

While the use of PPE has its place, PPE is considered to be the least effective way of minimising or controlling exposure to chemicals.

• Any accidents, near misses or illnesses when using the pesticides?	☐	☐	

If yes, there is a risk to workers' health. Think of ways of making sure these accidents, near misses or illnesses do not happen.

Result of assessment

Could there be a risk to workers' health?
If there is a risk, is it because the pesticides can;

• Get onto the skin?	☐	☐	
• Be breathed in?	☐	☐	
• Be swallowed through contact with dirty hands?	☐	☐	

If there is a risk to health you need to take action to avoid or minimise exposure.

Thinning, Pruning, Picking

	Yes	No	Comments
• Is a minimum 24 hour re-entry period observed?	☐	☐	_____
• Are workers kept away from areas being sprayed?	☐	☐	_____
• Do workers know which area or crop has been sprayed, when and with what pesticide?	☐	☐	_____
If yes, how do they know?			
• Spray diaries are kept	☐	☐	_____
• Workers are told	☐	☐	_____
• Signs are put up	☐	☐	_____
• Other?			_____

If no to any of the above, there may be a risk to workers' health.

Result of assessment

Could there be a risk to workers' health?

If there is a risk, is it because the pesticides can;

• Get onto the skin?	☐	☐
• Be breathed in?	☐	☐
• Be swallowed through contact with dirty hands?	☐	☐

If there is a risk to health you need to take action to avoid or minimise exposure.

For further information refer to Step 3 of the WorkCover poster *Using Farm Chemicals Safely*.

Cleaning, Service, Repair

	Yes	No	Comments
• Is spray equipment, including tractor, cleaned or hosed down?	☐	☐	_____
• Are spray nozzles flushed after use?	☐	☐	_____
• Is equipment cleaned before it is serviced or repaired externally?	☐	☐	_____

If no to any of the above, there may be a risk to workers' health.

Result of assessment

Could there be a risk to workers' health?

If there is a risk, is it because the pesticides can;

• Get onto the skin?	☐	☐	_____
• Be breathed in?	☐	☐	_____
• Be swallowed through contact with dirty hands?	☐	☐	_____

If there is a risk to health you need to take action to avoid or minimise exposure.

SAFETY WARNINGS

At GoldAcres safety is our number one priority. The following pages outline several warning and safety instructions that must be followed to ensure the safe operation of your GoldAcres sprayer.

To fully understand the manual there are some key terms that need to be understood.

- **DANGER** - Serious injury or death could occur if warning is ignored.
- **WARNING** - Precaution required
- **CAUTION** - Referencing to warning in this manual

THINK SAFETY - UNDERSTAND IT

Understanding safety decals and their purpose assists in the safe operation of your sprayer. Safety signs are there for your protection and it is your responsibility to replace damaged and missing safety signs. Ensure that all new machine components and replacement parts include current hazard identification signs.

Replacement safety signs are available from your GoldAcres dealer.

Maintain your machine in proper working condition.

Any **UNAUTHORIZED MODIFICATIONS** to the machine may affect the function of the machine and create a serious safety risk.

If you do not understand any part of this manual and need assistance, contact your local Gold Acres dealer.

PERSONAL PROTECTIVE CLOTHING

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

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

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

Goldacres also recommends you read the following Australian standards,
Australian Standard for Chemical protective clothing AS3765
Australian Standard for Respiratory protection devices AS1715

ENTANGLEMENT IN ROTATING DRIVE LINES

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

To reduce the risk of entanglement, ensure that appropriate protective equipment is worn and ensure that all other clothing is **not** loose fitting.

AIR BORNE PARTICLES

When heating and welding components ensure that all paint and other such materials are removed.

Often hazardous air borne particles and fumes are generated from welding and heating.

When sanding the machine, work in a well ventilated area and wear an approved respirator.

If a solvent is used to remove paint and other substances, wash the area with soap and water to neutralize the work area.

DO NOT HEAT PRESSURIZED FLUID LINES

When conducting any process on the machine that involves heat be aware of pressurized fluid lines in the vicinity of your work area.

Pressurized lines can be easily cut when the heat over shoots the target object.

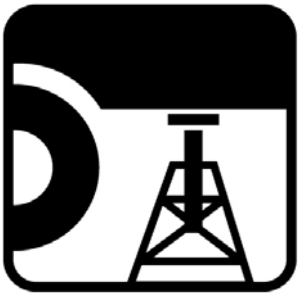
FLUIDS UNDER PRESSURE

Fluids escaping from high pressure lines can cause serious injury to skin. Hydraulic oil can easily penetrate human skin. The oil will have to be surgically removed within hours or gangrene could develop.

This hazard can be avoided by relieving the pressure in the system.

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

SUPPORT MACHINE SAFELY



Before raising the machine off the ground ensure that the boom is in it's closed position. Where possible before lifting machine empty the spray tank. Securely support the machine using a jack.

Do not support the sprayer using materials that may crumble.

Do not work under the machine when supported solely by a jack.

DO NOT CARRY PASSENGERS

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

TYRE MAINTENANCE

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

Extreme caution is required during the inflation of tyres. If the tyre is inflated at a rapid rate the separation and resulting explosion of the tyre rim combination can occur. This event can inflict serious or fatal injuries to the operator.

Always use a tyre inflation gauge.

Do not weld, heat or modify the rim, this will weaken the rim.

Be proactive and continually check the condition of your tyres.

CONSERVATION OF THE ENVIRONMENT

The GoldAcres sprayer uses several materials that may be harmful to the environment. Potentially harmful waste used with GoldAcres equipment includes such items as oil, fuel, coolant, brake fluid and batteries.

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

When draining fluids from the sprayer use leak proof containers. Do not use food or beverage containers because someone may consume the contents by mistake.

A trained technician must carry out servicing of the air conditioning system. Government regulations require old refrigerant to be recovered and recycled.

If you require information on the safe disposal of these fluids contact the environmental department at your local council.

SAFETY WARNINGS

This symbol denotes a safety warning. Failure to observe the various warnings in this manual may result in personal injury and/or reduced sprayer performance.

READ THE WARRANTY AND TERMS AND CONDITIONS.

READ THIS OPERATOR'S MANUAL BEFORE SPRAYING.

IT IS THE RESPONSIBILITY OF THE OWNER TO ENSURE THAT THERE ARE NO STICKERS MISSING FROM THE SPRAYER.

CARE SHOULD BE TAKEN WHEN TRANSFERRING LIQUID INTO THE TANK TO ENSURE THAT THE GROSS WEIGHT OF THE SPRAYER DOES NOT EXCEED THE CARRYING, BRAKING AND/OR TOWING CAPACITY OF THE VEHICLE TO WHICH THE SPRAYER IS ATTACHED AS SPECIFIED BY THE VEHICLE MANUFACTURER.

NOTE: 1 LITRE (WATER) = 1 KG (WEIGHT)

IT IS IMPERATIVE THAT THE VEHICLE MANUFACTURER'S SPECIFICATIONS BE CHECKED AND ALL INSTRUCTIONS FOR USE BE ADHERED TO AT ALL TIMES.

MAKE SURE THAT ALL RELEVANT TOWING REGULATIONS ARE ADHERED TO WHEN TOWING SPRAYER.

MAKE SURE THAT THE SPRAYER COMPLIES WITH ALL RELEVANT ROAD REGULATIONS.

SUITABLE CARE SHOULD BE TAKEN WHEN DRIVING WITH THE SPRAYER ATTACHED TO THE VEHICLE. CONSIDERATION SHOULD BE GIVEN TO BOTH THE CARRYING AND/OR TOWING CAPACITY OF THE VEHICLE AND THE GRADIENT OF THE TERRAIN WHEN DETERMINING THE SPEED AT WHICH THE VEHICLE CAN BE DRIVEN SAFELY.

ROWCROP MAXIMUM SPEED IS 20 KM/H AT ALL TIMES.

PRAIRIE MAXIMUM SPEED WITH TANK LOADED IS 20 KM/H.
(Not applicable to truck mounted sprayers)

PRAIRIE MAXIMUM SPEED WITH TANK EMPTY IS 40 KM/H.
(Not applicable to truck mounted sprayers)

SLOW DOWN WHEN TURNING TO PREVENT EXCESSIVE STRAIN ON THE BOOM. (ESPECIALLY ON BOOMS 24M OR LARGER)

CHECK WHEEL NUTS REGULARLY.

ENSURE THAT ALL BOLTS ARE TIGHTENED AND SECURED BEFORE OPERATION.

INSPECT THE SPRAYER THOROUGHLY FOR DAMAGE AND WEAR BEFORE OPERATION.

LUBRICATE THE SPRAYER AS PER RECOMMENDED REQUIREMENTS BEFORE OPERATING.

NEVER STAND WITHIN THE RADIUS OF BOOM WINGS.

NEVER WORK UNDER ANY HYDRAULICALLY RAISED BOOM.

ALWAYS ENSURE THAT THE BOOM IS SECURELY SUPPORTED WHEN TRAVELLING.

DO NOT TRAVEL WITH THE BOOM IN THE FOLDED POSITION UNTIL IT HAS BEEN LOWERED ONTO THE BOOM RESTS.

BOOM MUST BE RAISED CLEAR OF THE BOOM RESTS WHEN UNFOLDING OR SERIOUS BOOM DAMAGE MAY RESULT.

KEEP CLEAR OF OVERHEAD OBSTRUCTIONS – ESPECIALLY POWERLINES AS CONTACT CAN BE FATAL.

BE AWARE OF OVERHEAD OBSTRUCTIONS (IE POWERLINES) WHEN USING TILT CYLINDERS.

NEVER OVERFILL ANY PUMP WITH OIL.

DO NOT OPERATE DIAPHRAGM PUMPS ABOVE 540 RPM.

CUT THE PTO SHAFT TO THE CORRECT LENGTH TO SUIT THE SPRAYING TRACTOR BEFORE OPERATION.
(Not applicable to truck mounted sprayers)

MAKE SURE SPRAYER IS PROPERLY SUPPORTED WHEN CHANGING ANY TYRE.

NEVER CHANGE TYRES ON A SLOPE OR ON SOFT UNEVEN GROUND.

NEVER GET UNDER THE SPRAYER WHEN IT IS SUPPORTED ONLY BY THE SUPPLIED AND FITTED JACK.
(Not applicable to truck mounted sprayers)

DO NOT SUPPORT THE SPRAYER WITH THE SUPPLIED AND FITTED JACK UNLESS THE SPRAY TANK IS EMPTY.
(Not applicable to truck mounted sprayers)

NEVER ATTEMPT TO CLEAN NOZZLES BY BLOWING WITH MOUTH.

NEVER ATTEMPT TO SIPHON CHEMICALS BY SUCKING.

DO NOT USE FLAMMABLE CHEMICALS IN THE SPRAYER.

READ AND HEED THE CHEMICAL LABEL, BEFORE USING THE SPRAYER.

HANDLE ALL CHEMICALS WITH CARE AND FOLLOW THE HANDLING INSTRUCTIONS ON THE CHEMICAL CONTAINER.

WEAR PROTECTIVE CLOTHING RECOMMENDED ON THE CHEMICAL PRODUCT LABEL, INCLUDING WHILE INSIDE THE CABIN OF THE VEHICLE DURING SPRAYING.

FLUSH CHEMICALS FROM EQUIPMENT IMMEDIATELY AFTER USE.

A SUPPLY OF FRESH WATER SHOULD BE WITH SPRAYER AT ALL TIMES.

DO NOT OPERATE THE SPRAYER WHILE UNDER THE INFLUENCE OF ANY DRUGS OR IF EXCESSIVELY TIRED.

DO NOT LET CHILDREN PLAY ON OR NEAR THE SPRAYER.

CERTAIN CHEMICALS MAY BE UNSUITABLE FOR USE WITH A SPRAYER FITTED WITH STANDARD PLUMBING. CONSULT WITH GOLDACRES ON YOUR PARTICULAR REQUIREMENTS.

BEFORE WORKING UNDER THE BOOM OR LIFT, CLOSE THE HYDRAULIC TAP ON THE BOTTOM OF THE LIFT CYLINDER AND PLACE SUPPORT STANDS UNDER THE BOOMS.

Section index for all topics:

WORD OR PHRASE	SECTION
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CONEJET NOZZLE	NOZZLES
CONSOLE FAILURE	FLOWMETERS & RAVEN
CONSOLE PROGRAMMING, DUAL BOOM	FLOWMETERS & RAVEN
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POISONING	USING YOUR SPRAYER
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SAFETY WARNINGS	GENERAL INFORMATION
PRESSURE FILTER	PLUMBING
PRESSURE REGULATOR ELECTRIC	PLUMBING
PRESSURE RELIEF VALVE	PLUMBING
PRESSURE TROUBLESHOOTING	PUMPS
PRESSURE TYRE	TANK,CHASSIS, WHEELS ETC.
PROBE CHEMICAL	TRANS CAL & CHEM PROBE
PUMP SPEED SETTING	PUMPS
PUMP SYSTEM FLUSHING	USING YOUR SPRAYER
PUMP THREE WAY BALL VALVE	PLUMBING
PUMP TROUBLESHOOTING	PUMPS
PUMPING SYSTEM	PLUMBING
QUICK DRAIN	USING YOUR SPRAYER
QUICK FILL	USING YOUR SPRAYER
RATE CHART NOZZLES	NOZZLES
RATE SELECTION	USING YOUR SPRAYER
RAVEN AUTOMATIC MONITOR CONTROLLER	FLOWMETERS & RAVEN
RAVEN CONSOLE	FLOWMETERS & RAVEN
RAVEN FLOW MAX 220 CONSOLE	FLOWMETERS & RAVEN
RAVEN TROUBLESHOOTING	FLOWMETERS & RAVEN
REED VALVES	FOAM MARKER
REEL HOSE	NOZZLES
RELIEF VALVE PRESSURE	PLUMBING
RE-PHASING RAMS	BOOMS
RINSING CHEMICAL DRUMS	USING YOUR SPRAYER
RINSING ENVIRODRUM LINES	USING YOUR SPRAYER
WORD OR PHRASE	**SECTION**
RINSING HOPPER	USING YOUR SPRAYER

RINSING INDUCTION HOPPER & CHEMICAL DRUMS	USING YOUR SPRAYER
RINSING NOZZLES TANK	USING YOUR SPRAYER
RINSING TRANSCAL LINES	USING YOUR SPRAYER
RINSING TRANSCAL TANK	USING YOUR SPRAYER
RUBBER STOPPER	BOOMS
SELF TEST SIMULATION	FLOWMETERS & RAVEN
SIDE DIAPHRAGMS	PUMPS
SOLENOIDS	PLUMBING
SOLENOIDS TROUBLESHOOTING	PLUMBING
SPEED CAL CALCULATION	FLOWMETERS & RAVEN
SPEED MAXIMUM	USING YOUR SPRAYER
SPEED SELECTION	FLOWMETERS & RAVEN
SPEED SENSOR FAILURE	FLOWMETERS & RAVEN
SPRAY APPLICATION RATE SELECTION	USING YOUR SPRAYER
SPRAYER WARNING STICKERS	GENERAL INFORMATION
STICKERS WARNING	GENERAL INFORMATION
STOPPER HOLDER	FOAM MARKER
STORAGE CHEMICAL	USING YOUR SPRAYER
SUCTION FILTER	PLUMBING
SUMP DRAIN	USING YOUR SPRAYER
SUPERMIX AGITATOR	PLUMBING
TANK CALIBRATION USING FLOWMETER	FLOWMETERS & RAVEN
TANK FILLING	USING YOUR SPRAYER
TANK RINSING NOZZLES	USING YOUR SPRAYER
TANK SUMP DRAIN	USING YOUR SPRAYER
TANKS	TANK, CHASSIS, WHEELS ETC.
TARE WEIGHTS	USING YOUR SPRAYER
TASKS – END OF SEASON	USING YOUR SPRAYER
TASKS – END OF SPRAYING DAY	USING YOUR SPRAYER
TASKS PRIOR TO SPRAYING	USING YOUR SPRAYER
TECHNICAL INFORMATION DELTA BOOM	BOOMS
TEEJET	N0ZZLES
THREE WAY BALL VALVE	PLUMBING
TILT HYDRAULIC	BOOMS
TIPS	N0ZZLES
TRANSCAL	TRANS CAL & CHEM PROBE
TRANSCAL RINSING	USING YOUR SPRAYER
TRANSCAL TROUBLESHOOTING	TRANS CAL & CHEM PROBE
TRANSPORT GUIDELINES	USING YOUR SPRAYER
TYRE PRESSURE	TANK, CHASSIS, WHEELS ETC.
TYRES	TANK, CHASSIS, WHEELS ETC.
UDOR RO106 & RO121 PUMP	PUMPS
UDOR RO160 PUMP	PUMPS
UDOR RO210 & RO250	PUMPS
UDOR RO70 PUMP	PUMPS
UNFOLD HYDRAULIC	BOOMS
UNFOLDING FIXED & TWIN LINK BOOMS	BOOMS
VENTURI FILLER	TRANS CAL & CHEM PROBE
WARNING STICKERS	GENERAL INFORMATION
WARNINGS SAFETY	GENERAL INFORMATION
WARRANTY TERMS AND CONDITIONS	GENERAL INFORMATION
WORD OR PHRASE	**SECTION**
WHEEL AXLE LUBRICATION	TANK, CHASSIS, WHEELS ETC.
WHEEL NUTS	TANK, CHASSIS, WHEELS ETC.

WHEEL NUTS & TYRE PRESSURE	TANK, CHASSIS, WHEELS ETC.
WHEEL TRACK ADJUSTING	TANK, CHASSIS, WHEELS ETC.
WHEEL TRACK ADJUSTMENT	TANK, CHASSIS, WHEELS ETC.
WHEELS	TANK, CHASSIS, WHEELS ETC.
WIRING DIAGRAMS	WIRING
XR TEEJET	N0ZZLES

PARTS ORDERING:

When ordering spare parts, please quote.

- **Sprayer Serial No.**
- **Part No.**
- **Part Description**
- **Quantity Required**

When returning parts to GoldAcres or to a GoldAcres dealer for service or repair, **clean thoroughly all parts before sending them**. GoldAcres cannot expose technicians to the various pesticides that are in use. **Please ensure that all parts are clearly labelled with the owner's details, and a brief description of the fault.**

Only products recommended by GoldAcres should be used on GoldAcres sprayers.

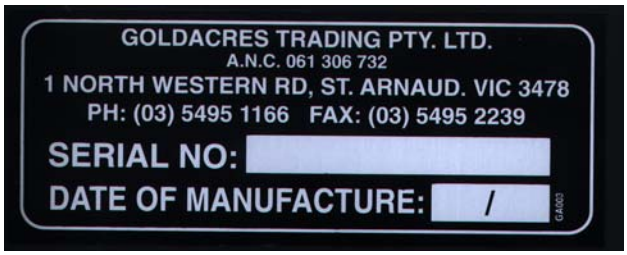
GoldAcres are not liable for the return of any goods to GoldAcres or a GoldAcres Dealer. The goods must be returned to the point of sale. The customer will be responsible for any cost incurred by a GoldAcres appointed person travelling to any site outside the point of sale.

READ THE WARRANTY TERMS AND CONDITIONS

SPRAYER WARNING STICKERS

Thoroughly read and understand all stickers on the sprayer before attempting to operate the sprayer. **It is the responsibility of the owner/operator to ensure that there are no stickers missing from the sprayer.** Regularly review safety-warning stickers with operators. Replacement stickers can be ordered.

Part No: GA001
Left hand side near jack stand, placed between the 'U' bolts



Part No: GA003
Left hand side, top of chassis.

Part No: GA004
Right hand side, top of chassis rail.
PRAIRIE ONLY

Part No: GA064
Right hand side, top of chassis rail.
ROWCROP AND DIRECTOR ONLY

Part No: GA005
Top of pump cover.

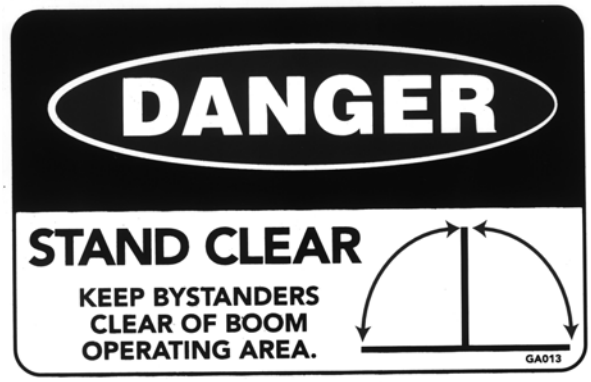
Part No: GA006
On both wheels

Part No: GA007
On 'T' bar on rear of tower, only if hydraulic boom is fitted.

Part No: GA008
On or near pump.

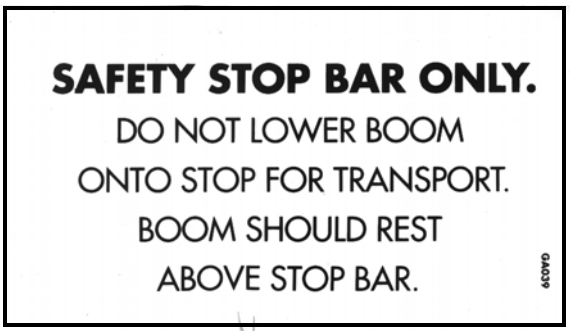
Part No: GA009
On side of hopper.

Part No: GA011
On right side top of chassis near front.



Part No: GA013
On rear of centre section.

Part No: GA032
On air filter at foam compressor box, and air bag compressor box if fitted.



Part No: GA039
On boom stopper bar.

Part No: GA040
On wing rest.

Part No: GA041
On wing rest.

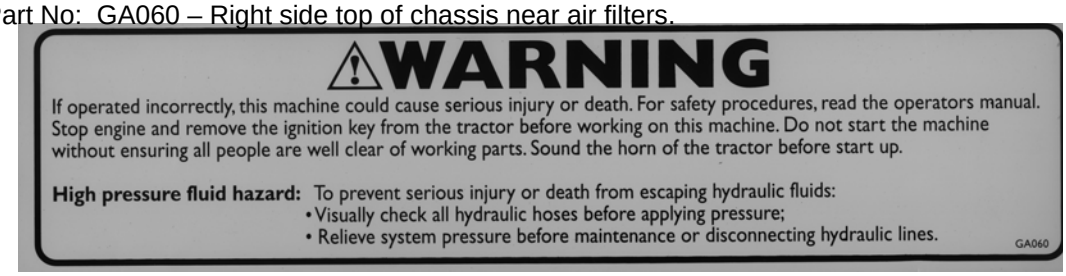
Part No: GA042
Near drain tap on chassis.

Part No: GA045
On 'H' frame and 'T' bar on lift.

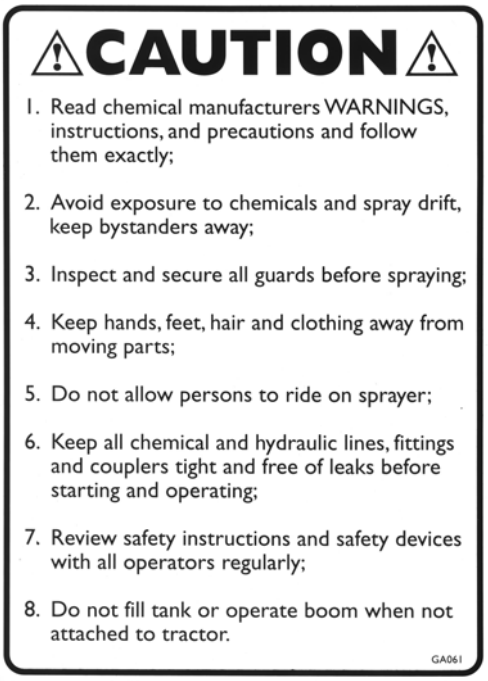
Part No: GA047
On or near pump.

Part No: GA058
On 10 litre flush tank.

Part No: GA060 – Right side top of chassis near air filters.



Part No: GA059 – Special - Left top of chassis near suction filter.
Prairie – Inside floor of locker.



Part No: GA061
Special - On front of tank, high enough to be visible when standing on the platform.

Prairie – Inside door of locker

REMOVE LID WHEN BOTTOM-FILLING FOAM TANK

Part No: GA 043
Next to foam tank on bottle bracket.

FLUSH CHEMICALS FROM EQUIPMENT IMMEDIATELY AFTER USE

Part No: GA 048
Near chemical induction hopper, on the hopper bracket

On mast near bottom of lift cylinder, if hydraulic lift is fitted.

CAUTION!

BEFORE WORKING UNDER THE BOOM

1. **PLACE SUPPORT CHOCKS UNDER THE BOOM FOR ADDED SAFETY.**
2. **ACCESS THE TAP ON THE BOTTOM OF THE LIFT CYLINDER ONLY FROM THE SIDE OF THE SPRAYER.**
   DO NOT USE THIS TAP BY REACHING UNDER THE BOOM.
3. **CLOSE THIS TAP TO PREVENT THE BOOM DECENDING IN THE CASE OF ANY RAPID LOSS OF HYDRAULIC PRESSURE.**

On lift near mast rollers, both sides, if fitted.

WARNING!

DO NOT STAND ON THIS PLATFORM OR STEPS

WHEN THE SPRAYER IS IN MOTION OR THE BOOMS ARE BEING FOLDED OR UNFOLDED

On chassis rail, above the top step, both sides.

WARNING!

DO NOT ENTER TANK
DO NOT CLIMB ON TANK

On tank rim facing upwards so that the sticker is against the tank lid

AVOID BOOM DAMAGE!

1. Booms must not be folded or unfolded whilst the sprayer is moving.
2. Speed must be reduced when directional changes are made.
3. Tilt cylinder operation (when fitted) must be kept to a minimum. Use central lifting cylinder whenever possible. Restrictors must be fitted to tilt cylinders.
4. Do not accelerate or brake quickly.

These precautions become much more important with increases in boom width.

Part Number 086
Inside door of the locker

HOPPER RELEASE

USE CAUTION WHEN LOWERING HOPPER!

1. **SUPPORT HOPPER WITH LEFT HAND**
2. **RELEASE HOPPER CATCH WITH RIGHT HAND**
3. **GENTLY LOWER HOPPER INTO WORKING POSITION.**

Part Number ____
On frame of hopper bracket near release handle

CAUTION!

1. **DO NOT HOLD VACUUM IN THE TANK FOR EXTENDED PERIODS OF TIME OR THE SHAPE OF THE TANK MAY BE AFFECTED.**
2. **<u>ALWAYS</u> RELIEVE ANY RESIDUAL VACUUM FROM THE TRANSCAL TANK IMMEDIATELY AFTER USE.**

Part Number ____
On Transcal bottle near
calibration markings

TRACKED VS WHEELED TRACTORS FOR CROP SPRAYING:

In recent times, a number of tracked tractors have become available, that may be used for crop spraying. These machines perform much differently in the field to their wheeled counterparts. Whilst there are a number of advantages in using tracked machines, including reduced ground compaction, tighter steering on headlands and reduced wheel slip, there are also a number of disadvantages, particularly with regard to crop spraying.
Tracked tractors are able to turn tighter than their wheeled counterparts for two main reasons:

1. The wheelbase of the machine is much shorter than that of a conventional tractor. A shorter wheelbase means that the operator needs to make more corrections when steering the machine to hold the correct line of travel. This creates problems on wide boom sprayers because more shock and vibration is transferred to the boom in the form of whipping, resulting in reduced boom life.
2. Tracked machines have differential steering. Tracked machines are not fitted with a conventional differential as wheeled machines are. Steering is achieved by reducing the speed of a track on one side and increasing it on the other. With this system, the inside track can be brought to a standstill, and when combined with the shorter wheelbase, the machine can be turned around on a very tight turning radius. This very tight turning can cause damage to PTO shafts and universal joints.

Cornering at high speed with tracked machines should be avoided. The shorter wheelbase, coupled with the very tight turning, allows quicker turns than those of a wheeled tractor. This places excessive stress on the boom and boom components, with the result being reduced boom life. PTO components are also more likely to be damaged when turns are attempted at high speeds

Tracked tractors have a much larger footprint than their wheeled counterparts. This translates to reduced ground compaction because the machine's weight is transferred to the ground over a much larger area. Wheel-slip is also reduced because the machine's power is transferred to the ground over this much larger contact area. This means that a tracked machine can be used in field conditions that are less than ideal for wheeled tractors. Using a sprayer in these less than ideal field conditions can result in damage to the sprayer. Boggy conditions can place excessive stresses on the axles and chassis of the sprayer. Rough ground can subject the sprayer to increased vibration, reducing the life of the boom by increasing the likelihood of failure by fatigue.

Where tracked machines are to be used for crop spraying, narrower booms are recommended. This is because they are lighter than the wider booms and also because the dynamic stresses in the boom structure that are created as a result of extra boom width and weight, are also much lower. This will result in much longer boom life.

CONVERSION TABLE

QUANTITY	CONVERSIONS
Length	1 Metre = 1.09 Yards 1 Yard = 0.91 Metres 1 Metre = 3.28 Feet 1 Foot = 0.305 Metres 1 Millimetre = 0.0394 Inches 1 Inch = 25.4 Millimetres 1 Kilometre = 0.621 Miles 1 Mile = 1.609 Kilometres
Area	1 Hectare = 10 000 Sq. Metres 1 Sq. Metre = 0.0001 Hectares 1 Hectare = 2.47 Acres 1 Acre = 0.405 Hectares 1 Sq. Centimetre = 0.155 Sq. Inches 1 Sq. Inch = 6.452 Sq. Centimetres 1 Sq. Metre = 0.093 Sq. Feet 1 Sq. Foot = 10.76 Sq. Metres
Volume	1 Litre = 0.22 Imp. Gallons 1 Imp. Gallon = 4.55 Litres 1 Litre = 0.264 US Gallons 1 US Gallon = 3.785 Litres 1 Litre = 1.76 Imp. Pints 1 Imp. Pint = 0.568 Litres
Mass	1 Kilogram = 2.204 Pounds 1 Pound = 0.454 Kilograms 1 Gram = 0.0353 Ounces 1 Ounce = 28.35 Grams
Velocity	1 Kilometre per Hour = 0.621 Miles per Hour 1 Mile per Hour = 1.609 Kilometres per Hour
Pressure	1 Kilopascal = 0.1450 Pounds per Sq. Inch 1 Pound per Sq. Inch = 6.895 Kilopascals 1 Kilopascal = 0.01 Bar 1 Bar = 100 Kilopascals 1 Kilopascal = 0.102 Metres of Water 1 Metre of Water = 9.81 Kilopascals 1 Kilopascal = 0.0075 Metres of Mercury 1 Metre of Mercury = 133.3 Kilopascals 1 Kilopascal = 0.00987 Std. Atmospheres 1 Std. Atmosphere = 101.325 Kilopascals

READ THE WARRANTY TERMS AND CONDITIONS!

The warranty is void if any damage occurs through misuse, neglect, accident, improper installation or as a result of service or modification by other than an approved GoldAcres person.

WARRANTY TERMS AND CONDITIONS:

Caution! - Goldacres sprayers are engineered to perform correctly within the following limitations:

1	**Sprayers cannot be used in ambient temperatures above 40˚C,**
2	**The maximum spraying pressure is 8 Bars,**
3	**With clean filters fitted, any individual boom section can deliver a maximum of 35 litres per minute,**
4	**With clean filters fitted, the maximum combined flow of all boom sections is limited to 140 litres per minute, or 50% of the pump flow, whichever is the lesser amount.**
IMPORTANT WARNING!	**Any GoldAcres sprayers ordered or operated outside these limitations are not warranted by GoldAcres for successful spray performance. Operators working outside these limitations do so at their own risk, unless specific advice has been sought from, and provided by, GoldAcres, in writing.**

GoldAcres Goods described are only available for purchase upon the warranty terms and conditions set out below.

Interpretation.

In these warranty terms and conditions:

1. “Goldacres” means Goldacres Trading Pty. Ltd. A.B.N. 30 061 306 732 of 1-3 North Western Rd., St. Arnaud. trading as Goldacres Agricultural Equipment (its successors and assigns) which is the seller of the Goods.
2. “Purchaser” means the purchaser of the Goods.
3. “Goods” means the product and, if nay, the services provided.
4. Nothing in these warranty terms and conditions shall be read or applied so as to exclude, restrict or modify or have the effect of excluding, restricting or modifying, any condition, warranty, guarantee, right or remedy implied by law (including the Trade Practices Act 1974) and which by law cannot be excluded, restricted or modified.

General.

1. These warranty terms and conditions (which shall only be waived in writing signed by Goldacres) shall prevail over all terms and conditions of the purchaser to the extent of any inconsistency.
2. This warranty may not be modified or added to without the expressed written consent endorsed hereon of the Managing Director of Goldacres.

Warranty Terms.

The warranty relating to the Goods and all other products sold and, if any, services sold or provided by Goldacres are contained in these warranty terms and conditions.

Specifications, etc: Catalogues, etc: Quantities.

All specifications, (without limiting the generality of same – including: drawings, particulars of weights, volumes, capacities, dimensions, load factors) are approximate only and any deviation shall not be taken to vitiate any contract with Goldacres or form any claim against Goldacres. The descriptions, illustrations and performances contained in catalogues, price lists and other advertising matter do not form part of the contract of sale of the Goods. Where specifications, drawings or other particulars are supplied by Purchaser, Goldacres' price is made on estimates of quantities required. Should there be any adjustments in quantities above or below the quantities estimated by Goldacres and set out in a quotation, then any such increase or decrease shall be adjusted on a unit rate basis according to unit prices set out herein.

Performance, Capacities, Chemicals, Liquids, Application Methods, Environmental Effects

Any performance, volumes, and/or capacity figures given by Goldacres are estimates only. Goldacres shall be under no liability for damages for failure to obtain such figures unless specifically guaranteed in writing and any such written guarantee shall be subject to the recognised tolerances applicable to such figures. The suitability of chemicals and other liquids for any application and the application methods and the environmental effects shall be sole decision and responsibility of the purchaser and the user of the Goods. Goldacres gives no warranty as to the suitability of any chemicals or other liquids for any application, nor the application methods nor the environmental effects which may result from the use of the Goods. Goldacres shall be under no liability for damages arising out of the use of any chemicals, liquids or mixtures in the Goods nor for any application, nor for the application methods nor for the environmental effects which may result from the use of the Goods.

Limit of Liability

1. Goldacres liability for Goods manufactured by it is limited to making good any defects by repairing the same or at Goldacres option by replacement within a period not exceeding either 1000 hours or twelve calendar months, whichever comes first, after the Goods have been dispatched provided that:
2. The defects have arisen solely from faulty materials or workmanship.
3. The Goods have not received maltreatment, inattention or interference.
4. Accessories of any kind used by the purchaser are manufactured or approved by GoldAcres.
5. Where applicable, the seals on the Goods remain unbroken.
6. There has been no improper adjustment, calibration or operation.
7. The use of accessories including consumables, hardware or software (not manufactured by Goldacres) has been approved in writing by GoldAcres.
8. No contamination or leakage has been caused or induced.
9. Any modification to the Goods has been authorised in writing by GoldAcres.
10. There has been no inadequate or incorrect use, storage, handling or application of the Goods.

11. There has been no use or operation of the Goods outside of the physical, electrical or environmental specifications of the Goods.
12. There has been no inadequate or incorrect site preparations.
13. There has been no inadequate or improper maintenance of the Goods.
14. it has not been caused by fair wear and tear, and
15. firstly the Goods have been thoroughly inspected and any damage (from whatever cause) to the Goods (and in particular – the structure, welding, seams, bolts, booms) has been repaired prior to the Goods being operated, used driven or moved and on each occasion the tanks are filled, and
16. There has been no failure to comply with the requirements of all present or future laws or regulations relating to the Goods and/or the use and/or the operation of the Goods. and
17. There has been no failure to maintain a record of hours of operation (which record shall contain full details of all inspections, repairs and maintenance) and produce same to Goldacres at the time of the warranty claim.
18. The defective Goods or any damaged part of the Goods are promptly returned free of cost to Goldacres or a representative of GoldAcres.
19. All warranty related repairs have been carried out with the prior authorisation of GoldAcres.
20. If Goods or any part thereof are not manufactured by Goldacres, in particular engines, engine accessories, transmissions, transfer cases, differentials, tyres, tubes, batteries and radios and UHFs, the guarantee of the manufacturer thereof shall be accepted by the purchaser and is the only guarantee given to the purchaser in respect of the Goods or that part.
21. In the case of hydraulic systems, Goldacres shall replace defective parts in accordance with section 6(1) of these conditions, provided that the failure of the part was not related to contamination within the system, Goldacres shall not be liable for labour in the case of repairing hydraulic system defects.
22. This warranty does not extend to components considered as normal wear items including, but not limited to nozzles, chains, belts, filters, brake pads, polyethylene bushes and liquid pump valves, valve O-rings, diaphragms and seals.
23. GoldAcres shall not be liable for and the purchaser releases Goldacres from any claims in respect of faulty or defective design of any Goods supplied unless such a design has been wholly prepared by Goldacres and the responsibility for any claim has been specifically accepted by Goldacres in writing and in any event Goldacres liability hereunder shall be strictly limited to the replacement of defective parts in accordance with paragraph 6 (1) of these conditions.
24. except as provided herein, all express and implied warranties, guarantees and conditions under statute or general law as to the merchantability, description, quality, suitability or fitness of the Goods for any purpose or as to design, assembly, installation, materials or workmanship or otherwise are hereby expressly excluded and Goldacres shall not be liable for physical or financial injury, loss or damage or for consequential loss or damage of any kind arising out of the supply, layout, assembly, installation or operation of the Goods or arising out of Goldacres negligence or in any other way whatsoever.
25. This warranty shall only be available to the Purchaser and shall not be transferable by the Purchaser.
26. This warranty in no way extends to any used Goods.

Goldacres liability for a breach of condition or warranty implied by Div. 2 of Pt. 5 of the Trade Practices Act 1974 (other than s 69) is hereby limited to:

(1) in the case of Goods, any one or more of the following:
   a) The replacement of the Goods or the supply of equivalent Goods.
   b) The repair of the Goods.
   c) The payment of the cost of replacing the Goods or acquiring the equivalent Goods.
   d) The payment of having the Goods repaired. or

(2) In the case of services.
   a) The supplying of the services again. or
   b) The payment of the cost of having the services supplied again.

Goldacres liability under s 68A and s 74H of the Trade Practices Act 1974 is expressly limited to a liability to pay to the purchaser an amount equal to:

1. The cost of replacing the Goods.
2. The cost of obtaining the equivalent Goods. or
3. The cost of having the Goods repaired, whichever is the lowest amount.

New Owners of 33 & 36 Metre Booms

The development of booms larger than 30 meters has highlighted the requirement by operators to assess and be **constantly aware** of the effect of turning and directional changes on boom stability and structural strength integrity.

The outer boom sections on a 36 Mt boom travel much faster when turning than a 30 Mt boom during the same turning operation.

As boom width increases, the acceleration and deceleration forces increase exponentially.

The wider the boom, the slower the turning speed must be to avoid boom damage.

Turning includes any directional changes such as manoeuvring around a tree or other obstacles, as well as **"end of run"** turns. Booms should never be **"whipped around"** in such a manner that the boom breakaways are activated.

Folding the boom (or unfolding) whilst moving has always been inadvisable because of the severe strain put on the boom and its support structure.

Again, this is even more critical with wider booms which have far greater overhanging weight, and must be avoided.

The Goldacres 33 & 36 Metre booms are performing extremely well, but additional care must be taken in their operation to avoid boom damage.

If any doubt exists please consult Goldacres for more information.

01 PR USING YOUR SPRAYER- INDEX:

WARNING:

ENSURE THAT THE AREA AROUND THE SPRAYER WILL NOT BECOME SLIPPERY WHEN WET.

TROUBLESHOOTING:

Useful formulas for calculating application rates.

Glossary:

L/min =	Litres per minute.
L/ha =	Litres per hectare.
Km/h =	Kilometres per hour.
W =	- Nozzle spacing (in cms) for broadcast spraying. - Spray width (in cms) for single nozzles, band spraying or boomless spraying. - Row spacing (in cms) divided by the number of nozzles per row for directed spraying.
M =	Metres of distance

$$\textbf{L/min (per nozzle)} = \frac{\text{L/ha} \times \text{Km/h} \times \text{W}}{60{,}000}$$

$$\textbf{L/ha} = \frac{60{,}000 \times \text{L/min (per nozzle)}}{\text{Km/h} \times \text{W}}$$

$$\textbf{KPH} = \frac{\text{M} \times 3.6}{\text{Time (seconds)}}$$

PREPARE THE SPRAYER FOR USE:

Read this manual thoroughly.

1. **BEFORE STARTING THE SPRAYER IN COLD CONDITIONS.**
   If the sprayer has been 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.
2. Inspect the sprayer to ensure there is no damage or wear which could lead to injury, further damage or reduce its performance.
3. Check all hoses and fittings for leaks or damage. Check the sprayer to ensure frosts and/or vermin have not damaged the machine, and that the tyres are correctly inflated.
4. Check all bolts and nuts to make sure they are tight and secure.
5. Complete the scheduled lubrication.
   (a) PTO shaft as described in **"Pumps".**
   (b) Boom as described in **"Booms".**
   (c) Wheels and axles as described in **"Spray tanker".**

Proper grease is essential for the sprayer 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. GoldAcres recommends that multi-purpose grease should be used for all lubrications. Make sure all open-end bearings are lubricated their full length by forcing lubricant into them until it begins to appear at the sides.

6. When hitching a sprayer it is critical that the PTO Shaft is correctly installed. Points to consider are:
   - MAXIMUM OPERATING LENGTH
   - MAXIMUM JOINT OPERATION
   - COUPLING THE PTO SHAFT
   - CHAINS

More information on correctly installing the PTO Shaft can be found in the section "**Pumps**".

7. Be sure to adequately clean and flush all chemical handling equipment.
8. All spray equipment should be cleaned at the start and end of each spray season including all filters and nozzles.
9. Test the pump with clean water. To start the pump, engage the PTO at the lowest revs possible and then gradually increase revs until the pump reaches its operating speed. **Do not run diaphragm pumps above 540 R.P.M.**
10. Check nozzle patterns for irregularities. If there are irregularities, clean the nozzles and replace. If the problem persists they could be worn so remove and replace.
11. Make sure there is a sufficient quantity of clean water in the rinse water tank in case of a chemical accident.
12. Arrange communication with someone who can come to your aid if need be.

TRANSPORTING THE SPRAYER:

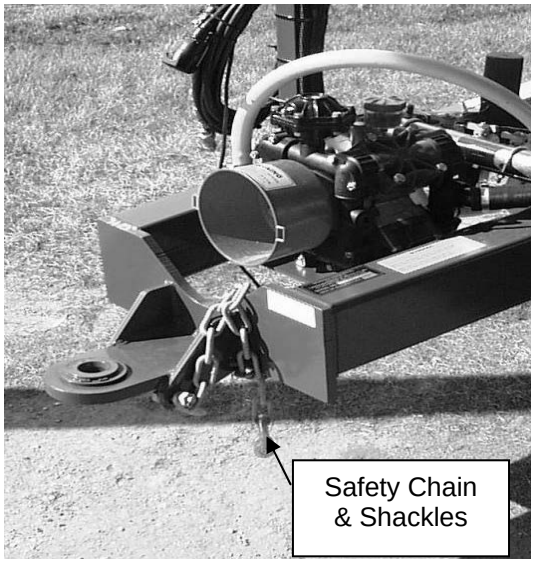
1. Inspect the sprayer to ensure there is no damage or wear.
2. Check all bolts and nuts to make sure they are tight and secure.

CHECK WHEEL NUTS REGULARLY.

3. Ensure that the scheduled lubrication has been completed for wheels and axles as described in **"Spray tanker".**
4. Check tractor oil, water and fuel.
5. Make sure the sprayer is securely hitched.
   - PTO shaft is properly fitted. PTO shafts that are too short may come apart and disengage drive and may cause damage to pump. PTO shafts that are too long will damage the universal joints and pumps.
   - Tail/indicator lights on the sprayer are connected via the 7-pin trailer plug. (if fitted on sprayer)
   - Safety chain is attached. Always allow sufficient length of chain so that the chain will not tighten and pull excessively on the towing vehicle, and avoid having too much chain so that the chain drags on the ground.
   - Ensure that the draw bar pin is not a tight fit in the draw bar. The draw bar tongue is fitted with a replaceable, hardened insert, and there are 2 sizes available. The insert is internally tapered at the top and bottom to allow some pin movement. A tight draw bar pin may cause the draw bar to bend if the angle between the sprayer and the tractor changes, such as when the sprayer is towed through a ditch or gutter.

Road safety regulations require towed agricultural vehicles to be fitted with a safety chain when towing.

GoldAcres Prairie tankers and ground glider booms are fitted with a 1 metre safety chain. This chain wraps around a suitable member of the towing vehicle and attaches back on itself by means of the 'D' shackle supplied. The chain is constructed from 10 tonne rated alloy links and the 'D' shackles are Grade 'S' alloy shackles made in accordance with AS2741 - 1992.



ALWAYS SECURELY ATTACH SAFETY CHAIN TO TOWING VEHICLE WHEN MOVING SPRAYER
Always ensure that the boom is securely supported when travelling.

6. The tare weights of the Prairie sprayers will normally exceed 1,500 kg, and reach up to 5000 kg.
7. The gross weight of the Prairie sprayers may exceed up to 11,000 kg.
8. The tare weight of the ground glider trailing boom will normally exceed 1,000 kg.

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

In some situations, (i.e. spraying foliar fertilizers) the tank will not be able to be fully filled as these products can weigh up to 30% more than water.

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

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

10. Make sure the tractor has sufficient towing and braking capacity to carry the sprayer.
11. All relevant towing regulations must be adhered to when transporting the sprayer. (I.e. speed regulations, oversize signs, flashing light, etc.) **It is the operator's responsibility to know the relevant regulations**.
12. The maximum speed of a Rowcrop or Director sprayer is 20 KM/H **at all times**.
13. The maximum speed of a loaded Prairie sprayer, (i.e. with any amount of water in the tank) is 20 km/h.
14. The maximum speed of a Prairie sprayer with the tanks completely empty is 40 km/h. This speed may need to be reduced to comply with state speed regulations. If transporting on a public road, make sure that the driver and sprayer comply with all relevant regulations.

CALIBRATING YOUR SPRAYER and PREPARING TO SPRAY:

WARNING:

If spraying is to be done at night, ensure that adequate lighting is available around the sprayer and the area to be sprayed.

- ✓ **The amount of lighting around the sprayer needs to be sufficient for all labels and warnings on the sprayer to be clearly visible to the operator.**
- ✓ **The amount of lighting in the area to be sprayed needs to be sufficient for obstacles in the path of the sprayer to be clearly visible to the operator.**

The Cancer Council of Victoria recommend that before you undertake outdoor activities;

"SLIP on a shirt, SLOP on sunscreen and SLAP on a hat".

FLOWMETER

- If there is a flowmeter on the sprayer, there will be a calibration number attached to it on a white sticker. The number that is applicable is the one in square brackets, i.e. [185]. Note this number down as this is the number that should be entered as the Meter Cal. number.
- The Flowmeter should be checked at the start of every spraying season and periodically during the season.
- The simplest way to check the accuracy of the flowmeter is to fill the tank to a previously determined volume mark (usually top fill marking) and then empty the tank through the flowmeter (i.e. via a self-test).
- Compare the reading from the flowmeter with the previous known volume. If there is a relatively large discrepancy (i.e. more than 50 litres out of a 3000 litre tank), the flowmeter should be removed from the sprayer, disassembled and the condition of the turbine checked and cleaned (make sure it spins freely).
- The flowmeter should then be reassembled and replaced on the sprayer. Perform the volume check again and if there is still a discrepancy, the Meter Cal No. can be changed.

  i.e.: If volume reads 3100 litres instead of 3000 litres and the original Meter Cal value is 185

  New Meter Cal value = 185 x 3100 ÷ 3000 = 191

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

ENSURING YOUR SPRAY NOZZLES DELIVER THE CORRECT AMOUNT OF CHEMICAL.

As part of your daily sprayer calibration, Goldacres recommends you carry out a simple **"JUG TEST"** to ensure the spray nozzles you are using are delivering the correct amount of chemical, as stated in your Nozzle Supplier's **"Rate Chart".**

The method of carrying out the **"JUG TEST"** is as follows;

1. You will need:
    a. A calibrated measuring container that can measure the medium in litres, in 10 ml increments. e.g. 0.45 Lt.
    b. A timing device showing seconds.
    c. A pressure gauge mounted at the nozzle tip to verify the system pressure being delivered at the nozzle. Goldacres part numbers QJ4676-45-1/4-NYR & Q590-2-NY will mount a suitable gauge to the nozzle body bayonet fitting. (Not including gauge).

Procedure:

2. Check the plumbing system for kinked or obstructed hoses and repair or replace any hoses that restrict the normal flow of the liquid.
3. Start your sprayer
    - For sprayers not fitted with a spray application controller, set the boom operating pressure to the pressure at which you expect to spray.
    - For sprayers fitted with a spray application controller, initiate a 'self test' procedure and set the application rate and speed to the settings depicted in your "Rate Chart" at which you expect to spray.
4. Then place the jug under one of the nozzles, for 1minute (exactly) and the record the volume of liquid collected.
5. Repeat the test over a representative sample of the jets in each boom section.
6. Compare the volume collected from each nozzle to the stated volume in your "Rate Chart". It should be no more than plus or minus 10% of the volume stated in your Nozzle Supplier's **"Rate Chart".**
7. In the event that any of your nozzles do not deliver the required volume, a further investigation is required which may include, but not be limited to;

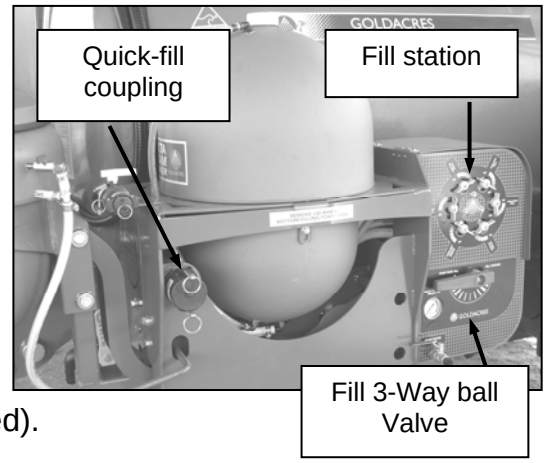
- ✓ Cleaning the nozzles, using the method recommended by the nozzle supplier.
- ✓ Replacing the nozzles.
- ✓ TeeJet advise that nozzles that flow greater than +10% of their stated volume are 'worn out' and should be replaced.
- ✓ Cleaning nozzle filters.
- ✓ Placing filters.
- ✓ Replacing pump diaphragms.
- ✓ Replacing the pump.
- ✓ Ensuring that the application rate required does not exceed the maximum flow and pressure parameters of the sprayer.

UNEVEN VOLUMES FROM INDIVIDUAL NOZZLES WILL RESULT IN VARIATIONS IN THE APPLICATION RATE ACROSS THE WIDTH OF THE BOOM. SPRAY EFFICACY WILL BE REDUCED. CROP DAMAGE MAY RESULT.

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

"Download you free copy of "A user's guide to spray nozzles" from the TeeJet website, www.teejet.com"

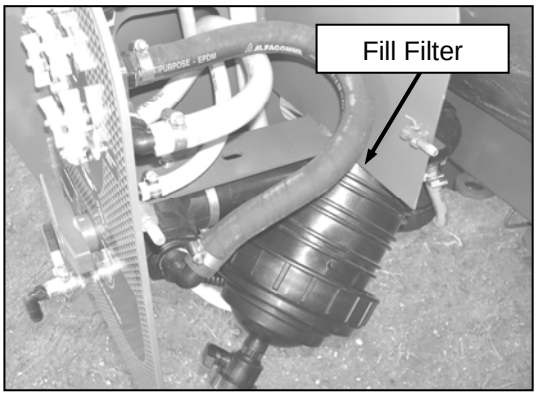
ADD WATER TO THE SPRAYER:



FILL SYSTEM

The fill system incorporates the fill station, the flush filter, the Fill 3-way ball valve and the quick-fill coupling. This system provides an easy method of utilising flow from the fresh water pumping supply to fill the various tanks on the sprayer and to rinse chemical drums via the induction hopper and the hopper itself (if fitted).

The maximum filling pressure provided by the fresh water pumping system should not exceed 690 kPa (100 psi).



GOLDACRES TANK FILL LIMITER

The GoldAcres tank fill limiter will assist in the prevention of tank overfilling and is fitted inside the top of the tank in the quick fill line.

Key features:

- ✓ A robust float valve that reduces flow to the tank when the maximum tank capacity has been reached.
- ✓ Heavy duty stainless steel butterfly valve.
- ✓ Allows tank filling to be done at full speed, whilst minimising the risk of overflow.

FILL FILTER

Clean the fill filter before connecting the filling hose to fill the sprayer!

WEAR ALL NECESSARY PROTECTIVE CLOTHING WHEN CLEANING ANY FILTER TO AVOID EXPOSURE TO CHEMICALS

WATER IN THE TANK MAY BE CONTANIMATED WITH CHEMICAL. DO NOT FILL THE SPRAYER IN SUCH A MANNER THAT IT MAY BE POSSIBLE FOR WATER IN THE TANK TO ENTER THE WATER SUPPLY.

DO NOT USE THE QUICK-FILL AS A DRAIN LINE.

FILL THE SPRAYER ON LEVEL GROUND.

QUICK FILL THE MAIN SPRAY TANK

The main tank should always be filled through the quick-fill. This line fills through the top of the tank and then through a hose inside the tank so that the water is deposited in the centre of the tank.

To fill the main spray tank from the fresh water supply via the quick-fill:

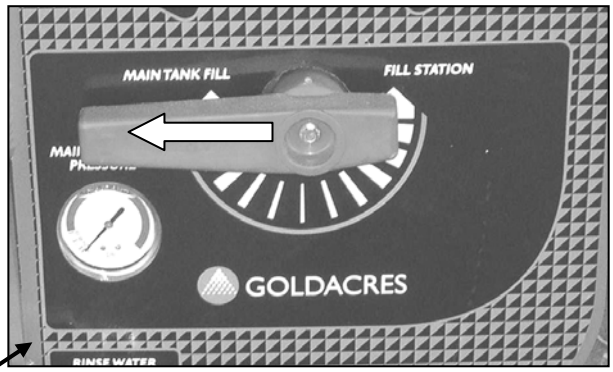
1) Make sure that initially the red handle on the fill 3-way ball valve is vertical so that there can be no flow coming out of the tank if it is not already empty.

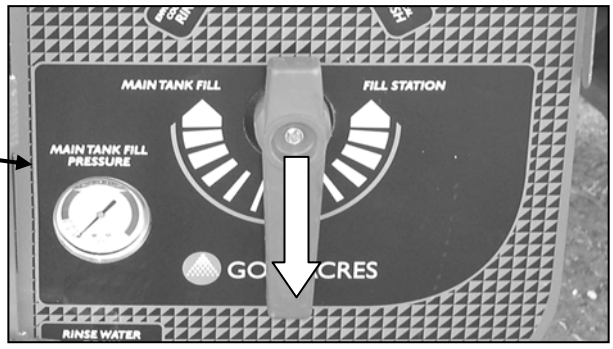
2) Connect the fresh water fill hose to the quick-fill coupling.

3) Operate the fresh water pumping system. (Make sure pressure does not exceed 100 psi)

4) Turn the red handle on the fill 3-way ball valve **left** so that the fresh water is directed to the hose going to the top of the main spray tank.

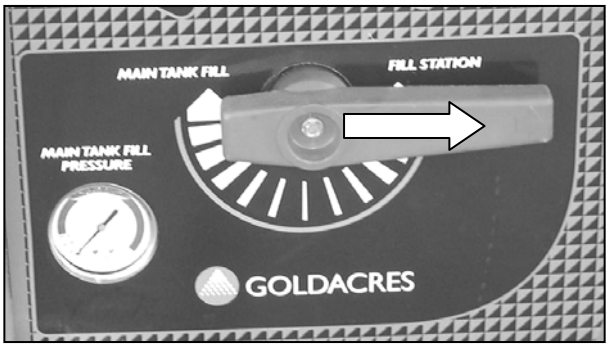
5) When the required amount of water has been transferred to the main spray tank, stop the flow by turning the red handle to **vertical**.





FILL THE RINSE WATER TANK

To fill the rinse water tank from the fresh water supply via the quick-fill and fill station:



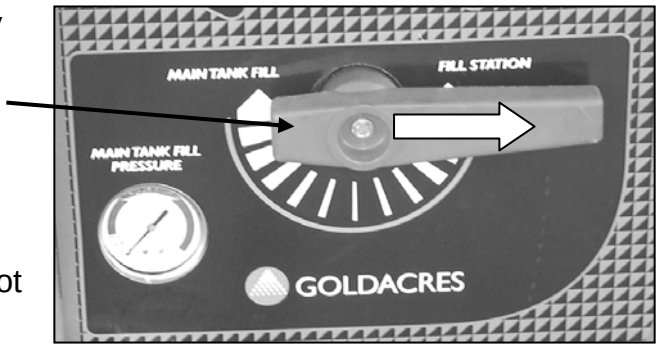
1) Start by ensuring that all ball valves on the fill station are turned off.
2) Ensure that the red handle on the fill 3-way ball valve is vertical.
3) Connect the fresh water fill hose to the quick-fill coupling.
4) Operate the fresh water pumping system. (Make sure pressure does not exceed 100 psi)
5) Turn the red handle on the fill three-way ball valve **right** so that the fresh water is directed to the fill station.
6) Turn the 'Rinse Water Fill' ball valve to 'ON'. (There should now be flow transferring to the rinse water tank)
7) When the required amount of water has been transferred to the rinse water tank, turn the 'Rinse Water Fill' ball valve to 'OFF' and stop the flow by turning the red handle back to vertical.

FILL THE FOAM TANK

The standard size Exacta foam tank holds approximately 100 litres.

To fill the foam tank from the fresh water supply via the quick-fill and fill manifold:

1) Start by ensuring that all ball valves on the fill station are turned off.
2) Ensure that the red handle on the fill 3-way ball valve is vertical.
3) Connect the fresh water fill hose to the quick-fill coupling.
4) Remove the lid from the foam tank.
5) Operate the fresh water pumping system. (Make sure that the pressure does not exceed 100 psi)



6) Turn the red handle on the fill 3-way ball valve **right** so that the fresh water is directed to the fill station.
7) Turn the 'Foam Marker Fill' valve to 'ON'. There should now be flow transferring to the foam tank. Fill to about one-third full.
8) Where a direct injection system is not fitted, add the required amount of foam concentrate for the whole tank mix. (E.g. 2 litres of GoldAcres foam concentrate if filling a 100 litre foam tank from empty)
9) Continue to bottom-fill the foam tank until the desired amount has been transferred. The bottom-filling should serve to adequately mix the concentrate and water with a minimum of frothing.

10)When the required amount of water has been transferred to the foam tank, turn the 'Foam Marker Fill' valve to 'OFF', and stop the flow by turning the red handle back to vertical.
11)Refit lid to tank, making sure the lid is screwed on securely and that the o-ring is in place inside the lid.

REMOVE THE LID WHEN BOTTOM FILLING FOAM TANK

100 litre foam tank

GENERAL INFORMATION ABOUT HANDLING & USING CHEMICALS:

Prior to using any chemical, always read and heed the chemical label, and fully understand all the safety procedures.

1. CHEMICAL TRANSPORT

- When transporting chemicals, make sure they are isolated from the driver and any passengers.
- The containers should be securely stowed and lids should be firmly fitted to prevent leakage.
- All safety equipment and food should be carried in a location where it can not be contaminated by the chemicals.
- Care should be taken whilst driving to minimise chemical spills.
- The vehicles need to display the appropriate signs as determined by the relevant authority.

2. CHEMICAL HANDLING, FIRST AID, POISONING AND STORAGE:

- Always ensure there is a supply of clean water readily accessible when spraying in case a chemical accident occurs. If a rinse water tank is not fitted as original equipment, it is the operator's responsibility to do so. GoldAcres can provide a rinse water tank (flush tank) with any of its sprayers.
- **Before using any chemical product, read and heed the instructions on the chemical label, and be sure that the instructions are fully**

understood. If confusion still arises, contact your local chemical supplier or chemical company.

- The chemical label will outline the safety instructions, mixing requirements and the chemical compatibility.

3. CHEMICAL SPILLS

- In the advent of a spillage, have bystanders moved.
- Put on recommended protective clothing as per chemical label.
- If possible, return uncontaminated chemical to the original container.
- Restrict the movement of the spillage as quickly as possible.
- Only hose down a spill, if the label suggests so. Many chemicals must not be hosed down as this will spread the chemical over a larger area.
- If the spill is on concrete, adsorb with sand or soil.
- If the spill is on soil, remove the top 5 cm of soil and dispose of in the appropriate manner (contact the relevant government Department of Agriculture, or Natural Resources, or your local council).
- Place all contaminated materials in a clearly labelled container for later disposal.
- Clean all protective clothes and equipment after use.

ADD CHEMICALS TO THE SPRAYER:

Warning:

In some situations, (i.e. spraying foliar fertilizers) the tank will not be able to be fully filled as these products can weigh up to 30% more than water.

To add chemicals to your sprayer, utilise the following equipment:

1. **Trans-cal system,** is used to transfer and measure liquid chemicals. Refer to the section “Trans-cal & chemical probe” for more information.

2. **Chemical probe only,** is used to transfer liquid chemicals. Refer to the section “Trans-cal & chemical probe” for more information.

3. **Induction hopper,** is used to transfer and measure liquid chemicals, or it can be used for some mixing and transfer of dry chemicals. Refer to the section “Induction hopper” for more information.

4. **Envirodrum coupler,** may be used in conjunction with a chemical probe or trans-cal system. Refer to the “Trans-cal & chemical probe section for more information.

READ THE LABEL - HEED THE LABEL

- Carefully observe the safety directions when using any chemical.
- Be sure to calculate the quantity required before decanting.
- When exposed to chemicals, wear the protective clothing stated on the label.
- Always wash hands after handling chemicals and never eat, drink or smoke while decanting or mixing.
- Use accurate measuring devices, and use them solely for the purpose of measuring farm chemicals. Never use kitchen utensils.
- The mixing site should be selected to minimise the risk of any spills entering the watercourses or damaging adjacent desirable vegetation. To facilitate accurate measuring, the site should be level and relatively free of other objects to prevent accidents. There should be a plentiful supply of clean water for mixing and washing, and the area should be well lit so that labels can be easily read.

CERTAIN CHEMICALS MAY BE UNSUITABLE FOR USE WITH A SPRAYER FITTED WITH STANDARD PLUMBING. CONSULT WITH GOLDACRES ON YOUR PARTICULAR REQUIREMENTS

DO NOT USE FLAMMABLE CHEMICALS IN THE SPRAYER.

- Before attempting to use your GoldAcres sprayer with any chemicals, the application rate in litres per hectare and the droplet spectrum need to be considered. This information should be readily available from your chemical agronomist and the chemical label. The key elements to determine are the rate per hectare to be applied and the optimum droplet spectrum to use.
- With the application volume known, it is then a matter of selecting the correct nozzle size, operating speed, and pressures to achieve the optimum droplet size for the given target. Climatic conditions also need to be considered when selecting nozzles. A larger sized nozzle may be suited if the conditions are windy to reduce spray drift, or if conditions are very dry and hot to reduce droplet evaporation. Varying concentrations of chemical added to the water and the addition of adjuvants such as wetters and oils will also affect droplet production. These issues must be discussed with your chemical agronomist. Nozzle charts are readily available for selecting the appropriate nozzle for the task. A key element to consider when selecting jets is that a smaller sized nozzle will produce a finer droplet spectrum. Smaller droplets provide greater coverage, however at the cost of being more prone to off-target drift and evaporation. As a result the correct selection of nozzles does require some thought, to achieve the most effective result. For more information about nozzles refer to the spraying systems (Tee jet) catalogue.

1. **Many chemicals are corrosive to metal and painted surfaces.** The supplied paint protector must be applied to the sprayer prior to the commencement of spraying to protect sprayer from chemical attack. Additional paint protector can be supplied from GoldAcres, or alternative protectors such as fish oil or summer oil, can be used. **In particular, the Booms should be protected from chemical attack because they are continually in the spray cloud during spraying.**
2. Ensure that fresh water has been added to the spray tank. The chemical mixing requirements include the minimum amount of water to add, prior to inducting any chemical.
3. Start the pump by engaging the PTO at the lowest revs possible and gradually increase revs until the pump reaches its operating speed (operate pump between 400-540 RPM). **Do not exceed 540 R.P.M.**
4. If a hydraulic drive is fitted to the pump, couple the hydraulic lines and engage the hydraulic drive.
5. After the minimum amount of water has been added to the spray tank, begin adding the chemical.
6. Allow the pump to agitate the tank mixture while filling. It is normal practice to agitate the spray mixture before commencing spraying. The chemicals need to mix uniformly throughout the spray mixture in order to achieve a correct spray application. Agitation is primarily a function of pump capacity, such that the larger the pump, the greater the amount of bypass and hence the greater amount of agitation for a given spraying application. This bypass agitation enters the rear of the tank via the supermix agitator. To assist with the agitation, a pressure line from the control manifold also goes to the supermix agitator at the back of the tank. The pressure relief valve line goes to the front of the tank.

To achieve satisfactory agitation, the following guidelines are recommended:

- Add 20 percent of the tank's volume of clean water to the main spray tank.
- Carefully add all chemicals (more water may be needed in the tank initially if adding granular or powder chemicals).
- Add the remaining water (this will then help to mix the chemicals).
- Agitate with pump at operating speed (max. 540 RPM).
- Check to ensure supermix agitator is working (there should be visible circulation of water near the back of the tank near the agitator). If it is not working, wait until sprayer is empty (important) and then unscrew and clean nozzle.
- If chemicals are added after the tank has been filled, or if the spray mixture has been allowed to settle, agitate for as long as it takes the pump to pump the quantity of water in the tank (i.e. for 3000 litres in tank with a 121 litre/min. pump, agitate for 3000 ÷ 121 = 25 minutes approx.).

In order to agitate before spraying:

- Have all boom lines switched off (i.e. solenoids).
- Operate pump and regulate pressure to near operating pressure.
- Ensure the supermix agitator ball valve is open.
- Ensure the bypass line ball valve is open.

NOTE: If the pressure is too high when agitating, it is probably because the butterfly in the electric control valve is almost shut and the pressure relief valve has to bypass too much flow back to the tank. To enable agitation to occur at a lower pressure alter the orientation of the butterfly in the control valve so that it can allow more bypass back to the tank:

- With the pump off, the three boom switches on and the master switch on, put the Rate1/Rate2/Man switch to Man and the Inc/Dec switch to 'Dec' and hold for at least 5 seconds **(440 Console)**
- With the pump off, the three boom switches on and the master switch on, put the Off/Man/Auto switch to Man and the Inc/Dec switch to Dec and hold for at least 5 seconds **(330 Console)**

To agitate while spraying:

- With the solenoids on for spraying purposes, have the bypass line ball valve and the supermix agitator ball valve open.
- Continue adding the fresh water until reaching the required amount. Never leave a spray mixture in the tank for extended periods. (i.e. overnight)
- Check to ensure the supermix (venturi) agitator is working properly. (there should be flow in the agitation line and circulation in the tank)
- Keep chemicals agitated until spraying.
- It is important to flush the envirodrum coupler and the trans-cal with fresh water immediately after adding chemicals to the sprayer. Inadequate rinsing will allow chemical to build up in the chemical system. **The envirodrum coupler will need to be rinsed before the trans-cal.**

AFTER ADDING CHEMICALS, RINSE THE SPRAYER ACCESSORIES:

For rinsing instructions, refer to the appropriate section within the 'Operators manual":

1. **Trans-cal system.** Refer to the section "Trans-cal & chemical probe" for more information.

2. **Chemical probe only.** Refer to the section "Trans-cal & chemical probe" for more information.

3. **Induction hopper.** Refer to the section "Induction hopper" for more information.

4. **Envirodrum coupler.** Refer to the "Trans-cal & chemical probe section for more information.

START SPRAYING:

1. Unfold the boom according to the relevant boom instructions in this manual. **KEEP CLEAR OF OVERHEAD OBSTRUCTIONS – ESPECIALLY POWERLINES AS CONTACT CAN CAUSE DEATH.** (Note: the Delta boom must be raised clear of rests when unfolding or serious boom damage may result)
2. Booms must not be folded or unfolded while the sprayer is moving. When the boom is between fully open and fully closed, there can be large stresses placed on many boom components. If the sprayer is moving and hits a bump, severe damage to the boom can occur.
3. The maximum speed for a Rowcrop sprayer **with any load** is 20 KM/H.
4. Speed must be reduced when directional changes are made. Although the outer sections of the booms are now made from aluminium to reduce inertial forces, there is still significant stress placed on springs and dampeners when turning. Sharp changes in direction can cause severe damage to the boom.
5. The use of tilt cylinders (when fitted) should be kept to a minimum, and restrictors to slow down the speed of their operation **must** be used. Tilt operation affects the balance of the boom causing a violent rocking of the whole boom assembly. When the tilted boom is returned to the level position, considerable stress is transferred along the boom section. Wherever possible the boom should be raised with the lifting cylinder rather than the tilt, providing a level and dampened change in boom height.
6. Recognise any obstructions or irregular surface features in the intended pathway which may affect the boom operation.
7. Do not drive sprayer too close to any obstruction. (i.e. fence, tree)Do not carry any persons or chemical containers on the sprayer whilst it is moving.
8. Correctly use the appropriate control system to apply the required application rate.

9. Frequently check nozzle spray pattern whilst spraying. Clean all filters at the end of every tank load and clean all nozzles regularly.
10. When spraying is to be halted for short periods of time, keep the sprayer pump running to provide sufficient chemical agitation.
11. It is important to flush the spray components with fresh water at the end of every tank load. Inadequate rinsing will allow chemical to build up in the spray system.
12. Frequently check pump for any changes to oil colour.
13. If there are any alterations, especially with pump performance, **STOP IMMEDIATELY.**

END OF SPRAYING DAY TASKS:

ENSURE THAT THE SPRAYER IS PARKED ON A FIRM SURFACE THAT WILL NOT BECOME SLIPPERY WHEN WET.

Sprayer decontamination

A typical sprayer decontamination procedure is indicated below. You must always ensure your Goldacres Sprayer is decontaminated using the procedure recommended by your chemical supplier.

Preliminary cleaning

The spray unit should always be cleaned in an area where the water used can be run to waste without causing any environmental damage.

Ideally, a soak pit should be provided to collect the run-off and hold it until soil organisms
degrade any chemicals it contains. If this is not possible, a site should be chosen where
washings will soak into the ground without running away.

The site should not be close to any vegetation that could be damaged, and there should be no chance of subsoil seepage reaching watercourses, wells or dams.
The following procedure is recommended for the preliminary cleaning of spraying equipment:

1. Hose down the outside of the unit; otherwise any herbicide adhering to the outside could contaminate the unit again after it has been cleaned.
2. Remove and thoroughly scrub all filters. Nozzles should also be removed and cleaned.
3. Particles of sulfonylurea have been known to collect on filters when the initial dispersion in the tank has not been complete.
4. Wash down the inside of the tank and flush out all lines and pumps. The nozzles may have to be replaced to do this. Care should be taken to wash out any indentations or ledges in the tank where herbicide could be deposited.
5. Carry out the special chemical cleaning detailed below if necessary. Enough water should be added to the tank to fully flush all lines with cleaning solution.

Chlorine bleach cleaning

This method should be used to remove **sulfonylurea's** and most other pesticides from sprayers.

Chlorine is a powerful oxidising agent and will decompose most organic molecules.
The most convenient source of chlorine is from liquid household bleach, liquid swimming pool chlorine or from solid pool chlorine granules.

Household bleach contains about 4 per cent available chlorine, liquid pool chlorine about 12.5 per cent (both as sodium hypochlorite), while solid pool chlorine contains 65 per cent available chlorine as calcium hypochlorite. When added to water, hypochlorite reacts to form free chlorine. Solid pool chlorine also produces a sediment of calcium oxides.

The procedure is as follows:

1. To each 100 L of water in the tank, add 300 mL of 4 per cent bleach; 100 mL of 12.5 per cent liquid pool chlorine, or 6 g of 65 per cent solid pool chlorine granules.
2. Agitate and circulate solution through all lines. The sprayer can be run briefly to fill the boom let the unit stand for 15 to 30 minutes, then drain.
3. Repeat step 1. The solution may be left to soak overnight for an especially thorough cleaning.

Alkaline cleaning

This method is recommended after using acidic chemicals such as **2,4-D, MCPA, dicamba, picloram and Garlon®**.

The alkaline solution can dissolve these herbicides and, if they were ester formulations, strong alkali is able to hydrolyse the molecules, converting them to a water-soluble form that is more easily remove.

Ester formulations are particularly bad contaminants, because they penetrate rubber and plastic seals and hoses. From there they can be gradually released into subsequent sprays and cause crop damage.

Water-soluble amine formulations

1. Add either 800 mL of household ammonia, 250 g of sodium carbonate (washing soda), or 200 g of sodium hydroxide (caustic soda) to each 100 L of water in the tank. Agitate and circulate the solution through all lines. Run the sprayer briefly to fill the boom.
2. Let the unit stand for two to three hours, then drain.
3. Repeat step 1. The solution may be left to soak overnight for an especially thorough cleaning.

The pumping system must be flushed with fresh water at the end of every day of spraying. Chemical should never be left in the sprayer or pumping system for a prolonged period of time (i.e. overnight). Thorough decontamination of all equipment should be an integral part of the spraying procedure. This will prevent chemical residue from building up to a concentration where it can damage equipment and contaminate following spray mixtures.

All spray equipment should be cleaned after each spray application and at the start and end of each spray season.

DO NOT USE WATER THAT CONTAINS A HIGH MINERAL CONTENT (BORE WATER) AS THE DURABILITY AND APPEARANCE OF YOUR SPRAYER MAY BE AFFECTED. GoldAcres recommend that sprayers and booms in particular, are coated with protecting oil (such as fish oil) at the start of each day's spraying.

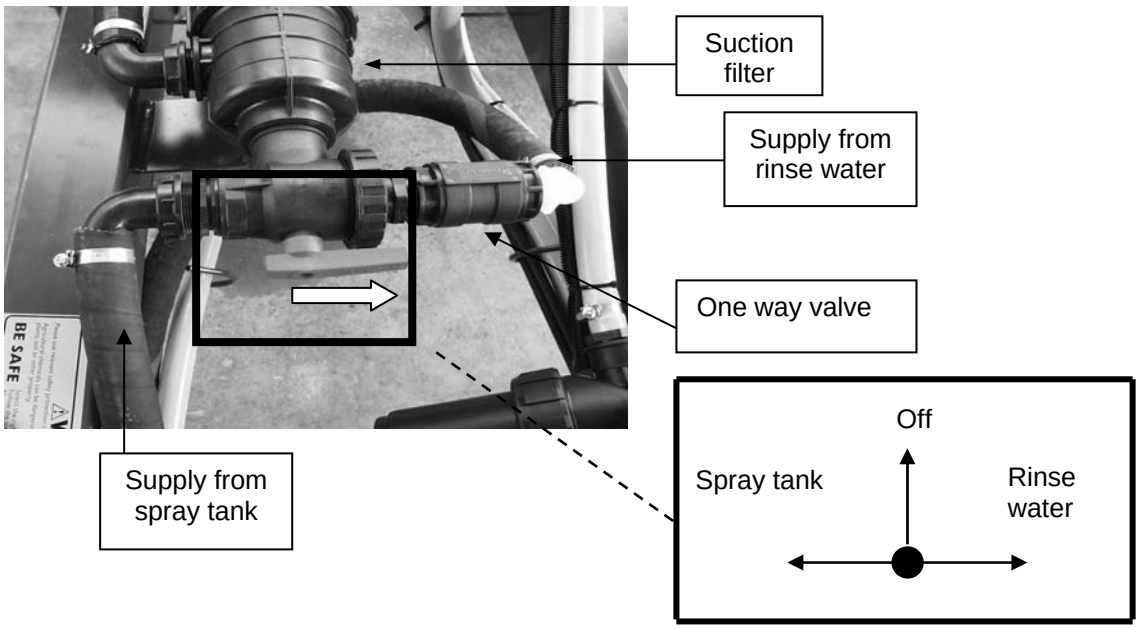
The method for cleaning will depend on the mixture used, so refer to the label or contact your chemical supplier for specific cleaning instructions and decontaminating agents.

The following steps are a guide to the cleaning and decontamination of sprayers:

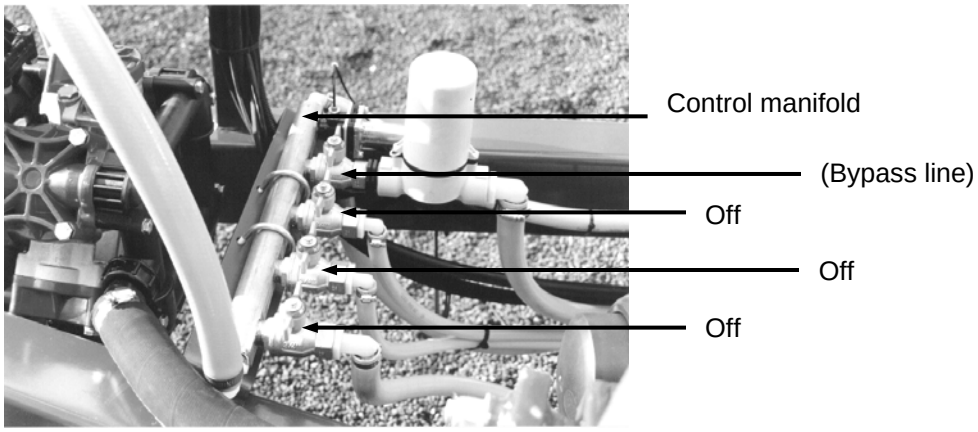
The pump can be flushed whilst there is chemical in the main tank, but an amount of fresh water will bypass back to the tank when flushing.

1. FLUSH THE PUMPING SYSTEM:

- Turn the red handle on the Pump 3-way ball valve on the suction filter, so that it points towards the hose coming from the rinse water tank.



- Turn all the ball valves on the control manifold off, except for the bypass line. (Electric pressure regulator line).



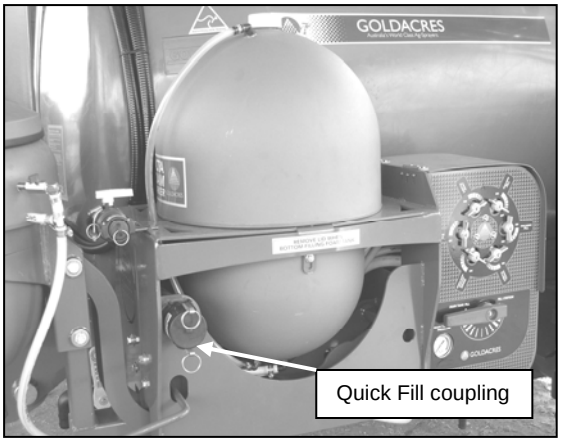
- Ensure the boom is unfolded, in the spraying position.
- Open the boom sections (i.e. boom solenoids).
- Run the pump at low speed. (idle)
- Flush a small amount of fresh water through the bypass line, and then close the bypass line ball valve. The electric valve on the bypass line must be thoroughly cleaned to prevent the butterfly valve from seizing.
- Flush out the nozzles.
- Where 2 TS dual boom is fitted the fast close valve must be activated by setting the Raven console in manual mode. Turn master switch and individual boom switches on. Push increase to start flow.
- You may also need to rinse the chemical induction equipment.

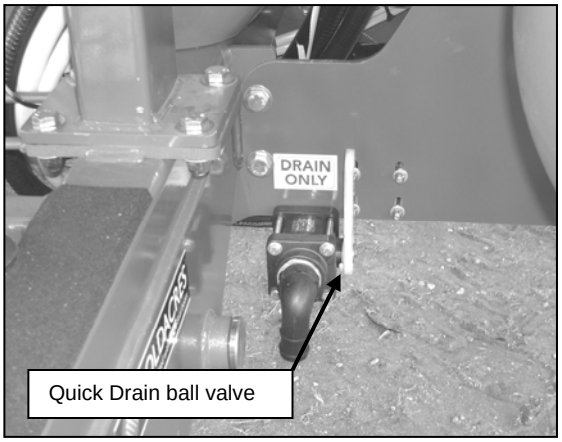
2. QUICK-DRAIN THE MAIN TANK & TANK SUMP

REFER TO THE CHEMICAL LABEL FOR CORRECT DISPOSAL OF CHEMICAL RESIDUE

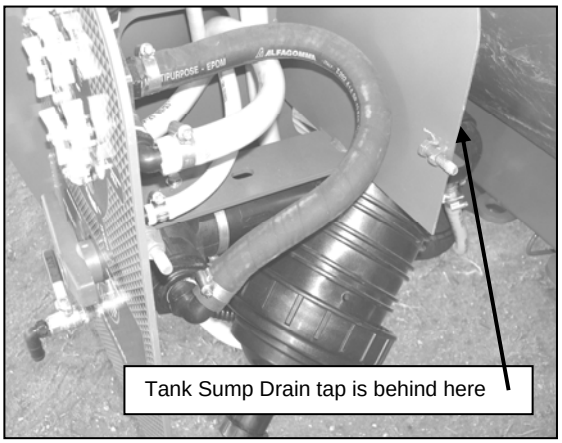
- The main tank should be drained through the quick-drain ball valve. This line drains from the side of the tank sump and almost all the tank liquid will drain through this line. There may be a relatively small amount of liquid left in the tank sump and this can be drained via the tank sump drain ball valve.
- To drain, open the quick-drain ball valve. When finished draining, make sure the quick-drain ball valve is closed.
- It is best to drain the sprayer tank such that the front of the tank is slightly lower than the back of the tank. This will facilitate a more effective draining.
- Take proper precautions when draining liquid from the tank as it may contain chemical residue.

THE QUICK-DRAIN IS TO BE USED SOLELY FOR DRAINING. DO NOT FILL THROUGH THE QUICK-DRAIN LINE.





- The quick drain will remove most of the tanks contents, however for a more complete drain; the small tank sump ball valve should also be used.
- Unhook the tank sump drain ball valve and let the valve hang down below the bottom of the tank sump. Open the valve for drainage. Shut the valve when finished and replace the tank sump drain ball valve on its hook on the sprayer, making sure it is securely fastened.



REFER TO THE CHEMICAL LABEL FOR THE CORRECT DISPOSAL METHOD FOR CHEMICAL RESIDUE

3. FLUSH THE MAIN SPRAY TANK:

TANK RINSING NOZZLES (OPTIONAL)

Tank rinsing nozzles can be fitted in the tank (usually two) to provide a method for washing the inside of the tank. This can either be done via the fill manifold (to clean tank with fresh water) or from the delivery side of the pump (to can clean tank with the required decontaminating agent).

The use of drop hoses inside the tank creates shadow areas that must be thoroughly cleaned and decontaminated.

DO NOT RELY SOLELY ON RINSING NOZZLES FOR THOROUGH TANK DECONTAMINATION

If tank rinsing nozzles are supplied with fresh water by the fill manifold:

- Empty tank of any chemical solution.
- Operate the fill station pumping system. (see fill system section in this manual)
- Open the ‘Main Tank Rinse’ ball valve on the fill station.
- Close the ‘Main Tank Rinse’ ball valve when finished tank rinsing.

- Dispose of rinsate in the tank. (This can be pumped out through the boom or drained out of the tank). **Be careful as to where the rinsate is being deposited as it may contain chemical residue.**

If tank rinsing nozzles are supplied with the cleaning mixture in the tank by the sprayer pump:

- Empty tank of any chemical solution.
- Add appropriate cleaning mixture to main spray tank.
- Operate the sprayer pump (pump speed needs to be at least half the maximum pump speed of 540 RPM).
- Open the tank rinse ball valve (either on the fill station or on the pump flow control manifold).
- Close the tank rinse ball valve when finished tank rinsing.
- Dispose of rinsate in the tank. (This can be pumped out through the boom or drained out of the tank). **Be careful as to where the rinsate is being deposited as it may contain chemical residue.**
- Remove and clean all strainers and nozzle caps in fresh water.
- Refill the tank with fresh water and add the **correct decontaminating agent**.
- When using Sulfonylurea chemicals such as Glean®, Ally®, or Logran®, a boom cleaning agent containing chlorine must be used to neutralise any residue. For other chemicals, a good quality boom cleaner will perform the task. If there are any concerns or queries with boom cleaners please **read the chemical label for the correct decontaminating procedures.**
- Operate the pump to flush all lines. (Minimum 10 minutes operation)
- Fill the tank with clean water and operate the pump to flush all lines.
- Wash the exterior of your Sprayer with fresh water to ensure that there are no chemical residues left where spray drift or overspray may have accumulated on the booms or chassis etc. GoldAcres recommend that sprayers and booms in particular, are coated with protectant oil at the start of each day's spraying.

DO NOT USE WATER THAT CONTAINS A HIGH MINERAL CONTENT (BORE WATER) AS THE DURABILITY AND APPEARANCE OF YOUR SPRAYER MAY BE AFFECTED.

BEFORE LEAVING THE SPRAYER IN COLD CONDITIONS:

- To prevent freezing, the sprayer needs to be stored in an environment where the temperature will not drop low enough for water to freeze. (as in the case of frosts)
- Frozen liquid can damage components when it thaws in a confined cavity (i.e. in pumps and ball valves).
- Exposure to cold environments will tend to reduce the longevity of components such as hose, filters, etc. The cold conditions can cause these components to become more brittle and more prone to cracking.

(a) PUMP

Do not leave water in the sprayer pump if frost is expected as iced or frozen water can cause damage to the pump if pumping is attempted. Therefore empty the pump of all water (run the pump dry for 15-20 seconds) and cover the pump if a frost is expected.

(b) BALL VALVES

After the pump has been run dry, open all ball valves to prevent cracking of the ball valve housing, by ice.

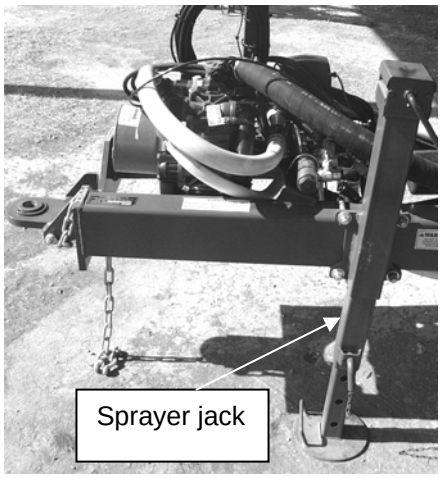
(c) FLOWMETER

Make sure the flowmeter is drained to prevent freezing.

THE RECOMMENDED PROCEDURE TO PARK YOUR SPRAYER IS:

1. Fold the boom into the transport position. (Note: Do not travel with the boom in the folded position until the boom is lowered onto its rests)
2. Inspect sprayer for damage or wear if it is to be towed on a public road.
3. Always ensure that the boom is securely supported when towing, the tail lights on the sprayer are connected via the 7-pin trailer plug (if fitted on sprayer), the safety chain is securely attached and the appropriate vehicle hazard safety precautions are attached (eg oversize sign, flashing light etc.).
4. The maximum speed for a Prairie sprayer with any load is 20 KM/H, or 40 KM/H when completely empty.
5. The maximum speed for a Rowcrop or Director sprayer is 20 KM/H **at all times**.
6. Empty the spray tank by disposing of any residual spray in the appropriate manner. When the tank has been emptied, shut off the pump drive by either disengaging the PTO, or closing the hydraulic supply.
7. To clean and decontaminate the sprayer, **read and heed the chemical label on sprayer cleanup.** If the instructions on the label are unclear, consult the chemical manufacturer or supplier.
8. With the sprayer attached to the tow vehicle, carry out a thorough observation to determine if there is any damage to the sprayer.
9. If the sprayer is left attached to the towing vehicle when parking sprayer, make sure the vehicle park brake is applied, the engine turned off and both the vehicle and sprayer is parked on level, firm ground.
10. If the sprayer is to be disconnected from the towing vehicle, it has to be securely parked. To suitably park the sprayer:
    - Park the sprayer on firm, level ground. The best storage for your sprayer is an environment where the temperature will not drop low enough for water to freeze and it is out of direct sunlight.
    - Ensure all spray tanks are empty.
    - Place obstructions to both the front and rear of the sprayer wheels (wheel blocks) to prevent the wheels from moving.
    - Use the sprayer jack to support the front of the sprayer. (i.e. use jack to raise sprayer off the vehicle hitch and remove the hitch pin)

DO NOT SUPPORT THE SPRAYER WITH THE SUPPLIED AND FITTED JACK UNLESS MAIN SPRAY TANK IS EMPTY.



11. Disconnect all lines between the sprayer and the tractor
    (a) Hydraulic lines.
    (b) Foam marker lines.
    (c) Tail/indicator plug.
    (d) PTO shaft.
    (e) Safety chain.

12. Remove console from tractor if it is not to be used for a prolonged period.

END OF SEASON TASKS

1. Clean the sprayer thoroughly as described under "**END OF SPRAYING DAY TASKS".**
2. The flowmeter turbine and turbine hub should be cleaned of all foreign material (such as metal filings and wettable powders which may have hardened in the plastic and metal parts). Check for worn turbine blades, scoring on the turbine shaft and damaged bearings (the turbine should spin freely when assembled correctly). Also check the condition of the flowmeter when inserting back on the sprayer.
3. The best storage for your sprayer is an environment where the temperature will not drop low enough for water to freeze and it is out of direct sunlight.
4. Periodically check the sprayer to ensure frosts and/or vermin are not damaging the machine, and that the tyres are correctly inflated.
5. Dispose of unwanted chemicals.

Minimizing chemical waste can be achieved by careful planning*:*

- Purchase only the amount of chemicals needed for the upcoming season.
- Accurately calibrate the sprayer to ensure correct chemical quantities are being applied.
- Mix only the quantity required for immediate use.
- Take care to avoid accidents during all stages of handling.
- Return any unopened containers to the supplier if they are not required next season.
- Do not dispose of raw chemicals on a farm. Contact your chemical supplier or local council regarding the disposal of unwanted chemicals.
- Excess spray mixtures should be disposed of carefully. Contact your local council, Department of Agriculture or Department of Natural Resources to ensure environmental damage will be minimised when disposing of excess spray mixture.
- Rinse all used containers with clean water and add to the sprayer when filling. Contact your chemical supplier regarding the possibility of recycling the containers. If this is not possible, contact your local council to find out where the containers can be disposed of. Puncture all containers to prevent them being reused.
- If there is any doubt, contact the relevant Government Department (Reference - Department of Agriculture and Rural Affairs).

GOLDACRES

PRE-SEASON CHECKLIST FOR GOLDACRES SPRAYING EQUIPMENT

Any adjustments or alteration instructions can be found in the GOLDACRES Operator's manual. All checks may not be applicable to some sprayers.

BOOMS

- ✓ Check alignment of outer booms, adjust if necessary _
- ✓ Adjust cable tension on outer booms _
- ✓ Adjust bi-fold hydraulic pressures _
- ✓ Check tower roller bearings for wear _
- ✓ Check end float clearance on tower rollers (1mm) _
- ✓ Check tower to roller clearance (1mm) _
- ✓ Check Para-lift spherical bearings for wear _
- ✓ Check routing of hoses around tower/ Para lift _
- ✓ Check plumbing on boom/ around pivots for kinks _
- ✓ Clean and grease breakaway hinge plates _
- ✓ Adjust tension on breakaway spring _
- ✓ Clean and lubricate all rose ends on booms _
- ✓ Clean and lubricate rose ends in centre section _
- ✓ Tighten tilt pin retaining hardware _
- ✓ Tighten tilt guide beams to a clearance of 1mm _
- ✓ Remove and soak all nozzles, check for wear _
- ✓ Grease all points, conduct regular maintenance checks _
- ✓ Check routing of plumbing along chassis. _

AIRBAGS

- ✓ Check condition of air bags and hosing _
- ✓ Adjust airbag ride height as per manual _
- ✓ Check air bag compressor cut out pressure (80psi) _
- ✓ Drain air bag chamber of moisture _
- ✓ Clean air bag compressor filter _
- ✓ Inspect airbag pivot bushes for wear _
- ✓ Tighten axle retaining hardware on axle clamps _
- ✓ Tighten axle hanger bolts _
- ✓ Tighten wheel bolts/nuts _
- ✓ Check tyre pressures _
- ✓ Check speed sensor mounting and clearance _
- ✓ Check/ repack wheel bearings _
- ✓ Check/ adjust/ tension wheel track retainers _

TANKS

- ✓ Check tension on tank straps _
- ✓ Check location of tank. Not rubbing. _
- ✓ Check rear tank stops _
- ✓ Check tank plumbing and fittings for leaks. _
- ✓ Check drain valves function correctly _
- ✓ Check tank level gauge functions correctly _

GOLDACRES

PRE-SEASON CHECKLIST FOR GOLDACRES SPRAYING EQUIPMENT

Any adjustments or alteration instructions can be found in the GOLDACRES Operator's manual. All checks may not be applicable to some sprayers.

PUMP

- ✓ Check tension of pump mounting bolts. _
- ✓ Check condition and grease P.T.O to Uni's _
- ✓ Clean and grease pump drive shaft _
- ✓ Remove hyd drive, clean and grease shaft, refit _
- ✓ Check speed sensor condition and clearance _
- ✓ Replace diaphragms and check valves if needed _
- ✓ Replace oil in pump _
- ✓ Check pressure of accumulator _

A FRAME

- ✓ Check routing of wiring and hoses _
- ✓ Grease and check operation of jack stand _
- ✓ Check hitch insert for wear _
- ✓ Ensure chassis angle is adjusted so tank sit level _
- ✓ Check hitch to chassis retaining hardware tension _
- ✓ Adjust friction on lower step bolts _

FOAM MARKER

- ✓ Clean out & check seal condition of compressor housing _
- ✓ Clean compressor / housing filters _
- ✓ Check foam marker lines for leaks, kinks, abrasions. _
- ✓ Clean out concentrate tank. _
- ✓ Remove clean and check operation of one way checks _
- ✓ Flush concentrate lines with clean water _
- ✓ Clean water filter _
- ✓ Clean and check operation of one way check, water. _
- ✓ Check sealing of cap O'Rings (under pressure) _

PLUMBING

- ✓ Check smooth operation and sealing of 3 way tap _
- ✓ Tighten clamps on suction lines _
- ✓ Tighten clamps on pressure lines and pump _
- ✓ Check pressure manifold taps, free to move. _
- ✓ Adjust regulated pressure to 110psi with 'T' handle _
- ✓ Check operation of 150psi relief valve on pump _
- ✓ Check calibration figures _

INDUCTION

- ✓ Check operation of Transcal, probe, enviro coupling _
- ✓ Check operation of Transcal and enviro rinse _
- ✓ Check operation of hopper and rinse system _
- ✓ Check hose routing around hopper slide _

02 PR PLUMBING - INDEX

WARNING:

Spraying systems use high pressures. Ensure that hoses are in good condition and all hose clamps and fittings are tight.

TROUBLESHOOTING

"MY SOLENOIDS FAIL TO OPEN"

- There may be a power supply failure –
  - ✓ Solenoids need at least 12 volts in order to operate satisfactorily.
  - ✓ Check all wiring and connections to ensure that there is12 volts at the solenoids.
- The system pressure may be greater than 110 psi.
  - ✓ Reduce the system pressure.

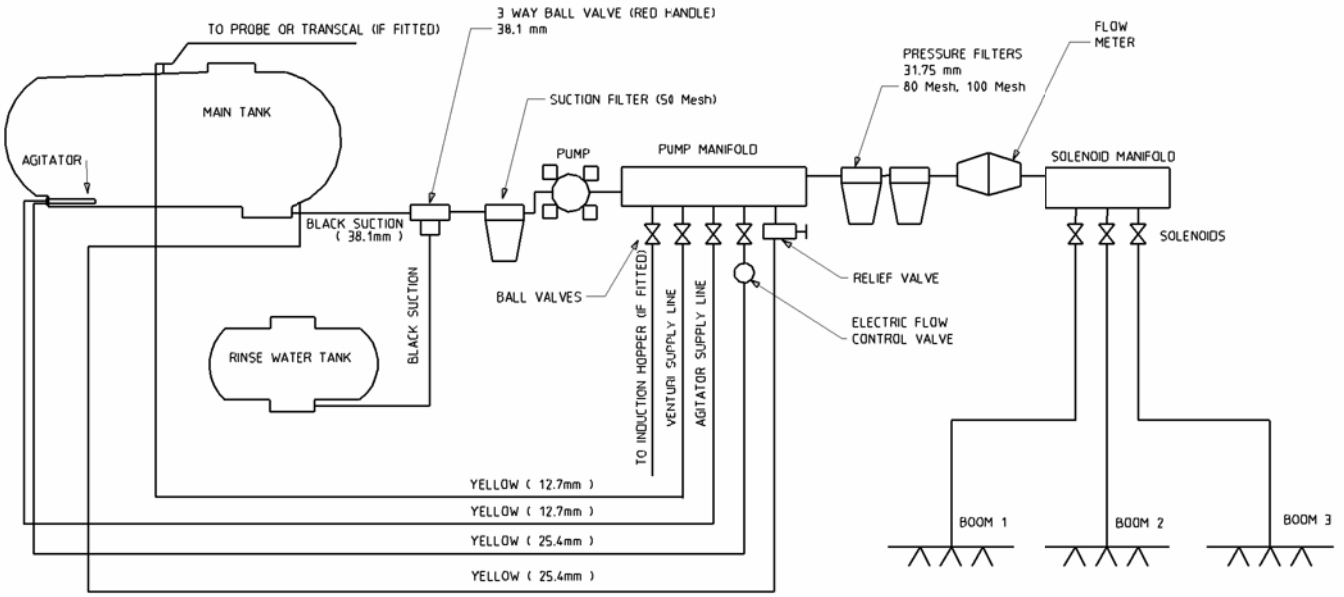
"MY SOLENOIDS FAIL TO CLOSE"

- ✓ Diaphragm damaged – replace diaphragm with a new seal kit.
- ✓ Foreign object blocking plunger from seating – clean inside solenoid.

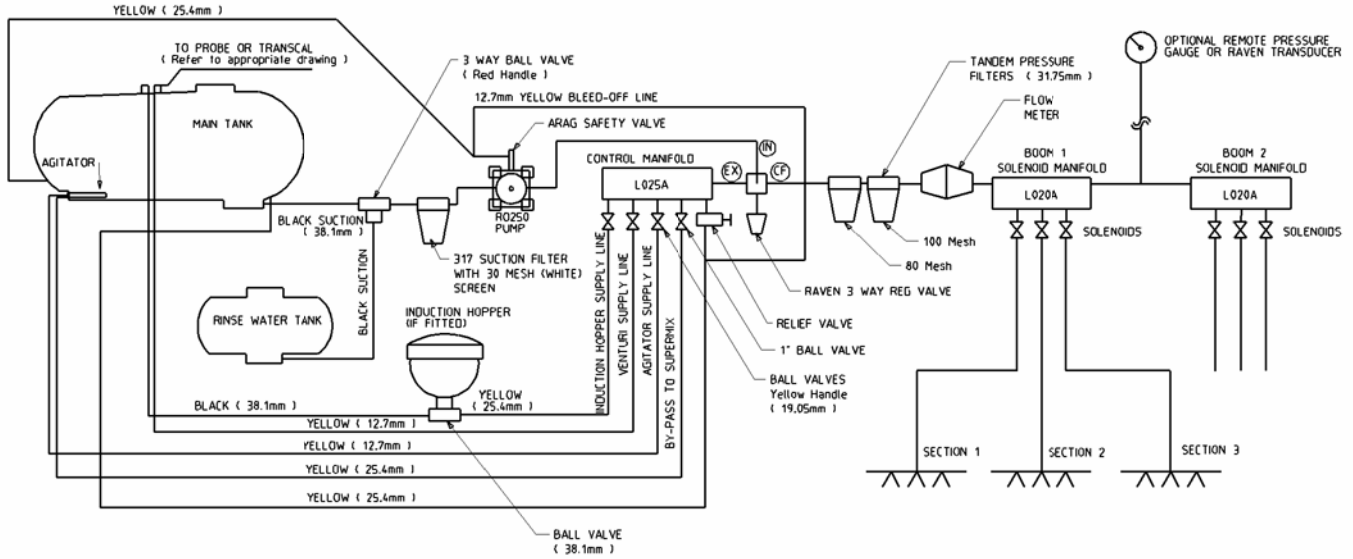
"MY BALL VALVES ARE CRACKED"

- ✓ Water frozen (best if ball valves are left open when there is any chance of frost).

PRAIRIE SPRAYER PLUMBING SCHEMATIC (BASE MODEL)



PRAIRIE SPRAYER PLUMBING SCHEMATIC (DUAL BOOM)



- THE 12.7mm BLEED-OFF HOSE BETWEEN THE BY-PASS TO SUPERMIX LINE AND THE SAFETY VALVE HAS TO BE PLUMBED AS CLOSE TO THE SAFETY VALVE AS POSSIBLE AT THE PUMP END TO PREVENT SEDIMENTATION IN THIS STATIC LINE
- CONSOLE MUST BE IN THE C-FC MODE (FAST CLOSE VALVE) IN THE SECOND PROGRAMMING STEP AND 743 PROGRAMMED IN VALUE CAL FOR THE SPRAYER TO OPERATE CORRECTLY

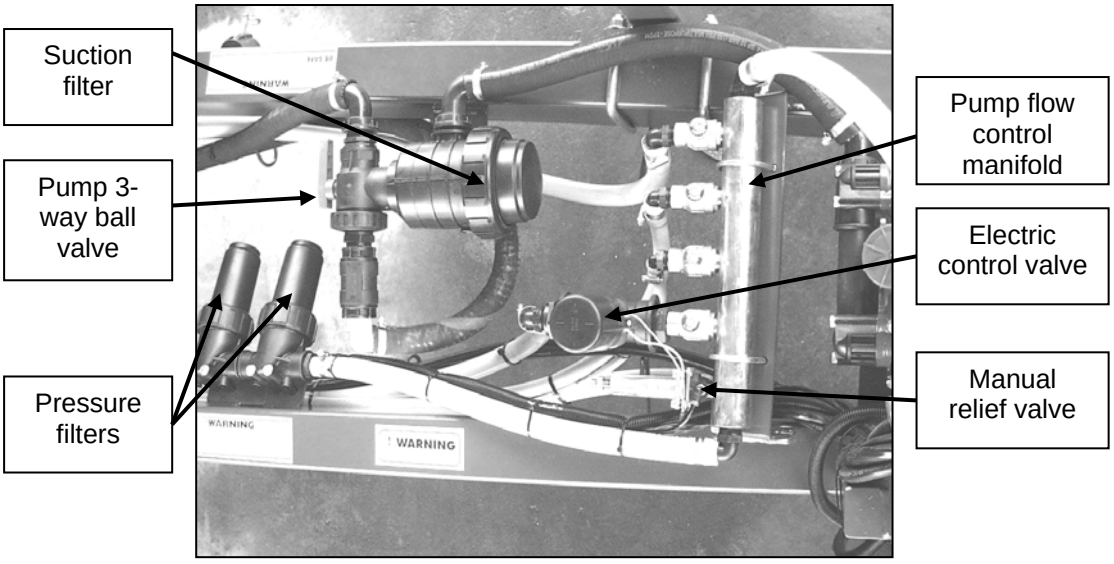
PLUMBING SYSTEM - KEY FEATURES

MAXIMUM SYSTEM WORKING PRESSURE 750 KPA (110 PSI)

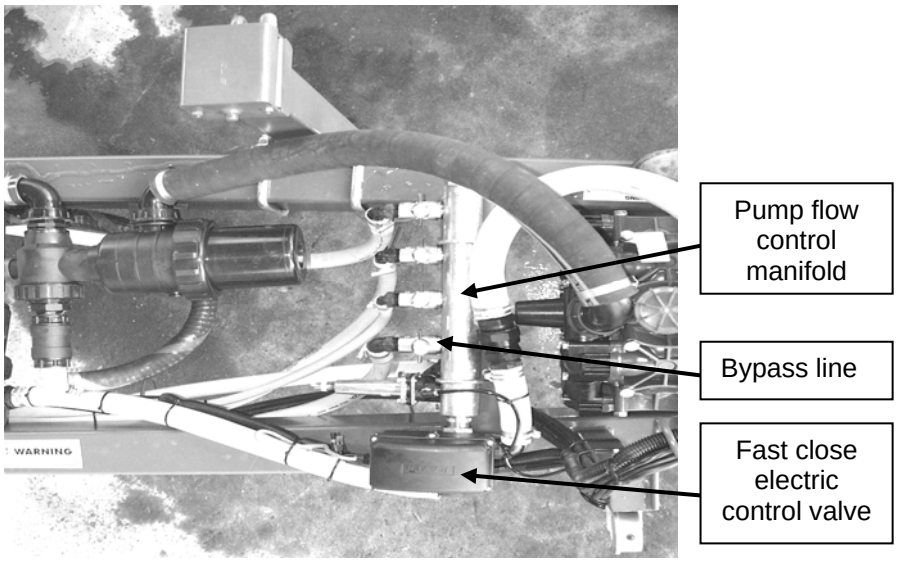
MAXIMUM ALLOWABLE SYSTEM PRESSURE BEFORE COMPONENT DAMAGE MAY OCCUR – 1000 KPA (150 PSI)

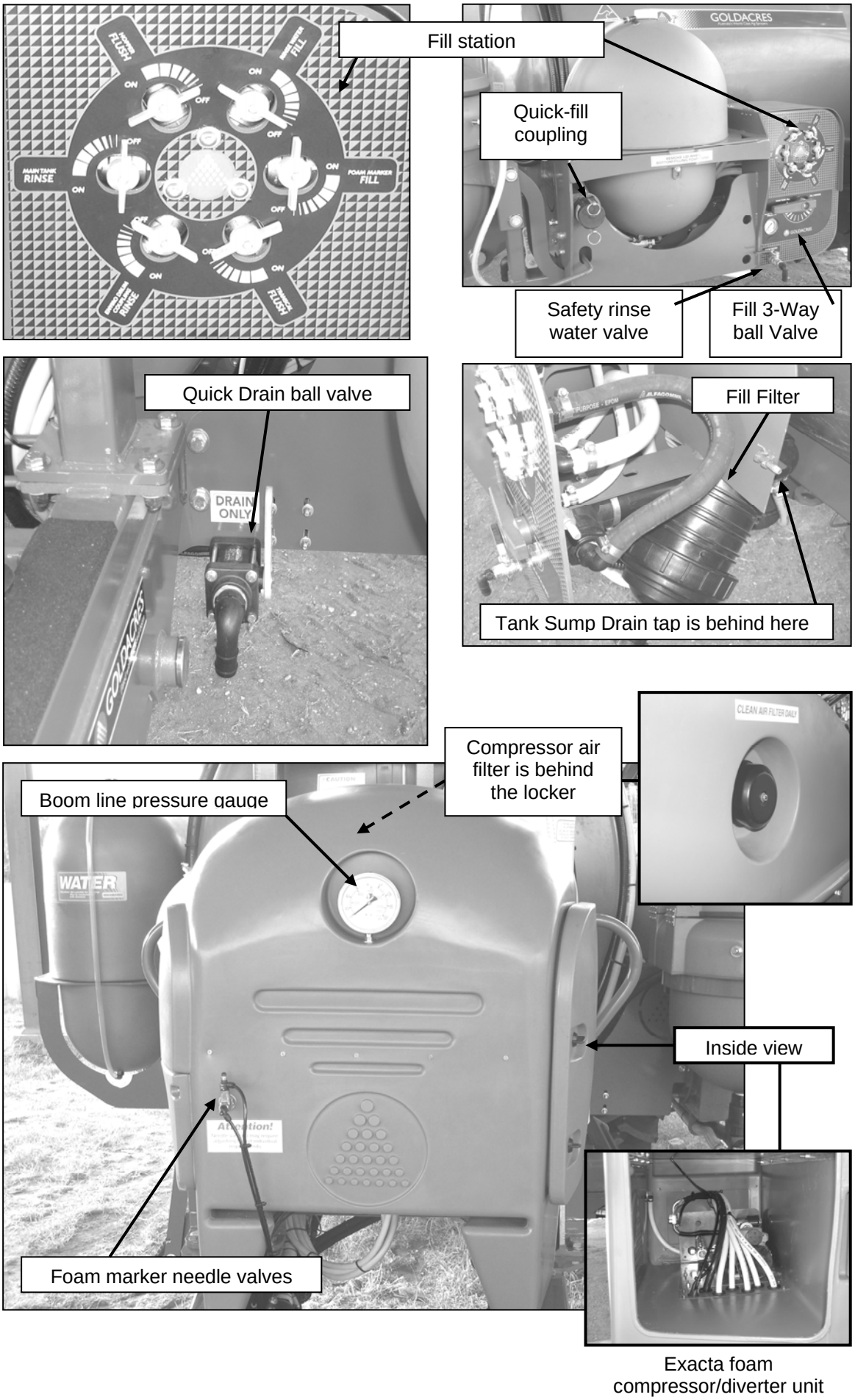
CERTAIN CHEMICALS MAY BE UNSUITABLE FOR USE WITH A SPRAYER FITTED WITH STANDARD PLUMBING. CONSULT WITH GOLDACRES ON YOUR PARTICULAR REQUIREMENTS

Prairie sprayer plumbing system (base model)



When the sprayer is fitted with 2TS dual boom spray lines, the electric control valve is replaced with a three way fast close valve. The fast close valve is positioned on the end of the pump flow control manifold.



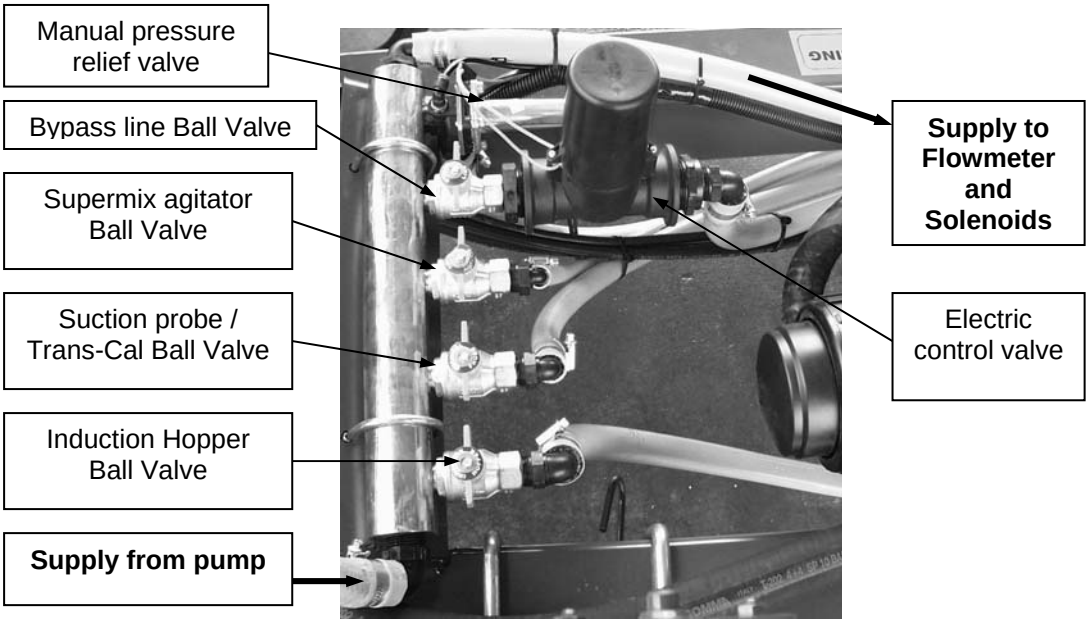


Exacta foam compressor/diverter unit

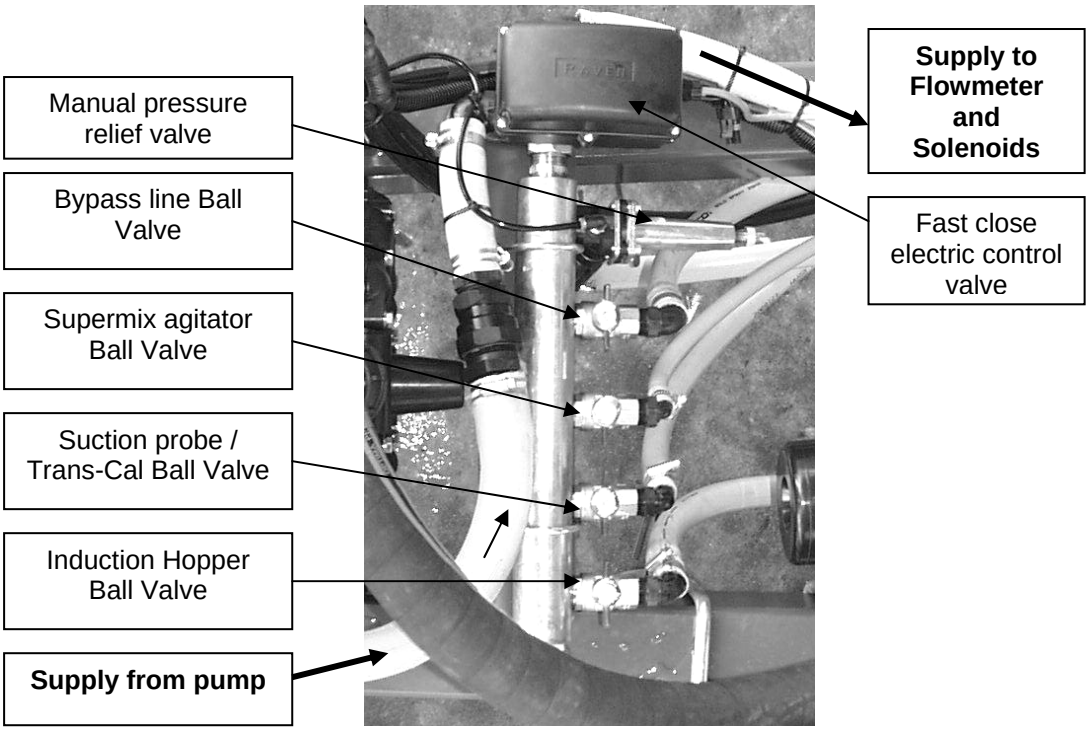
PUMP FLOW CONTROL MANIFOLD

For sprayers fitted with the base model plumbing, all the flow from the pump is delivered through the pump flow control manifold.

The pump flow control manifold allows for chemical induction equipment to be used to fill the sprayer. All the taps on the control manifold are labelled.

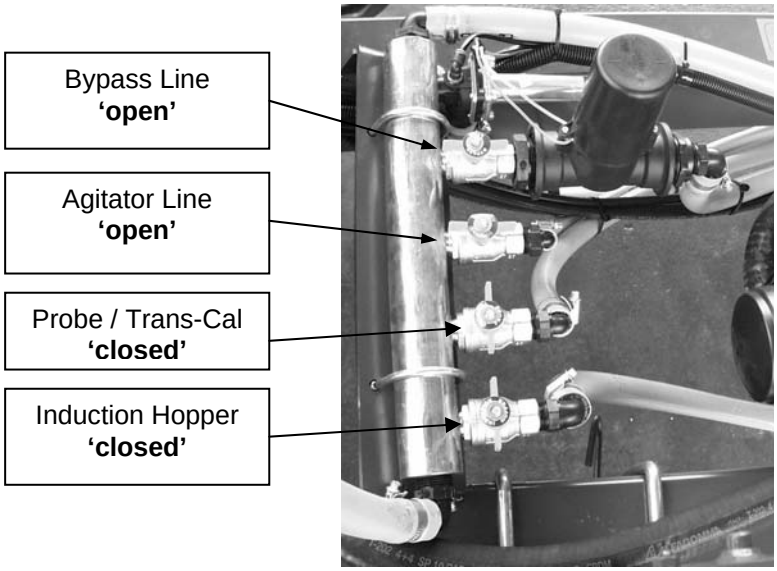


If the sprayer is fitted with a 2TS dual boom system, all the flow from the pump is delivered to the fast close electric control valve. The fast close valve then diverts flow to either the pump flow control manifold, or to the boom. When the boom sections are closed, all flow is diverted to the pump flow control manifold.



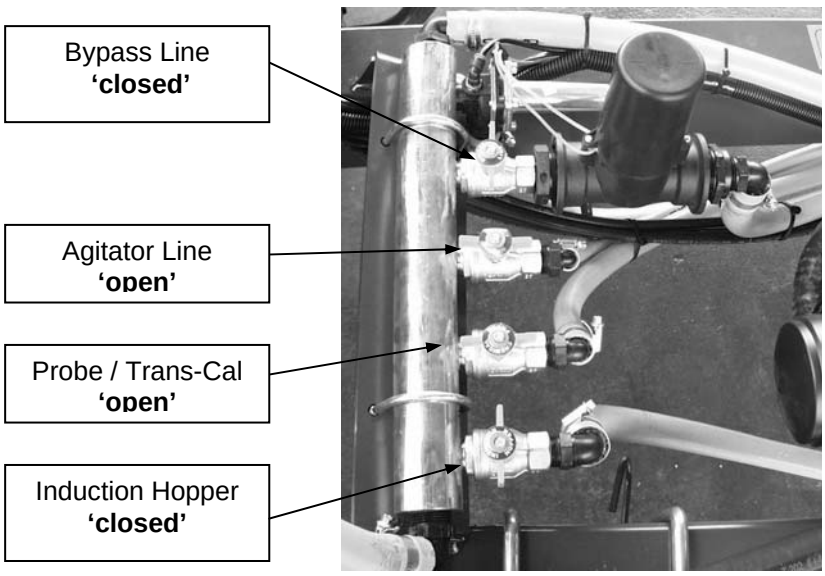
PUMP FLOW CONTROL MANIFOLD CONFIGURATION WHEN SPRAYING

When spraying using either a base model machine or sprayer fitted with 2TS, the bypass line ball valve and the supermix agitator ball valve should be open with both the chemical probe ball valve and the induction hopper ball valve closed.



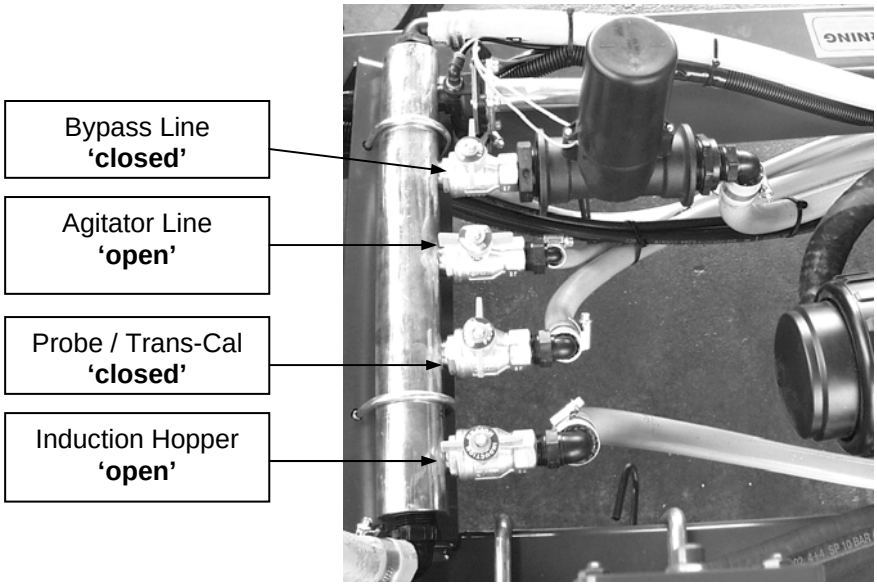
PUMP FLOW CONTROL MANIFOLD CONFIGURATION WHEN USING THE CHEMICAL PROBE / TRANS-CAL

When using the chemical probe, the chemical probe ball valve and the supermix agitator ball valve should be open with the bypass line ball valve and the induction hopper ball valve closed.



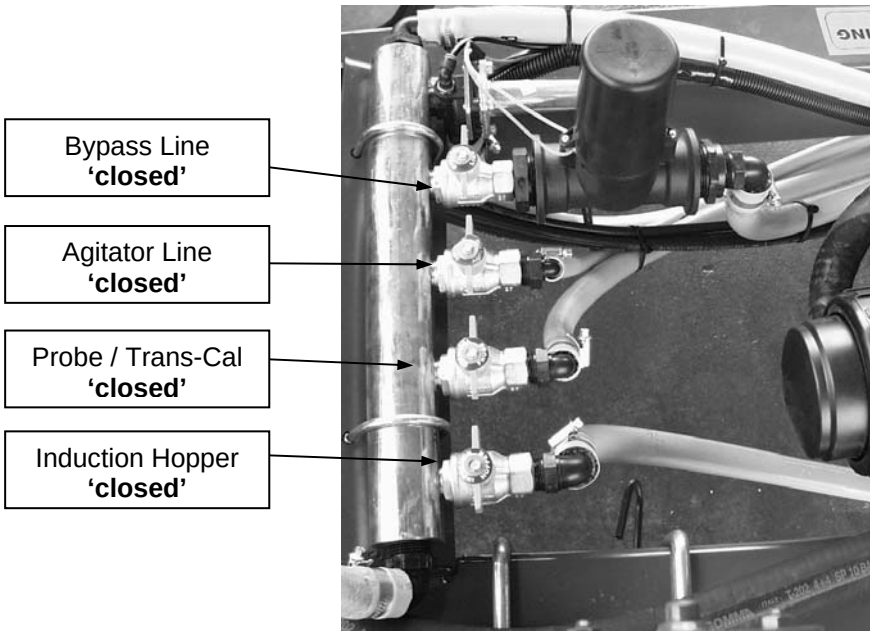
PUMP FLOW CONTROL MANIFOLD CONFIGURATION WHEN USING THE INDUCTION HOPPER

When using the induction hopper, the induction hopper ball valve and the supermix agitator ball valve should be open with the bypass line ball valve and the chemical probe ball valve closed.



PUMP FLOW CONTROL MANIFOLD CONFIGURATION WHEN SETTING THE RELIEF VALVE OR FLUSHING SPRAY LINES

When setting the relief valve or flushing the lines with fresh water, all control manifold ball valves need to be closed.

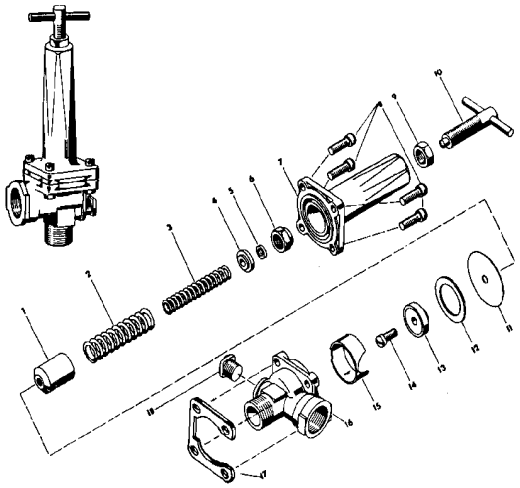


ELECTRIC CONTROL VALVE (PRESSURE REGULATOR)

The electric control valve provides delivery pressure control. For base model sprayers, altering the orientation of the butterfly affects the amount of bypass to the tank and thus the pressure delivered to the boom. Increasing the amount of bypass decreases the boom delivery pressure and decreasing the amount of bypass increases the boom delivery pressure. For sprayers fitted with the 2TS fast close valve, as more flow is required, the fast close valve will open reducing the amount of bypass to the control manifold. When a lower amount of flow is required, the valve will direct more flow to the pump manifold and less to the boom. When all boom sections are closed, all pump flow will be directed to the pump manifold.

PRESSURE RELIEF VALVE

The pressure relief valve provides relief when the pressure exceeds a pre-determined value. Altering the adjusting stem will affect the setting at which the relief valve will come into operation. Turning the stem clockwise will increase the pressure relief setting. GoldAcres pre-sets the pressure to approximately 700 kPa (100psi) and this should not be altered. To check or alter this setting, turn the pump off and unwind the relief valve. Turn the solenoids off, and then close all control manifold ball valves so that all flow passes through the relief valve. Run the pump at maximum operating speed (540 RPM) and slowly screw the relief in until the pressure achieved is 700kPa. Tighten the nut on the adjusting stem so that this setting is maintained. If the relief setting is too low, too much flow is allowed to bypass back to the tank and it will limit the maximum obtainable pressure.



ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	CP8367-AL	Aluminium Guide Sleeve	10	CP5896-ALSS	Adjusting Stem
2	CP8373-SS	Stainless Steel Outside Spring	11	CP8366-FA	Fairprene Diaphragm
3	CP8374-SS	Stainless Steel Inside Spring	12	CP8365-304SS	Type 304 Stop Ring SS
4	CP8371-AL	Aluminium Spring Retainer	13	CP8364-NYB	Black Nylon Back Up Seat
5	CP8369-NYB	Black Nylon Washer	14	CP8477-SS	Stainless Steel Screw
6	CP8368-SS	Stainless Steel Adjusting Nut	15	CP8389-304SS	Type 304 Chamber Insert SS
7	CP8362-AL	Aluminium Bonnet	16	CP8361-3/4-NYB	Black Nylon Body
8	CP7688-IZP	Zinc Plated Steel Screws (4)	17	CP9017-IZP	Zinc Plated Steel Clamp
9	CP5898-AL	Aluminium Lock Nut	18	8400-1/4-PPB	1/4” Pipe Plug

FILTERS

ALWAYS WEAR GLOVES IF REMOVING OR CLEANING FILTERS

If in-line filters have been fitted to replace nozzle filters, always unfold and lower the boom before attempting to unscrew any filter.
It is essential to maintain all filters and filter screens in good condition. Filter screens that are not regularly cleaned can severely impede liquid flow and delivery pressure. If the screens are in any way damaged, they can allow foreign material into the pumping system which can result in damage to the pump, solenoids, valves and cause blockages in nozzle tips. Also, if the screens are not properly fitted, air can enter the pumping lines which will reduce pump performance.
All filter screens should be cleaned after every spraying operation. Filter screens are best cleaned with a soft brush in clean water or by compressed air after washing.

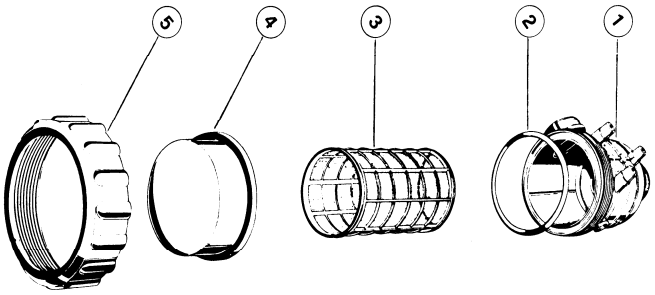
READ AND HEED THE CHEMICAL LABEL REGARDING PROTECTIVE CLOTHING WHEN CLEANING ANY FILTER

PUMP SUCTION FILTER

(Up to 160 pumps = 316 filter, over 160 pumps = 317 filter)

To clean the suction filter:

1) Wear gloves and other recommended protective clothing.
2) Ensure that the pump is turned off and the pump three-way ball valve is turned off to prevent flow to the filter.
3) Carefully unscrew filter nut and remove bowl.
4) Remove screen and clean.
5) Check for damage to screen, bowl, body and o-ring.
6) Place screen back in position.
7) Make sure o-ring is in position for proper seal.
8) Replace bowl and screw nut on.
9) Do not over-tighten nut.



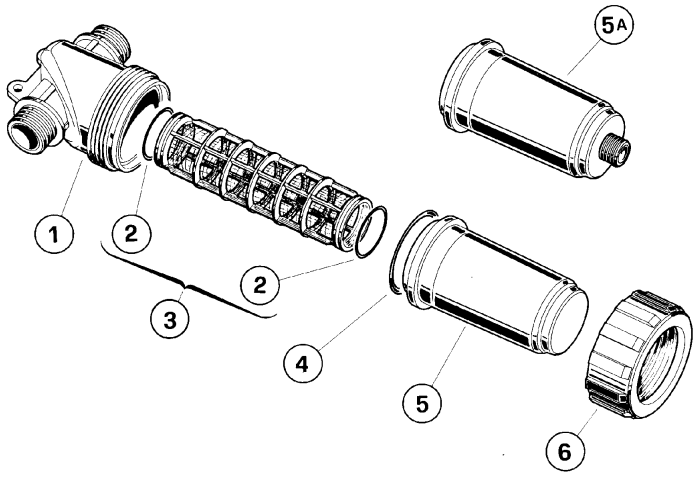
ITEM	PART NO.	DESCRIPTION
1	316060.010	316 - 1½" Suction Filter Body
1	316070.010	317 - 2" Suction Filter Body
2	316000.050	316 & 317 - Suction Filter Body O-Ring (126.4x7)
3	316003.030 316000.050	316 - Screen (50 Mesh) (Blue) 316 - Screen (80 Mesh) (Grey)
3	316300.030 317002.030	317 - O Ring 104x2 62 Filter Cartridge 317 - White Screen (32 Mesh)
4	316000.020	316 - 1½" Filter Bowl
4	317000.020	317 - 2" Filter Bowl
5	316000.040	316 & 317 - Filter Nut

PRESSURE FILTER

WEAR RECOMMENDED PROTECTIVE CLOTHING WHEN CLEANING ANY FILTER

To clean the pressure filter:

1) Wear gloves and other recommended protective clothing.
2) Ensure that the pump is turned off and the pump 3-way ball valve is turned off to prevent flow to the filter and pump.
3) Ensure that the supermix agitator ball valve is open (will release any residual pressure)
4) Carefully unscrew filter nut and remove filter bowl.
5) Remove screen and clean.
6) Check for damage to screen, bowl, body and o-ring.
7) Place screen back in position.
8) Make sure o-ring is in position for proper seal.
9) Replace bowl and screw nut on.



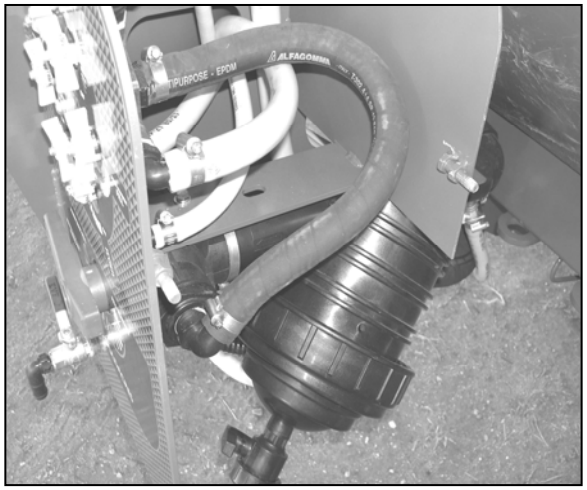
ITEM	PART NO.	DESCRIPTION
1	3282050.010	1 1/4” filter body (female) (pressure filter)
2	G10052	Screen O-ring (39.69x3.53)
3	326003.030 3260035.030 326004.030	Screen (50 mesh) (blue) Screen (80 mesh) (grey) Screen (100 mesh) (red)
4	G10090	Filter Body O-ring (74.63x5.34)
5 5A	3262000.020 3262300.020	Filter bowl (pressure filter) Filter bowl (self-cleaning filter)
6	3262000.050	Filter nut

FILL FILTER

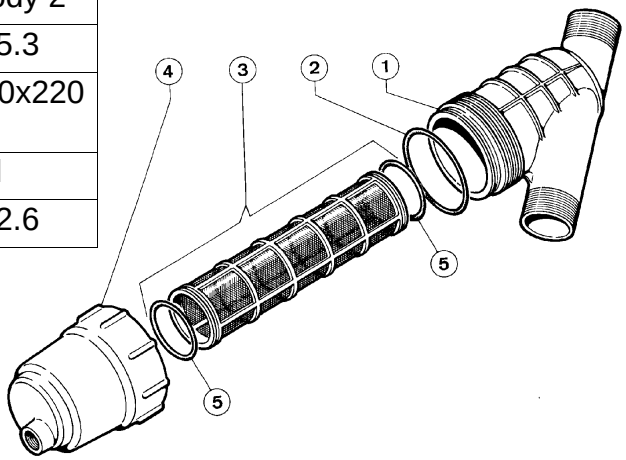
WEAR RECOMMENDED PROTECTIVE CLOTHING WHEN CLEANING ANY FILTER

To clean the flush filter screen:

1) Clean the filter prior to connecting the filling hose to fill the sprayer.
2) Turn the red handled ‘Fill 3-way ball valve’ to off. (Vertical)
3) Carefully unscrew filter bowl.
4) Remove screen and clean.
5) Check for damage to screen, bowl, body and o-ring.
6) Place screen back in position.
7) Make sure o-ring is in position for proper seal.
8) Screw on filter bowl.



POS	PART NUMBER	DESCRIPTION
1	329070.010	Inclined filter body 2”
2	314000.050	O-ring 94.6x5.3
3	329003.030	Blue cartridge 70x220 (50 mesh)
4	329000.020	Filter bowl
5	312300.060	O-ring 64.7x2.6



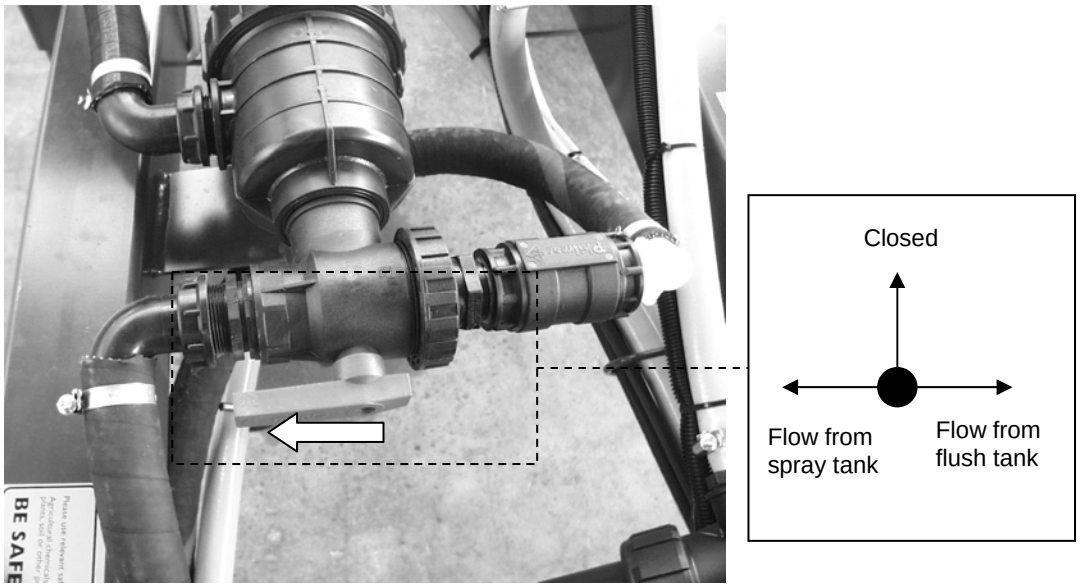
PUMP THREE-WAY BALL VALVE

This three-way ball valve controls from which tank the pump is drawing, i.e. either from the main spray tank or from the flush water tank. The position of the red handle determines which inlet the flow is coming through.

PUMPING FROM THE MAIN SPRAY TANK

To pump from the main tank:

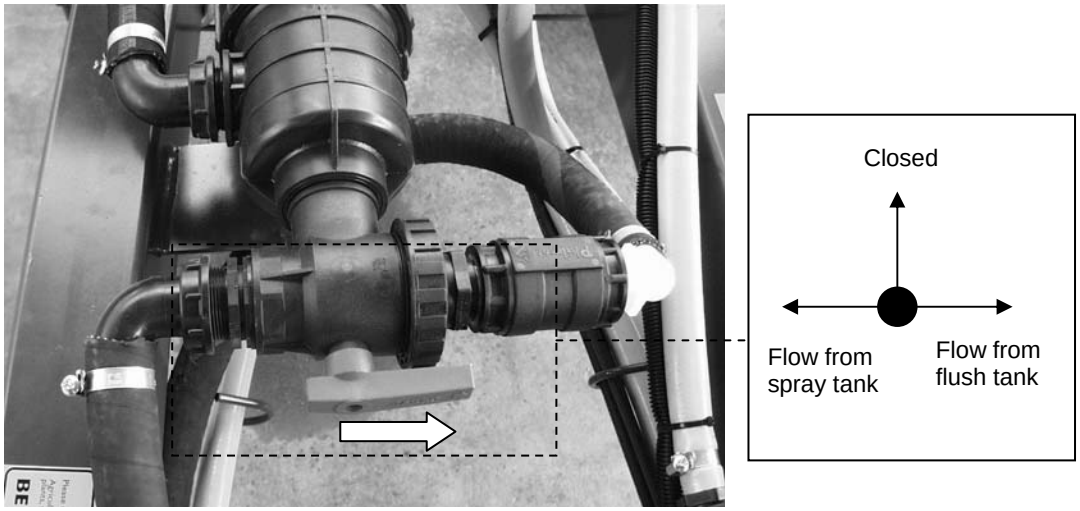
- Red handle points towards suction hose coming from main tank



PUMPING FROM THE FLUSH WATER TANK

To flush the lines with water:

- Red handle points towards the hose coming from the flush water tank

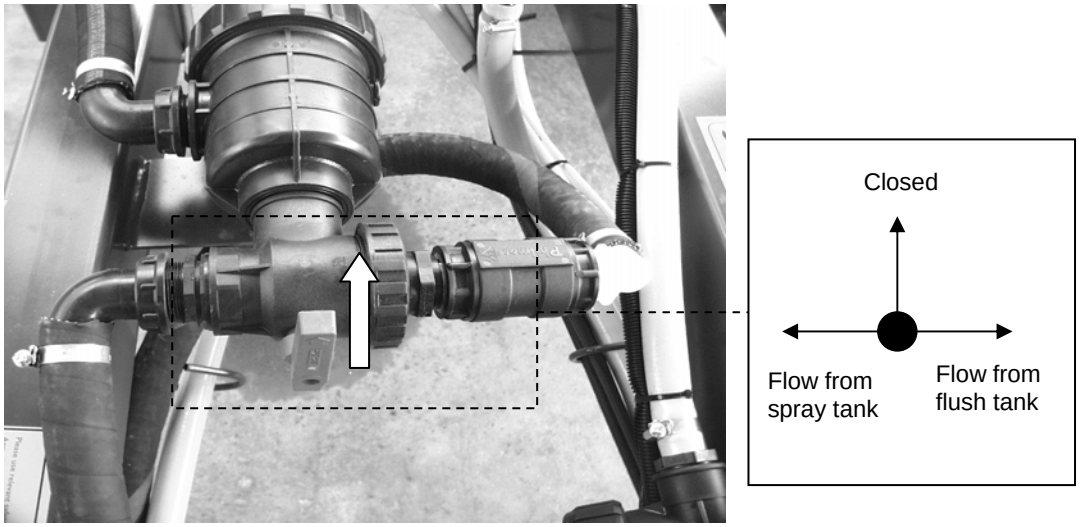


TO NOT PUMP FROM EITHER TANK

To clean the filters or storing sprayer, the flow from both tanks can be shut off:

- Red handle points perpendicular to valve

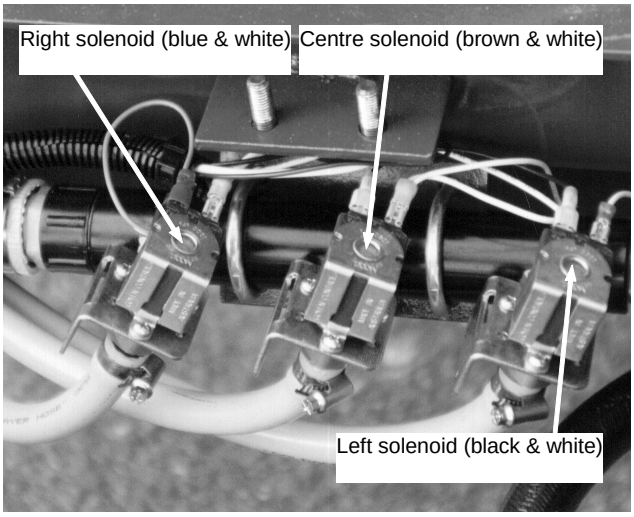
Note: Do not run the pump with the handle in this position!



SOLENOIDS

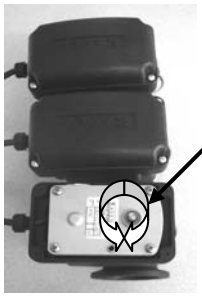
(Prairie Special Only)
Pilot-operated diaphragm solenoid valves are electrically controlled (via the console) and they control the flow to each boom section respectively.

NOTE: The positive and negative wires to the solenoids must be on the same respective solenoid terminals for each solenoid.



POSITION NO.	DESCRIPTION	HOSE SIZE	PART NO.	TO SUIT	REPAIR KIT PART NO.
1	12V DC Solenoid – Thread/Barb	½"	ST2-4R-V/2043	Electric Controls	M1682
2	12V DC Solenoid – Barb/Barb	½"	ST2-HR-V/1833	Electric Controls	M1682
3	12V DC Solenoid	¾"	12QW2-CNBVT-7507	Electric Controls	KM1306
4	12V DC Liquid Solenoid	¼"	4Q3M-ANBNT-7507	Exacta Foam Marker	KM1348
5	12V DC Air Solenoid	¼"	4Q3M3T-DNBNT-7507	Exacta Foam Marker	KM2071

(All Prairie's except the Special)
Raven motorised plunger valves, fitted as standard on all Prairie sprayers larger than the Special. The Raven valves feature a 12 volt motor that opens or closes a stainless steel plunger.



In the event of console or valve failure, the plunger can be released manually by removing the cap from the top of the motor, and turning the drive shaft with a spanner. With the valves manually opened, the boom can be controlled by engaging and disengaging the pump.

FLOWMETER

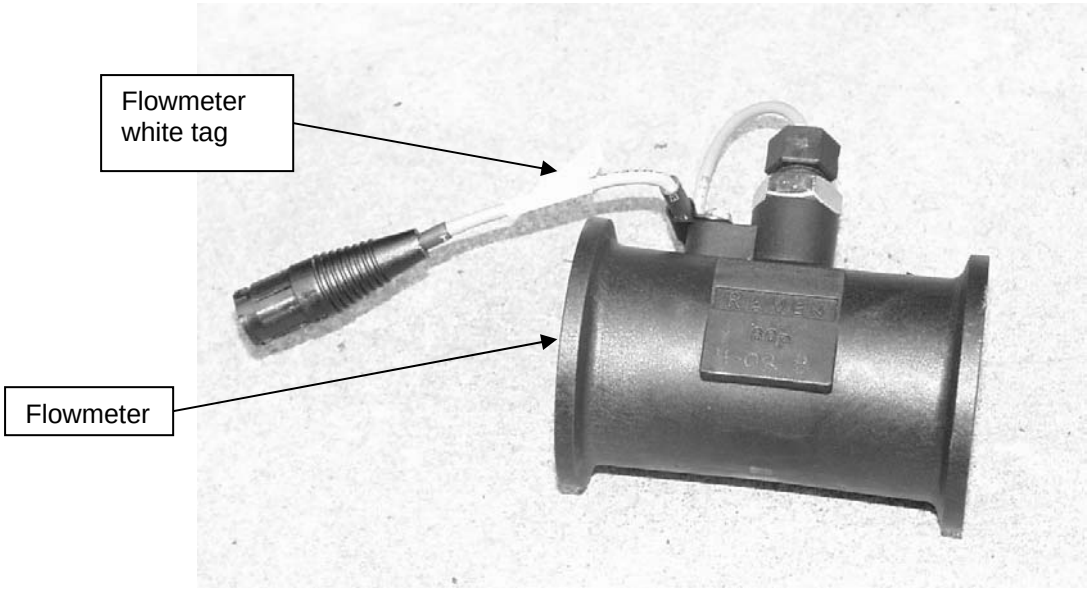
If there is a flowmeter on the sprayer, (positioned beneath the platform mesh on the front of the sprayer) there will be a calibration number attached to it on a white sticker. The number that is applicable is the one in square brackets, i.e. [185]. Note this number down as this is the number that should be entered as the Meter Cal. number.

The flowmeter must be flushed with fresh water before the sprayer is left unused for an extended period of time. Also do not allow water to freeze in the flowmeter as this can damage the housing.

The Flowmeter should be checked at the start of every spraying season and periodically during the season. The simplest way to check the accuracy of the flowmeter is to fill the tank to a previously determined volume mark (usually top fill marking) and then empty the tank through the flowmeter (i.e. via a self-test). Compare the reading from the flowmeter with the previous known volume. If there is a relatively large discrepancy (i.e. more than 50 litres out of a 3000 litre tank), the flowmeter should be removed from the sprayer, disassembled and the condition of the turbine checked and cleaned (make sure it spins freely). The flowmeter should then be reassembled and replaced on the sprayer. Perform the volume check again and if there is still a discrepancy, the Meter Cal No. can be changed.

i.e.: If volume reads 3100 litres instead of 3000 litres and the original Meter Cal value is 185

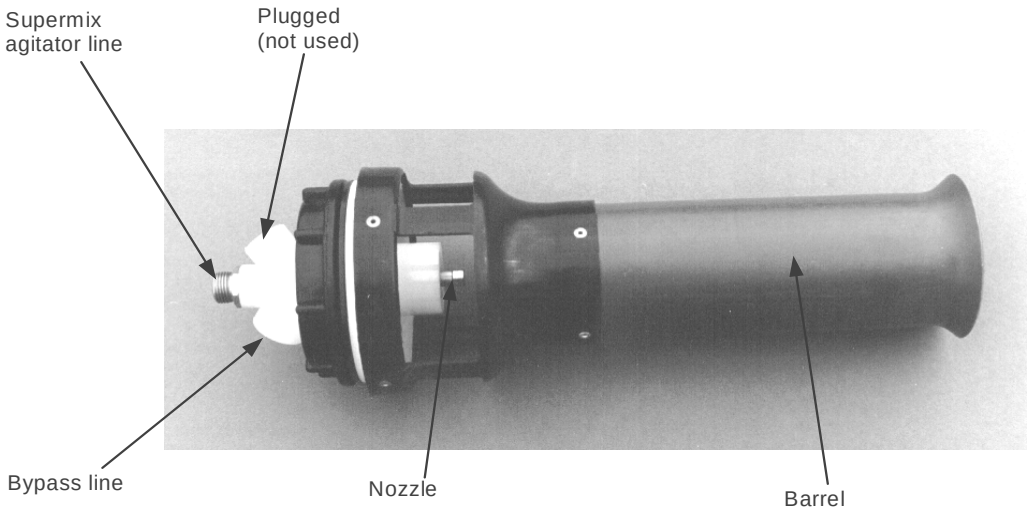
New Meter Cal value = 185 x 3100 ÷ 3000 = 191



SUPERMIX AGITATOR

The Supermix agitator is located at the back of the tank and is used to generate increased agitation within the tank. The pressure line to the Supermix agitator from the control manifold passes through a nozzle and then through the barrel into the tank. This causes extra agitation as flow around the agitator is sucked into the barrel and then passed back into the tank. To increase this venturi effect, the bypass flow from the electric control valve also passes through the barrel, multiplying the agitation effect.

If there does not appear to be sufficient agitation, it may be because the nozzle is blocked. To check and clean the nozzle, flush the tank out to remove all chemical residues and make sure the tank is then empty (important) and then unscrew the stainless steel insert where the pressure line is attached to. The nozzle can then be cleaned. Screw the stainless steel insert back in and make sure there are no resultant leaks.



03 Pumps - Index

Troubleshooting:

"MY PRESSURE AND FLOW RATE ARE TOO LOW"

1. **Check pressure side for excessive bypass:**
   Base model plumbing:
   - Verify console calibration settings.
   - Look in tank to see if there is much bypass coming back into the tank from either the pressure relief valve at the front of the tank, or the agitator at the rear of the tank.
   - Close the ball valve labeled "bypass line" and see if the pressure on the pump gauge rises. If it does then there is something wrong with the control valve.
   - Check the pressure relief valve setting.
   - Restrict the hose coming off the relief valve going back to the tank (i.e. with multi grips) and see if pressure on gauge rises.
   - Measure the flow per minute out of the nozzles and check with nozzle chart pressure for the corresponding flow.

   3TS plumbing (Dual boom):
   - Verify console calibration settings.
   - Look in tank to see if there is much bypass coming back into the tank from either the pressure relief valve at the front of the tank, or the bypass line at the rear of the tank.
   - Check that the fast close valve is rotating to full bypass when the boom valves are switched off. If the valve is not rotating, then the problem is with the valve or associated wiring.

2. **Check suction side for restriction:**
   - Clean suction filter strainer.
   - Check suction line and tank sump for blockages.
   - Check suction line for air leaks. (i.e. tighten nuts, hose clamps)

3. **Check Pump:**
   - Check pump speed.
   - Check oil for colour change to see if diaphragms are damaged. Diaphragms will need to be replaced if oil is milky.
   - Check valves in pump.

"MY PRESSURE AND FLOW RATE ARE TOO HIGH"

- Verify console calibration settings.
- Check restriction in bypass line. (make sure the ball valve in front of the control valve is open)
- Check pump speed is not too fast.

“THE PRESSURE ON MY GAUGE IS HIGHER THAN THE NOZZLE FLOW INDICATES”

- Check and clean all pressure and nozzle filters.
- There is always a pressure loss when flow goes through hose and components (such as filters, solenoids, etc). The pressure at the nozzle tip is what the nozzle chart pressure is referring to. The pressure on the gauge is the pressure at the nozzle tip plus the pressure that is lost between the pressure gauge and the nozzle. The pressure at the nozzle tip can be measured by measuring in one minute the amount of flow coming out of the nozzle and checking this with the nozzle flow chart. The pressure loss in the system increases as the flow rates increase.
- The diaphragms within the solenoids may have swollen causing restrictions, and thus may require replacement solenoid kits.

“MY FLOW RATE IS CORRECT BUT MY PRESSURE IS TOO LOW”

- Check nozzle chart for correct nozzle size.

“MY FLOW RATE IS CORRECT BUT MY PRESSURE IS TOO HIGH”

- Check nozzle chart for correct nozzle size.
- Check and clean all pressure and nozzle filters.

“MY PRESSURE IS CORRECT BUT MY FLOW RATE IS TOO LOW”

- Check nozzle chart for correct nozzle size.
- Check and clean all pressure and nozzle filters.

“MY PRESSURE IS FLUCTUATING”

- Check suction side for air leaks. (pump sucking air)
- Check the pump speed is between 400 and 540 RPM.
- Check valves in pump.

“MY PRESSURE IS PULSATING”

- Reset the air damper chamber pressure.
- Check the air damper chamber diaphragm.
- Check pump speed. (Should be between 400 and 540 RPM).
- Check suction side for air leaks. (pump sucking air)

“MY TANK IS NOT EMPTYING COMPLETELY”

- Reduce pump speed to minimize foaming in tank and prevent a vortex from occurring.

“MY PUMP OIL IS CHANGING COLOUR, IT’S BECOMING MILKY”

STOP SPRAYING IMMEDIATELY

- Diaphragms damaged and all will need to be replaced.

“MY PUMP OIL IS CHANGING COLOUR, IT’S BECOMING BLACK OR DARK GREY”

STOP SPRAYING IMMEDIATELY

The Pump is overheating:

- Check the pump speed. (must not be greater than 540 RPM)
- Check PTO shaft lubrication.

“MY PUMP IS NOISY”

- Check pump oil level.
- Reset the air damper chamber pressure.
- Check whether the PTO shaft is suitably lubricated.
- Check suction line for air leaks. (pump sucking air)
- Check suction line for restrictions.
- Check pump valves.
- Check pump bearings.

“MY PUMP HOUSING OR MOUNTINGS ARE CRACKED”

- Check PTO shaft length and lubrication.
- Check for ice in the pump, particularly if the sprayer has been parked in an environment where it may have been subjected to sub-zero temperatures or frosts.

“MY UNIVERSAL JOINTS ARE DAMAGED”

- The PTO shaft is too long.
- The PTO shaft is not adequately lubricated.

“MY PTO SHAFT IS BENT OR IS VIBRATING EXCESSIVELY”

- The PTO shaft is too short.

PTO Shaft:

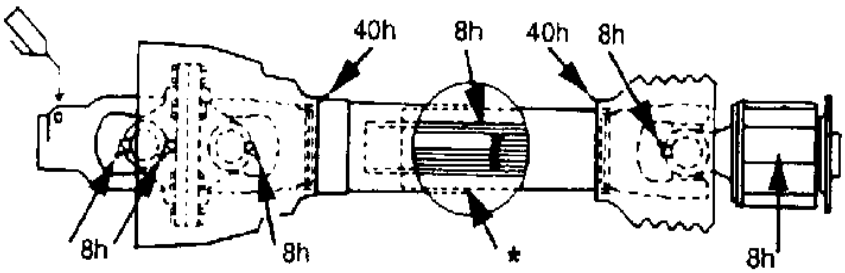
WARNING: *Never lubricate the PTO shaft while shaft is connected to tractor.*

WARNING: *Make sure PTO shaft is lubricated as per instructions and that the grease in the shaft is kept clean.*

Grease:

Proper grease is essential for the sprayer 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. GoldAcres recommends that multi-purpose grease should be used for all lubrications. Make sure all open-end bearings are lubricated their full length by forcing lubricant into them until it begins to appear at the sides.

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



*Pull shaft apart - apply grease to inside of outer Telescopic profile.

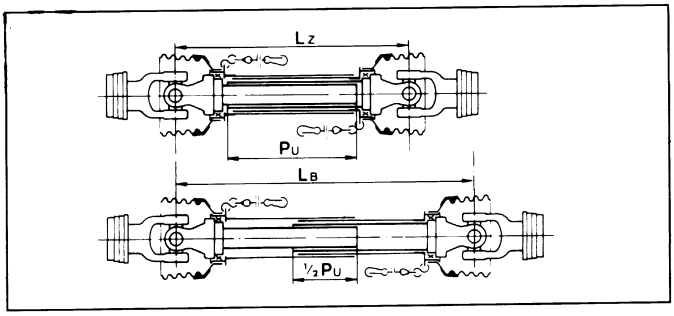
WARNING: *Cut PTO shaft to correct length to suit tractor before spraying.*

WARNING: *Always keep PTO shaft safety covers in place.*

When hitching a sprayer, especially for the first time, the following critical points concerning the PTO shaft must be considered:

Maximum PTO operating length L_b

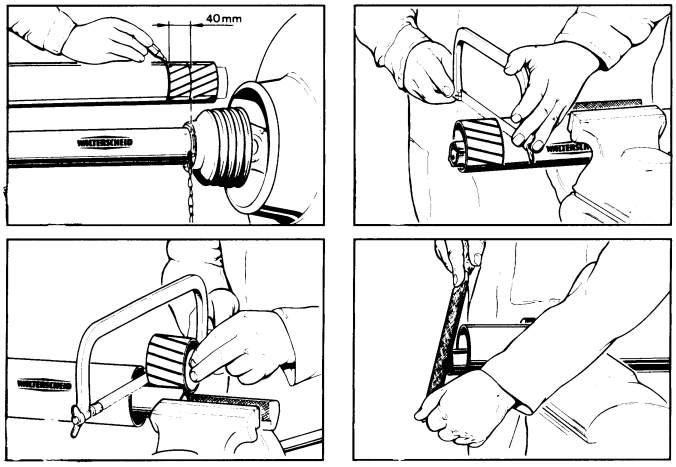
Try to obtain the greatest possible overlap. In its working position, the PTO shaft must not be extended by more than half the profile overlap P_u available when fully compressed L_z.



PTO SHAFT LENGTH ADJUSTMENT

To adjust the length:

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

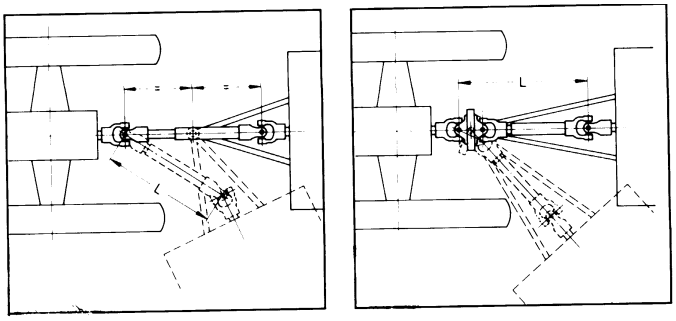


- It is preferable to have the hitching point halfway between the universal joints on the PTO shaft. This will equalize the joint angles when turning.
- When attaching shaft to sprayer and tractor, always ensure all guard covers are in place.
- Operate the PTO slowly when the PTO shaft is first attached to assess installation.
- Care should be taken when engaging the clutch as sudden loading, can result in pump damage and gear wear. Ideally the pump should start from zero pressure.
- It is essential to maintain the lubrication, refer to the maintenance schedule chapter.

Care must be taken when traversing drains, channels, ditches, etc., as extreme angles may be encountered. Be sure that the PTO shaft does not damage the pump or pump mounting.

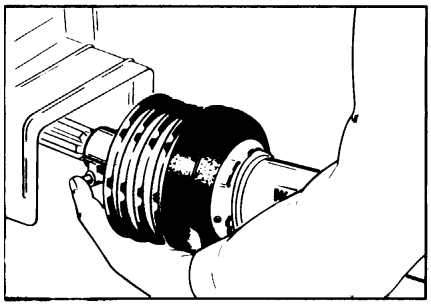
Maximum PTO joint operation:

Ensure equal joint angles. **NOTE:** *Stop operation if joint angle exceeds 25°.*



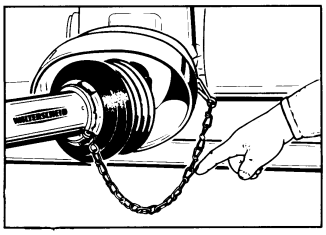
Coupling the PTO shaft:

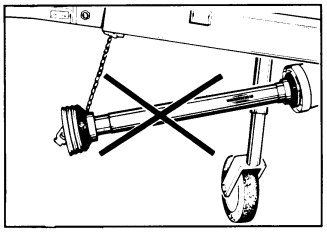
Press in the locking pin and simultaneously push PTO shaft onto pump or tractor PTO shaft until pin engages. Pull PTO shaft back to make sure pin has engaged and the shaft can not come off.



Chains:

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





Diaphragm pumps:

Flushing the pump system with fresh water:
To flush the pump system, use the procedure described under the General Information section of this manual, for "**End of Spraying Day Tasks**".

WARNING: *Never overfill pump with oil as damage to seals and oil bowl may result.*

The pump will perform optimally operating between 400 and 540 RPM. At lower revs excessive pulsation will occur, while pump and diaphragm damage can result at higher revs.

WARNING: *Do not operate diaphram pumps above 540 RPM.*

Maintaining the pump and using it correctly are essential in obtaining the best possible performance from your sprayer.

- When the pump is operating, the oil should be visible in the bowl.
- Whilst the pump is running, frequently check the oil level and colour. A change in either colour or level indicates probable damage to diaphragm or valves. **STOP THE PUMP IMMEDIATELY.**
- Inspect all hoses to make sure they are the correct size, fitted securely and that there is no throttling or leaking.
- Do not start the pump with the pump under pressure.
- Make sure that the pump PTO shaft cover is fitted correctly to prevent accidental injury.
- Make sure the strainer in the suction filter is clean and correctly installed.
- Regularly lubricate the PTO shaft according to recommendations (see "PTO SHAFT") to prevent the shaft from binding.
- Always flush pump with clean water at the end of each spraying day. Prolonged chemical contact can severely damage seals and diaphragms.
- Regularly check the pump mounting bolts.
- Change the pump oil after the first 50 hours of operation and then after every 300-350 hours. Be careful to use the correct oil (use SAE 30W40 motor oil) and do not overfill. Rotate pump manually (by hand) to remove air locks when filling with oil.
- Do not leave water in pump if sprayer is to be left in a cold environment. The water may freeze and cause damage to pump if pumping is attempted while water is frozen. Empty pump of all water (run the pump dry for 15-20 seconds) and cover pump (i.e. with bag) to ensure this situation does not arise. If this has not been done, and there is a possibility there may be frozen water in the pump and/or in the lines, wait until any ice has completely thawed before using pump. **Ensure that the pump can be turned over by hand before starting.**

WARNING: *Always wear protective clothing recommended on the chemical label product.*

WARNING: *Flush pump with clean water before dismantling.*

WARNING: *Remove air from air damper chamber before removing air damper chamber cover.*

Pump diaphragms:

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

- Pump diaphragms should be replaced prior to diaphragm failure.
- For large operations, where the sprayer is used extensively, the pump should be reconditioned once a season, including replacement diaphragms, seals and valve springs.
- It is wise to keep a spare pump repair kit (including diaphragms, seals, valve o-rings and springs) on hand in case of a breakdown.

The main causes of premature diaphragm failure are:

- Blocked or incorrectly fitted suction filter restricting flow to the pump.
- Incorrect air damper chamber pressure.
- Running pump at speeds greater than 540 RPM.
- Exceeding the pressure limit of the pump.
- Failure to wash chemicals from pump after use.
- Incompatibility of the diaphragm material and the chemicals used.
- Insufficient lubrication of PTO shaft or binding of PTO shaft which can cause a side thrust to the internal components of the pump and overheat the pump and diaphragms.

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

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

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

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

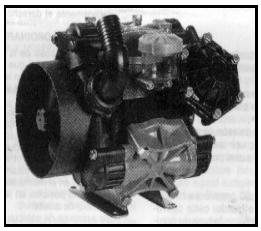
7. Remove diaphragms.
8. Remove cylinder sleeves.
9. Flush inside of pump with diesel.
10. Visually inspect inner workings of pump.
11. Reassemble with new diaphragms (must be correct diaphragms) once satisfied with condition of pump.
12. Refill with oil. Rotate pump manually (by hand) to remove air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

Air damper chamber:

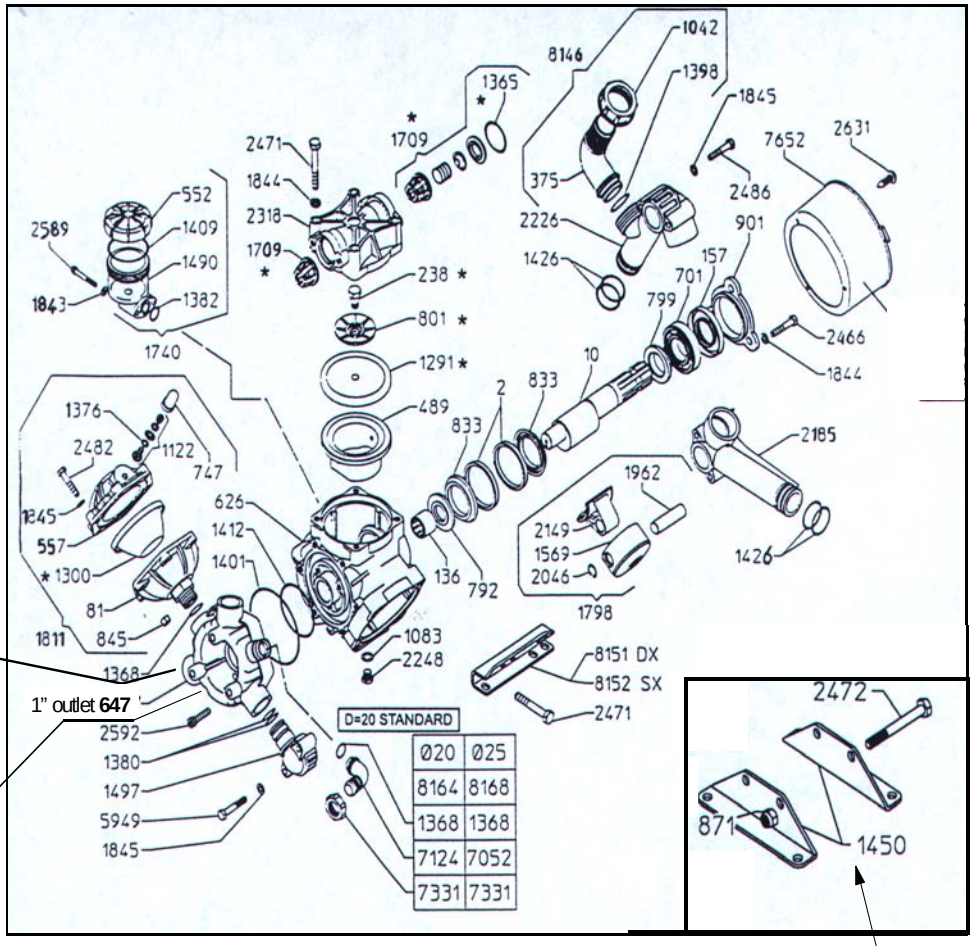
WARNING: *Remove air from air damper chamber before removing air damper chamber cover.*

It is essential to maintain the correct air pressure in the air damper chamber. If the pressure in the damper chamber is too great or too small there will be excessive pulsation. The correct pressure setting for the air damper chamber should be marginally less than the pump delivery pressure. To find the optimum pressure setting, fill the chamber to about 690 kPa (100 psi), **while the pump is not running**. Then operate the pump at the desired speed and pressure and release pressure from the damper chamber until the pump is running relatively smoothly (i.e. minimum pulsation). Due to the size of the chamber, small releases of air will result in large pressure drops. Release the pressure in very small quantities and never use a hand pump or pressure gauge as this will release a significant amount of pressure when disconnecting.
To approximately determine the pressure in the damper chamber, again run the pump at the desired speed and then vary the delivery pressure, via the control valve (pressure regulating valve), until the pump is running with minimum pulsation.

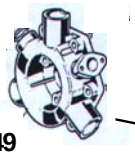
Udor RO 106 & 130 diaphragm pumps:



	RO106	RO121	RO130
Maximum pump capacity:	105 l/min	120 l/min	130 l/min
Maximum pump speed:	540 RPM	540 RPM	540 RPM
Maximum pressure capacity:	20 bar (284 PSI)	20 bar (284 PSI)	20 bar (284 PSI)
Maximum power requirement:	5.36 KW (7.3HP)	6.24 KW (8.49HP)	4.8 KW (6.6 HP)
Oil Type:	Motor Oil SAE 30W40		



Original style delivery manifold (3/4" outlet)

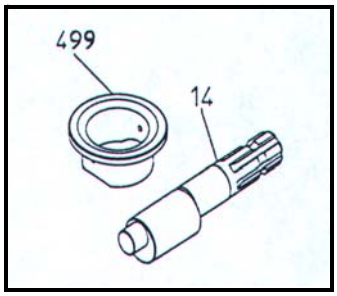


649

To 2000 model delivery manifold. (3/4" outlett)

651

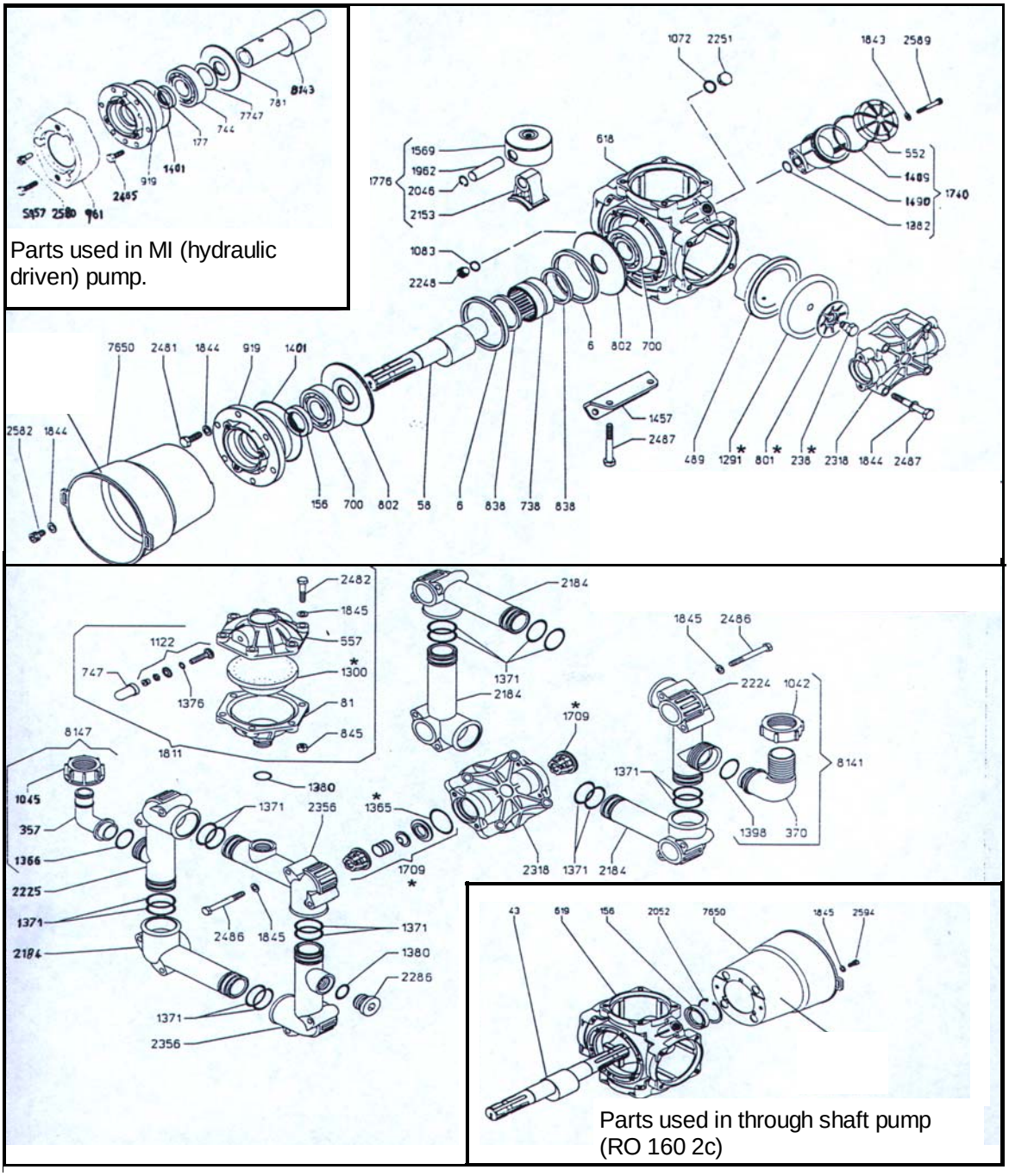
Previous model mounting brackets



RO 121 fitted with these two parts, in lieu of Part No's. 489 and 10 above.

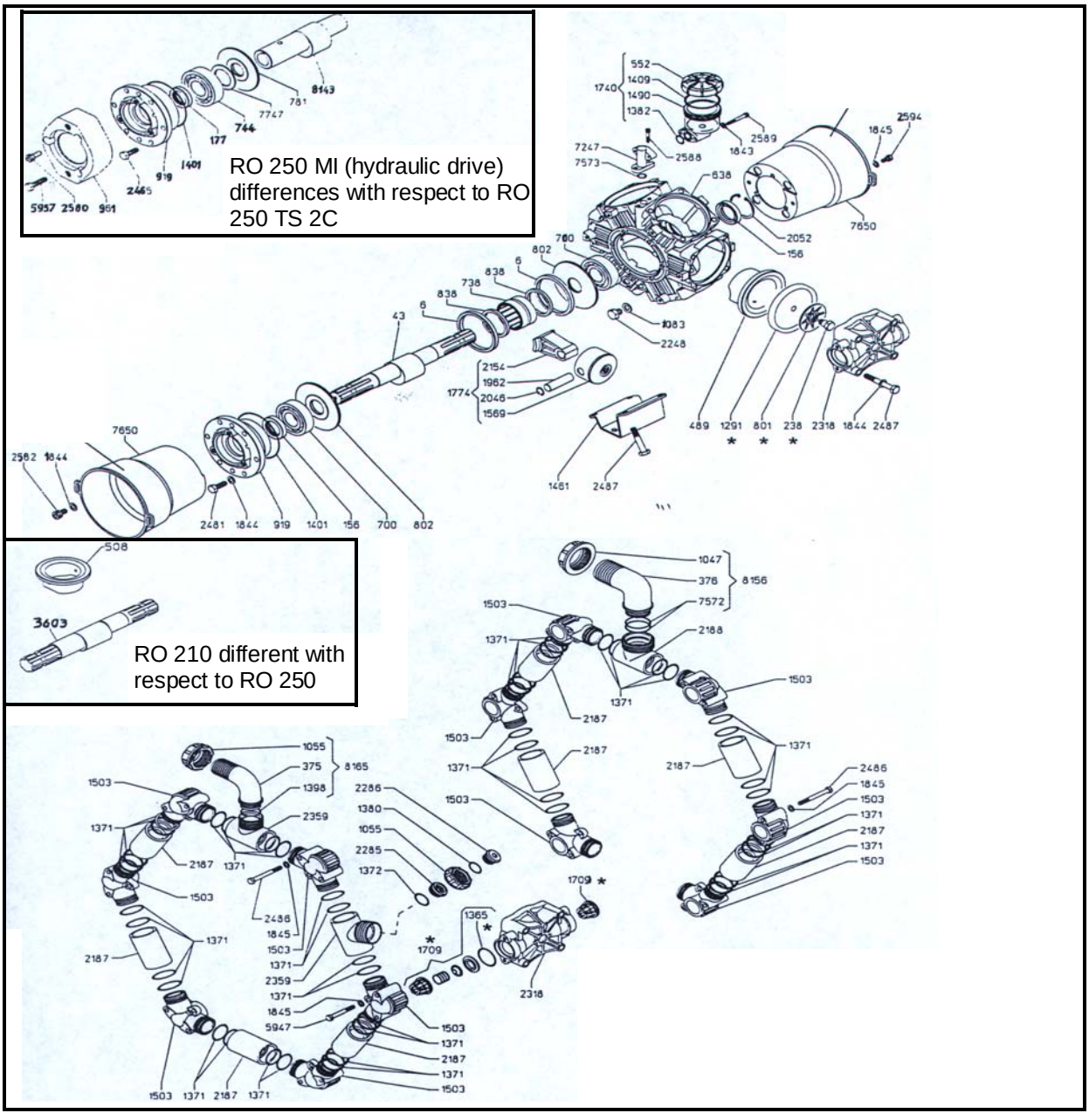
Udor RO 160 diaphragm pump:

Maximum pump capacity: 158 l/min
Maximum pump speed: 540 RPM
Maximum pressure capacity: 20 bar (284 PSI)
Maximum power requirement: 7.05 KW (9.6HP)
Oil Type: Motor Oil SAE 30W40

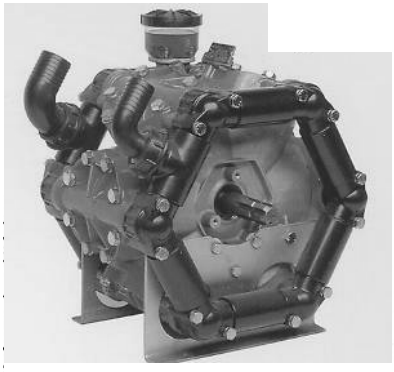


Udor RO 250 diaphragm pumps:

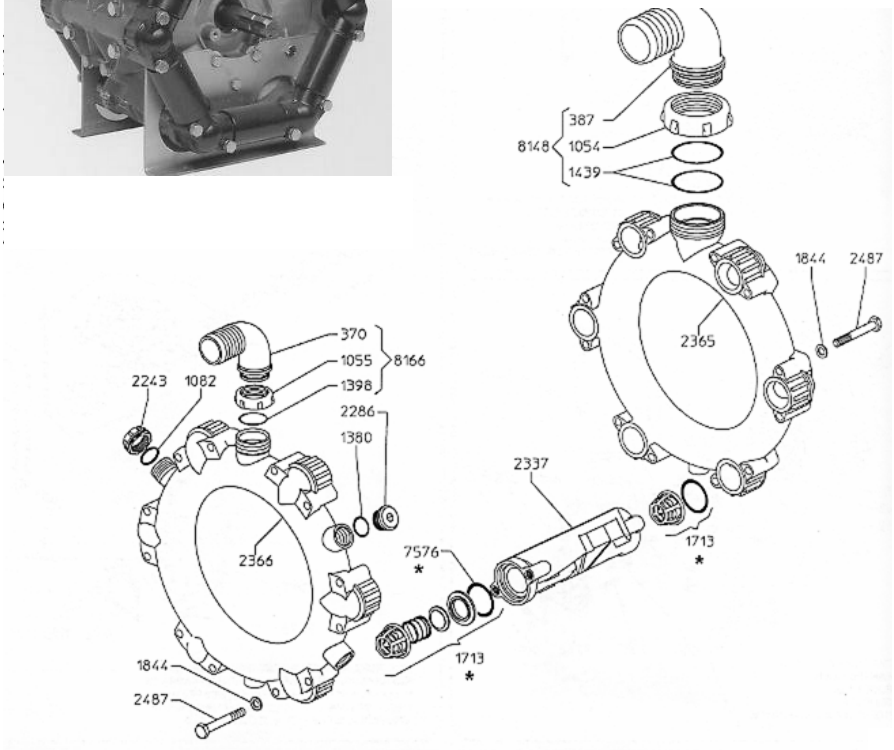
	RO 210	RO 250
Maximum pump capacity:	209 l/min	239
Maximum pump speed:	540 RPM	540 RPM
Maximum pressure capacity:	20 bar (284 PSI)	20 bar (284 PSI)
Maximum power requirement:	7.21 KW (9.82 HP)	8.09 KW (11.01HP)
Oil Type:	Motor Oil SAE 30W40	

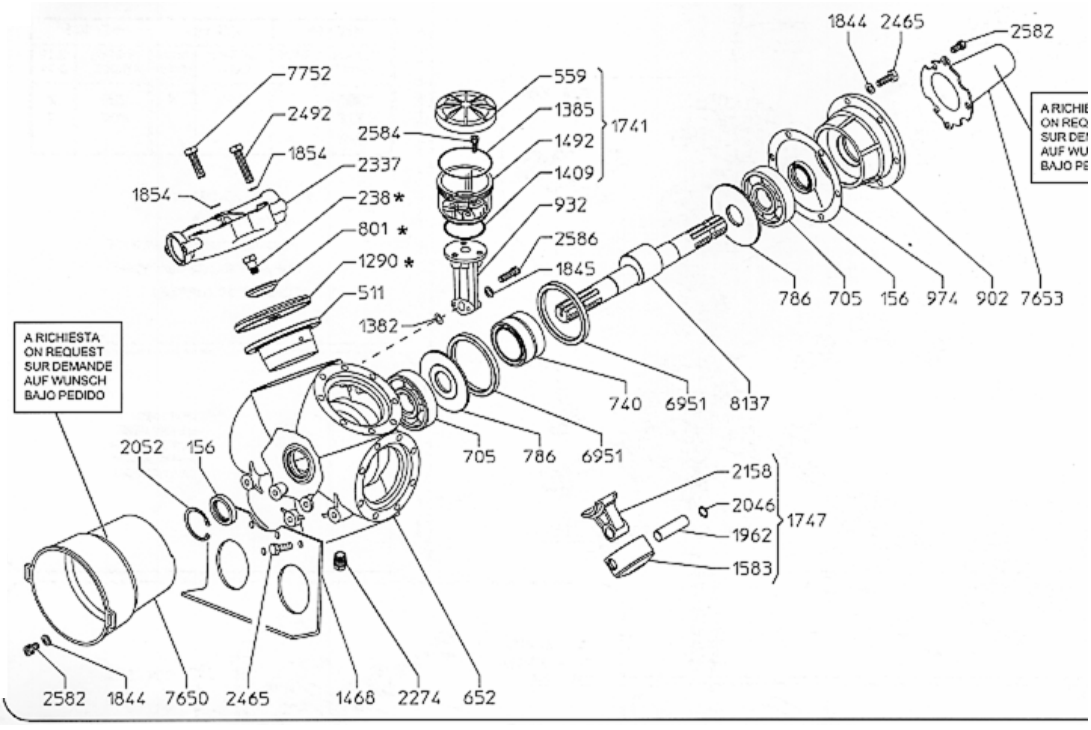


Udor RO 320 diaphragm pump



Maximum pump capacity: 316 Lt/Min
Maximum pump speed: 540 RPM
Maximum pressure capacity: 20 bar (284psi)
Maximum power requirement: 12.13 KW (16.5 HP)
Oil Type: Motor oil SAE 30W40





Pump parts table:

NOTE*: The product code incorporates both the position number and the part number.*

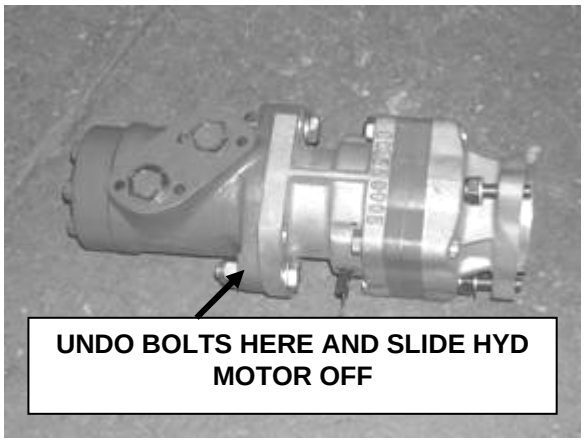
For example: For a product code of **0002-7003000102** the position number is **0002** (the number referred to on the pump drawing) and the part number is **7003000102**

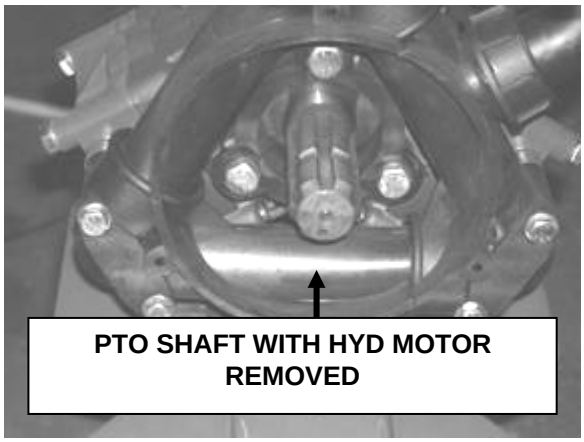
PRODUCT CODE	DESCRIPTION	PRODUCT CODE	DESCRIPTION
0002-7003000102	CON ROD RETAINING RING	0919-7042050167	BEARING SUPPORT FLANGE
0006-7036000108	CON ROD RETAINING RING	0927-7023050179	BEARING SUPPORT FLANGE
0010-7023000259	ECCENTRIC SHAFT	0953-7004060110	VALVE CAGE
0011-7023000260	ECCENTRIC SHAFT	1038-7003060418	SUCTION NUT M42x2
0014-7050000263	ECCENTRIC SHAFT	1042-7600060425	SUCTION NUT 1 1/2"
0050-7027000214	ECCENTRIC SHAFT	1045-7600060432	DELIVERY NUT 1 1/4"
0058-7036000246	ECCENTRIC SHAFT	1072-7004060509	FLAT ALUMINIUM WASHER 17x22x2
0077-7015000309	LOWER AIR CHAMBER	1122-5003060815	AIR VALVE ASSY
0081-7014000315	LOWER AIR CHAMBER	1199-7022080111	KEYSHAFT 10x8x40
0136-7014000607	BEARING HK25-26	1235-7004090135	VALVE SPRING
0156-7004000702	SEAL 35x55x10	1291-7003090302	SIDE DIAPHRAGM
0157-7451000705	SEAL 35x72x10	1300-7015090314	AIR DIAPHRAGM
0238-7003010203	DIAPHRAGM BOLT	1365-7002110101	VALVE O-RING
0357-7003020218	DELIVERY HOSE BARB ELBOW 19	1366-7002110102	O-RING 29.75x3.53
0365-7008020252	HOSE BARB ELBOW 11/4"	1368-7002110104	O-RING 20.63x2.62
0375-7202020278	HOSE BARB ELBOW 38	1371-7004110107	O-RING 34.52x3.53
0489-7014020614	CYLINDER LINER	1374-7011110112	DELIVERY O-RING 17.13x2.62
0493-7012020619	CYLINDER LINER	1376-7010110116	O-RING 6x3
0499-7202020626	CYLINDER LINER	1380-7003110125	O-RING 20.22x3.53
0552-7014020807	OIL BOWL CAP	1382-7015110129	O-RING 16x3
0557-7016020820	AIR CHAMBER COVER	1389-7014110141	SUCTION O-RING 28x3
0602-7003020909	PUMP HOUSING	1391-7021110143	O-RING 71.12x2.62
0618-7036020925	PUMP HOUSING	1395-7040110148	O-RING 88.5x3.53
0626-7023020934	PUMP HOUSING	1398-7014110142	SUCTION O-RING 32x3
0649-7023025702	DELIVERY MANIFOLD	1401-7036110158	O-RING 110x2.5
0700-7004021404	BEARING 6307	1406-7028110117	O-RING 60.33x3.53
0701-7004021405	THRUST BEARING 6207	1409-7046110168	OIL BOWL CAP O-RING 60.33x3.53
0704-7012021409	BEARING 6305	1412-7023110179	O-RING 74.8x2.6
0735-7001021601	CON ROD BEARING NK4220	1426-7021110189	O-RING 36.1x3.53
0738-7036021607	CON ROD BEARING NK55/35	1428-7004120103	VALVE PLATE
0747-7001021801	AIR VALVE COVER	1447-7201120202	MOUNTING BRACKET
0791-7011030110	THRUST WASHER	1450-7014120211	MOUNTING BRACKET
0792-7014030114	THRUST WASHER	1457-7036120229	MOUNTING BRACKET
0799-7014030124	THRUST WASHER	1490-7014120327	OIL BOWL
0801-7003030107	DIAPHRAGM WASHER	1497-7021120336	MANIFOLD END
0802-7036030128	THRUST WASHER	1500-7027120338	MANIFOLD END
0820-7003030201	SPACER RING	1569-7003120506	PISTON
0833-7023030252	SPACER RING	1574-7012120512	PISTON
0838-7036030259	SPACER RING	1607-7021120622	STUD M10x50
0845-7001030301	AIR CHAMBER NUT M8	1709-4004600608	VALVE ASSY
0871-7801030404	NUT M10	1740-4021603301	OIL BOWL ASSY
0901-7014050145	BEARING SUPPORT FLANGE	1772-4012601534	PISTON ASSY
0905-7201050102	BEARING SUPPORT FLANGE	1776-4036601530	PISTON ASSY
0907-7027050118	BEARING SUPPORT FLANGE	1798-4023601524	PISTON ASSY
0916-7021050162	SHAFT ADAPTER	1843-7003140307	WASHER 6.5x13x1.2

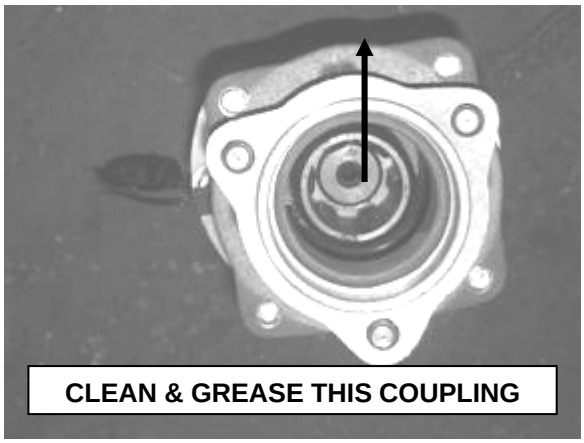
PRODUCT CODE	DESCRIPTION
1844-7015140309	FLAT WASHER 10.5x18x2
1845-7002140310	FLAT WASHER 8.5x15x1.5
1929-7003150117	VALVE SPACER
1962-7005150201	GUDGEON PIN 18x64
2046-7001150602	GUDGEON PIN CIRCLIP 18
2149-7023151916	CONNECTING ROD
2153-7036151920	CONNECTING ROD
2155-7003151922	CONNECTING ROD
2184-7036160112	MANIFOLD WITH END
2185-7021160113	SUCTION MANIFOLD
2186-7021160114	SUCTION MANIFOLD WITH END
2218-7003160214	SUCTION MANIFOLD
2224-7036160220	SUCTION MANIFOLD WITH PORT
2225-7036160221	DELIVERY MANIFOLD WITH PORT
2226-7021160222	SUCTION MANIFOLD
2227-7021160223	SUCTION MANIFOLD WITH PORT
2251-7004160302	PLUG 3/8"
2261-7003160323	OIL DIPSTICK
2318-7036160436	CYLINDER HEAD
2324-7027160450	CYLINDER HEAD
2356-7036160515	DELIVERY MANIFOLD WITH PORT
2465-7004180403	BOLT M10x30
2466-7201180406	BOLT M10x20
2469-7605180418	BOLT M8x45
2471-7001180429	BOLT M10x70
2472-7010180431	BOLT M10x90
2473-7015180454	BOLT M8x35
2478-7011180468	BOLT M6x22
2481-7201180407	MOUNTING BRACKET BOLT
2482-7207180409	AIR CHAMBER BOLT M8x40
2486-7112180479	BOLT M8x70
2487-7605180425	BOLT M10x75
2584-7004180506	BOLT M8x20
2586-7207180513	BOLT M8x35
2589-7004180526	BOLT M6x45
5949-7209180472	BOLT M8x50
7051-7201020269	DELIVERY HOSE BARB 19
7261-7201050806	FLANGED DELIVERY OUTLETS
7330-7201060429	DELIVERY NUT 3/4" (RED)
7700-7201160322	DELIVERY OUTLET PLUG
8113-7003090334	SIDE DIAPHRAGM DESMOPAN

Service information for Diaphragm Pumps & Hydraulic Drive Motors:

Dusty conditions can cause the hydraulic drive coupler on HYDDR and HYDDRC motors to wear excessively. This wear can cause lack of drive to the diaphragm pump. The drive coupler mentioned is fitted to Diaphragm pumps with 540 PTO shafts but are hydraulically driven.
This coupler is in an adaptor housing therefore it is hard to see amount of dust build up around it. For this reason it is recommended that the motor be unbolted and the coupler cleaned and greased at regular intervals (approximately 250hrs).
It is also possible for dust to build up around the sensor enough to affect the pulse reading to the console. Regular servicing of the drive coupler will prevent this from happening.







When fitting hydraulic drive to new model Udor pumps, an 'MI' pump is used which allows a hydraulic motor to be bolted directly to the front of the pump.

The oil line to the hydraulic pump is fitted with a needle valve that regulates oil flow to the pump. Although many tractors feature hydraulic oil flow regulation in the cab, the needle valves are still fitted in case of the sprayer being coupled to an old model tractor.

Udor 160 Lt/Min MI pump fitted with a hydraulic drive.

When a hydraulically driven pump is coupled to a tractor fitted with in cab oil flow adjustment, it is recommended to close the needle valve and adjust the hydraulic oil flow in the tractor to set the pump running at the correct speed (i.e. Between 400 and 540rpm). To set the pump speed, follow the directions listed below.
Depressing the [**SPEED**] button for five seconds on the Raven 440 console shows the pump speed. Sprayers not fitted with Raven controllers will have a display panel to show pump speed.

The aim is to pump the least amount of hydraulic oil out of the tractor to obtain the required pump speed. This will minimize oil heat up.

WARNING: *Be careful to avoid getting caught in any rotating components.*

WARNING: *Operate pump between 400 RPM and 540 RPM when spraying.*

04 FLOWMETERS AND RAVEN 440 - INDEX:

CALIBRATION INFORMATION:

SI		**SP1**	
C-SD		**BOOM 1 CAL**	
BOOM 2 CAL		**BOOM 3 CAL**	
BOOM 4 CAL		**BOOM 5 CAL**	
BOOM 6 CAL		**BOOM 7 CAL**	
SPEED CAL		**METER CAL**	
VALVE CAL		**RATE 1**	
TIER 1		**TIER 2**	
TIER 3		**DCI 1**	
DCI 2		**DCI 3**	

TROUBLESHOOTING

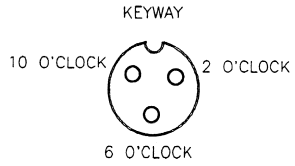
"MY APPLICATION RATE IS INACCURATE, UNSTABLE OR ZERO"

a) Check the application rate by performing a jug test over a representative number of jets across the boom width.
b) Check that the console is correctly programmed by ensuring that the correct values have been entered. Record these numbers in the console.
c) When spraying, press speed and see if the speed is unstable or zero.
d) When spraying, press volume and see if the volume is erratic or not changing.
e) When spraying, place flow control switch into manual and use the Inc/Dec switch to see if the rate (and pressure) can be adjusted.
f) Check the length of the fill hose inside the tank. Some chemicals can cause this hose to increase in length, causing it to foul on the suction outlet in the sump. Shorten the hose so that it sits 150mm clear of the bottom of the tank.

"MY SPEED SENSOR DISPLAY IS INACCURATE, UNSTABLE OR ZERO"

1. Check Speed Cal No.
2. Clean and check all pins and sockets on speed sensor cable connectors.
3. Make sure magnets are on wheel (red followed by black) and that the magnets pass by the centre of the sensor and have between 6 to 20mm clearance.
4. Perform the following procedure to test speed sensor cables at the back of the console and at the cable breakaway (at front of sprayer). This test will determine if one of the cable sections is faulty or if the speed sensor itself is at fault.

"I NEED TO TEST MY SPEED SENSOR CABLES".



a) 2 o'clock socket is power
b) 6 o'clock socket is signal
c) 10 o'clock socket is ground

Voltage Readings

a) 10 o'clock to 6 o'clock (+5 VDC)
b) 10 o'clock to 2 o'clock (+5 VDC)

a) Change Speed Cal Number to 1000 in [SPEED CAL] key
b) Press [DISTANCE] key
c) With a jumper wire (or paper clip or screwdriver), short between 6 o'clock and 10 o'clock sockets with a "short – no short" motion. Each time contact is made, the [DISTANCE] total should increment up 1 or more counts

d) If distance does not count up, perform test at the next connector closer to the console. If this next test works, the previous section of cable must be faulty and should be replaced
e) Perform above voltage checks
f) Change Speed Cal Number back to previous number.

Note: Speed sensor is not repairable and will need to be replaced if faulty.

"MY SPEED SENSOR HAS FAILED".

NOTE: If a relatively constant ground speed is indicated on the console, then the problem is with the sensor, magnets, or cable, but not the console.

If the speed sensor fails, the following procedures should be adhered to:

- Enter a self-test speed that is the same as the ground speed that you can manually maintain. The console should then give an application rate for that simulated ground speed.

OR

If a reasonably constant ground speed can not be maintained, or the console unable to perform a self-test, then:

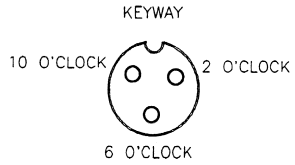
- Adjust the spraying pressure by switching the flow control into manual and using the Inc-Dec switch to adjust to the desired pressure as shown by the pressure gauge on the sprayer.
- Drive the sprayer at the constant speed (as measured by the tractor) in order to apply the required application volume as determined by the nozzle selection chart.

The sprayer should then be operated so as to empty the tank. Once the sprayer is empty of chemical, partially fill the tank with fresh water (no chemical) so that test can be performed in order to correct the problem. Repair or replace the speed sensor as soon as possible.

"MY VOLUME DISPLAY IS INACCURATE, UNSTABLE, ZERO OR NOT CHANGING"

1. Check Meter Cal No.
2. Clean and check all pins and sockets on Flowmeter sensor cable connectors.
3. Make sure the Flowmeter is pointing in the correct direction for flow.
4. Perform the following procedure to test Flowmeter sensor cables at the cable breakaway (at front of sprayer) and at the Flowmeter. This test will determine if one of the cable sections is faulty or if the Flowmeter itself is at fault.

"I NEED TO TEST MY FLOWMETER CABLES".



a) 2 o'clock socket is ground
b) 6 o'clock socket is signal
c) 10 o'clock socket is power

Voltage Readings

a) 2 o'clock to 6 o'clock (+5 VDC)
b) 2 o'clock to 10 o'clock (+5 VDC)

a) Change Meter Cal Number to 1 in [METER CAL] key
b) Press [TOTAL VOLUME] key and place boom switches ON
c) With a jumper wire (or paper clip or screwdriver), short between 2 o'clock and 6 o'clock sockets with a "short – no short" motion. Each time contact is made, the [TOTAL VOLUME] total should increment up 1 or more counts
d) If total volume does not count up, perform test at the next connector closer to the console. If this next test works, the previous section of cable must be faulty and should be replaced
e) Perform above voltage checks
f) Change Meter Cal Number back to previous number.

5. If the Flowmeter appears to be not working, take the Flowmeter apart.

- The Flowmeter turbine and turbine hub should be cleaned of all foreign material (such as metal filings and wettable powders which may have hardened in the plastic and metal parts).
- Check for worn turbine blades, scoring on the turbine shaft and damaged bearings so that the turbine spins freely when assembled correctly.
- Check the general condition of the Flowmeter when inserting it back onto the sprayer.
- If there is still no signal from the Flowmeter, the Flowmeter may need to be replaced.

"MY FLOWMETER HAS FAILED".

If the Flowmeter fails to give accurate readings, the following procedures should occur:

- Adjust the spraying pressure by putting the flow control switch into manual and using the Inc-Dec switch to adjust to the desired pressure as shown by the pressure gauge on the sprayer.
- Drive the sprayer at a constant speed (as measured by the tractor) in order to apply the required application volume as determined by the nozzle selection chart.

The sprayer should then be operated to empty the tank. Once the sprayer is empty of chemical, partially fill the tank with fresh water (no chemical) so that test can be performed in order to correct the problem. Repair or replace the Flowmeter as soon as possible.

"I CANNOT ALTER MY APPLICATION RATE OR PRESSURE".

1. Perform a self-test and put the flow control switch into manual, turn a boom section on and use the Inc/Dec switch to see if the rate can be adjusted (if the rate cannot be altered, control valve is not altering the amount of flow back to the tank).
2. Check the green and yellow wiring to the control valve and the connectors.
3. **Make sure the yellow wire is swapped over to the green wire and the green wire is swapped over to the yellow wire near the control valve for base model sprayers.**
4. Check that there is 12 volts reaching the control valve (check at the console side of the breakaway connector and where the wires are swapped over). To do this, have the flow control switch in manual and the Inc/Dec going up and down. See if the motor is going and that the butterfly is going around. The hose and hose barb elbow fitting will have to be removed in order to do this.
5. **For sprayers fitted with 2TS plumbing, there is an additional positive (red) and negative (black) wire running to the valve. These additional wires should display constant twelve volts. The yellow and green wires running to the valve must remain in the yellow and green sequence (i.e. <u>not swapped</u>) with 5 volts power being displayed when the inc/dec switch is operated with the rate switch placed into the manual position.**

"MY CONTROL VALVE HAS FAILED".

If the control valve does not respond to the console to alter the amount of flow going back to the tank, then:

For sprayers fitted with base model plumbing:

- Close the Bypass Line ball valve in front of the control valve.
- Adjust the ball valve in front of the electric control valve until the desired spraying pressure is shown by the pressure gauge on the sprayer. If the desired spraying pressure is not able to be achieved with the ball valve, adjust the pressure relief valve setting to achieve the desired pressure.
- Drive the sprayer at a constant speed (as measured by the tractor) in order to apply the required application volume as determined by the nozzle selection chart.

For sprayers fitted with 2TS plumbing:

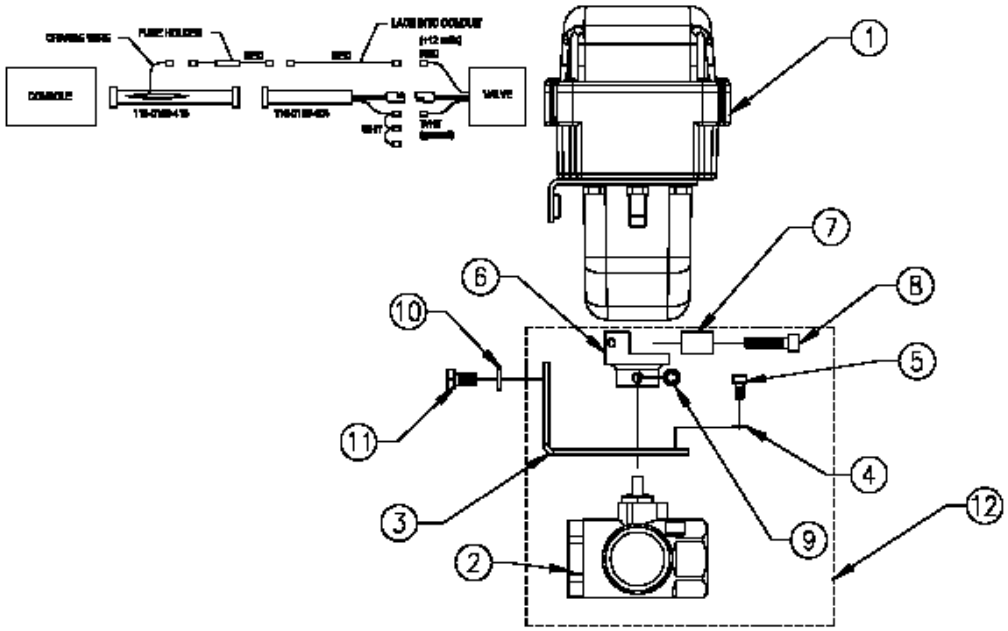
- Remove the motor from the 3 way tap (exposing the drive shaft) and manually turn the tap to achieve the desired spraying pressure.

The sprayer should then be operated to empty the tank. Once the sprayer is empty of chemical, partially fill the tank with fresh water (no chemical) so that test can be performed in order to correct the problem. Repair or replace the control valve as soon as possible.

1" 3-WAY BALL VALVE REPLACEMENT PARTS

063-0172-172

ITEM	DESCRIPTION	RAVEN PART #
1	Motor Assembly, Fast Valve	063-0172-146
2	1" 3 Way Ball Valve	334-0002-043
3	Bracket	107-0171-396
4	Washer Split Lock	313-1000-036
5	Screw, Cap #10-24 x 3/8"	311-0068-047
6	Coupler, 1" 3-Way	107-0171-397
7	Clamp, Coupler	107-0171-394
8	Screw, Cap, 1/4'20 x 1"	311-0068-068
9	Screw, Cap, 1/4-20 x 1/2"	311-0068-064
10	Washer, Split Lock	313-1000-017
11	Bolt, Hex, 1/4-20 x 1/2"	311-0050-201
12	Valve/Bracket Assembly	063-0172-152
13	Wiring Kit	117-0159-642



"I NEED TO TEST MY CONSOLE".

If there is a problem with the console, the following power check procedure should be performed. Otherwise the console may need servicing by the appropriate GoldAcres representative.

To check the power to the console:

1. Check that the red wire is connected to the positive and the white wire to the negative terminal of a 12 volt DC supply.
2. Make sure the battery connections are clean.
3. Check to ensure the fuse at the back of the console is not blown.
4. With a multi-meter, check the voltage potential across pins 1 and 16 on the 16-pin plug going into the console (should be at least 12 volts).

"MY CONSOLE HAS FAILED".

If a relatively constant ground speed is indicated on the console, then the problem is with the sensor, magnets, or cable, but not the console.

If the Raven console fails so that it is not able to control the solenoids, and control valve, the following procedures should be adhered to:

1. Disconnect console from console cable.
2. Disconnect console cable from power source (i.e. battery).
3. Remove the plunger and spring from the solenoids. (This will open the solenoids)

To start and stop spraying through the nozzles, start and stop the pump. **(Care should be taken because there is no agitation while the nozzles are not spraying)**

For base model sprayers:

- Adjust the manual pressure relief valve to alter the spraying pressure to the desired pressure as shown by the pressure gauge on the sprayer. If the desired spraying pressure is not able to be achieved, alter the pressure relief valve setting so as to achieve the desired pressure (i.e. alter the adjusting stem).

For sprayers fitted with2TS:

- Remove electric motor from three way fast close valve, and manually rotate valve until desired spraying pressure is achieved.

4. Drive the sprayer at a constant speed (as measured by the tractor) in order to apply the required application volume as determined by the nozzle selection chart.

The sprayer should then be able to be operated in order to empty the tank. Once the sprayer is empty of chemical, partially fill the tank with fresh water (no chemical) so that testing can be performed in order to correct the problem. Repair or replace the console as soon as possible.

FLOWMETERS

LEAVING AND STARTING THE SPRAYER IN COLD CONDITIONS

Make sure the Flowmeter is drained to prevent freezing. If the sprayer has been 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.

FILLING FLOWMETERS

To use a filling Flowmeter system effectively with a Raven Automatic Controller, both Flowmeters (i.e. the filling Flowmeter and the controller Flowmeter) need to be calibrated such that they record the same amount of volume in the tank. That is if the filling Flowmeter records 3000 litres as having been put into the tank, the controller Flowmeter should also record this volume as having gone out through the nozzles. Thus the required amount of area will be covered for the amount of chemical that has been deposited into the tank. The Meter Cal No. of one of the Flowmeters may need to be altered to achieve this.

It is important that both the filling Flowmeter and the controller Flowmeter record the same volume as being in the tank. Always do some initial calibration checks to ensure this is the case. The calibration constant of one (or both) of the Flowmeters may need to be altered to suit.

PROCEDURE TO EQUATE BOTH FLOWMETERS

To set the filling Flowmeter and the controller Flowmeter up so that they both read the same volume in the tank:

1. Fill the tank through the filling Flowmeter. Record the volume reading that the filling Flowmeter measures.
2. Pump out the tank through the Raven controller Flowmeter (either do a self-test or do a spray operation). Record the volume reading that the controller Flowmeter measures.
3. Compare the two volume readings. If the volumes differ by an amount greater than 5%, alter one of the calibration constants for the respective Flowmeter so that the volumes will not differ by more than 2%.

For Example: A filling Flowmeter (with a calibration constant of 175) measured 2925 litres into a 3000 litre tank. The controller Flowmeter (with a calibration constant of 188) measured 3050 litres as being in the 3000 litre tank. To make the Flowmeters measure the same:

New calibration constant for the filling Flowmeter is 175 x 2925 ÷ 3050 = 168

4. Repeat the filling tests for the tank being full and part full to calculate the correct calibration constant.

NOTE: Either of the Flowmeter calibration constants can be altered. Also both can be altered so as they read the same as the maximum tank graduation (i.e. 3000 litres).

RAVEN FLOW MAX 220 FLOW METER (OPTIONAL EQUIPMENT)

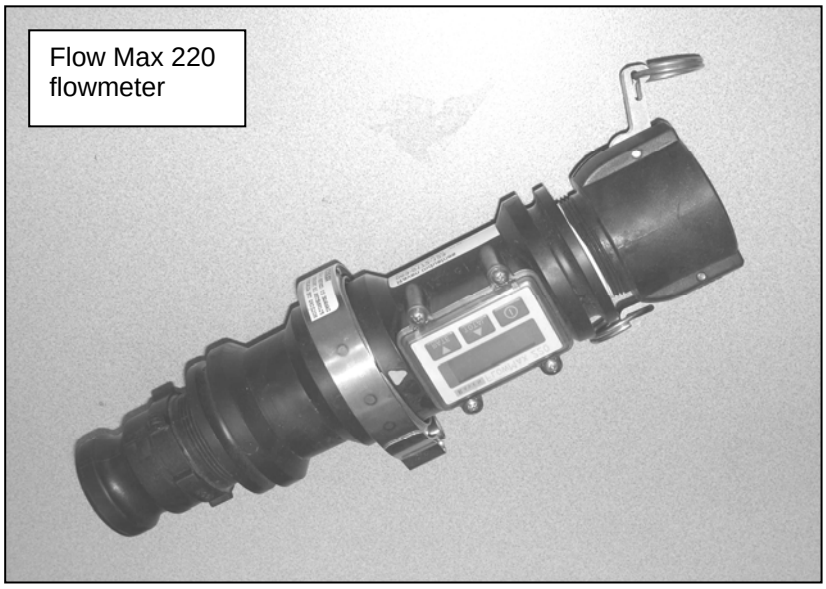
The Flow max 220 provides for accurate tank filling. The console is mounted directly to a Raven Flowmeter. The digital display provides total volume and sub volume measurements.

FLOW CAPACITY

The Flowmeter should be sized so as to not be working at the extreme ends of the flow capacities.

FLOW MAX 220 Flowmeter: 50 - 758 l/min

NOTE: The Flowmax console operates from a 3.6volt volt battery. This is required to store the programmed information in the console.



RAVEN AUTOMATIC MONITOR CONTROLLER

The Raven automatic controller is designed to improve the uniformity of spray applications. Raven controllers will monitor and control the determined application volume, but prior calculations will be required to ensure spraying pressures do not exceed operating parameters. (Refer to Teejet catalogue) The Raven system comprises a console, flowmeter, speed sensor and liquid flow control valve.

As the sprayer is moving, the console records ground speed and then calculates the amount of flow required to maintain the respective application rate at that speed. The console monitors the amount of flow being used via the flowmeter and then determines if the flow is correct for that speed. Flow adjustments are made by the control valve which varies the amount (volume) of by-pass and thus the volume being applied via the boom is controlled.

When the console is in the automatic mode, as the ground speed increases, the flow to the booms required to maintain the application volume will be increased. This will result in the pressure (as displayed on the gauge) increasing. Conversely, as the ground speed decreases, the required flow to the booms, as well as the pressure, decreases.

When the console is in the manual mode, as the ground speed increases, the pressure and flow will remain constant and the application volume will decrease. Similarly, as the ground speed decreases, again the pressure and flow will remain constant and the application rate will increase.

MOBILE PHONES MAY INTERFERE WITH AND/OR DISRUPT AUTOMATIC CONTROLLERS

CALIBRATION

The following information is a condensed version of the Raven installation and service manual. It is designed to provide sufficient basic information to enable the unit to be calibrated before starting to spray. For more detailed information about console features, consult the Raven installation and service manual.

It is imperative that the Raven console is correctly programmed, as the system will only work as accurately as its programmed information.

The following information is applicable for the SCS 440, SCS 450, and SCS 330 console.
Write down all the numbers that are entered when calibrating the console for future reference.

Initially displaying "**SP 1**" and "**CAL**" (**440 Console**)
"**SP 1**" (**330 Console**)

STEP 1: Press **[ENTER]** to lock in "**SP 1**" (Wheel-Drive or Drive-Shaft Speed Sensor)
For Radar Speed Sensor, toggle to "**SP 2**" by pressing [CE] then **[ENTER]**

STEP 2: Press [ENTER] to lock in "**C-SD**" (Standard Valve)
For 2TS system refer to the 2TS console programming.

NOTE: These 2 steps are very important because the system will appear to function properly but if the units are incorrect the quantities will be very inaccurate. If an error has been made whist calibrating these 2 steps, turn the console off then turn back on again with [CE] pressed and all information will be cleared. To see what has been programmed, depress [**SELF TEST**] (**440 and 450 Console**) or [**TOTAL AREA**] (**330 Console**) for about 5 seconds and the programmed information should be displayed (flashing and toggling)

STEP 3: **(330 AND 440 CONSOLE ONLY)**
Press [BOOM **CAL 1**] then [ENTER]
Enter Boom Section 1 in Centimetres, Press [ENTER]
(For example 6m = 600 cm. Press [6] then [0] then [0])

Most booms are plumbed into 3 sections and the console needs to know the width of each section so that when a section is turned off the console can reduce the width of the boom accordingly in order to calculate only the area that is sprayed. To measure the boom width for each section, count the number of nozzles in each section and multiply by the nozzle spacing. i.e. 12 nozzles in one section at 50 cm (½ metre) spacings = 12 * 0.5m = 6 metres.

STEP 4: Press [BOOM **CAL 2**] then [ENTER]
Enter Boom Section 1 in Centimetres, Press [ENTER]
(For example 6m = 600 cm. Press [6] then [0] then [0])

STEP 5: Press [BOOM **CAL 3**] then [ENTER]
Enter Boom Section 1 in Centimetres, Press [ENTER]
(For example 6m = 600 cm. Press [6] then [0] then [0])

NOTE: If only one or two boom sections are to be used, enter "0" for width of boom section not being used

STEP 3: **(450 CONSOLE ONLY)**
Press [BOOM **CAL**] then [ENTER]
Enter Boom Section 1 in Centimetres, Press [ENTER]
(For example 6m = 600 cm. Press [6] then [0] then [0])

The Raven 450 console has provisions for handling up to 5 boom sections. To measure the boom width for each boom section, count the number of nozzles in each section and multiply by the nozzle spacing. i.e. 12 nozzles in one section at 50 cm (½ metre) spacings = 12 * 0.5m = 6 metres.

STEP 4: Press [1] to select boom section 2 (b-02)
Key in Boom Section 2, then press [ENTER]

STEP 5: Insert remaining boom sections by using toggle **[∧]** & **[∨]** buttons [1] or [2]
If a boom section is not needed, enter a "**0**" for the length.

STEP 6: **(330, 440 and 450 consoles)**
Press [SPEED **CAL**] then [ENTER]
Enter Speed Cal in Decimetres **(1metre = 10 decimetres)**
Press [ENTER] (eg 477)

Speed Cal is the distance measured by 10 revolutions of the Speed Sensor Wheel. This is best done with the tank half full of water (best simulates average between full and empty) and measured on ground that is typical to what will be encountered when spraying. Also note the tyre pressure when this procedure is performed. This tyre pressure needs to be maintained for the speed cal to be accurate. The speed cal should be checked at the start of every spraying season as the speed cal may need to be altered to compensate for tyre wear, etc.

NOTE:
For **440 and 450 console** with 4 wheel magnets (2 red and 2 black) - measure distance and multiply by 10 (to convert into decimetres)
For **440 and 450 console** with 2 wheel magnets (1 red and 1 black) - measure distance and multiply by 10 (to convert into decimetres) then multiply by 2

For **330 console** with 4 wheel magnets (2 red and 2 black) - measure distance and multiply by 10 (to convert into decimetres) then divide by 2
For **330 console** with 2 wheel magnets (1 red and 1 black) - measure distance and multiply by 10 (to convert into decimetres)

STEP 7: Press [METER **CAL**] then [ENTER]
Enter Meter Cal for litres. Press [ENTER] (eg 185)

Meter Cal is the Calibration number on the Flow Meter white tag. The required number for litres is the number in square brackets.

STEP 8: (**440 and 450 Console**)
Press [VALVE **CAL**] then [ENTER]
Enter "2123" (standard Raven spraying value)
Press [ENTER]
(If the sprayer is fitted with a 2TS system, refer to the section, "2TS console programming")

STEP 9: (**440 and 450 Console**)
Press **[RATE 1**] then [ENTER]
Enter Rate 1 (**litres per hectare**)
Press [ENTER] (eg 60)

STEP 10: (**440 and 450 Console**)
Press **[RATE 2**] then [ENTER]
Enter Rate 2 (**litres per hectare**)
Press [ENTER] (eg 75)

Note: Rate 2 can be the same as Rate 1 if only the one rate is to be used.

STEP 11: **(OPTIONAL FOR 440 AND 450 CONSOLE)**
Press [VOL**/TANK**] then **[ENTER**]
Enter the Volume in Tank at start of spraying
Press [ENTER] (eg 3000)

STEP 12: **(OPTIONAL FOR 440 AND 450 CONSOLE)**
Press [TIME] then [ENTER]
Enter the time of the day. Press [ENTER] (egg 10:30)

STEP 13: **(WHERE HYDRAULIC DRIVE IS FITTED TO SPRAYER PUMP)**
Press [SPEED**]** and hold down for 5 seconds until speed value begins to flash. When the pump is fitted with hydraulic drive, the flashing 'speed' figure represents the pump's RPM.

TO ZERO INFORMATION WHEN ENTERING NEW FIELD

When entering a new field, the previous data in the console can be changed to zero so that the new data is current for that field only.

WRITE DOWN ALL NECESSARY DATA BEFORE REMOVING DATA FROM CONSOLE MEMORY

To zero out data in Area and Volume:

STEP 1: Write down the previous information for Area and Volume

STEP 2: Press **Area** or **Volume** (Total or Field for 440 & 450 consoles)

STEP 3: Press [**ENTER**]

STEP 4: Enter “0”

STEP 5: Press [**ENTER**]

The Area and Volume will now count from zero for the new field. If using a 440 console, the Area and Volume can have sub-totals (that is new data for every new field or tank load) as well as keeping total data (that is data that has not been changed to zero and has accumulated).

CALIBRATION INFORMATION

Write down the correct calibration information for future reference.

DATE:

SP 1 / SP 2–	**BOOM CAL 1 –**	**SPEED CAL –**	**RATE 1 –**
C-SD –	**BOOM CAL 2 –**	**METER CAL –**	**RATE 2 –**
	BOOM CAL 3 –	**VALVE CAL (440/450 Console) –**	
	BOOM CAL 4 –		
	BOOM CAL 5 –		

SELF-TEST SIMULATION

By simulating speed, the Raven controller can be tested without having to move. The Raven works in rate (i.e. litres per hectare) and a speed is required in order to calculate a rate. The self-test simulation provides the console with a simulated speed even though the sprayer is stationary and thus the console will be able to display a rate.

This self-test should be performed when first testing the system so that the operator can become familiar with the working system.

NEVER FIRST TEST THE RAVEN SYSTEM WITH CHEMICAL IN THE TANK

STEP 1: (**440 and 450 Console**) Press [**SELF TEST**] then [ENTER]

(**330 Console**)Press [SPEED] and hold for at least 5 seconds until "⌈ " appears, then [ENTER]

Enter speed (i.e. 12.0 for 12 km/h)
Press [ENTER]
Press [SPEED] to verify speed

The sprayer will now operate so that it can be tested. Switch the boom sections on and off to see that the system compensates and the applied rate returns to the required rate. The self-test will cancel when motion from the vehicle is detected by the speed sensor. For radar speed sensor, disconnect the speed cable going into the back of the console in order to do a self-test.

THE RAVEN CONSOLE

It is important that the console is mounted in the cabin in such a way that it cannot cause harm to the operator under any circumstance. If the sprayer is disconnected from the towing vehicle but the cable looms connecting the Raven console (or any console for that matter) to the sprayer are not disconnected, make sure the console will not harm the operator if it becomes a projectile.

Disconnect the console before jump starting, charging the battery or welding on equipment.

Do not mount the console such that it will be exposed to sunlight as this will cause damage to the console LCD displays.

Remove the console when not in use for an extended period of time (especially at the end of the spraying season).

NOTE: The Orange and Orange/White wires coming out of the loom are for a remote switch operation and are usually left disconnected, except on self propelled sprayers.

When the two wires are connected together via a remote switch, this remote switch will act as a secondary Master switch.

CALCULATION OF SPEED CAL FOR DRIVE-SHAFT SPEED SENSOR AND RADAR (ALSO TO CHECK WHEEL-DRIVE SPEED CAL)

STEP 1: Measure accurately 100 metres on a flat surface, preferably on ground typical of the ground to be sprayed. Do not rely on vehicle speedometer for measuring distance accurately.

STEP 2: Half fill tank with water

STEP 3: Calibrate Raven console

NOTE: Make sure "**SP 1**" is programmed in for wheel-drive or drive-shaft speed sensor.
Make sure "**SP 2**" is programmed in for radar speed sensor.

STEP 4: Enter Speed Cal value of "155" or the Speed Cal value that is to be verified in key labelled [SPEED **CAL**]

STEP 5: Place Master switch and Boom 1 switch to "On"

STEP 6: At start of 100 metres, enter "0" in key labelled [DISTANCE]

STEP 7: Drive 100 metres

STEP 8: Read distance by depressing key labelled [DISTANCE]

STEP 9: Alter Speed Cal value accordingly if there is a sufficiently large discrepancy between the measured distance and the theoretical distance. (I.e. greater than 5 metres)

Eg. If distance reads 120 metres
New Speed Cal value = 155 x 100 ÷ 120 = 129

STEP 10: Enter in new Speed Cal value and repeat procedure (Step 5 to Step 8)

Continue to re-iterate the Speed Cal value until the desired distance accuracy is achieved

STEP 11: Write down the appropriate Speed Cal value for future reference.

USING THE FLOWMETER TO CALIBRATE THE TANK

STEP 1: Enter in the Meter Cal value as given on the white Calibration sticker on the Flowmeter.

STEP 2: Enter all the other calibration information needed to enable the console to work.

STEP 3: Fill the tank to the top mark with water (i.e. 2500 or 3000 etc.). Make sure the tank is level.

STEP 4: Make sure the Total Volume reads "0"
Press [TOTAL **VOLUME**] then [ENTER]
Enter "0" then [ENTER]

STEP 5: Perform a self-test. (Choose a relatively high speed and high rate so that the tank will empty relatively quickly but make sure the pressure does not exceed 60 psi)

STEP 6: When the tank is empty press [TOTAL **VOLUME**] to read what the Raven Flowmeter says the tank holds.

STEP 7: If there is a large discrepancy (i.e. the difference between theoretical tank volume and Flowmeter volume is greater than 100 litres), alter the Meter Cal value accordingly.

Eg. If volume reads 3100 litres instead of 3000 litres and the original Meter Cal value is 185

New Meter Cal value = 185 x 3100 ÷ 3000 = 191

STEP 8: Enter in new Meter Cal value and repeat procedure (Step 3 to Step 6)

Continue to re-iterate the Meter Cal value until the desired volume accuracy is achieved

STEP 9: Write down the appropriate Speed Cal value for future reference.

STEP 10: Re-fill the tank to the top mark and perform the self test again. Stop the self test after every 200 litres has been pumped out (read by pressing [**TOTAL VOLUME**] and check how the water level compares with the appropriate tank calibration mark (I.e. after 200 litres has been pumped out there is 2800 left in a 3000 litre tank). There may need to be extra marks put on the tank to indicate where the actual tank calibration levels are.

2TS DUAL BOOM OPERATION

A GoldAcres 2TS Dual Boom has two complete and totally separate boom lines on the same boom frame. Where a conventional 30 metre boom has 60 nozzle outlets on one boom line, a Dual Boom has an additional second line containing another 60 nozzles, 120 nozzles in total.

The advantage of the 2TS Dual Boom system is that it enables the sprayer to operate across a wider range of application rates and speeds without exceeding optimum nozzle operating pressures.

When set up correctly the 2TS Dual Boom starts off in the same manner as a conventional boom with only one boom line operating. As the sprayer accelerates the Raven Controller increases the pressure at the nozzles to maintain the given application rate, but at a predetermined flow rate (vol/min equivalent to the maximum desired kPa) the controller engages the second boom line. This reduces the pressure at the nozzles because twice as many nozzles are now operating for the same flow rate. The sprayer now has the scope to continue accelerating with both boom lines operating until the maximum desired pressure is again reached (refer Tee Jet catalogue). The controller meantime is still maintaining the desired application rate per hectare.

As the sprayer slows down the reverse occurs. The Raven Controller reduces the pressure at the nozzles and at the predetermined flow rate (volume per minute) the controller shuts off the second boom line. This allows the Controller to maintain the desired application rate within the suggested pressure range of the nozzles whilst negotiating a corner or obstacle in the paddock.

A GoldAcres sprayer fitted with 2TS dual spray lines requires different console programming and operational procedures to that of a single line system.

2 TS CONSOLE PROGRAMMING

The following information is applicable for the SCS 440 DB and SCS 450 DB (dual boom) consoles.

As you proceed through the instructions write down all the calibrating figures for future reference.

STEP 1:

- Turn on the console power switch located at the top left-hand corner of the console.
- The initial display should flash the word **"CAL"** and display **"SP 1"** (wheel drive)

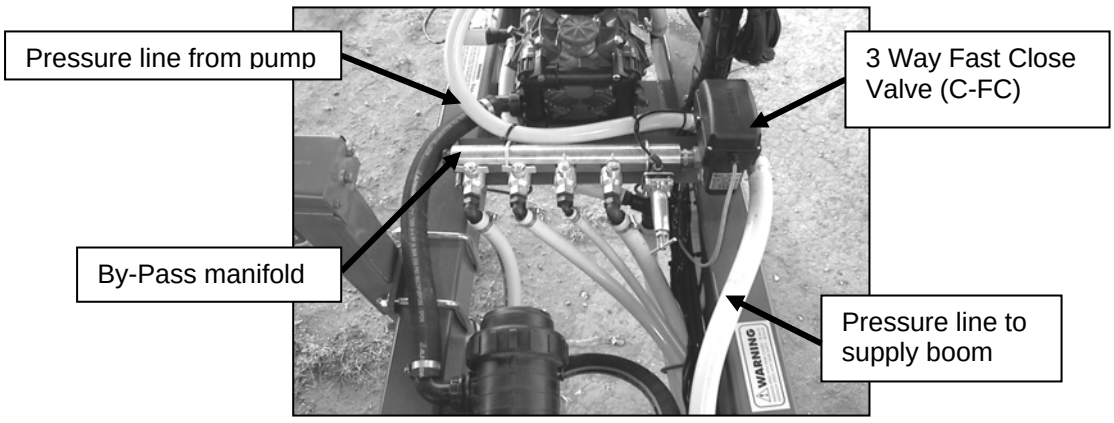
If this is not displayed turn the console power switch "off", depress and hold the [CE] key while turning the power switch back "on". This procedure resets the console.

- Press **[ENTER]** to lock in **"SP 1"** (Wheel-Drive or Drive-Shaft Speed Sensor)
- For Radar Speed Sensor, momentarily press **[CE]** to toggle to **"SP 2"** then press **[ENTER]** to lock it in.

STEP 2:

- **Selecting the correct valve type.** Labelling on the side of the valves, which provides both the VALVE TYPE and the VALVE CAL figure (required in step 9 below) easily identify the valves.
- **Note: Fast Close Valves** will rotate to full bypass when the boom valves (solenoids or motorised valves) are closed. As a result, no spray will be omitted from the nozzles when the sprayer is stationary, even with the boom valves open, except when performing a [**SELF TEST**].

3 Way Fast Close Valve (C-FC) plumbing:



- The flow control valve can be found on the pump delivery line manifold located directly after the pump.
- The console automatically displays a default setting of "**C-SD**" (Standard Valve).
- Press the **[CE]** key **twice** to toggle through the options until ''**C-FC**'' (control-fast close valve) is displayed then press **[ENTER]** for the 'fast close valve'.
- **NOTE: If the sprayer is fitted with a "Fast Close Valve" [C-FC] must be entered into the console and not [FC] "Fast valve" for it to operate correctly.**

These steps are very important because the system will appear to function properly but be very inaccurate if the values are incorrectly entered. If an error has been made in calibrating the steps to this point, turn the console "off" press and hold the **[CE]** key while turning the power switch back "on". This clears and restarts the programming process.

The values in these first steps can be viewed at any time by pressing and holding down the **[SELF TEST]** key. The console will automatically toggle through and display the values.

STEP 3:

- Press [**BOOM CAL 1**] then [**ENTER**] on SCS 440 console or [**BOOM CAL**] then [**ENTER**] on SCS 450.
- The console needs to know the width of each section so that when a section is turned off the console can reduce the width of the boom accordingly in order to calculate only the area that is sprayed. To measure the boom width for each section, count the number of nozzles in each section **of one boom line only** and multiply by the nozzle spacing. i.e. 12 nozzles in one section at 50 cm (½ metre) spacings = 12 X 0.5m = 6 m
- Enter Boom Section 1 in Centimetres (for example 6m = 600 cm) Press [**6**] then [**0**] then [**0**] Press [**ENTER**]

Note:
The second boom line mirrors the first line, and is automatically programmed when the first line is entered.

STEP 4:

- Press[**BOOM CAL 2**] then [**ENTER**] on SCS 440 consoles or [Δ] then [**ENTER**] on SCS 450 consoles
- Enter Boom Section 2 in Centimetres (for example 6m = 600 cm) Press [**ENTER**]

STEP 5:

- Press [**BOOM CAL 3**] then [**ENTER**] on SCS 440 or [Δ] then [**ENTER**] on SCS 450 consoles.
- Enter Boom Section 3 in Centimetres (for example 6m = 600 cm) Press [**ENTER**]

- **NOTE:** For SCS 450 consoles continue entering the **BOOM CAL'S** in the remaining boom sections up to a total of 5. **If a boom section is not utilised "0" must be entered in that section or the console will fail to function correctly.**

STEP 6:
For sprayers fitted with Wheel Drive speed sensor

- Press [**SPEED CAL**] then [**ENTER**]
- Enter Speed Cal in Decimetres (1m = 10 dm) Press [**ENTER**]

Speed Cal is the distance measured by 10 revolutions of the Speed Sensor Wheel. This is best done with the tank half full of water (best simulates average between full and empty) and measured on ground that is typical to what will be encountered when spraying. Also note the tyre pressure when this procedure is performed. This tyre pressure needs to be maintained for the speed cal to be accurate. The speed cal should be checked at the start of every spraying season as the speed cal may need to be altered to compensate for tyre wear, etc.

For sprayers with 4 wheel magnets (2 red and 2 black)

- Measure distance and multiply by 10 (to convert into decimetres).

For sprayers with 2 wheel magnets (1 red and 1 black)

- Measure distance and multiply by 10 (to convert into decimetres) then multiply by 2.

For example: If a distance of 47.7 metres is measured for the 10 revolutions on a wheel that has 4 wheel magnets (2 red and 2 black) then the [**SPEED CAL**] value to be entered will be 47.7 X 10 = [**477**]

For sprayers fitted with Tail shaft speed sensor.

- For sprayers fitted with drive shaft sensors accurately mark and measure 100 metres.
- Press [**SPEED CAL**] then [**ENTER**] [**155**] then [**ENTER**] again.
- With the power switch "on" and all other switches "off" Enter [**0**] into the [**DISTANCE**] function by pressing the [**DISTANCE**] button then [**ENTER**] then press [**0**] then [**ENTER**] again.
- Drive the 100 metres, being careful not to accelerate or reaccelerate too suddenly.
- Record the distance that the console displays once the 100 metres has been travelled.
- The distance should read 100. If it reads between 99 or 101 this calibration value will be correct. If the distance reads any other valve perform the following procedure.

New SPEED CAL = Old SPEED CAL [155] X 100 ÷ Recorded DISTANCE

Press [**SPEED CAL**] then [**ENTER**] and type in the [New SPEED CAL] then [**ENTER**] again.

STEP 7: Press [**METER CAL**] then [**ENTER**]
Enter Meter Cal for litres. Eg [**185**]
Press [**ENTER**]

Meter Cal is the Calibration number on the Flow Meter white tag. The required number for litres is the number in square brackets.

STEP 8: Press [**VALVE CAL**] then [**ENTER**]
Enter [**743**] (fast close valve)
Press [**ENTER**]

The "valve cal" figure is printed on the side of the flow control valve. Refer to the photos of the flow control valves.

STEP 9: Press [**RATE 1**] then [**ENTER**]
Enter Rate 1 (litres per hectare) Eg [**50**]
Press [**ENTER**]

STEP 10: Press [**RATE 2**] then [**ENTER**]
Enter Rate 2 (litres per hectare) Eg [**75**]
Press [**ENTER**]

Note: Before entering an application rate consult the nozzle application chart (in the operators manual or the Tee Jet catalogue) to ensure the rate is within the speed and pressure capabilities of the nozzles fitted to the boom.

For the console to function correctly a rate value has to be entered in both [**Rate 1**] and [**Rate 2**]. The same value can be entered into [**Rate 2**] as in [**Rate 1**] if only one rate is to be used.

STEP 11: Press [**DATA MENU**] repeatedly to toggle through the functions until **Tier 1 Max Rate** is displayed.

Press [**ENTER**]

The SCS 440 and SCS 450 2TS Dual Boom consoles require a flow rate figure (litres/min) to be entered into the **'Tier 1 Max Rate'** provision in the console before the second boom line will become active.

Before this figure can be entered the maximum flow rate (litres/min in total) that the first line reaches before the second line opens has to be calculated.

From the nozzle chart in the operator's manual or the Tee jet catalogue, find the flow rate of a single nozzle at the maximum pressure required. Eg. The flow rate of an XR11002 nozzle at 3.5 bars is 0.85 Litres / minute.

Multiply this figure by the number of nozzles on the boom 1. Eg. A 30 metre boom with 500mm nozzle spacings has 60 nozzles, therefore:

Tier 1 Max Rate = 60 nozzles x 0.85 litres / minute = 51 litres per minute

This will be the total maximum flow required by the boom before boom 2 is switched on.
The console doesn't have a decimal point facility in the **'Tier 1 Max Rate'** function so this number needs to be rounded off to the nearest whole number.

Enter [**51**]
Press [**ENTER**]

Once entered, the second line will be activated when the flow rate exceeds 51 litres/min (3.5 bars).

NOTE: Keep in mind that when a Dual Boom Sprayer starts off with only one boom line operating, the sprayer assumes the characteristics of the nozzles in that boom line only. As the sprayer increases in speed and the second boom line cuts in, the sprayer then automatically assumes the characteristics of the nozzles in Boom 1 and Boom 2 combined.

NOTE: The above example is based on a 30 metre broad acre boom. Some booms may have different nozzle spacings or layout (i.e. row crop) so it is important to count the total number of nozzles on the first line to ensure the correct **'Tier 1 Max Rate'** figure is calculated.
The 3.5 bar pressure figure used above is an example only. Other trigger point pressures may be selected but consideration needs to be given to the likelihood of spray drift occurring if too high a figure is used (refer to Tee Jet catalogue for drift information).
When the second boom line is activated, the controller simply calculates the same flow across a larger number of nozzles. This effectively reduces the nozzle operating pressure.
When selecting a trigger point, pressure consideration needs to be given to this pressure drop. With the same size nozzles in both lines the pressure will more than halve when the second boom line activates. If too low a trigger point pressure is selected the pressure may fall below the minimum recommended for the nozzles (refer Tee Jet catalogue) resulting in poor coverage.

STEP 12: When setting the [**TIER 1 MAX RATE**], there is a percentage setting called the [**PERCENT TIER DISABLE**]. The default setting for this is 10 percent. Therefore the flow rate will exceed the preset TIER 1 MAX RATE by 10 percent before the second line will open. The flow rate will need to drop 10 percent below the pre set value for the second line to close. In most instances, the [**PERCENT TIER DISABLE**] should be set at [**0**]. To zero the percentage figure:

Press the [**DATA**] button to display the [**PERCENT TIER DISABLE**]

(The Percent Tier Disable is the function following the Tier 1 Max Rate function)

Press [**ENTER**] then [**0**] then press [**ENTER**] again.

An important note to consider is that a reverser switch in the foam marker console allows the boom opening first to be swapped. For example, if XR11002 nozzles fitted to boom 1 are opening first, and 015 nozzles fitted to boom 2 are wanted first, simply flick the reverser switch to prioritise the 015 line. A self test may need to be performed to determine the orientation of the switch and which line it is activating first. The reverser switch should also be considered if the same nozzles are used in both lines, to maintain even nozzle wear.

STEP 13: **(Optional)** – **Required if pump is hydraulically driven.**

To display the operating speed of a hydraulically driven pump, press the [**SPEED**] button and hold down for at least 5 seconds until [**RPM**] is displayed.

STEP 14: **(Optional)** Press [**VOL/TANK**] then [**ENTER**]

Enter the volume in the tank at start of every load. (Eg 3000)
Press [**ENTER**]

STEP 15: **(Optional)** Press [**TIME**] then [**ENTER**]

Enter the time of the day (eg 10:30 AM)
Press [**ENTER**]

05 PR CHEMICAL PROBE & TRANSCAL - INDEX

DO NOT LEAVE RESIDUAL VACUUM IN THE TRANSCAL WHEN THE TRANSCAL IS NOT IN USE. RELEASE THE VACUUM BY OPENING THE TAP ON THE CHEMICAL PROBE.

DO NOT USE FLAMMABLE CHEMICALS IN THE SPRAYER.

WEAR ALL NECESSARY SAFETY PROTECTIVE CLOTHING AND EQUIPMENT WHEN EXPOSED TO CHEMICALS. REFER TO THE CHEMICAL LABEL

TROUBLESHOOTING

"MY TRANSCAL IS NOT WORKING OR IS WORKING TOO SLOWLY."

To successfully draw a viscous chemical from a container, measure the liquid, and transfer to sprayer height is a task which requires all equipment, hoses and fittings to be in perfectly air tight condition. All equipment must be kept clean, free of chemical and dirt, or seals will not be efficient and the system will not function.

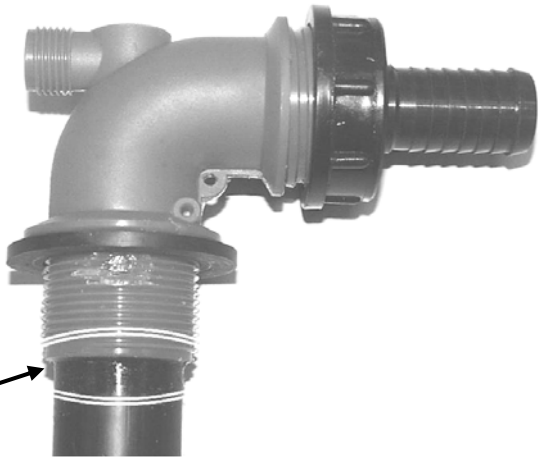
There are 2 main areas to be checked if a Transcal system is not working or is operating too slowly.

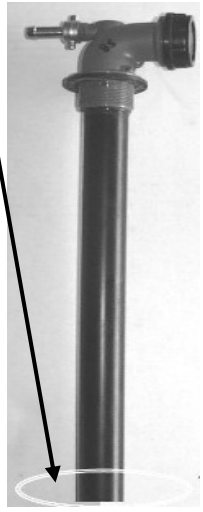
- The water speed flowing through the orange venturi is critical to its ability to create a vacuum. Normally a pressure in the ½ ″ line to the venturi of 100 PSI (7 bar) will provide sufficient flow velocity to function properly, but if the supply line is kinked or blocked the flow (velocity) can be restricted even though the pressure appears to correct. It must transfer at least 20 litres of water from ground level in 60 seconds or adjustments are required. This figure is tested by GoldAcres prior to despatch.
- Air leaks in the system at any suction point will cause system failures.

To isolate the area of possible air leak:

Step 1.
First check the operation of the chemical probe only. That is by-pass the Transcal tank. If this will transfer water at a minimum of 30lt/min then this part of the system is okay. If not check for air leaks at:

- Cam lever fitting at the probe.
- Hose fittings.
- Venturi – the venturi can suck air (less vacuum) where the black drop-pipe connects to the orange venturi.
- The venturi may also suck air where the 'lay flat' hose joins the bottom of the black PVC drop pipe.





Step 2.
Check Transcal tank. If the probe is working successfully but the Transcal tank system won't work then the air leak areas to check are:

- The Tank lid. This lid may tighten against the metal bracket above the tank and not the tank itself. Also the top of the tank needs to be clean and smooth for the lid to seal. Also check the lid for cracks and condition of the seal.
- Fitting at the base of the Transcal tank.
- Any hoses and connectors.

Step 3.
If probe works correctly and Transcal tank works correctly when using suction probe but envirodrum will not operate, check for air leaks in envirodrum fitting (this must be thoroughly cleaned after each use) and check interior pipes in the envirodrum for air leaks or damage.

IN SUMMARY:
First - Check the flow of water into venturi.

Then - Step 1. Check the probe only.
Step 2. Check the probe and Transcal
Step 3. Check Transcal and envirodrum section.

- Tests must be done with water because the speed of the transfer is affected by the increased viscosity of the chemical.
- The old foot valve at the bottom of the drop pipe caused some problems, and this has been replaced by 'lay flat' tube on all new sprayers. GoldAcres can supply a service kit to retro-fit old sprayers to the new 'lay flat' tube.
- When fitting layflat do not distort the drop pipe when tightening clamp or an air leak can develop. It will not be possible to fit the backnut to the venturi when layflat is fitted.
- Do not remove drop pipe from venturi except for resealing.

"MY SIGHT TUBE IS NOT GIVING A TRUE INDICATION OF LIQUID LEVEL."

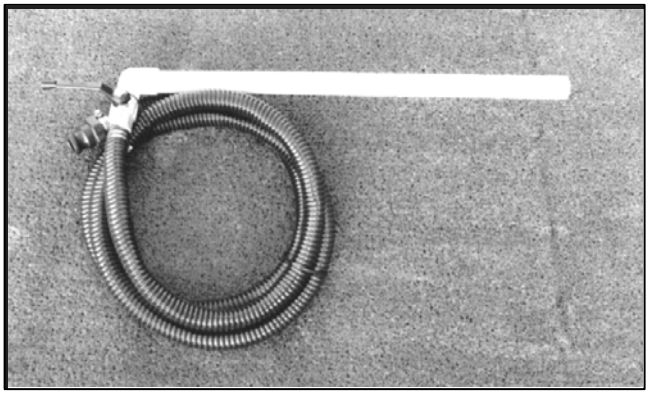
Ensure that the tap on the probe or envirodrum coupler is turned off before using the sight tube for evaluating liquid level.

"MY TRANSCAL TANK HAS DEFORMED OR "SUCKED IN."

Ensure that the sprayer is **not** left with residual vacuum in the Transcal Tank when the Transcal is not is use. This is especially important when spraying in warm weather or when the sprayer is parked overnight.

CHEMICAL PROBE

ALWAYS WEAR PROTECTIVE CLOTHING RECOMMENDED ON THE CHEMICAL PRODUCT LABEL.



A simple method of transferring chemical into the sprayer tank is via the chemical probe. The chemical probe enables the chemicals to be transferred with minimal exposure to the operator. The probe is used in conjunction with the Venturi filler which creates the required suction on the pressure side of the pump.

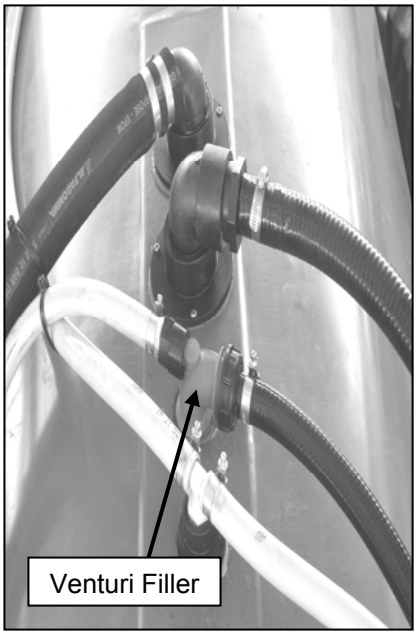
The viscosity of the chemical being transferred will affect the rate of suction flow and hence the amount of time required to transfer the chemical. Water and air have very small viscosities whereas molasses and tar are examples of highly viscous liquids. The higher the viscosity of the liquid, the longer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

The chemical should be transferred after about 20% to 50% of the required water quantity has been added to the sprayer tank. This will ensure that agitation takes place when the remaining water is added.

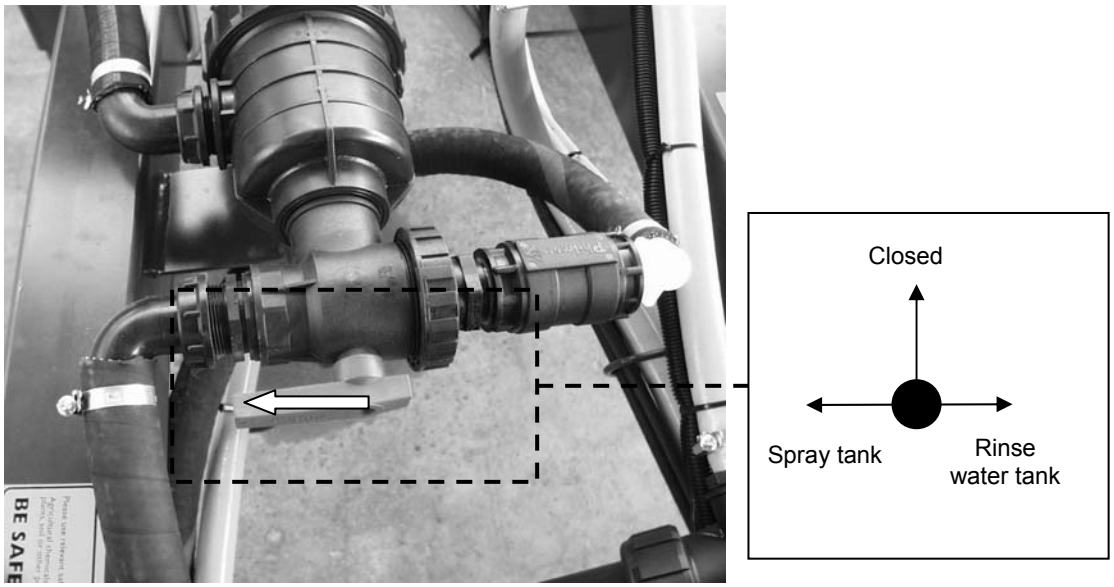
The end of the probe is not flat so that the probe, when placed flat against the bottom of the container, will not restrict the flow of chemical.

To operate the chemical probe:

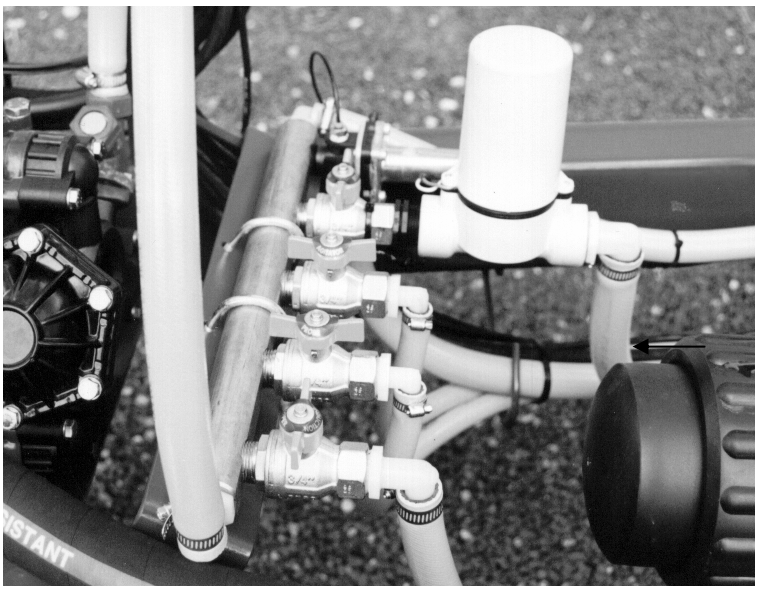
1) Add 20 percent of the tank's volume of clean water to the main spray tank. Initially there needs to be a sufficient amount of water in the tank in order for the pump delivery to create the venturi effect via the venturi filler.



2) Ensure that the red handle on the pump 3-way ball valve is pointing towards the suction hose coming from the main tank sump (allows pump suction to be from the main tank).



3) Open the chemical probe ball valve and the supermix agitator ball valve.
4) Close the bypass line ball valve and the induction hopper ball valve.



LABEL DIAGRAM USED AS AN EXAMPLE ONLY. TAPS MAY BE POSITIONED IN A DIFFERENT SEQUENCE TO THAT SHOWN

Closed ⬆	**Bypass line**
Open	**Supermix agitator**
Open ➡	**Chemical probe**
Closed	**Induction hopper**

➡

⬆

5) Connect probe via cam lever fitting.

6) Operate the pump at the lowest speed necessary to generate at least 600 kPa (85 psi) delivery pressure (as displayed on the sprayer pressure gauge). Do not run faster than 540 RPM. The higher the pump delivery pressure, the greater the venturi suction and the quicker the probe will transfer the chemical. The delivery pressure should not exceed 100 psi (690 kPa) as determined by the pressure relief valve setting.

7) Place probe in chemical.

8) Open both valves that control the flow from the probe to the tank via the venturi filler (one on the probe and one near the probe cam lever fitting).

9) The chemical should be now transferring to the sprayer tank via the venturi filler.

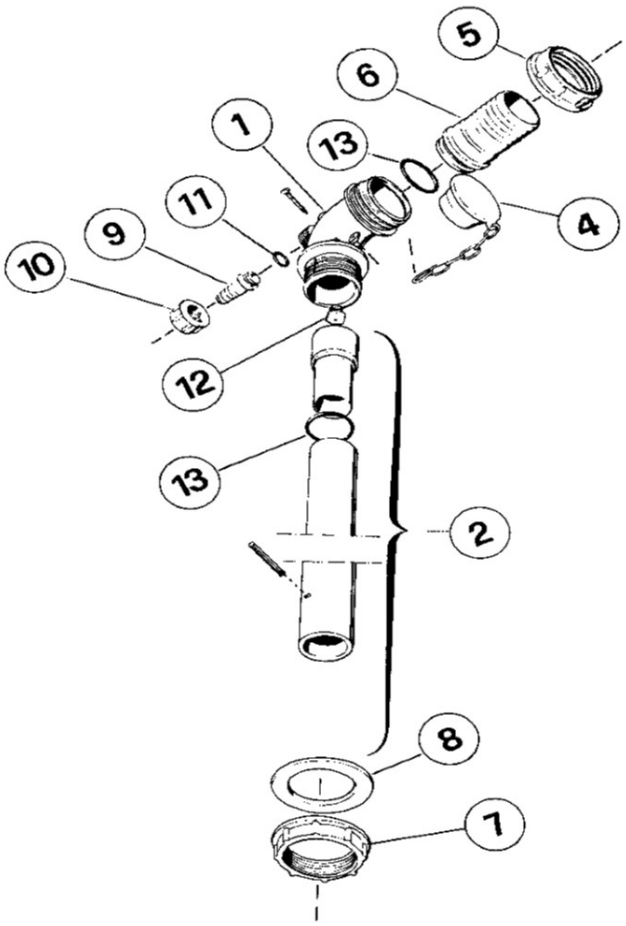
10) When all the chemical has been transferred, rinse the chemical container with water and transfer the rinsate to the sprayer tank via the probe. This should ensure all the chemical is transferred and that the probe, venturi filler and connecting suction hose are cleaned.

11) When finished, close the two valves controlling the flow from the probe, open the bypass line ball valve, keep the supermix agitator ball valve open, close the chemical probe ball valve and disconnect the probe. Once chemical has been transferred into the main spray tank the sprayer should always be agitating until spraying begins.

VENTURI FILLER

Venturi filler is used to create suction on the pressure side of the pump. This suction is utilized by the chemical probe to transfer the chemicals from their container to the tank.

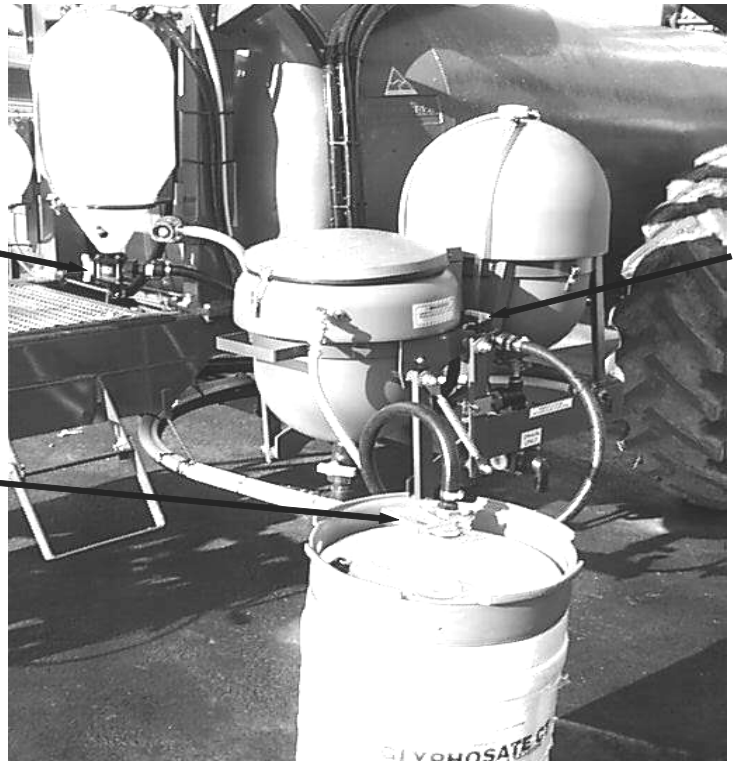
The venturi filler is plumbed into the pump delivery line and a venturi effect is created when water is pumped through the filler. The filler has a variable diameter and when the water passes through pipe of decreasing diameter, a pressure differential is created. The fluid velocity increases and pressure decreases and this difference in pressure is used to provide the suction.



ITEM	DESCRIPTION
1	Threaded Union Ejector Body
2	Complete Ejector Pipe
4	Threaded Union Ejector Cap
5	1 1/4" Fly Nut
6	1 1/4" Hose Barb Fitting
7	1 1/4" Fly Nut
8	1 1/4" Flat Seal
9	1/2" Hose Barb Fitting
10	1/2" Fly Nut
11	O – Ring
12	Low Pressure Nozzle
13	High Pressure Nozzle

TRANSCAL (VOLUMETRIC MEASURING SYSTEM)

The Transcal volumetric measuring system is designed to provide a measuring facility without the need for an auxiliary pump and flowmeter. When used in conjunction with the venturi chemical probe, the required volume of chemical can be transferred out of the chemical container into the Transcal tank. The chemical can then be transferred into the main spray tank via venturi suction by simply turning a valve. Thus there is no undiluted chemical coming into contact with any pump or complex components. The system can be used with most types of chemical containers (including the envirodrum closed transfer system).



NOTE:

- The calibration markings on the Transcal tank should be used as a guide only.

The Transcal system requires a vacuum to operate. Any air leaks in the tank lid, hoses or cam lever seals will affect the performance or cause total failure to operate.

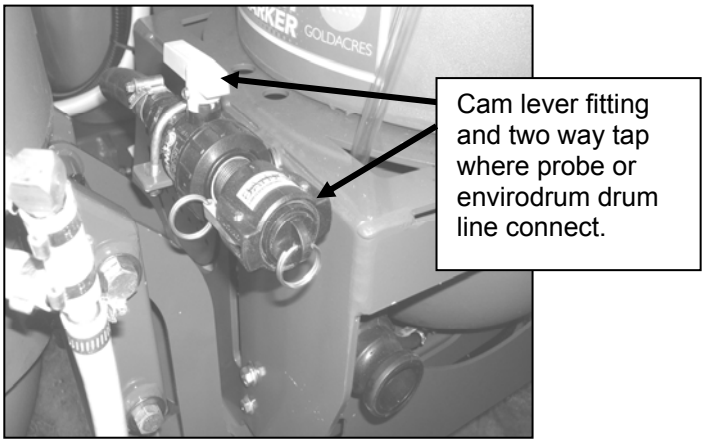
DO NOT FILL TRANSCAL TANK PAST THE 45 LITRE MARK

DO NOT USE THE TRANSCAL TANK TO STORE CHEMICALS SPRAYING

The Trans-Cal system requires a vacuum to operate. Any air leaks in the tank lid, hoses or cam lever seals will affect the performance or cause total failure to operate.

MEASURING CHEMICAL INTO THE TRANSCAL TANK

- Remove the cam lever plug and connect the chemical probe line (or the envirodrum line with the Micro-Matic coupler) to the cam lever fitting in the line to the top of the Transcal tank.

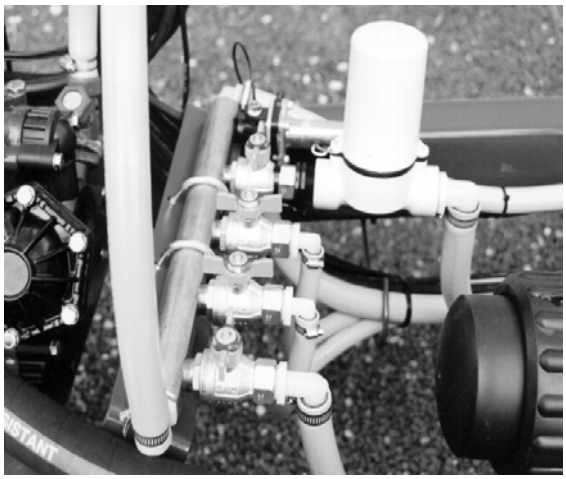


- Ensure that the yellow T-handle on the 3-way ball valve at the bottom of the Transcal tank is aligned so that the flow arrow is pointing '**down**' (arrow directed towards "FILL TRANS") and thus the bottom port of the valve is open (i.e. the port where the hose goes to the top of the Transcal tank).

- Add 15% (of the tanks volume) of clean water to the main spray tank.

- Ensure that the red handle on the pump 3-way ball valve is pointing towards the suction hose coming from the main tank sump (allows pump suction to be from the main tank, refer previous photo).

Closed	**Bypass Line**
Open	**Supermix Agitator**
Open	**Chemical Probe**
Closed	**Induction Hopper**



LABEL DIAGRAM USED AS AN EXAMPLE ONLY TAPS MAY BE POSITIONED IN A DIFFERENT SEQUENCE TO THAT SHOWN:

- Open the chemical probe ball valve and the supermix agitator ball valve on the control manifold.

- Close the bypass line ball valve and the induction hopper ball valve on the control manifold.

- Turn the yellow handle to 'open' on the line valve where the chemical probe line (or the envirodrum line) connects into the cam lever fitting.

- Operate the pump at the lowest speed necessary to generate 690 kPa (100 psi) delivery pressure (as displayed on the sprayer pressure gauge). Do not run faster than 540 RPM. The higher the pump delivery pressure, the greater the venturi suction and the quicker the probe will transfer the chemical. The delivery pressure should not exceed 690 kPa as determined by the pressure relief valve setting.

- Place the probe in the chemical drum or connect the appropriate Micro Matic fitting to the outlet on the envirodrum and push the handle down so that it locks into position and opens the valve on the envirodrum. Open the valve on the chemical probe.

- The chemical should now be transferring into the Transcal tank.

- When the required amount of chemical has been transferred, close the ball valve on the chemical probe. Remove it from the chemical drum and then open the valve on the chemical probe again. If chemical has been transferred from an envirodrum, push the handle on the Micro Matic coupling down slightly and then up. This will make the handle lift up and close the valve on the envirodrum. This should be done when doing successive fills into the Transcal tank. When finished transferring chemical, turn the fitting in order to release it from the envirodrum.

WHAT TO DO IF THE TRANSCAL TANK IS OVERFILLED

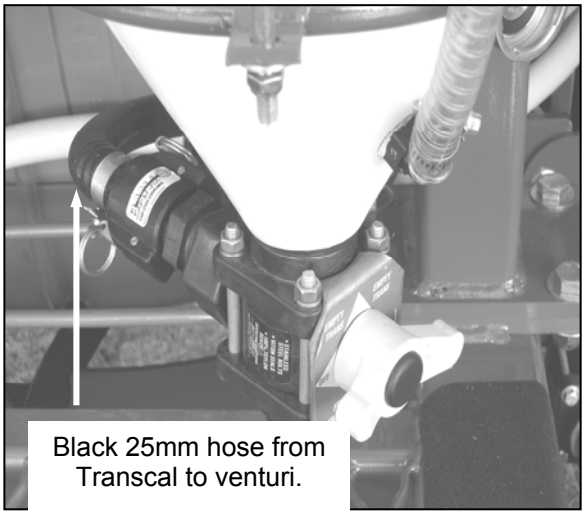
In the event of over-filling the Transcal tank, a small piece of supplied black 25mm hose can be fitted to the ball valve on the bottom of the Transcal to drain away any excess chemical. To perform this:

1. **Ensure that the appropriate protective clothing is worn, as per the chemical label.**

2. Turn the yellow handle on the ball valve on the bottom of the Transcal horizontal to the '**off**' position.

3. Close the 'chemical probe' ball valve on the control manifold to prevent the venturi from operating.

4. With the ball valve on the bottom of the Transcal in the '**off**' position, and wearing the appropriate safety clothing, undo the cam lever fittings on the ball valve on the bottom of the Transcal and remove the black 25mm hose.



Black 25mm hose from Transcal to venturi.

5. Attach the short length of black drain hose.

6. Place an appropriate container under the drain hose, then turn the yellow handle on the 3-way ball valve underneath the Transcal to '**up**'. (Arrow directed towards "EMPTY TRANS").

7. After draining the required amount of chemical, remove the drain hose, replace the vacuum supply hose and resume operating the Transcal. The raw chemical should be returned to the original container.

Ensure the ball valve is in 'off' position before exchanging hoses.

Attach the drain hose to the rear of the 3-way ball valve to drain excess chemical.

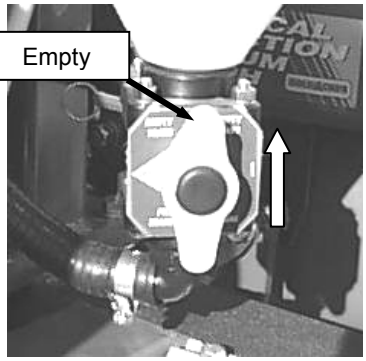
TRANSFERRING THE CHEMICAL FROM THE TRANSCAL TANK INTO THE SPRAYER TANK

Once the required amount of chemical is in the Transcal tank, transfer it into the sprayer tank:

1) Continue to operate the venturi in the sprayer tank.

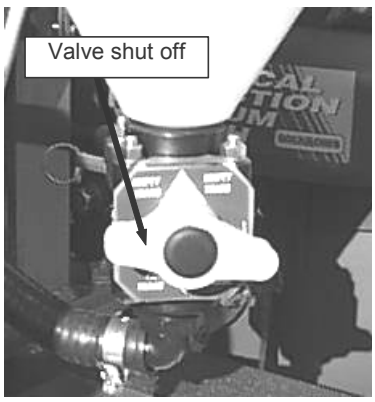
2) **The Transcal tank needs to be vented when emptying**. To achieve this, remove the chemical probe from the container and open the valve on the chemical probe as well as on the line valve (the Micro Matic fitting will allow venting to occur). Alternatively disconnect the probe line from the Transcal tank and do not replace the cam plug.

3) Turn the yellow T-handle on the 3-way ball valve at the bottom of the Transcal tank so that the flow arrow is pointing '**up**' (arrow directed towards "EMPTY TRANS), and thus the top port of the valve is open (i.e. the port which the bottom of the Transcal tank is attached to).



4) The chemical should now transfer into the main spray tank.

5) When finished, the Transcal tank and the probe (or Micro Matic coupler) should be thoroughly rinsed (see following instructions). Then shut off the 3-way ball valve at the bottom of the Transcal tank by turning the yellow T-handle on the 3-way ball valve so that it is horizontal. The venturi filler system should also be stopped (i.e. close the two valves controlling the flow from the probe, open the bypass line ball valve, keep the supermix agitator ball valve open, and close the chemical probe ball valve). Once chemical has been transferred into the main spray tank turn on the agitator until spraying begins.



4) Disconnect the line from the Transcal tank to the probe (or envirodrum) and replace the cam plug in the cam lever fitting.

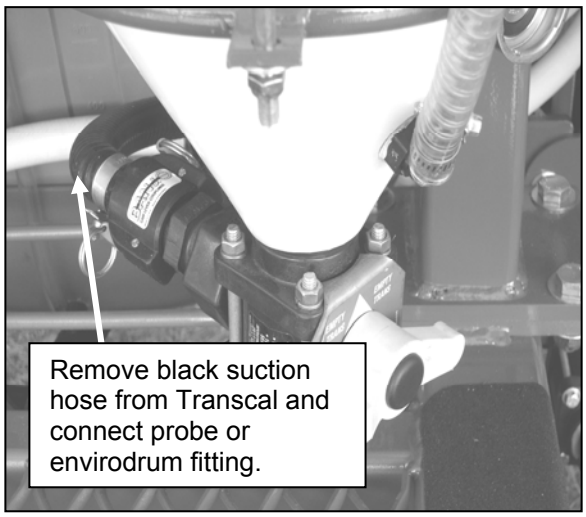
TRANSFERRING CHEMICAL WITHOUT MEASURING

The chemical can be transferred from the chemical container into the main spray tank (bypassing the Transcal tank) without the chemical being measured (i.e. by emptying full containers). This will reduce the time taken to transfer the chemical. To do this:

1) Release the cam lever fitting from the rear of the Transcal three-way ball valve, and connect either the probe or the envirodrum line.

2) Place the probe in the chemical drum and open the ball valve on the chemical probe, or connect to the envirodrum and engage the micro matic handle.

3) Operate the venturi filler system at 690 kPa (100 psi) (see previous instructions).



4) The chemical should now transfer from the chemical drum into the main sprayer, bypassing the Transcal.

5) When the required amount of chemical has been transferred, close the ball valve on the chemical probe and remove it from the chemical drum or release the micro matic fitting.

6) When finished, the probe or micro matic coupler) should be thoroughly rinsed (see following instructions). The venturi filler system should then be stopped (i.e. close the two valves controlling the flow from the probe, open the bypass line ball valve, keep the supermix agitator ball valve open, and close the chemical probe ball valve). Once chemical has been transferred into the main spray tank the sprayer agitator should be maintained until spraying begins.

7) Disconnect the probe or envirodrum line from the sprayer and re-attach black suction hose to the Transcal.

RINSING:

RINSING THE ENVIRODRUM LINE

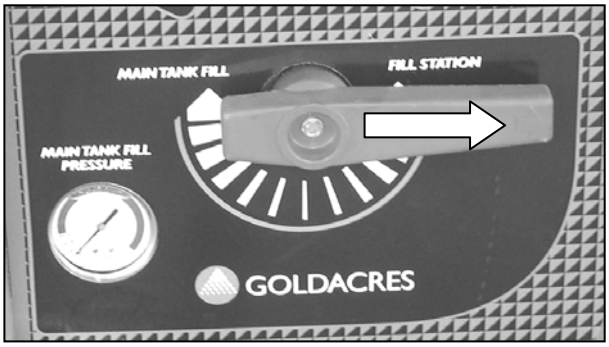
To rinse the trans-cal lines when using the Micro Matic coupler.

1. Connect the Micro Matic coupler to the Micro Matic rinsing socket. Connect the envirodrum suction line to the venturi cam lever on the sprayer.

Micro Matic Rinsing Socket

Micro Matic Coupler

2. Ensure that the tank is vented by turning the yellow T-handle on the 3-way ball valve at the bottom of the trans-cal tank so that the flow arrow is pointing 'up' (arrow directed towards "Empty Trans".
3. Turn the red handle on the fill station **right**, so that fresh water is directed to the fill station.
4. Open the 'Enviro Drum Coupling Rinse' valve on the fill station so that the fresh water cleans both the Micro Matic coupler and the line to the trans-cal tank.
5. Operate the trans-cal venturi at 690 kPa. (100 psi)



6. The fresh water should now transfer through the Micro Matic fittings to the trans-cal tank and then into the main spray tank so cleaning the lines from the Micro Matic coupler to the trans-cal tank and to the main spray tank.
7. When there has been sufficient cleaning with fresh water (at least 5 minutes of cleaning), close the ball valve controlling the fresh water supply to the rinsing socket.

RINSE THE CHEMICAL PROBE LINE

If wanting to rinse the trans-cal lines when using the chemical probe.

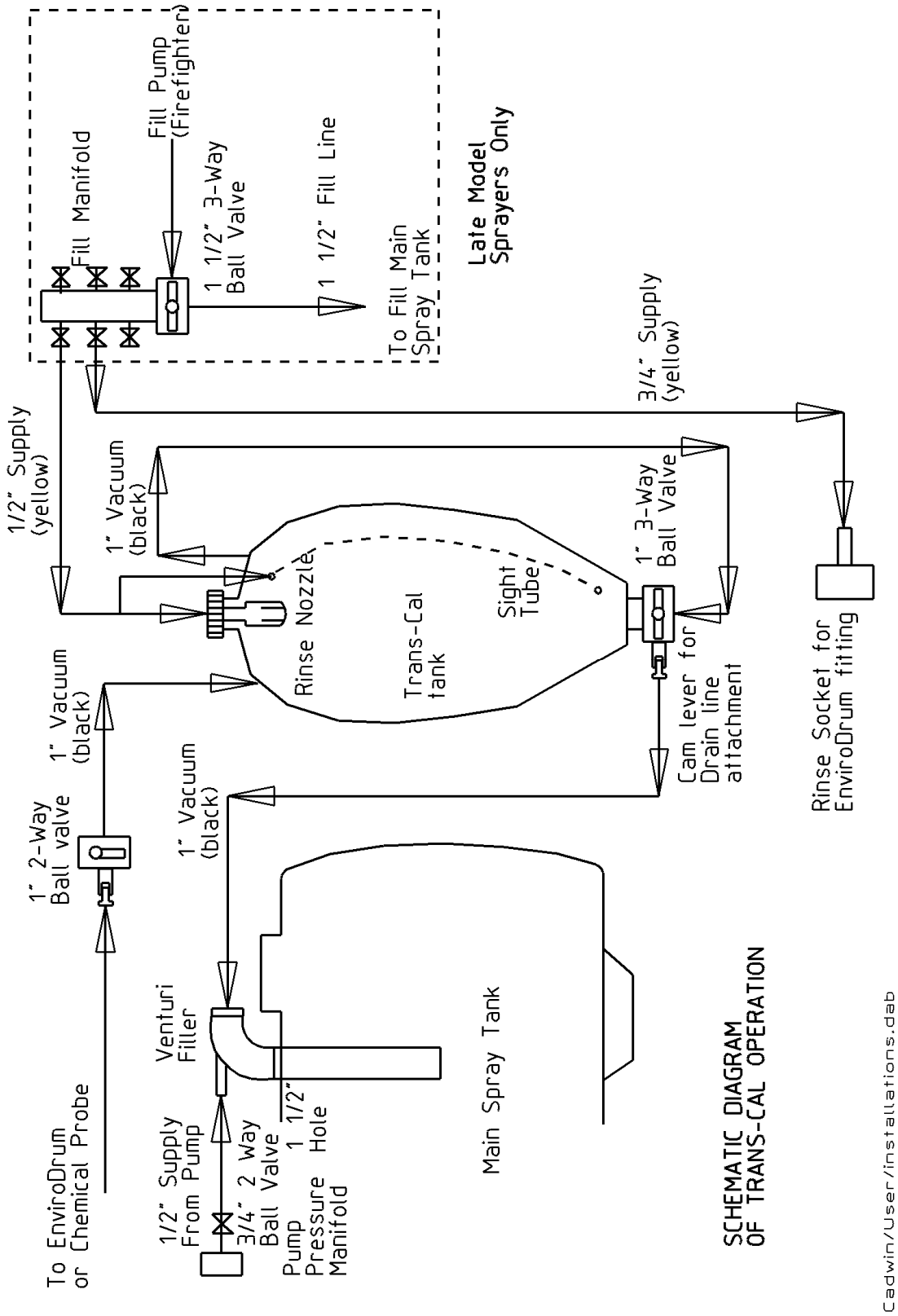
1. Fill a suitable container with fresh water (and any applicable decontaminating agent), (at least 50 litres of fresh water for sufficient cleaning).
2. Remove the cam lever plug and connect the chemical probe line to the cam lever fitting in the line to the top of the trans-cal tank. Turn the yellow handle so that the line valve is open.

3. Place the probe into the container with fresh water and open the ball valve on the chemical probe.
4. Turn the yellow T-handle on the 3-way ball valve at the bottom of the trans-cal tank so that the flow arrow is pointing '**up**' and the arrow directed towards "Empty Trans".
5. Operate the trans-cal venturi around 690 kPa.
6. The fresh water should now transfer to the trans-cal tank and then into the main spray tank so cleaning the lines from the chemical probe to the trans-cal tank and to the main spray tank.
7. When finished, shut off the 3-way ball valve at the bottom of the trans-cal tank by turning the yellow T-handle on the 3-way ball valve so that it is horizontal. Then the trans-cal venturi should be stopped i.e. close the two valves controlling the flow from the probe, open the bypass line ball valve, keep the supermix agitator ball valve open, and close the chemical probe ball valve.
8. Disconnect the line from the trans-cal tank to the probe from the cam lever fitting and replace the cam plug.

RINSE THE TRANS-CAL

1. Continue to have the sprayer pump operating and the trans-cal venturi system operating at 690 kPa (100 psi).
2. Ensure that the tank is vented by turning the yellow T-handle on the 3-way ball valve at the bottom of the trans-cal tank so that the flow arrow is pointing 'up'. (arrow directed towards "Empty Trans")
3. Open the 'Transcal Flush' ball valve controlling the fresh water flow from the fill station to the tank rinsing nozzle in the lid of the trans-cal tank. The tank and sight tube should be rinsed and the rinsate transferred to the main spray tank.
4. Rinse the trans-cal tank for as long as recommended on the chemical label, or at least two minutes.
5. Close the 'Transcal Flush' ball valve when tank is sufficiently rinsed and the rinsate should all have been transferred to the main spray tank.

Schematic Diagram of the Transcal system.



06 PR INDUCTION HOPPER – INDEX

TROUBLESHOOTING

"I NEED TO CONDUCT A PERFORMANCE TEST ON MY INDUCTION HOPPER"

With a 121 litres per minute pump running at approximately 400 kPa, the induction hopper should transfer water at a minimum rate of 50 litres per minute.

If the induction hopper is not performing satisfactorily, check:

- ✓ The pressure as displayed on the sprayer pressure gauge should be at least 400 kPa.
- ✓ Air leaks to make sure fittings are screwed tightly and hoses are in good condition and that cam lever fittings have gaskets in place.

WEAR ALL NECESSARY PROTECTIVE CLOTHING AND SAFETY EQUIPMENT TO AVOID EXPOSURE TO CHEMICALS

DO NOT USE THE CHEMICAL INDUCTION HOPPER TANK TO STORE CHEMICALS WHEN SPRAYING

CHEMICAL INDUCTION HOPPER

The Chemical Induction Hopper is an alternative method of transferring chemical into the main spray tank. The hopper can be lowered to a more convenient height for adding chemicals. The chemical can either be in liquid form or granular form and once in the hopper the chemical can then be easily transferred into the main spray tank. The hopper facilitates drum rinsing with fresh water and the hopper itself can be rinsed and all rinsate then transferred into the tank.

The hopper transfers the chemical via venturi effect. Water from the main spray tank is pumped under the bottom of the hopper and it passes through a venturi fitting under the hopper. This causes a suction effect and when the bottom of the hopper is open (via the hopper tank ball valve) the tank contents are drawn into the flow from the pump passing under the hopper and then transferred into the middle of the main spray tank. This eliminates chemical attack resulting from high concentrations of chemical coming into contact with spray components.

The hopper calibrator should be used as a guide only.

TRANSFER CHEMICAL INTO MAIN SPRAY TANK

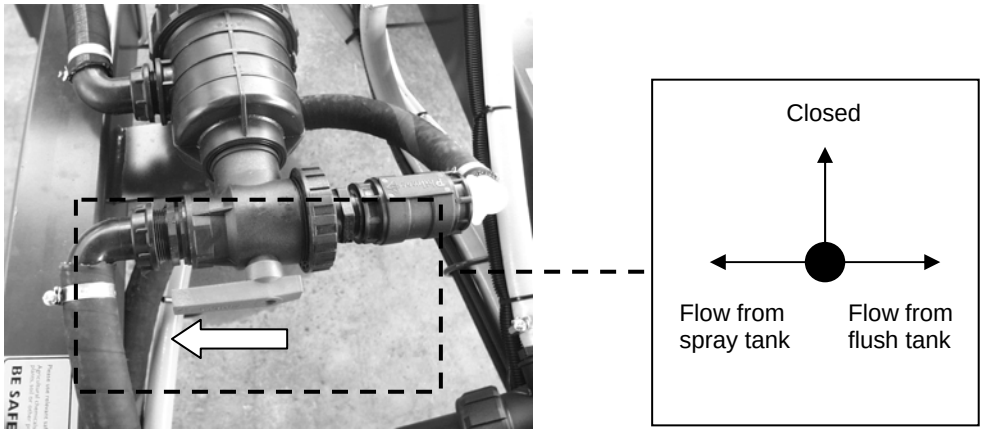
ALWAYS RAISE THE INDUCTION HOPPER INTO THE TRANSPORT POSITION BEFORE MOVING SPRAYER

To operate the induction hopper:

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

2) Check that the delivery hose to the hopper is not restricted or kinked.

3) Ensure that the red handle on the pump three-way ball valve is pointing towards the suction hose coming from the main tank sump (allows pump suction to be from the main tank).



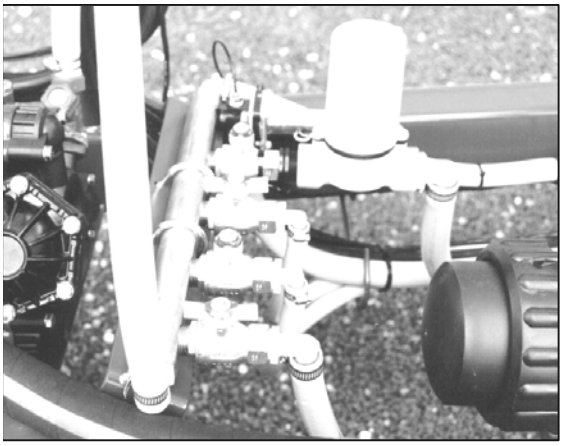
4) Lower the hopper for convenience.

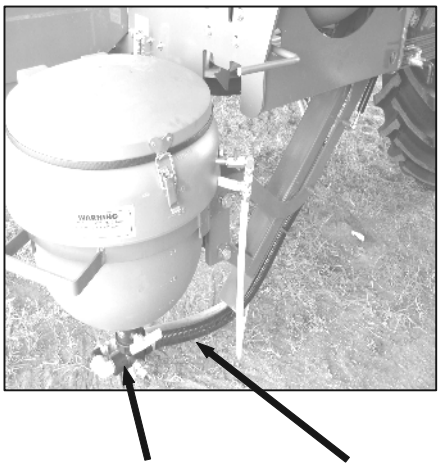
5) Open the induction hopper ball valve and the supermix agitator ball valve.

6) Ensure the bypass line ball valve and the chemical probe ball valves are closed.

7) Operate the pump at the lowest speed necessary to generate at least 400 kPa (56 psi) delivery pressure (as displayed on the sprayer pressure gauge). Do not run faster than 540 RPM. The higher the pump delivery pressure, the greater the venturi suction and the quicker the hopper will transfer the chemical. The delivery pressure should not exceed 100 psi (690 kPa) as determined by the pressure relief valve setting.

LOWERED POSITION



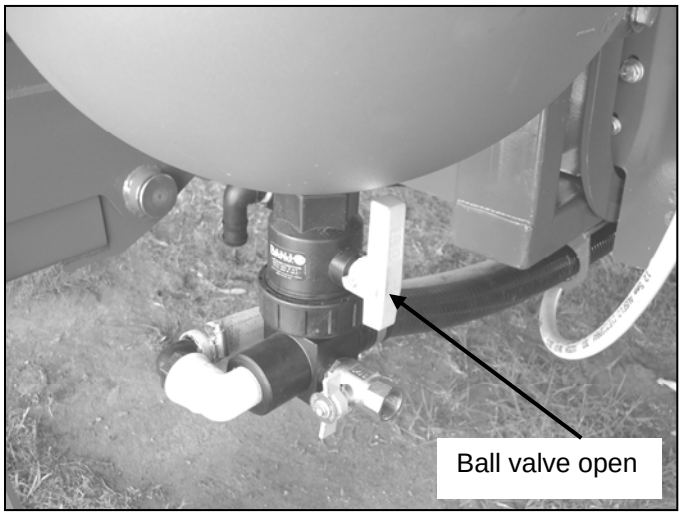


LABEL DIAGRAM USED AS AN EXAMPLE ONLY. TAPS MAY BE POSITIONED IN A DIFFERENT SEQUENCE TO THAT SHOWN

Closed ↑	**Bypass Line**
Open →	**Supermix Agitator**
Closed ↑	**Chemical Probe**
Open →	**Induction Hopper**

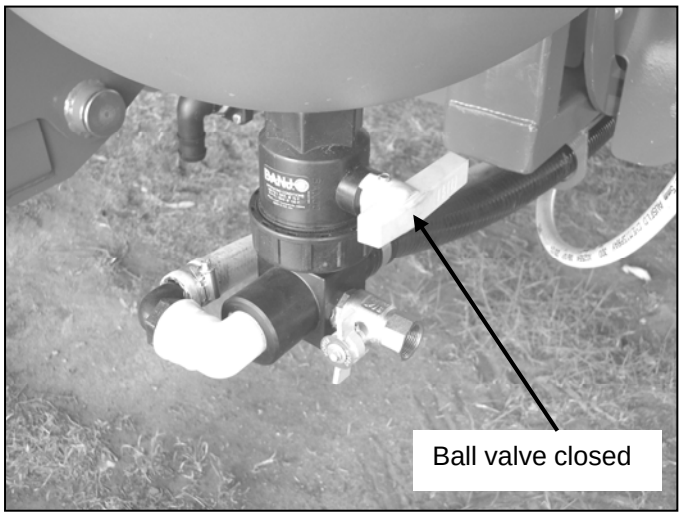
8) Put the required amount of chemical into the hopper (liquid or granular). **Wear the necessary protective clothing and use the required safety equipment to avoid exposure to chemicals**.

9) Open the hopper tank ball valve at the bottom of the hopper by turning the yellow handle up. The chemical should be now transferring to the main spray tank.



10)Rinse all chemical drums and the hopper itself as per the relevant instruction pages.

11)When finished (transferring chemical, rinsing hopper and rinsing chemical drum), close the hopper tank ball valve at the bottom of the hopper by turning the yellow handle so that it is horizontal.



12)Also when finished, open the bypass line ball valve and close the induction hopper ball valve, while keeping the supermix agitator ball valve open and raise the hopper to its transport position. Once chemical has been transferred into the main spray tank the sprayer should always be agitating until spraying begins.

MAKE SURE THE HOPPER IS EMPTY AND IS IN ITS TRANSPORT POSITION BEFORE MOVING SPRAYER.

DO NOT STORE CHEMICAL IN HOPPER WHILST SPRAYING.

ALWAYS RINSE TRANS-CAL AND ENVIRODRUM FITTING WITH FRESH WATER AFTER EVERY USE

RINSING:

RINSE THE CHEMICAL DRUMS

To rinse the Induction Hopper and chemical drums with rinse water from the rinse water supply via the fill station:

1. Make sure that initially all valves on the fill station are turned off and the red handle on the fill 3-way ball valve is vertical.
2. Connect the rinse water fill hose to the quick-fill coupling.
3. Operate the fresh water pumping system (make sure pressure does not exceed 690 kpa).
4. Turn the red handle on the fill 3-way ball valve **right** so that the fresh water is directed to the fill station.
5. Select 'Hopper Flush' on the pressure station ball valve. This will now supply fresh water to the induction hopper for either the hopper rinse ball valve or the drum rinsing nozzle.
6. Push the drum rinsing nozzle down via the open lid of the drum.
7. When finished, shut the hopper rinse ball valve, remove from the hopper any chemical drums that have been rinsed, shut the pressure station 'Hopper Flush' and turn the red handle so that it is vertical.
8. Drain the hopper.

RINSE THE HOPPER

When all the chemical has been transferred, the hopper should be rinsed. To do this:

1. Continue to have the sprayer pump operating, the hopper pulled down to its lower height setting.
2. The induction hopper ball valve open (on the pump flow control manifold) so that there is flow going through the hopper venturi at sufficient pressure for the hopper to work effectively (at least 500 kPa).
3. Ensure the fresh water filling supply pump system is operating and the red handle on the fill three-way ball valve right so that the rinse water supply is directed to the fill station.
4. Open the 'Hopper Flush' ball valve on the fill station.
5. Open the hopper rinse valve on the side of the hopper.
6. Open the hopper tank ball valve at the bottom of the hopper by turning up the yellow handle so that it is vertical.
7. The hopper should now be rinsing with the rinsate transferring to the main spray tank.

8. When finished, close the hopper rinsing valve, the hopper ball valve at the bottom of the hopper and the 'Hopper Flush' ball valve on the fill station.
9. Leave the red handle on the fill 3-way ball valve in its current position if wanting to continue to use the fill manifold, or turn it down (to direct fresh water into the main spray tank) or horizontal (to stop any filling).
10. To finish rinsing open the hopper drain valve.

MAKE SURE THE HOPPER IS EMPTY AND IS IN ITS RAISED POSITION BEFORE MOVING SPRAYER.

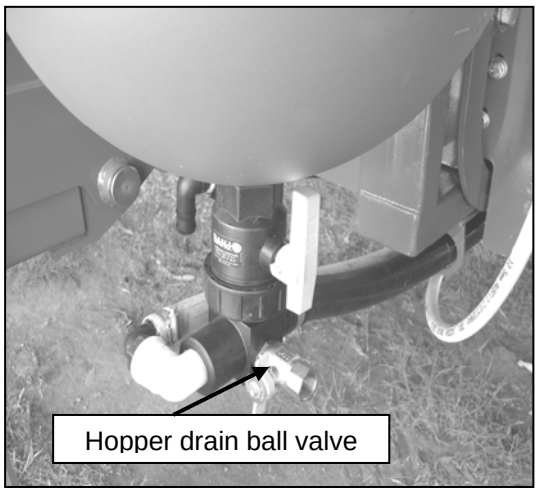
DO NOT STORE CHEMICAL IN HOPPER WHILST SPRAYING.

NOTE: The hopper seal can be removed for cleaning.

The hopper can be rinsed and the rinsate emptied through the hopper drain ball valve rather than transferred into the main spray tank. To do this:

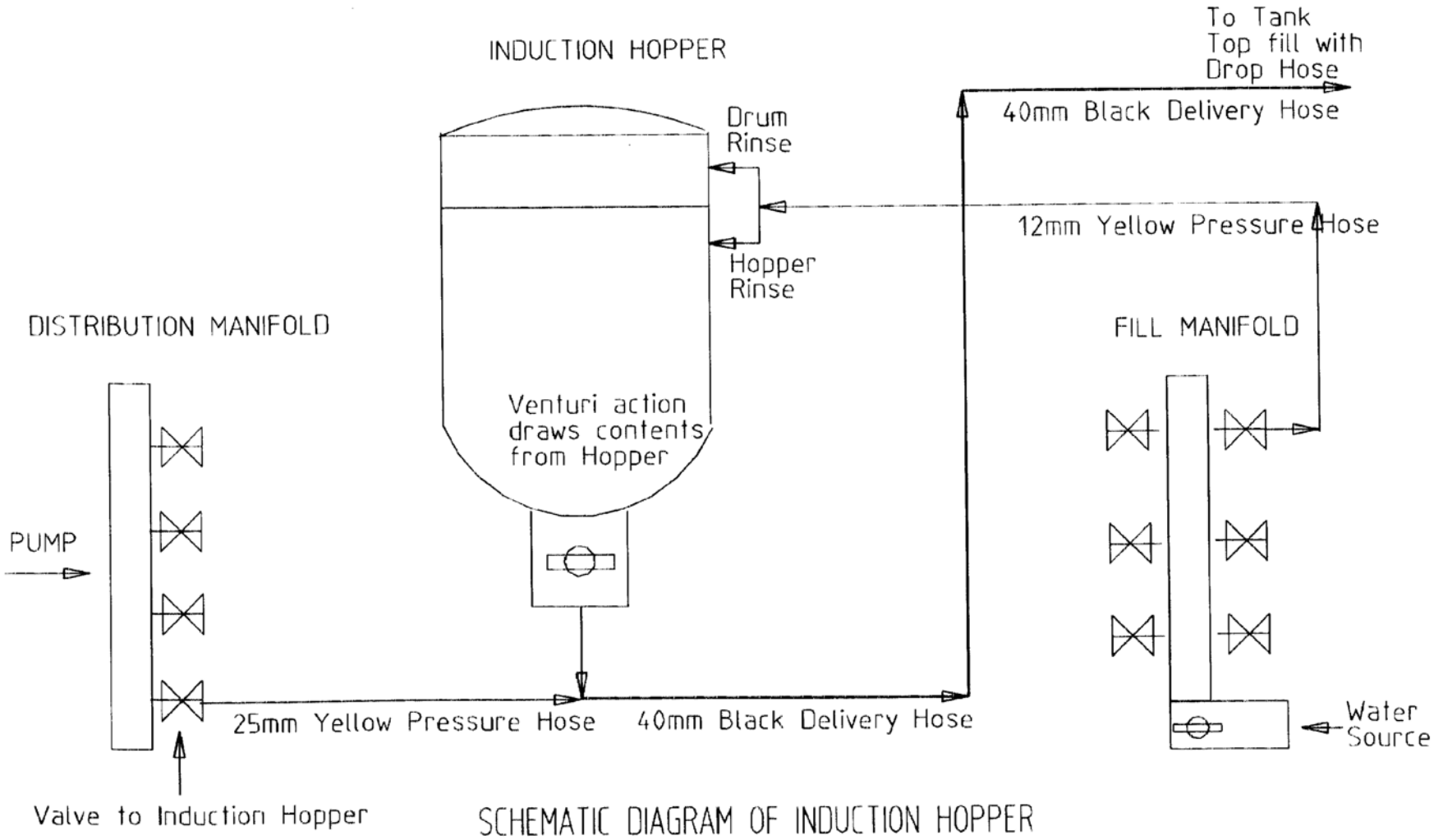
Do not have the sprayer pump operating!

1. Ensure the fresh water filling supply pump system is operating.
2. Turn the red handle on the fill 3-way ball valve right so that the water supply is directed to the fill station.
3. Open the 'Hopper Rinse' ball valve on the fill station.
4. Open the hopper rinse valve on the side of the hopper.
5. Open the hopper tank ball valve at the bottom of the hopper by turning up the yellow handle so that it is vertical, removing the rinsate from the hopper.



NOTE:

- ✓ Take proper safety precautions to avoid any contact with rinsate when draining, as it may contain chemical residue.
- ✓ Be careful as to where the rinsate is being deposited as it may contain chemical residue.
- ✓ **This procedure <u>will not</u> rinse the hose from the bottom of the hopper to the main tank.**

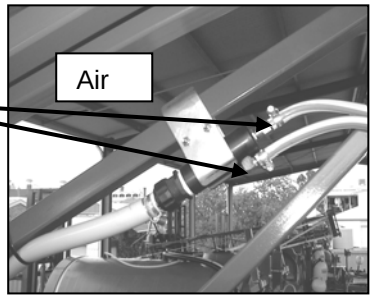


SCHEMATIC DIAGRAM OF INDUCTION HOPPER

07 EXACTA FOAM MARKER – INDEX

TROUBLESHOOTING

"I HAVE INSUFFICIENT OR POOR QUALITY FOAM ON ONLY ONE SIDE"



- Compare the flow coming out both the air and liquid lines for both sides to determine whether the solenoids are working properly.
- Swap the foam generators over to see if the poor foam is dependent on the foam generator or not.
- If air is coming out of both sides, clean the air diverter solenoid.

"I HAVE INSUFFICIENT OR POOR QUALITY FOAM"

● CONDUCT A PERFORMANCE TEST FOR AN <u>EXACTA</u> FOAM MARKER:

You should fill a 20 litre bucket up with foam in approximately 1 minute at a mixing rate of 1 to 50. You will need to add 200 ml of **GoldAcres concentrate** to 10 litres of clean, soft water**.**

If the Standard Foam Marker is not performing to near this rate or the foam is of a poor quality check the following possible causes:

- Incorrect concentrate rate – drain and add new mix at correct rate (use clean, soft water and GoldAcres concentrate).
- Dirty or hard water used – drain and add new mix at correct rate (use clean, soft water and GoldAcres concentrate).
- Stale foam concentrate – drain and add new mix at correct rate (use clean, soft water and GoldAcres concentrate).
- Foam mixture not sufficiently mixed – stir mixture in tank or replace mixture with pre-stirred mixture.
- Insufficient power to compressor/diverter unit – check power supply (should be minimum 12 volts) to solenoids and all connections.
- Compressor failing to produce sufficient air – check and/or replace compressor flapper valves and clean compressor filter.
- Air or water hose blocked – check all hoses or kinks and blockages.

For Exacta Foam Markers:

- Filter under foam tank blocked – clean filter screen.
- Solenoids not opening or closing – check diaphragm and replace if necessary.
- Foam generator not performing – check and clean filter screen in foam generator.

For Direct Injection Foam Markers:

- Check that the needle valve settings are correct. Use the settings on Page 6.
- The tank contents may be contaminated. (either concentrate in the fresh water or fresh water in the concentrate tank) – flush and replace contents and check the one-way valves.

FOAM CONCENTRATE

It is most important that GoldAcres foam marker concentrate be is used exclusively in GoldAcres foam marking systems. Problems associated with other brands of concentrate can be inadequate quantities of foam being produced and poor quality foam generated.

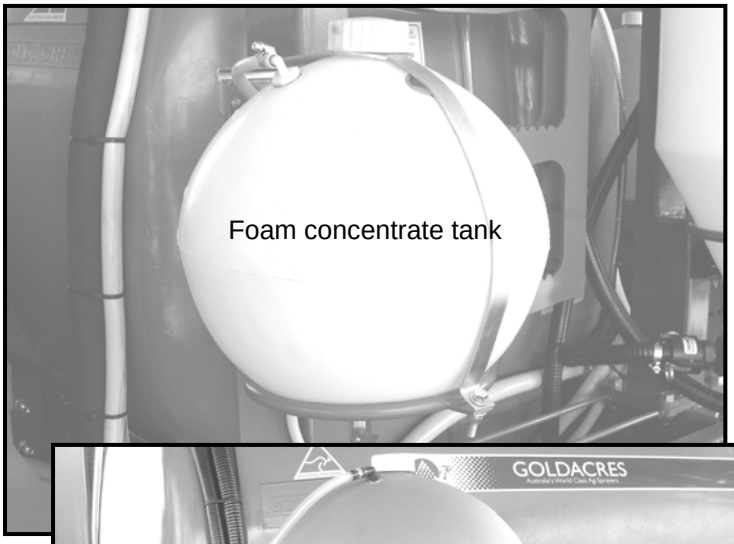
With the Exacta Direct Injection system, our foam concentrate is specially formulated to minimise gumming up of valves and lines and its viscosity is more temperature stable than other brands.

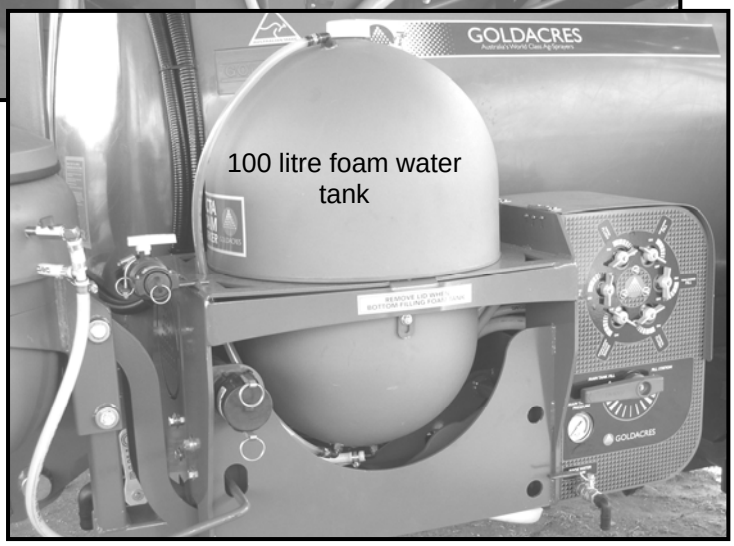
Please ensure you have good stocks of concentrate on hand at all times and impress on your customers the importance of using only GoldAcres concentrate to minimise foam marker difficulties.

The addition of alcohol based dyes to colour foam can result in much less foam being produced than with standard white foam.

"EXACTA" FOAM MARKER WITH DIRECT INJECTION

The “Exacta” foam marking system with Direct Injection features the foam concentrate and water being contained in separate tanks. With this system the foam concentrate is injected directly into the water line which is then mixed with air in the foam generator along the boom. The generated foam is then forced to the accumulator at the end of the boom.

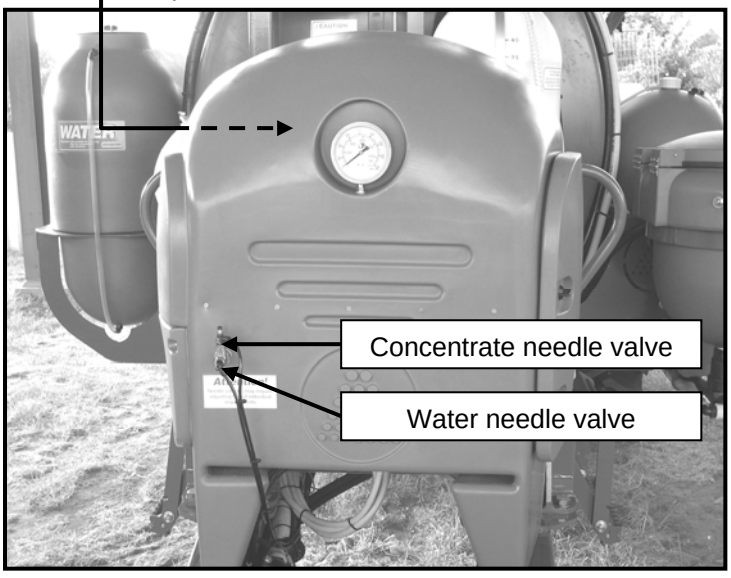




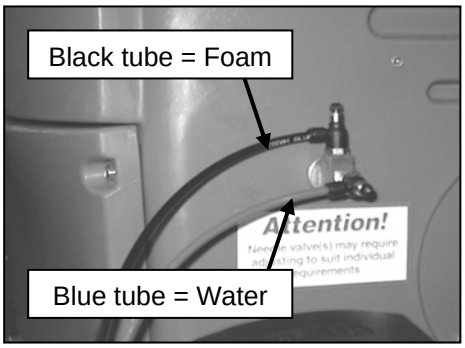
Both the foam concentrate tank and foam water tank are pressurized by back pressure (typically around 70 kPa). A control valve (needle valve) in the foam concentrate line regulates the amount of concentrate used. A control valve (needle valve) is used to vary the amount of water being delivered which enables variability in the foam composition to suit appropriate spraying conditions.

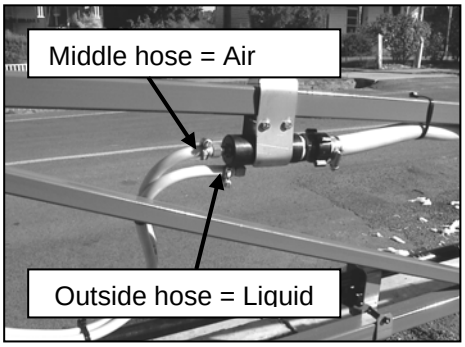
The system is controlled electrically via the foam control console from the cabin. The compressor/diverter unit is mounted on the sprayer and thus the compressor noise is not a problem for the operator. A 7-pin trailer plug connects the foam control console to the compressor/diverter unit.

Compressor air filter is located behind the locker



USING THE "EXACTA" FOAM MARKER





Where direct injection is fitted:

- Fill the exacta foam water tank with only clean soft water.
- Fill direct injection with only GoldAcres foam concentrate.
- Up to 24 metre booms, open the water needle valve **9 turns.** Over 24 metre booms, open the water needle valve **12 turns.**
- Up to 24 metre booms, open the concentrate needle valve **up to 3 turns.** Over 24 metre booms, open the concentrate needle valve **up to 4 turns.**
- **Start with half this amount and open the concentrate in only quarter turn intervals until the correct foam consistency is reached. Allow up to 5 minutes for each needle adjustment to take effect.**

To successfully use the exacta foam marking system, it is essential to observe the following points:

- **Add foam marker concentrate to clean, soft water** at the rate of **1 to 50** (1 part foam concentrate to every 50 parts water, i.e. for 100 litres of water, 2 litres of foam concentrate is required). Rain water is the best to use while bore water and dam water may tend to produce less foam as the water may be harder.
- **It is important that the correct rate of 1 to 50** is used and it is necessary to adequately mix the foam concentrate and the water. To achieve this when filling the foam tank via the fill manifold:
    1. Make sure that initially all ball valves on the fill station are turned off and the red handle on the fill 3-way ball valve is vertical.
    2. Connect the fresh water fill hose to the quick-fill coupling.
    3. **Remove the lid from the foam tank**.
    4. Operate the fresh water pumping system (**make sure pressure does not exceed 200 kPa**).
    5. Turn the red handle on the fill 3-way ball valve **right** so that the fresh water is directed to the fill station.
    6. Open the 'Foam Marker Fill' ball valve. Water should now flow into the foam tank. Fill to about one-third full.
    7. Add the required amount of GoldAcres foam concentrate for the whole tank mix (i.e. 2 litres of GoldAcres foam concentrate if filling the foam tank full from empty, i.e. 100 litres).
    8. Continue to bottom-fill the foam tank until the desired amount has been transferred. The bottom-filling should serve to adequately mix the concentrate with a minimum of frothing.
    9. When the desired amount of water has been transferred to the foam tank, shut the 'Foam Marker Fill' ball valve and turn the red handle so that it is vertical.
    10. Refit lid to tank, making sure the lid is screwed on securely and that the o-ring is in place inside the lid.

REMOVE LID WHEN BOTTOM FILLING FOAM TANK

When filling the foam tank via the lid, it is best to use a funnel, which extends to the bottom of the tank to minimize frothing:

1) Remove the lid from the foam tank.
2) Fill the tank to about one-third full.
3) Add the required amount of foam concentrate for the whole tank mix (i.e. 2 litre of GoldAcres foam concentrate if filling tank full from empty, i.e. 100 litres).
4) Continue to bottom-fill the foam tank until the desired amount has been transferred.
5) Replace the lid on the foam tank (making sure the o-ring is in place).

If the foam marker concentrate has been allowed to settle in the tank, it will need agitating before operating in order to produce satisfactory foam.

- If the foam concentrate is not mixed thoroughly it will tend to settle to the bottom of the tank. Consequently, the initial concentrate rate may be too high and then later too low.
- The best way to agitate is to stir the mixture with an appropriately shaped object.
- Foam concentrate does not take long to deteriorate when mixed with water, so that it does not produce foam as well. This can happen very quickly so if the foam mixture has been left for an extended period of time and it does not produce good foam, replace the mixture.
- If there is uncertainty regarding the percentage of foam concentrates in the tank mixture, drain the tank and replace with water and foam concentrate.
- Join the 7-pin plugs. Ensure the compressor has the proper 12 Volt battery supply (compressor will pump more air with vehicle running due to increased voltage).
- Switch to '**on**' the master switch on the foam control box. This will start the compressor (with air being delivered out the left side). As backpressure develops in the air line, the foam concentrate tank will begin to be pressurised causing the liquid to be pushed out to the generator. Allow several minutes for this to occur (more when tank is not full). Switch the left/right switch to the relevant side. This opens the relevant solenoids in the compressor/diverter box to allow the air and foam mixture to be delivered to the selected foam generator.
- Adjust the needle control valve on the compressor / diverter box to produce foam of the required foam composition (dense or loose depending on the respective conditions).
- To return to the base factory settings;
    1. Turn the concentrate and water needle valves completely off.
    2. Open the needle valves to the settings shown on page 6.
    3. Allow sufficient time for the altered foam to come out of the accumulator. (1 or 2 minutes)
    4. The water needle valve can then be varied to make the foam lighter or heavier. **All adjustments of the control valve should be within + or – ½ a turn or similar**. **Allow up to 5 minutes for each needle adjustment to take effect.**

5. If the foam is too runny close the water valve slightly, if the foam is stiff and has air holes open the water valve slightly. **Loose foam is desirable** when spraying in crops where the foam needs to sit on top of the crop in order to be visible. **Tight foam is desirable** when the foam needs to be visible for an extended period of time and when the spraying conditions are relatively hot and windy.

- Switch the master switch to '**off'** and the left/right switch to the center position when operation is finished and **shut the foam tank ball valve at the bottom of the tank**.
- Regularly inspect the foam marker lines, to ensure they are free of foreign matter.
- Periodically remove and clean the filter. The foam marker filter is located underneath the foam marker tank. To remove the filter, ensure the appropriate protective clothing is being worn. Close the foam tank ball valve, loosen the filter bowl, remove the filter and clean. Replace the filter and tighten the filter bowl.
- Periodically check the condition of the one-way valve in the compressor/diverter unit.

PREVENT SIPHONING WHEN EITHER THE WATER OR FOAM CONCENTRATE TANK EMPTY

If either the water tank or the foam concentrate tank empties, it is possible that flow from the other tank (foam water or foam concentrate) can siphon into the empty tank. To prevent this, as soon as either the foam water tank or foam concentrate tank empties, shut the ball valve at the bottom of both tanks. Re-fill the tanks prior to the next spraying operation.

TURN OFF THE TAPS BENEATH BOTH THE FOAM WATER AND FOAM CONCENTRATE TANKS AT THE END OF EACH DAY.

BLEEDING THE CONCENTRATE LINE WHEN THE FOAM CONCENTRATE TANK EMPTIES

If the foam concentrate tank empties, it will take a few minutes for the concentrate to feed through the lines to the compressor/diverter unit. To reduce this time, the concentrate can be bled to minimize water wastage.

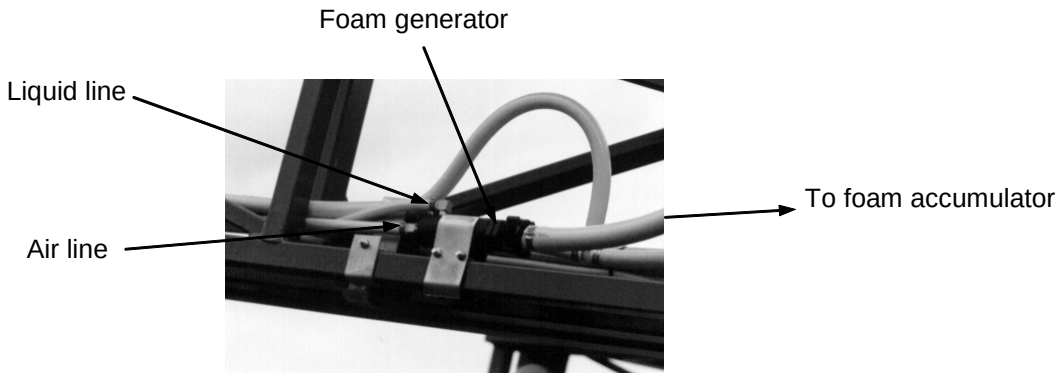
To bleed the foam concentrate:

- Open the concentrate needle valve several turns to increase the flow of concentrate.
- When the concentrate comes through, fully close the concentrate needle valve, and then re-open the valve to the factory setting shown on page 6.

FOAM GENERATOR

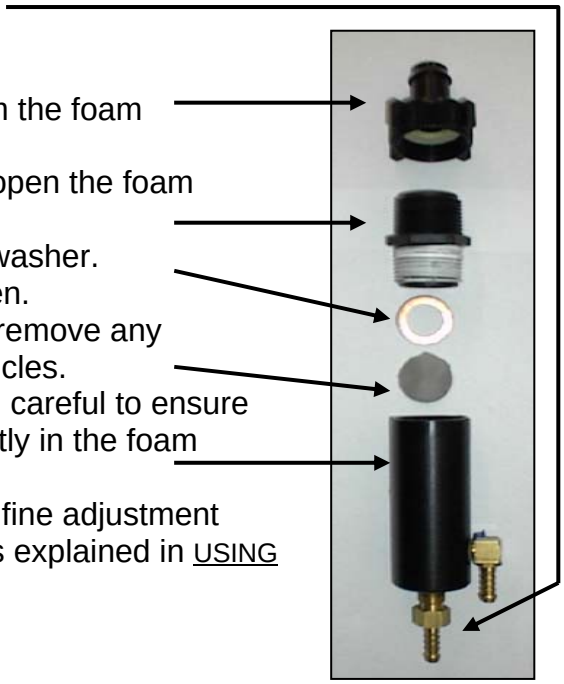
The foam generator comprises an air entry port in the end, which passes air through the generator aiding the delivery of the liquid in a side port. The air shears the liquid and both fluids then pass through a screen where the foam is formed. The loose foam is then compressed in the 19mm hose before emerging in the accumulator at the end of the line. The bore of the air entry port has been precisely drilled to maximize air pressure in the system as well as maximize the venturi effect on the liquid entry point. These holes must not be altered.

The foam line from the foam generator to the accumulator must be 19mm (3/4") diameter hose and four metres long. This gives the foam time to pack to a fine, light consistency.



FOAM GENERATOR FILTER

WARNING:
Do not attempt to remove the brass fittings on the end of the foam generator. The brass fitting from the foam water tank controls the general mixture of concentrate/water and is set at the factory. Adjusting this brass fitting will affect the general mixture of concentrate/water beyond the range of the fine adjustment mixture screw.



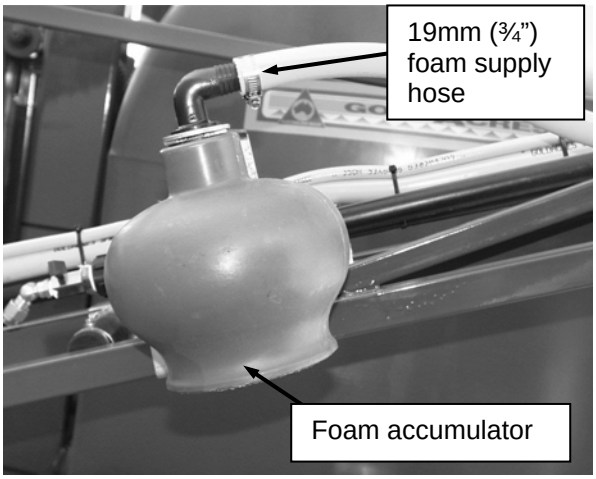
To clean the foam generator filter:

1. Remove the 19mm hose from the foam accumulator.
2. Remove the plastic fitting to open the foam generator.
3. Remove the brass retaining washer.
4. Remove the mesh filter screen.
5. Clean the screen in water to remove any concentrate residue and particles.
6. Replace the mesh filter being careful to ensure that the filter is seated correctly in the foam generator housing.
7. After re-assembly, return the fine adjustment screws to the basic setting as explained in USING THE "EXACTA" FOAM MARKER.

FOAM ACCUMULATOR

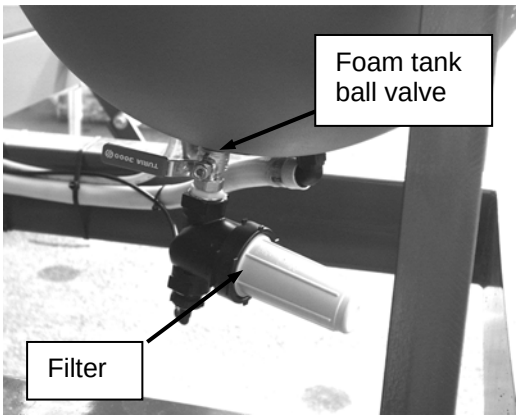
The foam accumulator has been designed to optimize the size of the foam blob, thus increasing its visibility.

NOTE: The position of the foam accumulator is between the last two nozzles on the spray boom (to prevent the accumulator from being dislodged frequently from the boom). This position must be taken into consideration when using the foam to line up the next pass.



EXACTA FOAM FILTER

It is essential to maintain the filter in good condition. A partially blocked filter can impede flow and thus delivery pressure and foam quantity or quality. If the filter is in any way damaged, replace it. Also, if the filter is not properly fitted, it can allow leaking of the foam mixture. The filter should be cleaned daily.



To clean the filter:

- Close the foam tank ball valve, thus isolating the tank from the filter.
- Carefully unscrew filter bowl.
- Remove filter strainer and clean strainer with water (under pressure) or toothbrush.
- Check for damage to strainer, body, seal or bowl.
- Place strainer back in position.
- Make sure seal is in proper position.
- Screw bowl back on (hand tight).
- Do not over-tighten bowl.
- Open foam tank ball valve when wanting to operate.

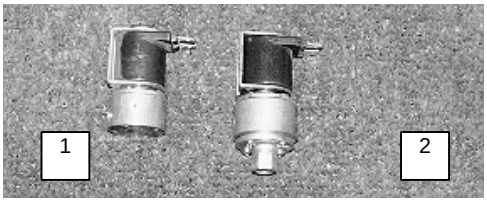
DRAINING THE FOAM MARKER TANK

Removing the bowl on the filter provides a drain for the foam marker tank. To drain the tank:

- Ensure the foam tank ball valve is closed.
- Remove the filter bowl and strainer.
- Open ball valve and drain tank.
- Wash strainer.
- Replace strainer and filter bowl, then open ball valve.

- Make sure the seal is not lost when draining.

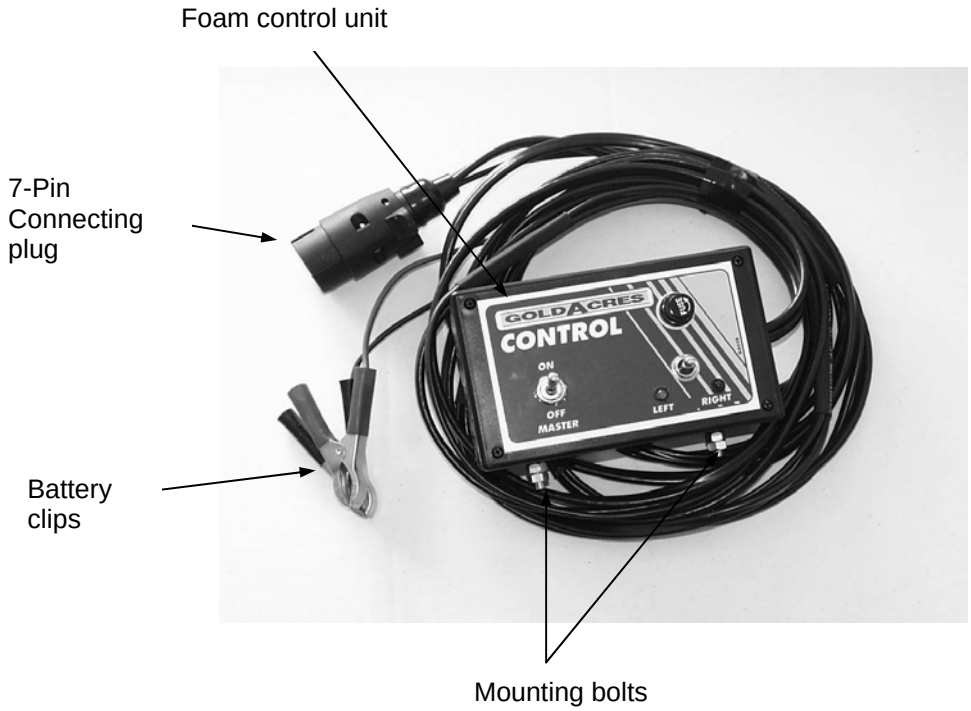
SOLENOIDS



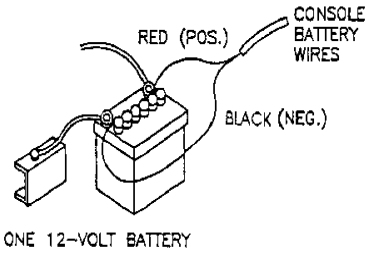
POSITION NO.	DESCRIPTION	HOSE SIZE	PART NO.	TO SUIT	REPAIR KIT PART NO.
1	12V DC Liquid Solenoid	¼"	4Q3M-ANBNT-7507	Exacta Foam Marker	KM1348
2	12V DC Air Solenoid	¼"	4Q3M3T-DNBNT-7507	Exacta Foam Marker	KM2071

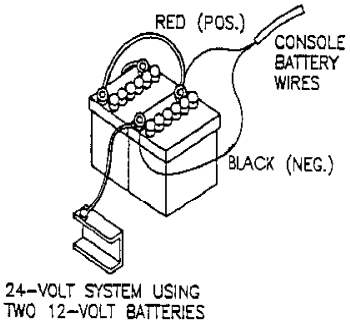
MOUNTING THE FOAM CONTROL CONSOLE SAFELY

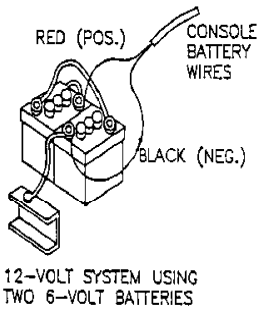
- It is important that the foam control console is mounted in the cabin in such a way that it cannot cause harm to the operator, especially if the foam control console becomes a projectile. When for example, the sprayer is disconnected from the vehicle but the cable loom connecting the foam control box (or any console for that matter) to the sprayer is not disconnected, ensure the foam control box will not harm the operator if it becomes a projectile.
- Securely install the foam control console in a position within easy reach of the operator. The two bolts at the base of the foam control box are designed to provide adequate mounting.
- Connect the 7-pin plugs (one attached to the compressor/diverter box, the other attached to the foam control box). Do not use excessive force to connect the plugs as this may damage the pins and thus impair the contact. Carefully push the plugs together so that they lock into position and fit together evenly.
- Directly connect the power wires to a 12 volt battery (see the diagram on the next page). Do not connect to other voltage outlets, as they will not be able to handle the current. Attach the red wire (positive) to the positive terminal and the black wire (negative) to the negative terminal. Do not tie the battery wires close to the existing battery leads or any other electrical wiring.
- If using two 12 volt batteries (i.e. two batteries in parallel) it is best to utilize the power supplied by both batteries (i.e. connect to positive terminal on battery supplying starter motor and negative terminal on other battery, see the diagrams on the following page).

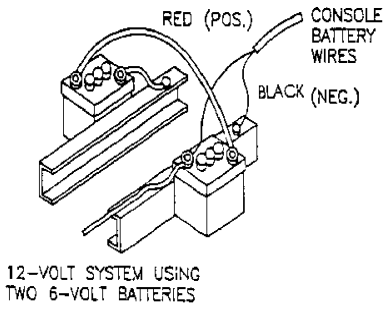


BATTERY CONNECTIONS

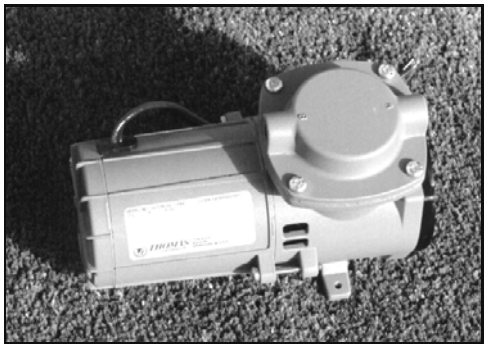






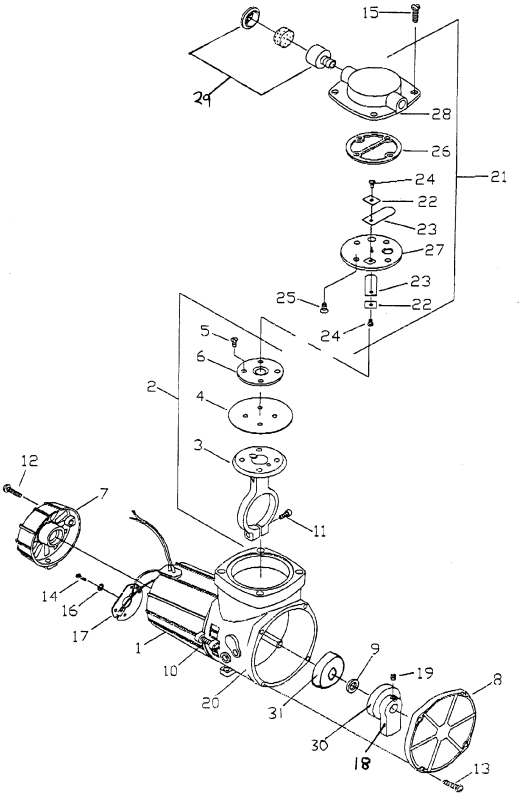


FOAM MARKER COMPRESSOR



This compressor is used for both the Exacta and Standard foam markers.

107CDC20 Bare compressor
107CDC20-C Standard compressor and box for manual operation



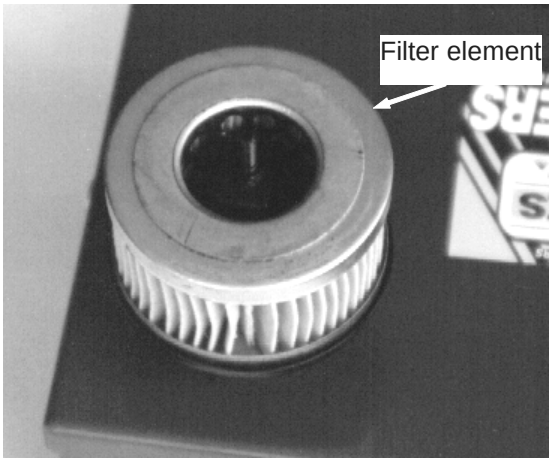
POS. NO.	PART NO.	DESCRIPTION
1	T602492	Stator Winding
2	T607180	Connecting Rod Assy
3	T607139	Connecting Rod
4	T608148	Diaphragm
5	T625540	Screw - Hold Down Plate
6	T654649	Hold Down Plate
7	T614381	Motor End Cap Assy
8	T614608	Front Cover
9	T615403	Spacer - Eccentric
10	T625058	Screw - Housing
11	T625114	Screw - Connecting Rod
12	T625260	Screw - Motor End Cap
13	T625266	Screw - Front Cover
14	T625407	Screw - Brush
15	T625444	Screw - Head
16	T626516	Lockwasher - Brush
17	T627096	Brush Assembly
18	T645374	Eccentric Drive Lever
19	T625244	Set Screw
20	T660662	Housing
21	T660873	Head & Valve Plate Assy
22	T617045	Valve Keeper Strip
23	T621102	Flapper Valve
24	T625160	Screw - Flapper Valve
25	T625606	Screw - Valve Plate
26	T633439	Gasket - Valve Plate
27	T654129	Valve Plate
28	T660131	Head
29	T660763	Filter
30	6002-2RS1	Bearing - Cam Assy
31	6201Z-8MM	Bearing - Motor Assy

COMPRESSOR AIR FILTER

CLEAN COMPRESSOR AIR FILTER ELEMENT DAILY

If the compressor filter element is not cleaned and becomes blocked then damage may result to the compressor through overheating.

Clean the element with compressed air - Do not use water to clean element.

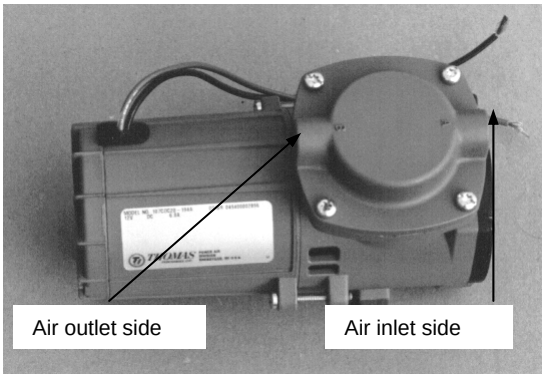


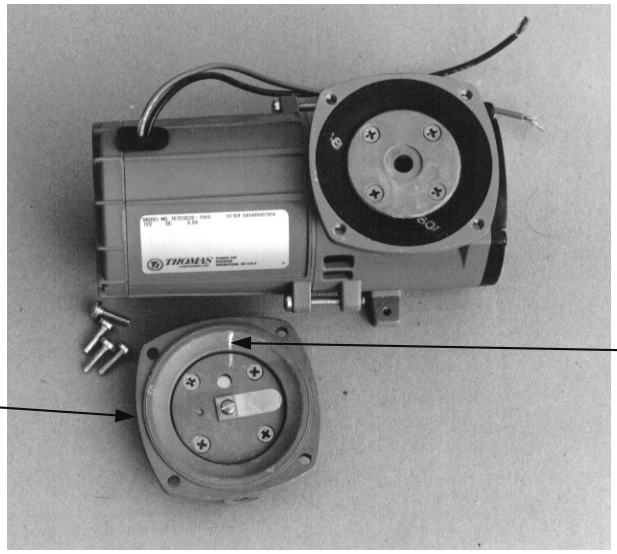
CHECKING / REPLACING FLAPPER (REED) VALVES

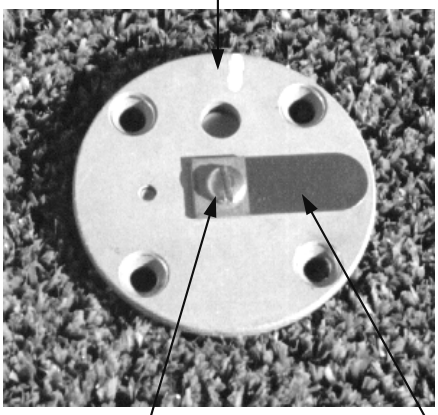
If the compressor is not performing adequately, firstly check the wiring to ensure there is enough voltage reaching the compressor. If the compressor is still not performing, the flapper (reed) valves are prone to wear and therefore need to be checked. If the reed valves are damaged or bent in any way, or if dirt becomes lodged under the reed valves, this will dramatically reduce the performance of the compressor.

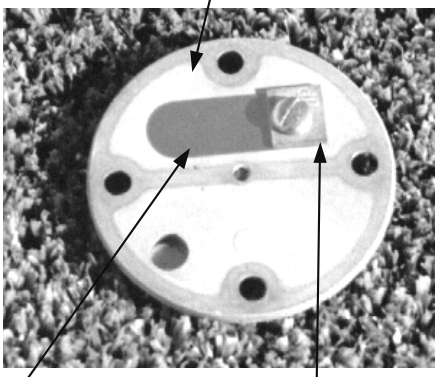
The following procedure should be adhered to when checking or replacing reed valves:

- Remove head from compressor. (note where the inlet and outlet are on the head relative to the compressor)
- Mark both the head and valve plate so that the valve plate will be reassembled correctly.
- Remove valve plate from head.
- Remove valve screw and valve keeper strip (note the orientation) for both reed valves (top and bottom).
- Inspect both flapper (reed) valves.
- Replace valve if damaged or bent (available from your nearest GoldAcres dealer or the manufacturer).
- Ensure that the surface under the valves is clean.
- When reassembling flapper (reed) valve, make sure the valve is orientated correctly (covering the proper hole) and is facing up the right way (note position of angled corner) (See following diagrams).
- Replace valve keeper strip (with "UP" facing up and away from the reed valve) and screw.
- Replace valve plate making sure the mark on the valve plate lines up with the mark on the head.
- Screw the valve plate screws in.
- Replace head and head screws.

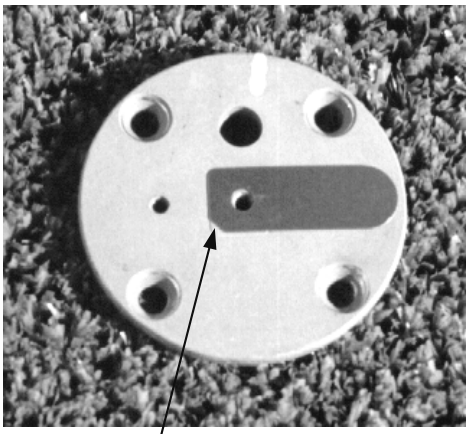


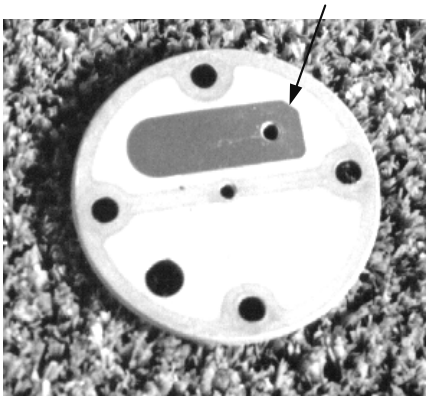




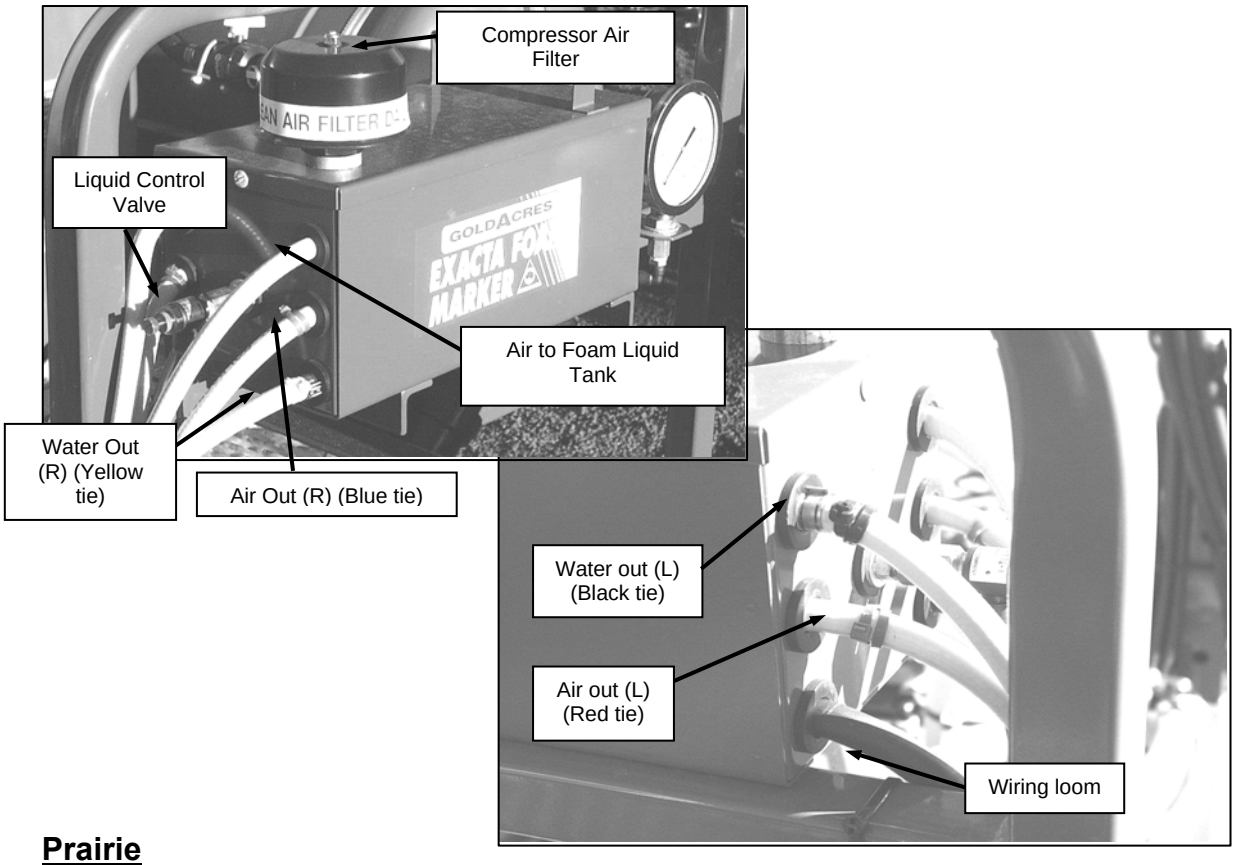


Flapper (reed) valve

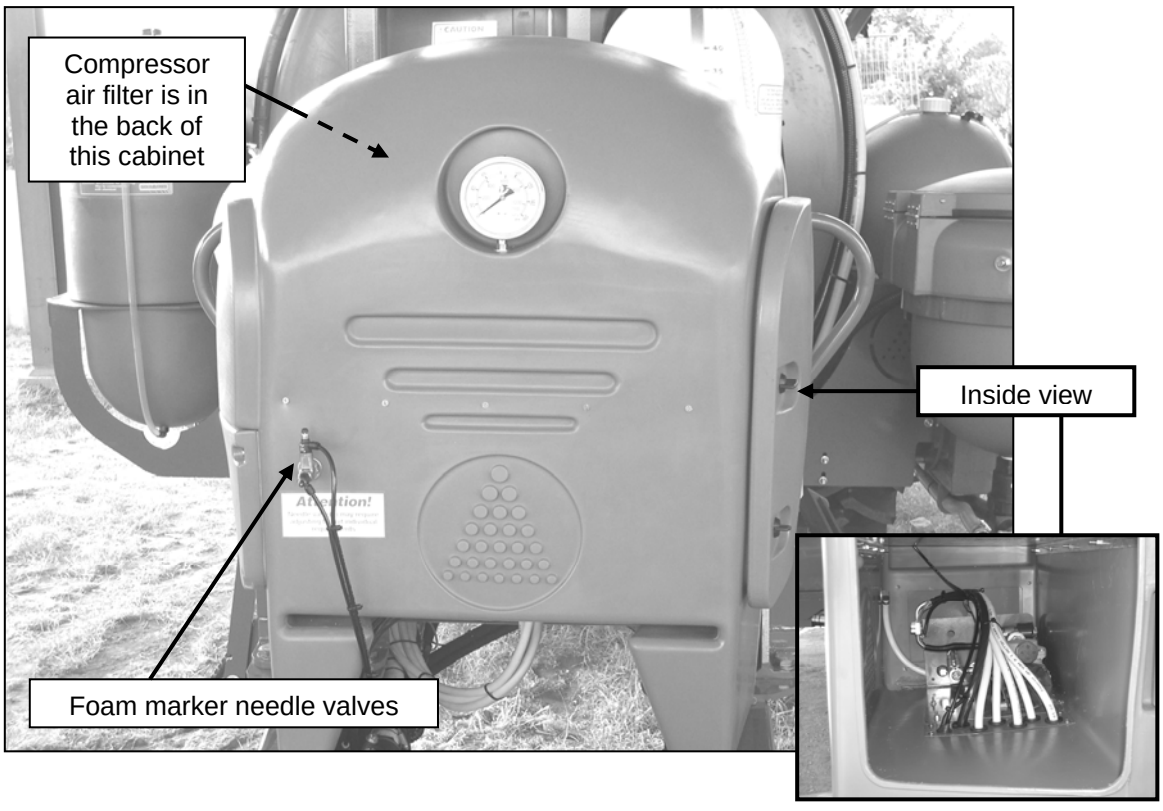




"EXACTA" FOAM MARKER COMPRESSOR/ DIVERTER UNIT - Prairie Special

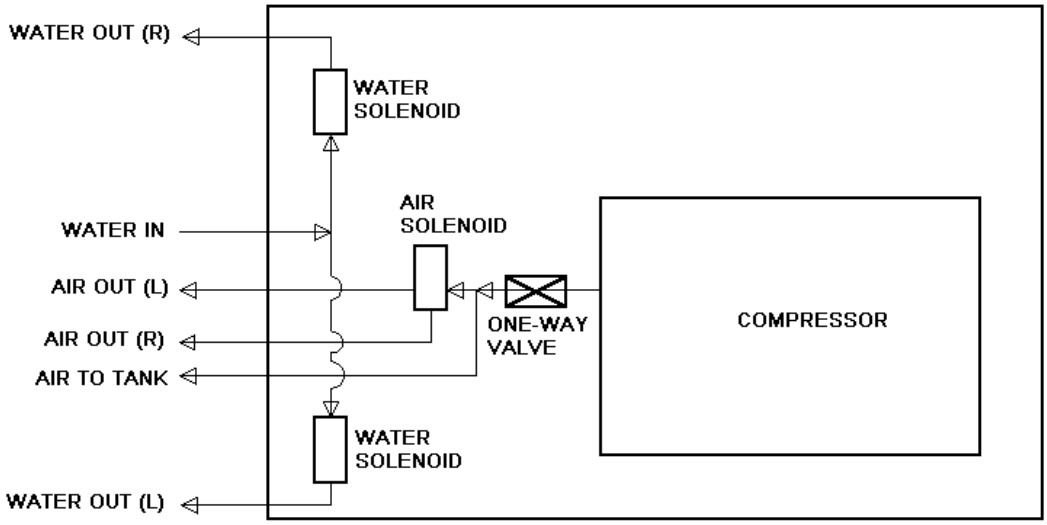


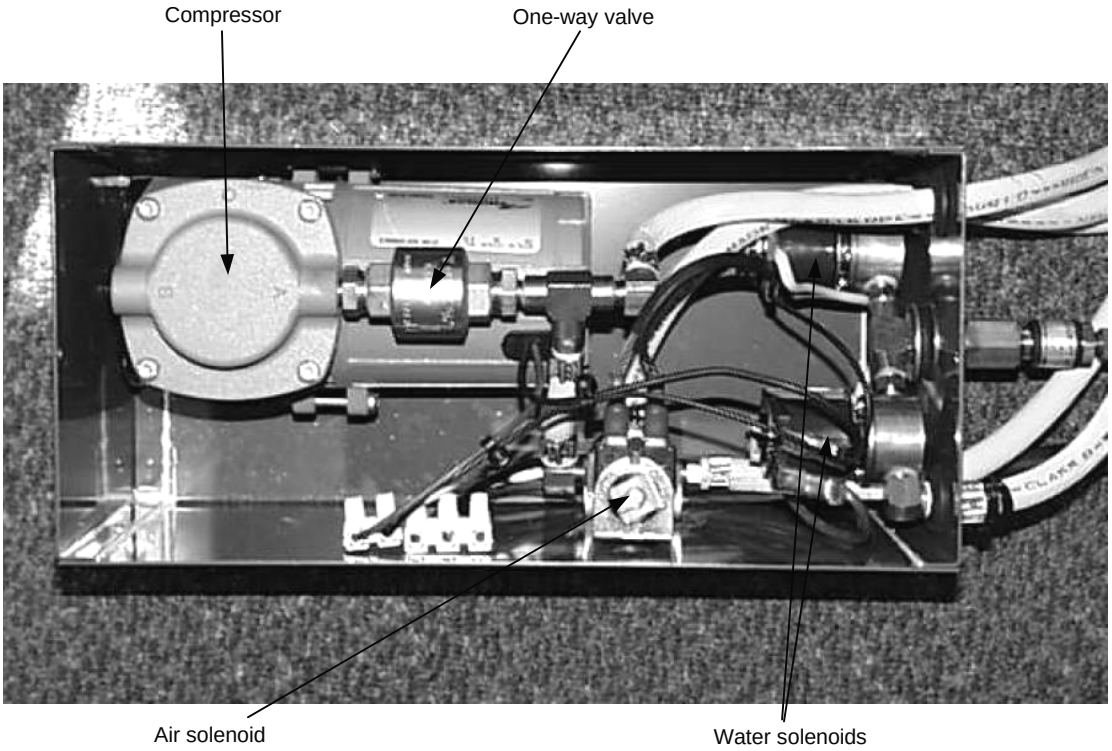
Prairie



Exacta foam compressor/diverter unit

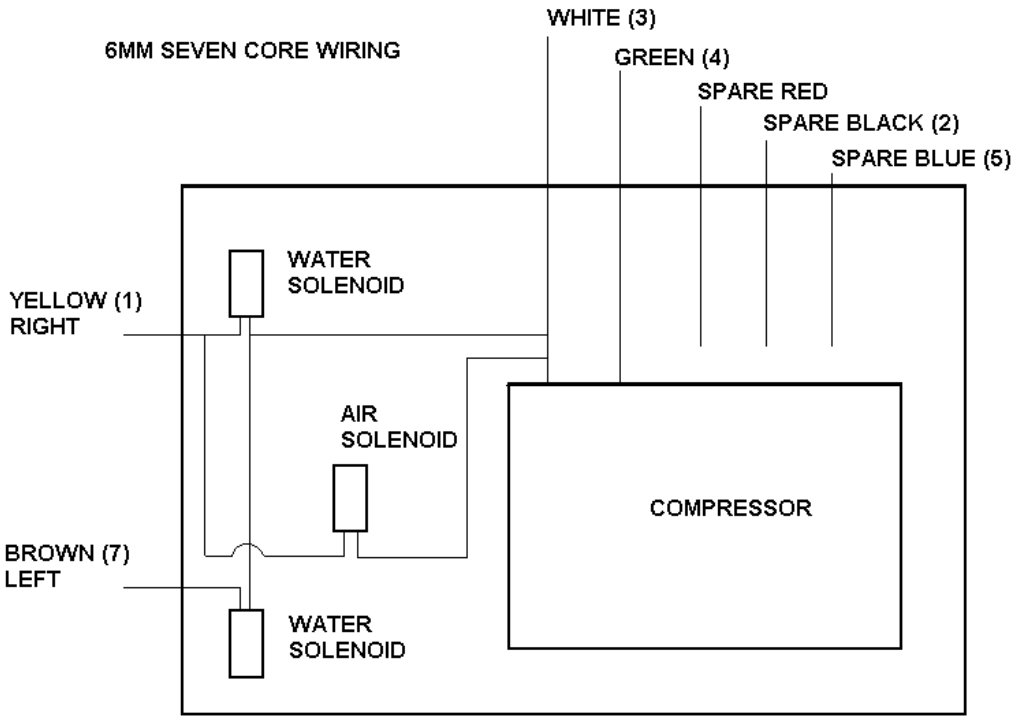
SCHEMATIC LAYOUT OF COMPRESSOR/ DIVERTER UNIT



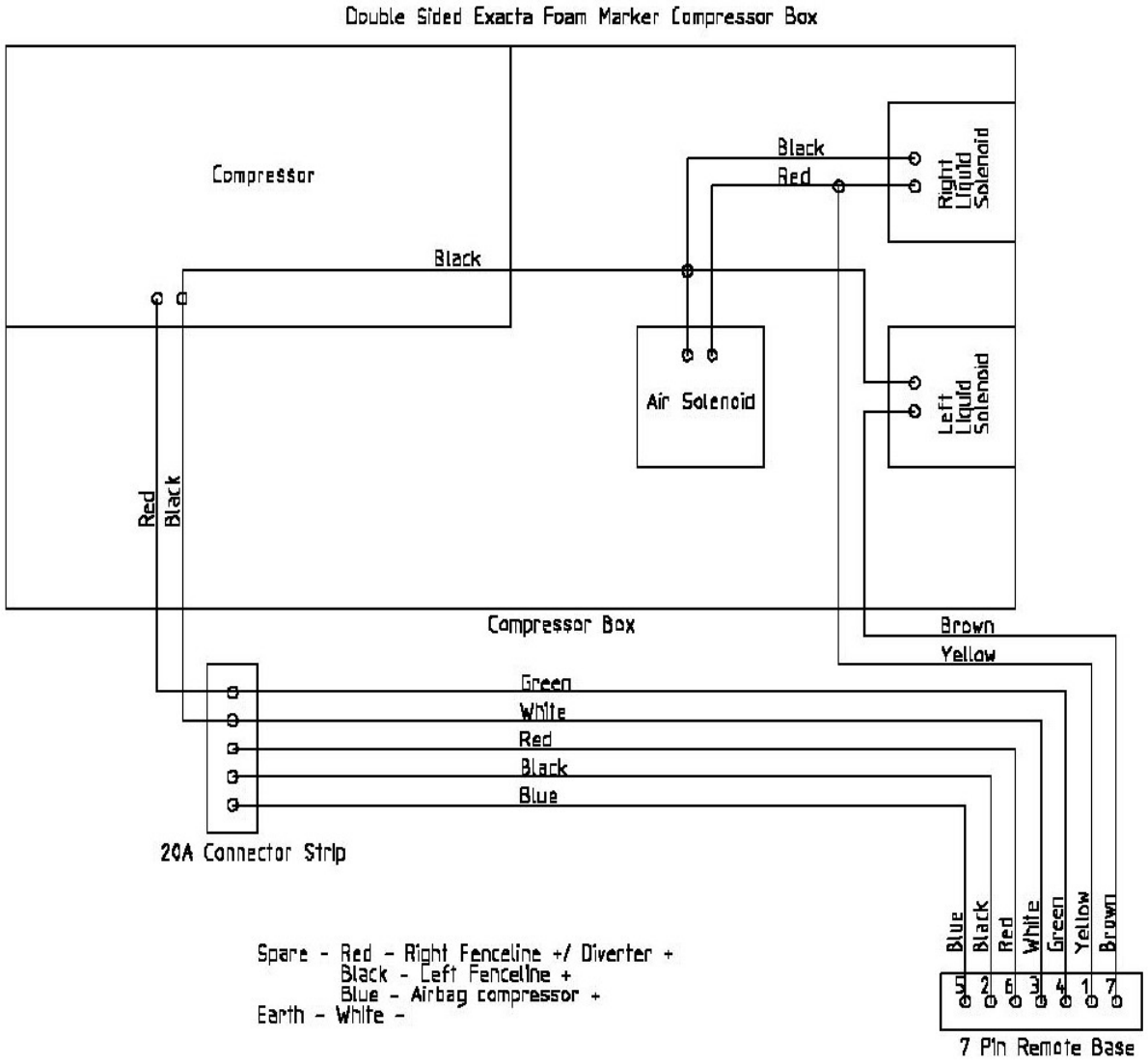


ELECTRICAL WIRING DIAGRAMS

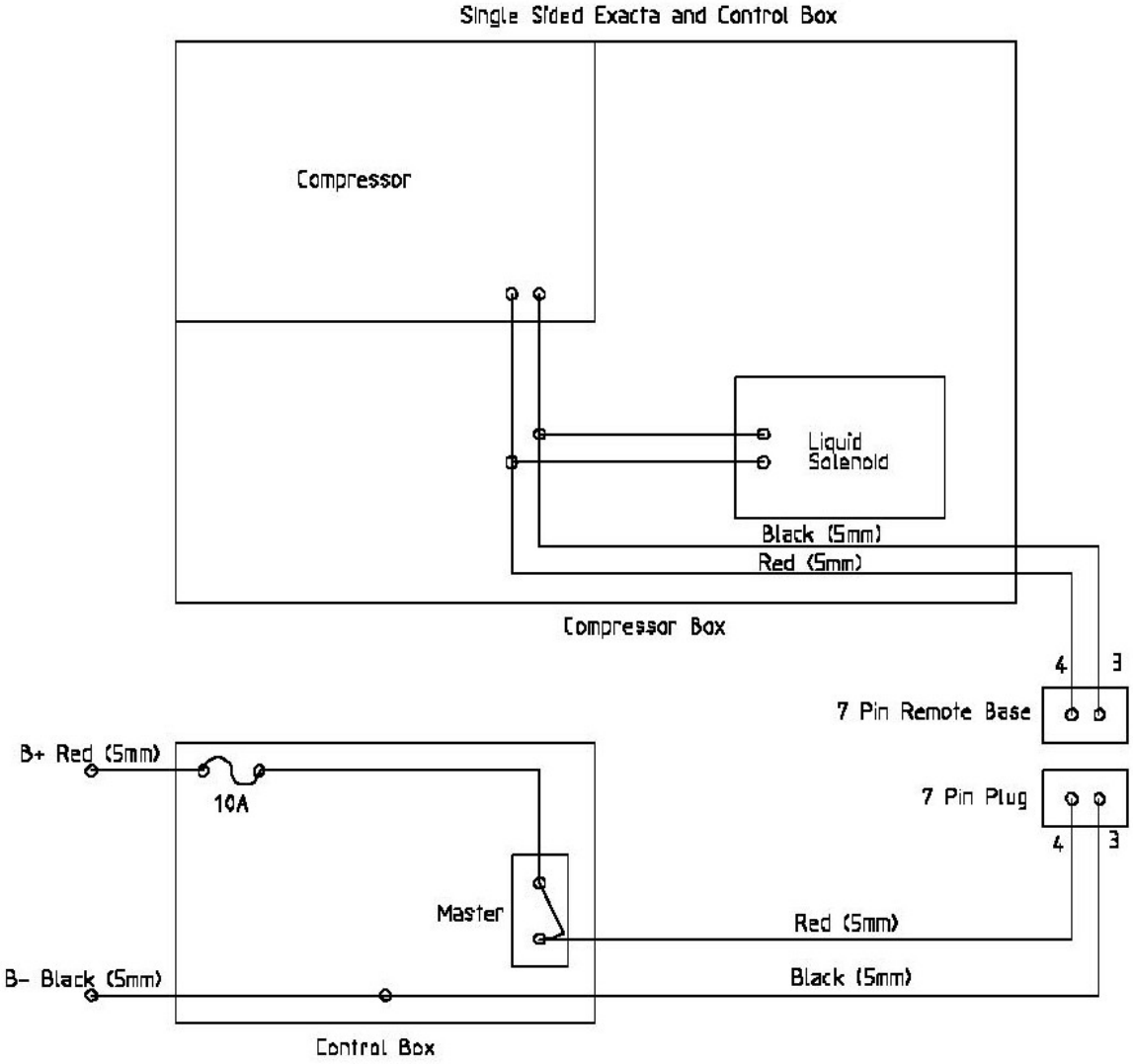
ELECTRICAL WIRING DIAGRAM OF COMPRESSOR/ DIVERTER UNIT



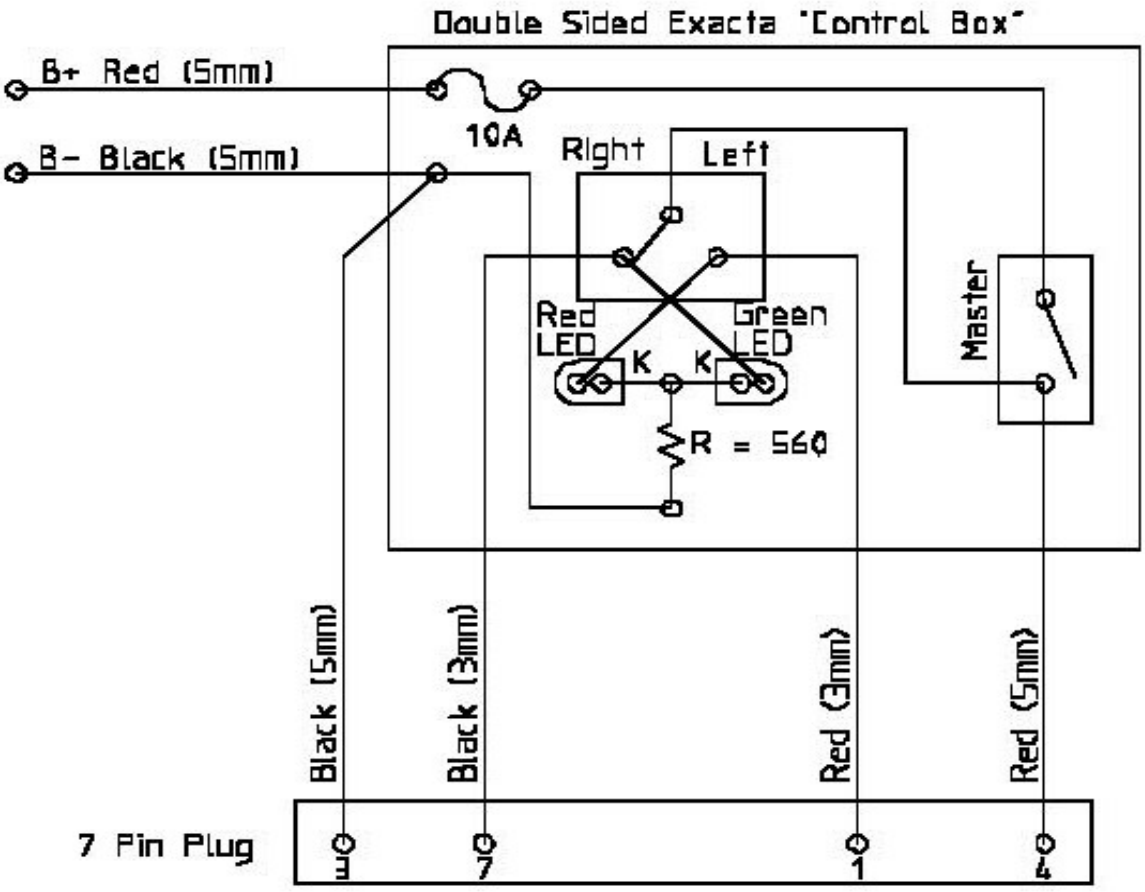
DOUBLE SIDED EXACTA COMPRESSOR BOX



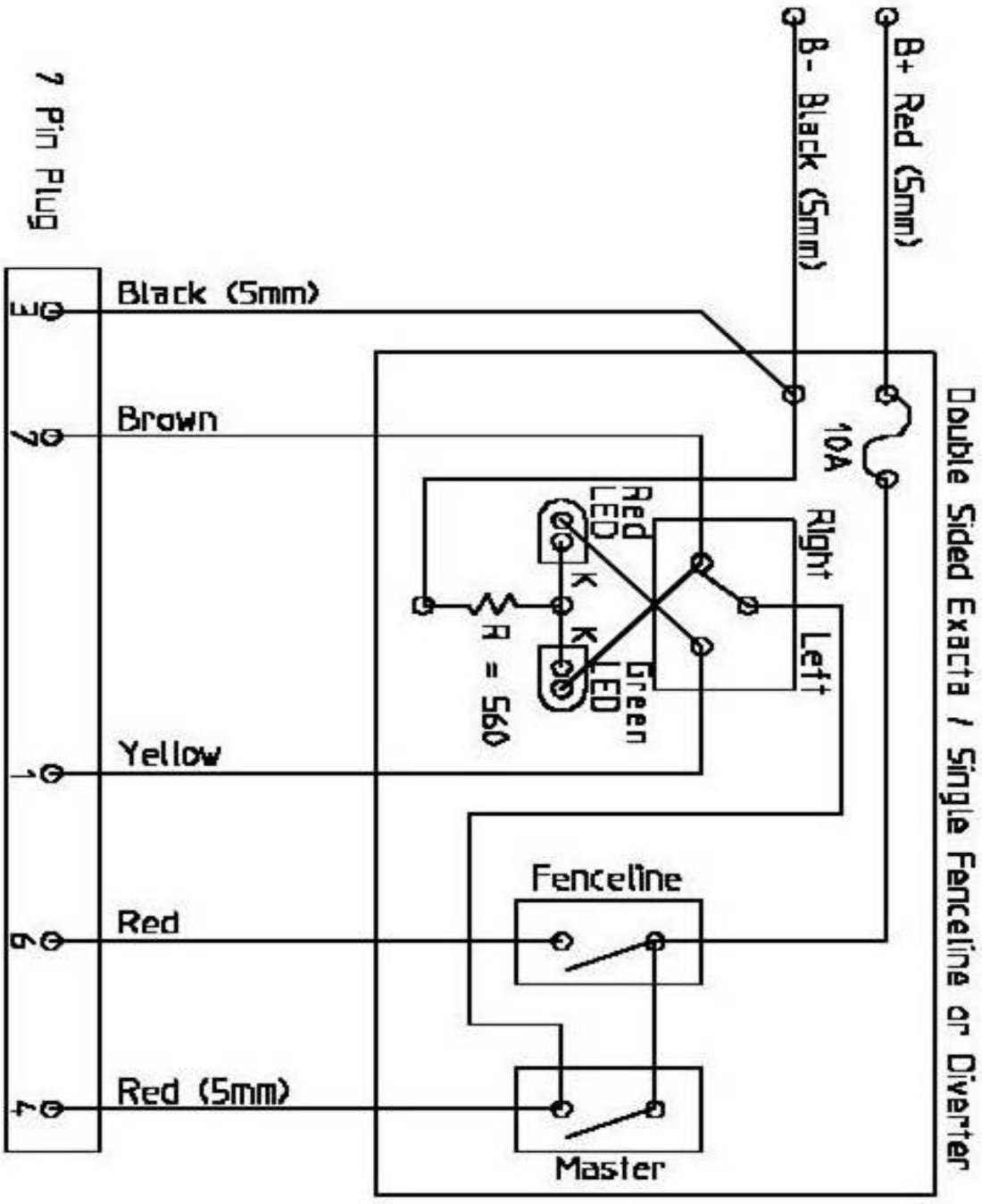
SINGLE SIDED EXACTA AND CONTROL BOX



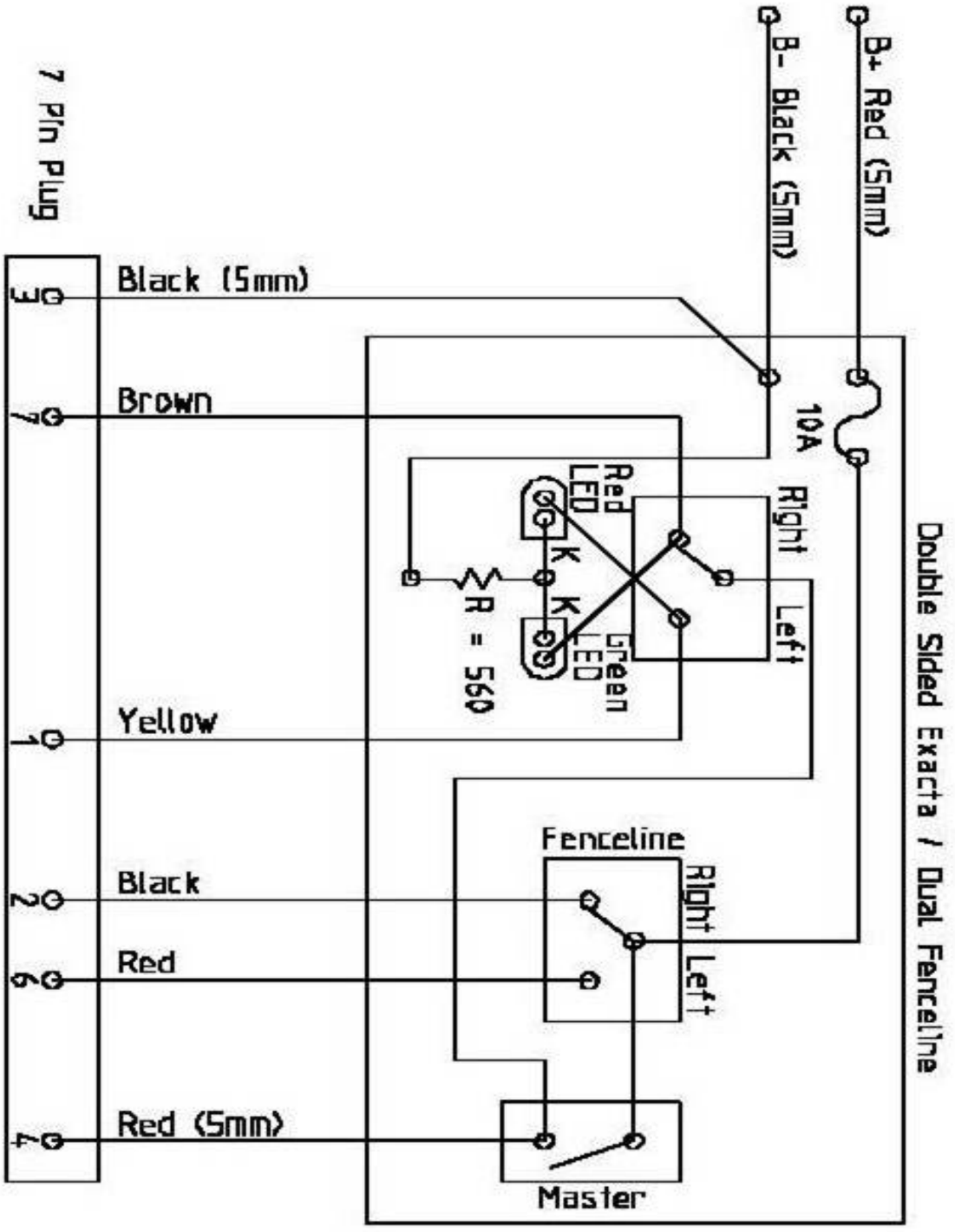
DOUBLE SIDED EXACTA CONTROL BOX



DOUBLE SIDED EXACTA / SINGLE FENCELINE OR DIVERTER



DOUBLE SIDED EXACTA / DUAL FENCELINE



09 PR SUSPENDED BOOMS – INDEX

CAUTION!
BEFORE WORKING UNDER THE BOOM OR LIFT, CLOSE THE HYDRAULIC TAP ON THE BOTTOM OF THE LIFT CYLINDER AND PLACE SUPPORT STANDS UNDER THE BOOMS.

TROUBLESHOOTING

"MY INNER AND OUTER BOOMS ARE NOT IN LINE WITH EACH OTHER WHEN I FOLD OUT MY BOOMS."

- ✓ Refer to the section "BOOM CABLES" for information about adjusting the alignment of the inner and outer booms.

"MY BOOM APPEARS TO BE NOT RIDING SMOOTHLY UP AND DOWN, AND IT LOOKS LIKE ITS BINDING ON THE MAST ROLLERS."

Or;

"MY TOWER APPEARS TO HAVE GOUGE MARKS OR SCORING ON THE TOWER RAILS."

- ✓ Refer to the section "ADJUSTMENT OF MAST ROLLERS" for information about adjusting the vertical movement of the boom on the tower.

"ONE OF MY BOOMS IS NOT FULLY FOLDED WHEN THE OTHER IS ALREADY ALL THE WAY IN."

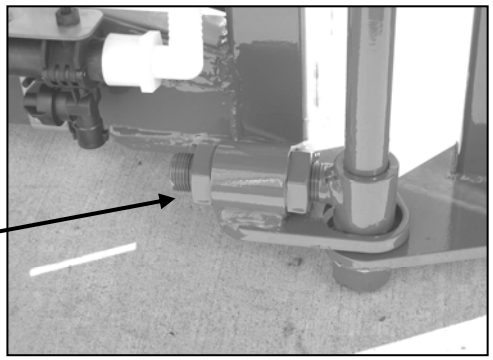
- ✓ Refer to the section on "RE-PHASING THE RAMS" to correct the phasing of the boom rams.

"MY BOOMS WILL NOT FULLY FOLD TO THE BOOM RESTS."

- ✓ Refer to the section on "MAINTENANCE – DELTA BOOMS" for information about grease points on the booms.
- ✓ A lack of lubrication on the boom-link rose ends will result in the boom refusing to fully fold.

"I CANNOT GET MY BOOMS LEVEL."

- ✓ Ensure that the air bag suspension is level before attempting to level the booms.
- ✓ Adjustment of the height of the outer boom can be made by using the adjustment thread located at the bottom of the hinge.

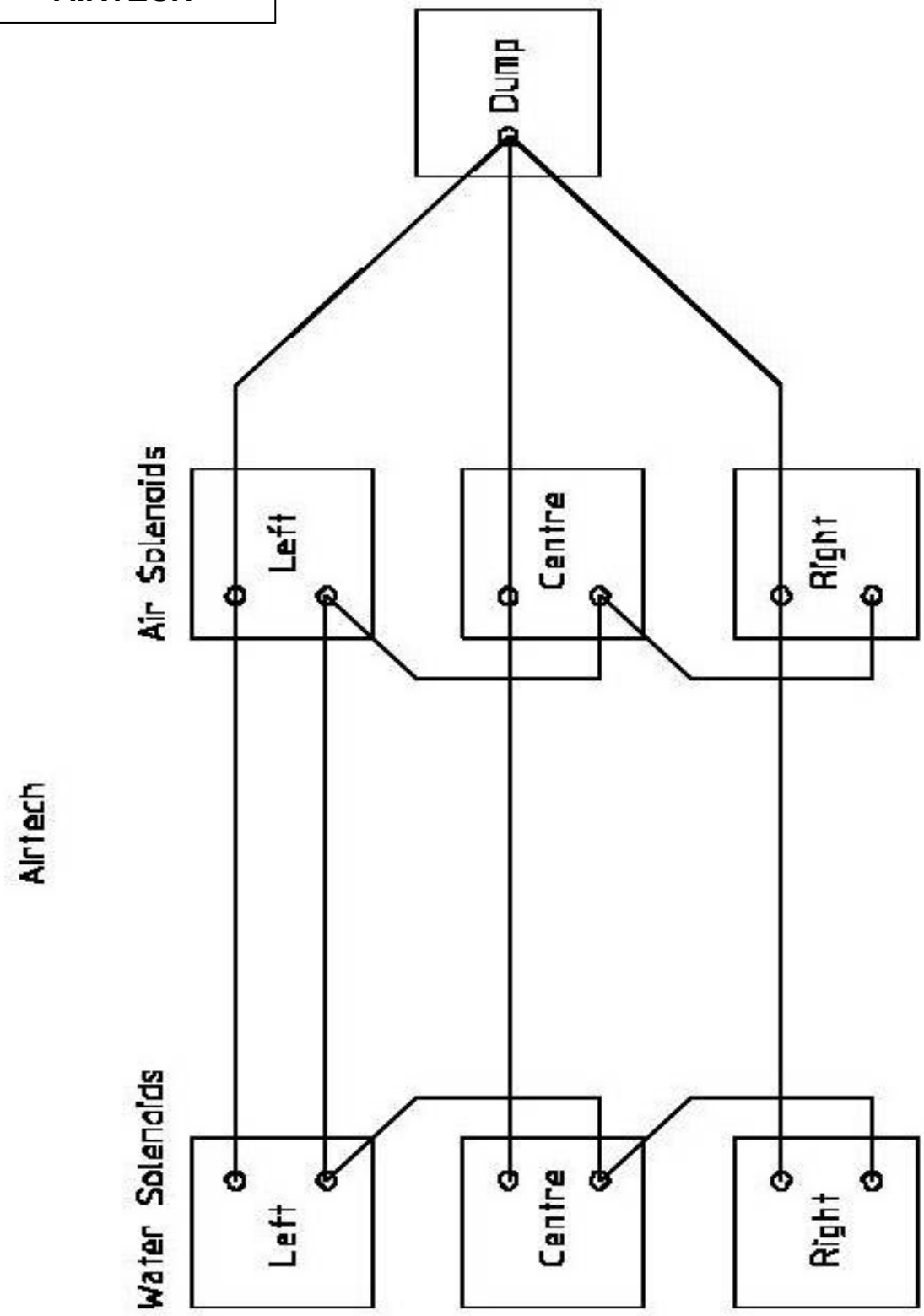


“MY BOOMS ARE SHOWING SIGNS OF BROKEN WELDS OR BENT COMPONENTS”

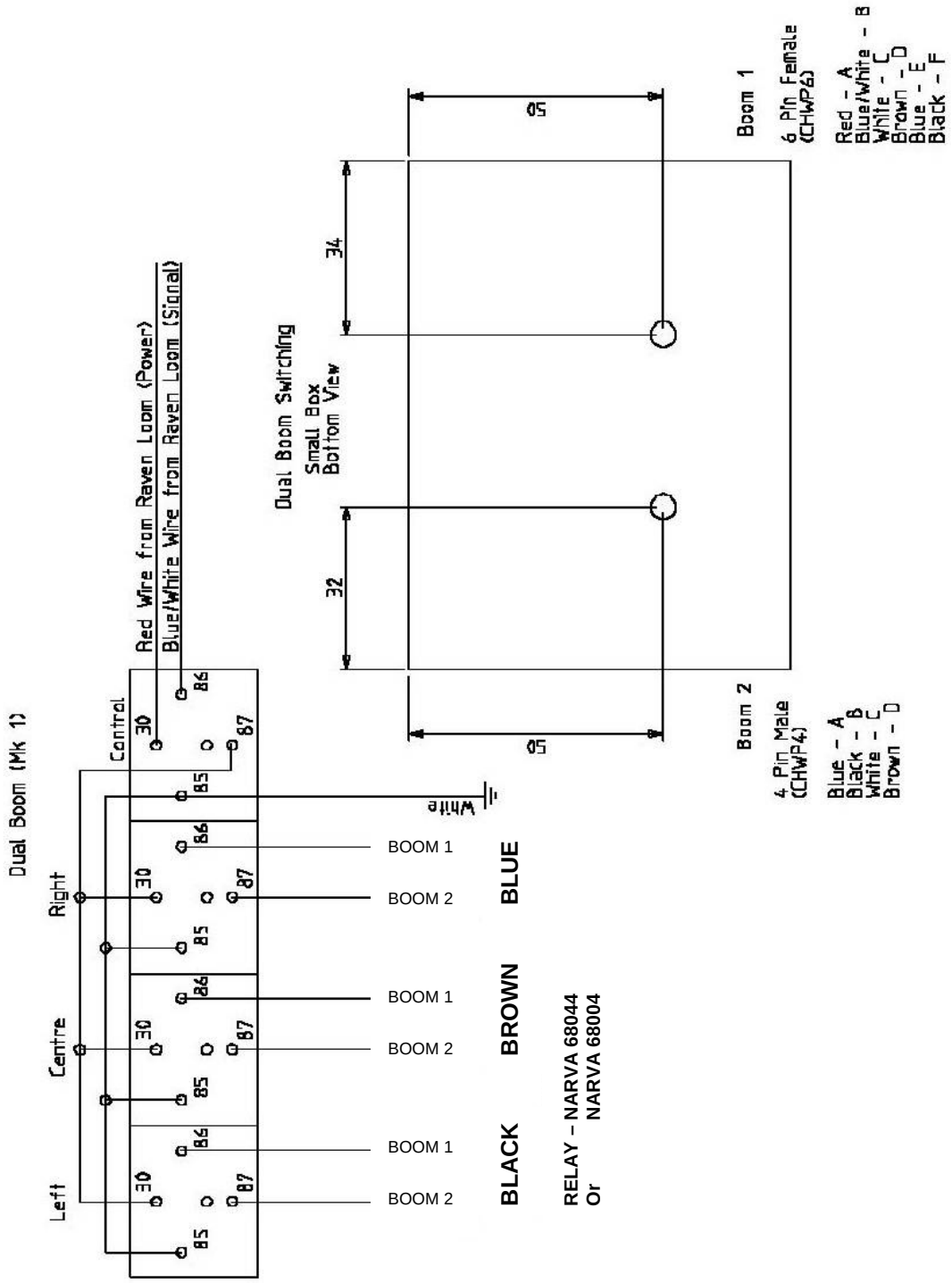
1. **Booms must not be folded or unfolded while the sprayer is moving.** When the boom is between fully open and fully closed, there can be large stresses placed on many boom components. If the sprayer is moving and hits a bump, severe damage to the boom can occur.
2. **Speed must be reduced when directional changes are made.** Although the outer sections of the booms are now made from aluminium to reduce inertial forces, there is still significant stress placed on springs and dampeners when turning. Sharp changes in direction can cause severe damage to the boom.
3. **The use of tilt cylinders (when fitted) should be kept to a minimum,** and restrictors to slow down the speed of their operation **must** be used. Tilt operation affects the balance of the boom causing a violent rocking of the whole boom assembly. When the tilted boom is returned to the level position, considerable stress is transferred along the boom section. Wherever possible the boom should be raised with the lifting cylinder rather than the tilt, providing a level and dampened change in boom height.

ELECTRICAL WIRING DIAGRAMS

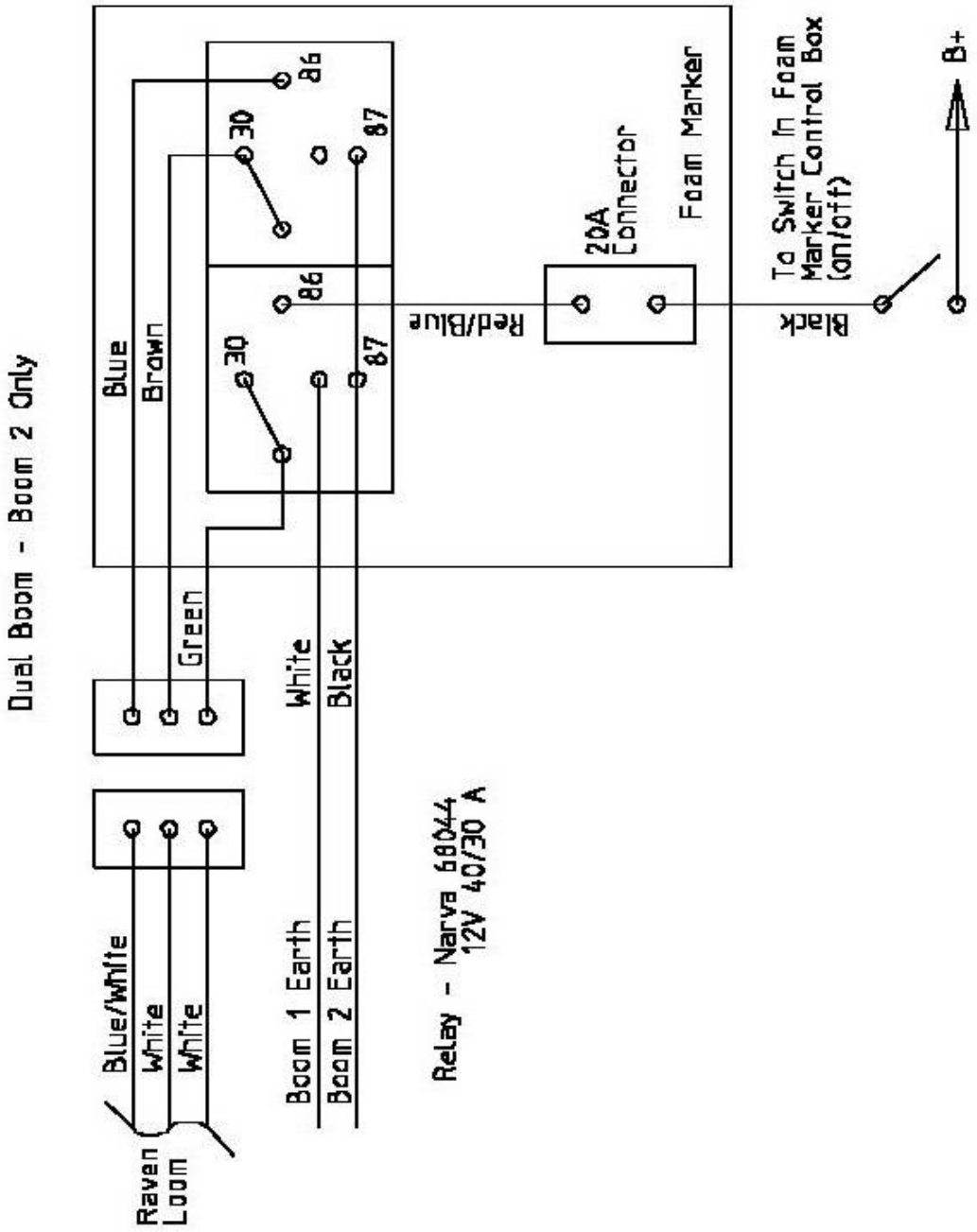
AIRTECH



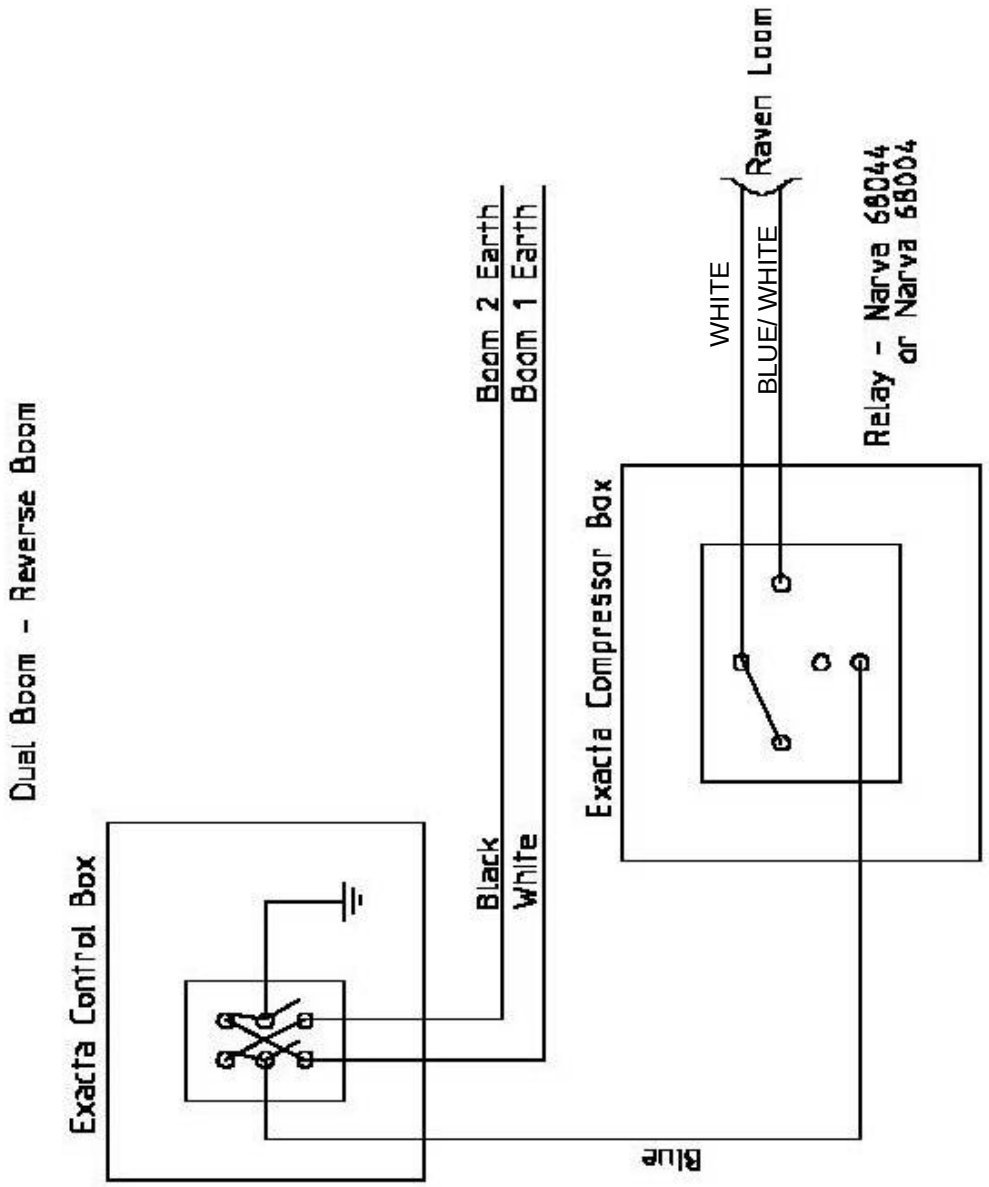
DUAL BOOM (MK 1)



DUAL BOOM – BOOM 2 ONLY



DUAL BOOM – REVERSE BOOM



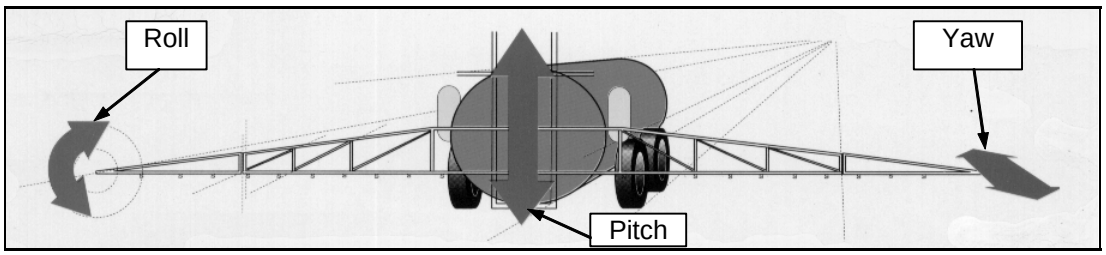
DELTA BOOM

The Delta Boom incorporates a unique patented boom suspension, which provides suspension in three directions:

PITCH: Compression coil spring(s) and shock absorbers dampen the vertical boom movement encountered over rough ground conditions.

ROLL: Shock absorbers help to maintain constant boom height over sloping and uneven ground.

YAW: Shock absorbers and springs overcome the erratic whipping movement, which creates undue stress on the boom frame and uneven spray application.



Boom Skids on Delta Booms

We are sometimes asked for skids to be fitted to the outer sections of larger delta booms to stop the booms touching the ground in uneven ground conditions.

WE DO NOT FIT SKIDS TO BOOMS AND DO NOT RECOMMEND THE RETROFITTING OF SKIDS.

The reasons for this are:

1. Skids add additional weight to the outside of the boom. Even a lightweight spring weighs several kilograms and this weight is magnified many times by the distance from the centre of the boom. This additional weight accentuates boom yaw and pitch.
2. The skid continually comes in contact with the ground, dragging the boom back. This places continual stress on the boom, the hydraulic folding cylinder mounting points, and boom hinge joints.
3. A spring loaded skid in contact with the ground bounces the boom up, rocking it onto the opposite side.
4. The skid is in the spray pattern.

With the fitting of tilt cylinders and hydraulic lift cylinders enabling “on the go” height change, delta booms can be quickly adjusted to suit altering terrain. The ongoing development of the delta boom has seen the adoption of aluminium outer boom sections to reduce weight, having a positive effect on boom stability and strength. We believe that fitting skids or wheels on the boom is moving in the opposite direction, and will only result in a detrimental effect on the performance of the boom and the sprayer.

SAFETY WARNINGS

SLOW DOWN WHEN TURNING TO PREVENT EXCESSIVE STRAIN ON BOOM (ESPECIALLY ON BOOMS 24m OR LARGER)

NEVER STAND WITHIN RADIUS OF BOOM WINGS. PERSONAL INJURY CAN RESULT IF ANY PART OF THE SPRAYER HITS A PERSON DURING OPERATION OF THE SPRAYER.

ALWAYS ENSURE THERE IS ADEQUATE ROOM TO OPEN BOOM. SERIOUS DAMAGE CAN BE DONE TO THE SPRAYER IF THE BOOM HITS OR BECOMES ENTANGLED WITH ANY FOREIGN OBJECTS.

ALWAYS ENSURE BOOM IS SECURELY SUPPORTED WHEN TRANSPORTING. SERIOUS DAMAGE MAY OCCUR IF THE BOOM OPENS OUT DURING TRANSPORT.

DO NOT TRAVEL WITH BOOM IN FOLDED POSITION UNTIL BOOM IS LOWERED ONTO RESTS

ENSURE BOOM IS NOT LOWERED ONTO TYRES WHEN IN THE FOLDED (TRANSPORT) POSITION

BOOM MUST BE RAISED CLEAR OF RESTS WHEN UNFOLDING OR SERIOUS BOOM DAMAGE MAY RESULT

MAKE SURE ALL RELEVANT TOWING REGULATIONS ARE ADHERED TO WHEN TOWING SPRAYER

NEVER WORK UNDER HYDRAULICALLY RAISED BOOM

MAKE SURE SPRAYER COMPLIES WITH ALL RELEVANT ROAD REGULATIONS

SUITABLE CARE SHOULD BE TAKEN WHEN DRIVING WITH SPRAYER ATTACHED TO THE VEHICLE. CONSIDERATION SHOULD BE GIVEN TO BOTH THE CARRYING AND/OR TOWING CAPACITY OF THE VEHICLE AND THE GRADIENT OF THE TERRAIN WHEN DETERMINING THE SPEED AT WHICH THE VEHICLE CAN BE DRIVEN SAFELY

BE AWARE OF OVERHEAD OBSTRUCTIONS (IE POWERLINES) WHEN USING TILT CYLINDERS

ENSURE ALL BOLTS ARE TIGHTENED AND SECURED BEFORE TRANSPORTING AND OPERATING

INSPECT SPRAYER THOROUGHLY FOR DAMAGE AND WEAR BEFORE TRANSPORTING AND OPERATING

LUBRICATE SPRAYER AS PER RECOMMENDED REQUIREMENTS BEFORE OPERATING

CAUTION!

BEFORE WORKING UNDER THE BOOM OR LIFT, CLOSE THE HYDRAULIC TAP ON THE BOTTOM OF THE LIFT CYLINDER FROM THE SIDE OF THE SPRAYER. DO NOT REACH UNDER THE BOOM TO ACCESS THE TAP. FOR ADDED SAFETY PLACE SUPPORT STANDS UNDER THE BOOMS.

HYDRAULIC BOOM LIFT

The hydraulic lift on a delta boom enables the boom to be raised and lowered so as to maintain an adequate boom height above the ground.

The hydraulic lift enables the boom to be raised when folding and then lowered onto the rests.

The boom lift ball valve provides the means to shut off the hydraulic oil flow between the tractor and hydraulic lift cylinder:

- When attaching the hydraulic coupling to the boom lift hydraulic line, shut the boom lift ball valve so that the boom will not alter its position.

- When disconnecting the boom lift hydraulic line from the tractor, shut the boom lift ball valve first. If the boom is not lowered down to its lowest position, work the tractor hydraulic control lever backwards and forwards to relieve the pressure in the hydraulic line caused by the weight of the boom, and then disconnect the coupling. This should enable the line to be able to be connected again without having to act against any hydraulic pressure.

HYDRAULIC BOOM FOLD & LOWERING THE BOOM ONTO THE RESTS

The boom rests are height adjustable. **The boom rests are set in their lowest position to minimize transport height at the manufacturing plant.** Raising the boom rests will provide greater clearance between the boom and wheels.

The hydraulic fold on a delta boom enables the boom to be opened and closed from within the tractor cabin via the tractor hydraulic system.

Booms must not be folded or unfolded while the sprayer is moving. When the boom is between fully open and fully closed, there can be large stresses placed on many boom components. If the sprayer is moving and hits a bump, severe damage to the boom can occur.

Speed must be reduced when directional changes are made. Although the outer sections of the booms are now made from aluminium to reduce inertial forces, there is still significant stress placed on springs and dampeners when turning. Sharp changes in direction can cause severe damage to the boom.

NEVER STAND WITHIN THE RADIUS OF THE BOOM WINGS.

To hydraulically fold the boom:

IMPORTANT: Make sure that the sprayer has been brought to a complete standstill. Folding or unfolding the boom while the sprayer is moving will result in damage to the boom.

- Make sure the Boom Fold hydraulic lines are properly connected to the tractor hydraulic system via the hydraulic couplings.
- Make sure the boom is raised sufficiently high so that when it is folded it will be well clear above the boom support rests.

IMPORTANT: FOR BI-FOLD BOOMS ONLY; always fold the outer section of the boom fully, before starting to fold the inner boom onto the wing rests.

- Use the tractor hydraulic control lever to fold the boom completely in (i.e. move the control lever backwards or forwards, depending on how the hydraulic lines are connected).
- Lower the boom until the boom just touches the rests.
- Then continue to lower the boom a further 100 mm (4") so as to put sufficient weight on the rests. **The rests need to be positioned high enough to allow the boom to lower 100mm without the boom resting on the tyres.**

DO NOT TRAVEL WITH THE BOOM IN THE FOLDED POSITION UNTIL THE BOOM HAS BEEN LOWERED ONTO THE RESTS.

NEVER WORK UNDER HYDRAULICALLY RAISED BOOM

ENSURE THE BOOM IS NEVER LOWERED ONTO THE TYRES OF THE SPRAYER, EITHER IN TRANSPORT OR IN STORAGE.

RAISING THE BOOM & HYDRAULIC BOOM UNFOLD

NEVER STAND WITHIN THE RADIUS OF THE BOOM WINGS.

To hydraulically unfold the boom into the working position:

IMPORTANT: Make sure that the sprayer has been brought to a complete standstill. Folding or unfolding the boom while the sprayer is moving will result in damage to the boom.

- Make sure the boom fold hydraulic lines are properly connected to the tractor hydraulic system via the hydraulic couplings.
- Raise the boom sufficiently high so that when it is unfolded it will be well clear above the boom support rests.

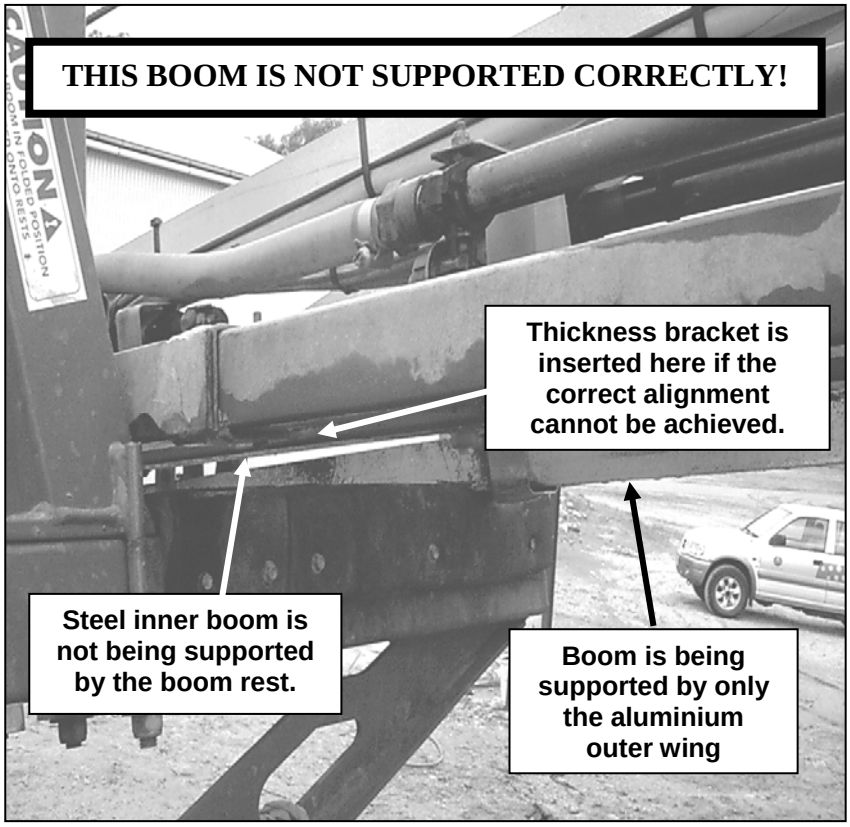
IMPORTANT: FOR BI-FOLD BOOMS ONLY; always unfold the inner section of the boom off the wing rests fully, before starting to unfold the outer boom.

- Use the tractor hydraulic control lever to unfold the boom so that the boom is aligned with the centre section (i.e. move the control lever backwards or forwards, depending on how the hydraulic lines are connected).
- Lower the boom to the desired height above the spraying surface.

BOOMS MUST BE RAISED CLEAR OF THE RESTS WHEN UNFOLDING OR SERIOUS BOOM DAMAGE MAY RESULT.

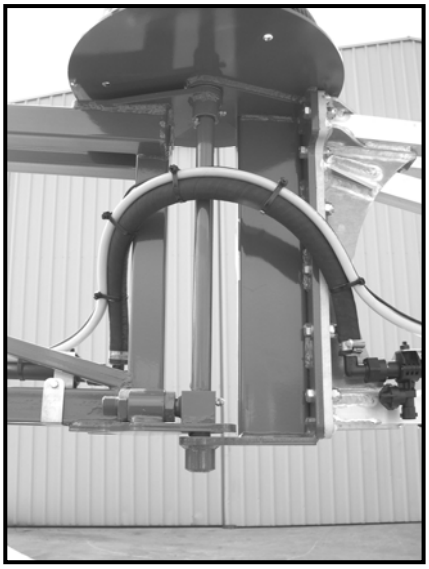
CORRECT ADJUSTMENT OF BOOM OUTER ALUMINIUM SECTION

It is most important to ensure when booms are seated in the transport position that the weight of the inner and outer boom sections is shared equally.

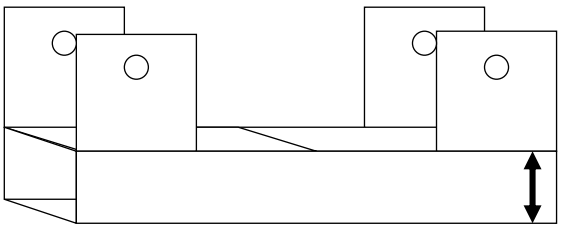


If the weight of the folded boom is supported by the outer section excessive stress is applied to the aluminium boom section and to the hinge under the cable drum.

Careful adjustment of the adjusting bolt on the boom hinge will in most cases achieve a satisfactory alignment. Placing shims between the aluminium boom mounting plate and the hinge plate must be kept to a minimum. In some cases it may be necessary to bolt an additional support bracket to the bottom of the steel boom, as described below.



Example of a Support Bracket

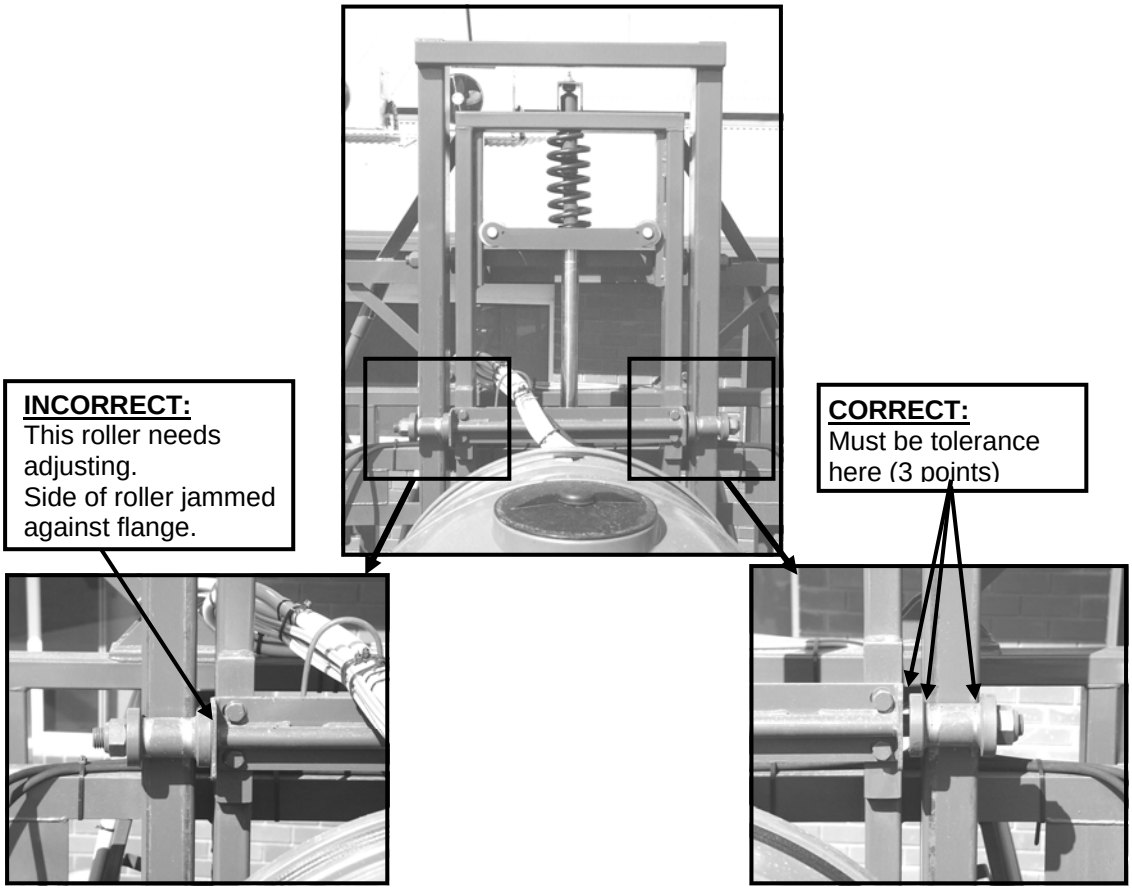


ADJUSTMENT OF MAST ROLLERS

The vertical suspension component of a Delta boom is vital to long life and good ride characteristics required.

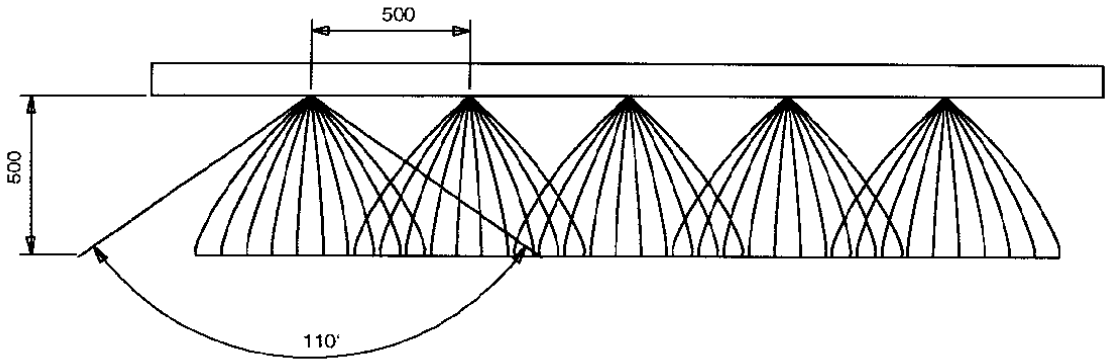
This suspension is provided by the boom “floating” in the mast on rollers and dampened by springs and shock absorbers.

- ✓ Check that the alignment of the rollers does not result in excessive side pressure on the side of the mast or flange. This can result in restricted mast “float” creating stress on the boom.
- ✓ This can be adjusted by the nuts on the end of the rollers, and with the centre shaft, additional adjustment can be made by shifting the shaft on the oversize locating bolt holes.
- ✓ Please ensure all masts travel up and down freely prior to use.



BOOM HEIGHT

The boom nozzle spacing is usually 500 mm, and for this spacing, the optimum height of the boom to the target is 500mm for nozzles with a 110° fan angle. There will be adequate spray coverage if the nozzles are higher than this but there can be an increase in drift.
The spray pattern is affected by gravity, pressure, chemical composition and droplet size so the pattern does not extend to the full theoretical coverage.



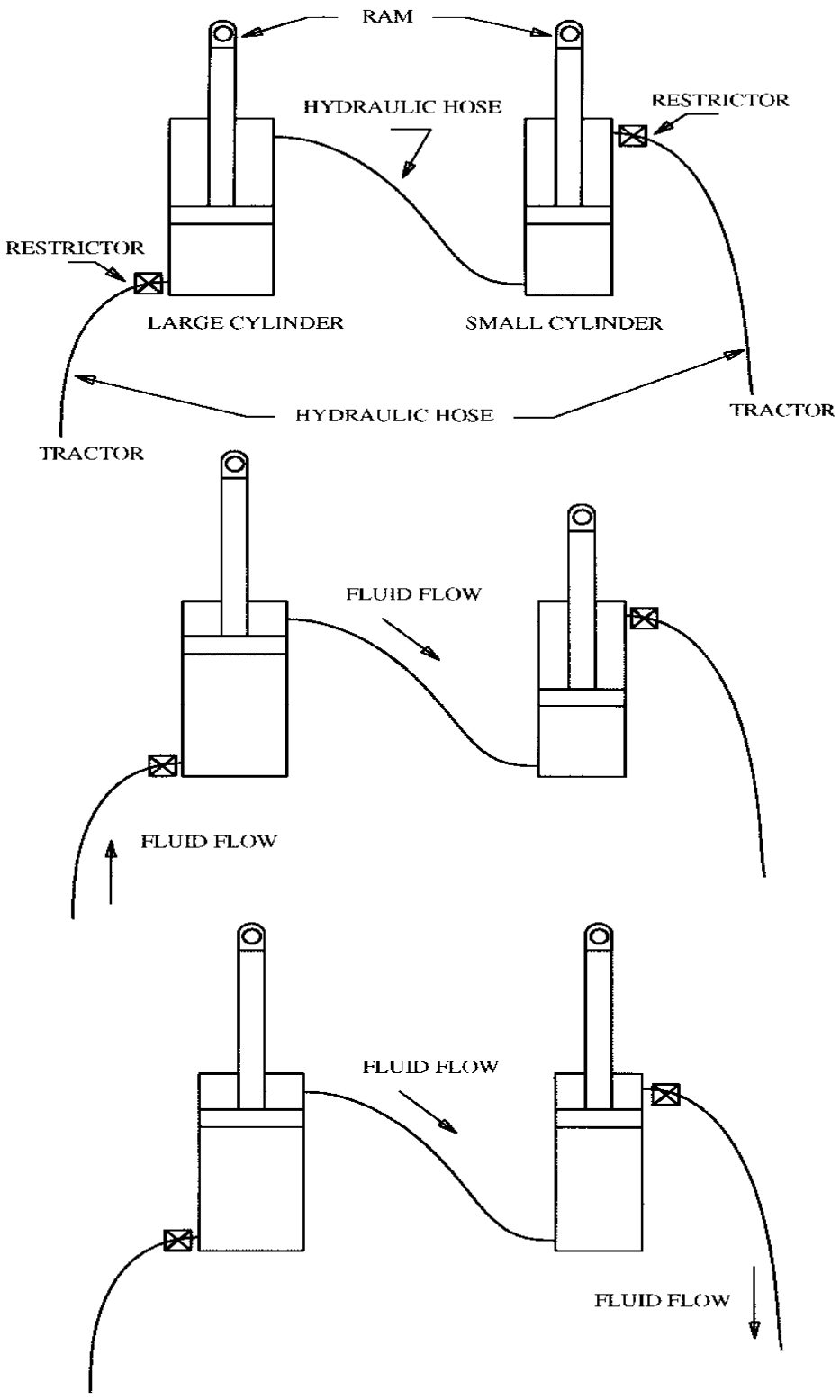
HYDRAULIC PHASING RAMS

For the raised side-fold Delta booms, hydraulic phasing rams are used in the folding operation of the boom. This ensures that both sides of the boom are synchronised and open and close together so that the weight distribution is the same for both sides of the boom.
As hydraulic fluid enters one cylinder, it acts upon the first ram and causes it to move. This motion results in an amount of fluid entering a second cylinder which causes the second ram to move an equivalent distance.
There is also a flow restrictor for each ram so that the hydraulic fluid will enter and leave the respective cylinders at a controlled rate. This has the effect of slowing down the rate of fluid transfer and thus causes the boom to open and close more slowly, protecting the boom from damage and reducing any risk to bystanders.

RE-PHASING THE RAMS

If the sides of the boom do not fold together so that they become out of line, the hydraulic rams will need to be re-phased. To do this, depending on whether the boom is to be folded or unfolded;

- ✓ Close the boom right up or open the boom right out and continue to hold the control lever in that position for several seconds until the rams are synchronised.
- ✓ We recommend that periodical re-phasing of the rams is good practice, as this not only ensures that the rams are working in tandem, but that any air that may be trapped in the rams is also forced out of the hydraulic lines.


RAM
HYDRAULIC HOSE
RESTRICTOR
RESTRICTOR
LARGE CYLINDER
SMALL CYLINDER
HYDRAULIC HOSE
TRACTOR
TRACTOR
FLUID FLOW
FLUID FLOW
FLUID FLOW
FLUID FLOW

HYDRAULIC TILT

The Delta boom can incorporate a hydraulic tilt option, which allows the individual boom sides to be raised independently when in the working position. This serves to provide greater variability of boom height control to compensate for undulating ground conditions.

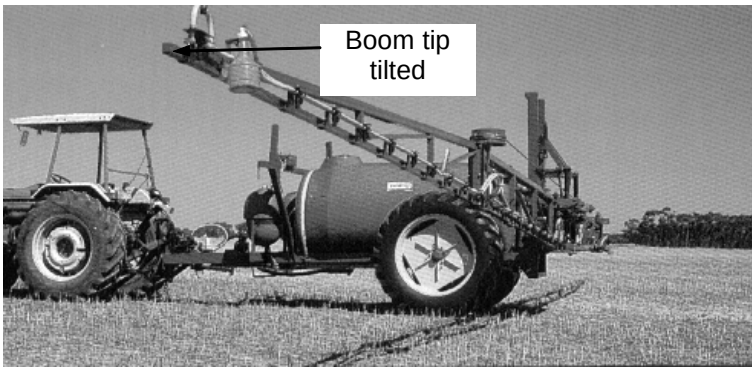
The use of tilt cylinders (when fitted) should be kept to a minimum, and restrictors to slow down the speed of their operation **must** be used. Tilt operation affects the balance of the boom causing a violent rocking of the whole boom assembly. When the tilted boom is returned to the level position, considerable stress is transferred along the boom section. Wherever possible the boom should be raised with the lifting cylinder rather than the tilt, providing a level and dampened change in boom height.

- ✓ An extra hydraulic cylinder is required for each side to have the tilt option.
- ✓ The boom pivots on the tilt pivot and thus the tip of the boom is raised (or lowered) in the vertical plane when the tilt cylinder ram is contracted.
- ✓ The amount the tip of the boom is raised (or lowered) depends on the size of the boom and the tilt cylinder ram contraction.
- ✓ The tip of the boom will be raised when the hydraulic tilt cylinder is anchored in the tilt top hole and the tilt cylinder ram contracted.
- ✓ The tip of the boom will be lowered when the hydraulic tilt cylinder is anchored in the tilt bottom hole and the tilt cylinder ram contracted.
- ✓ If the hydraulic tilt is not fitted on the 24m Delta booms or larger, a fixed link is placed in substitute for the tilt hydraulic cylinder.

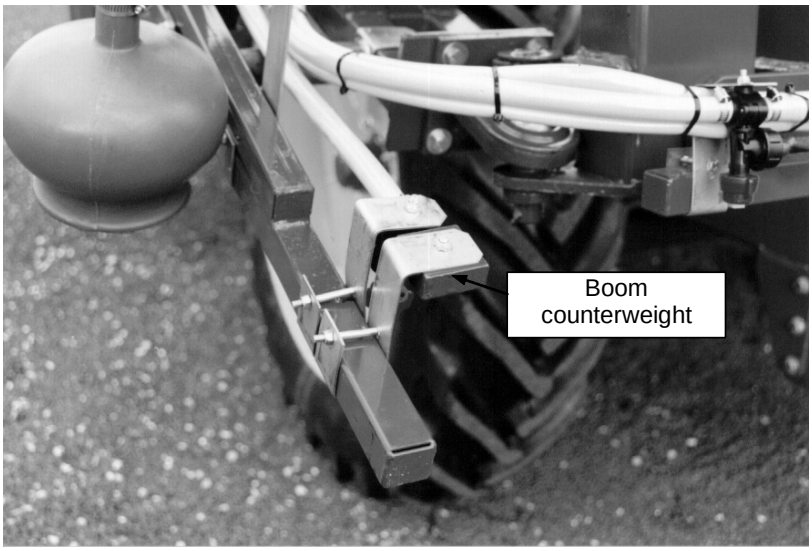
THE TILT MECHANISM IS TO ONLY BE EMPLOYED WHEN THE BOOM IS FULLY UNFOLDED IN THE WORKING POSITION

DO NOT USE THE TILT MECHANISM WHEN THE BOOM IS FOLDED AND SEATED ON THE BOOM SUPPORT RESTS

BE AWARE OF OVERHEAD OBSTRUCTIONS (IE POWERLINES) WHEN USING TILT CYLINDERS



BOOM BALANCE

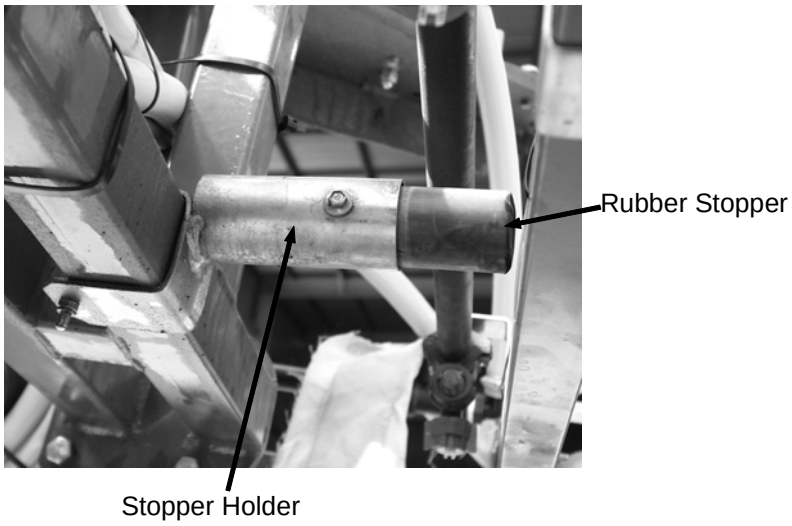


The Delta boom suspension system causes the boom to adopt the same plane as the spray tanker. If one side is heavier than the other, the boom will tend to hang lower on the heavy side, so both sides need to be balanced for the boom ends to be of the same height. To achieve this, a boom counterweight is included on the boom and placed strategically so that it compensates and balances the boom (usually placed on the opposite boom side to the fenceline jet to compensate for its weight).

If the boom is not balanced (such that the height of the boom ends is different), the counterweight can be moved or more weight added to the counterweight until the boom is balanced.

STOPPER HOLDER

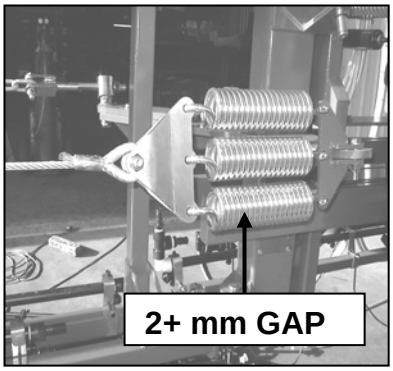
The stopper holder houses the rubber stopper that prevents the outer boom wing from hitting the inner boom wing during transport.



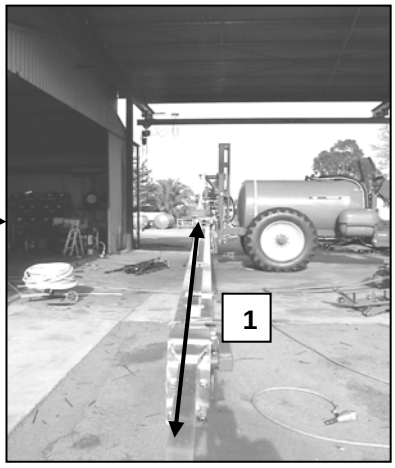
BOOM CABLES

Loose boom cables can cause boom damage by allowing the outer boom section hang out of alignment or to 'break away' too easily. This can shorten the sprayer's life by placing unnecessary stresses on the boom, lift and chassis.

- ✓ The cable tension can be checked by inspecting the cable springs, which must have a 1-2mm gap between the coils. The tension of the cable affects the rigidity of the boom (i.e. how much the outer wing moves around when the boom is folded and unfolded).

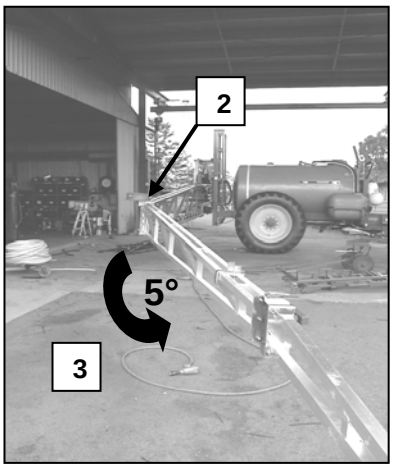


- ✓ The boom alignment can be checked by visually inspecting the straightness of boom sections.



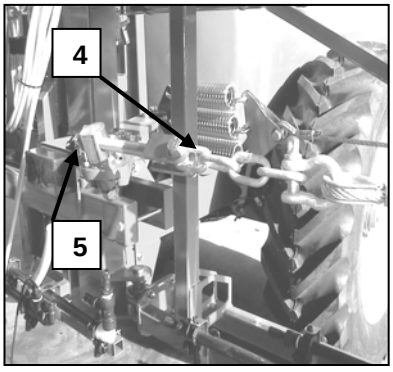
To adjust the tension of the cable and the alignment of the boom sections at the same time, use the following procedure;

1. Open the boom fully into the working position.
2. Loosen the U-bolts in the cable drum.
3. Move the outer boom section 5 degrees forward.
4. If necessary, move the 'D' shackle on the tightening bolt to allow for more adjustment.
5. Adjust the nut accordingly on the adjustable cable support, ensuring that there is at least 2mm spring gap on the large cable springs.
6. Check and adjust the boom sections so that they are straight.
7. Re-tighten the U-bolts.



To adjust the tension of the cable only, use the following procedure;

1. Open the boom fully into the working position.
2. Loosen the U-bolts in the cable drum.
3. If necessary, move the 'D' shackle on the tightening bolt to allow for more adjustment.
4. Adjust the nut accordingly on the adjustable cable support, ensuring that there is at least 2mm spring gap on the large cable springs.
5. Check and adjust the boom sections so that they are straight.
6. Re-tighten the U-bolts.

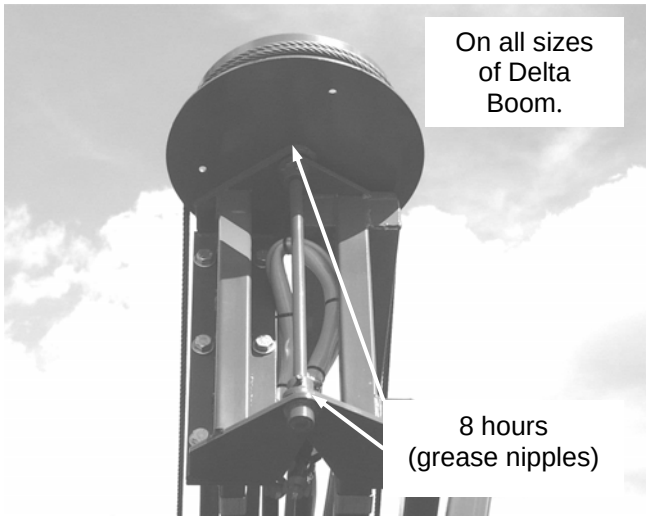


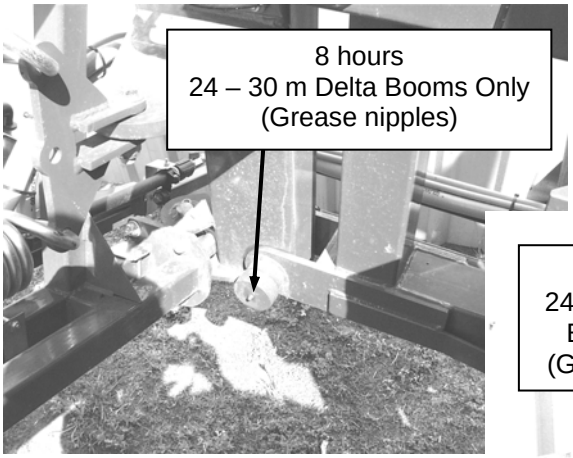
These procedures should be performed for both sides of the boom.

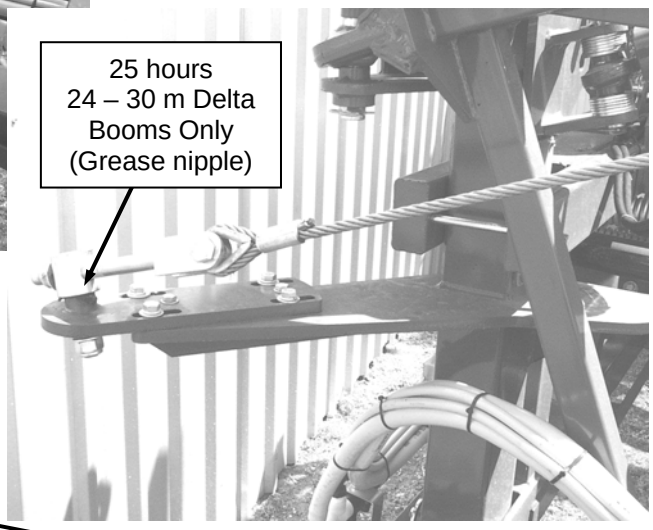
BOOM MAINTENANCE - GREASE

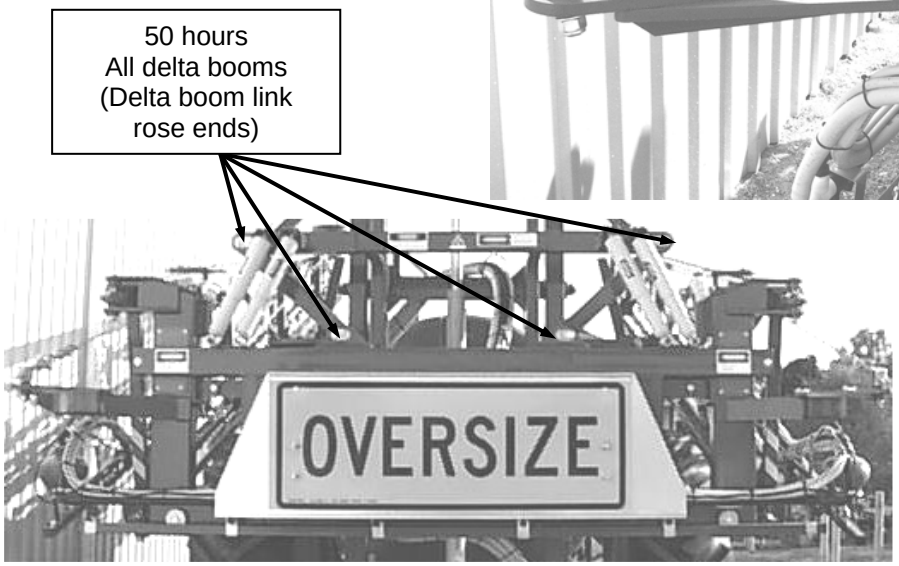
Proper grease is essential for the sprayer to operate with maximum effectiveness and life-expectancy.

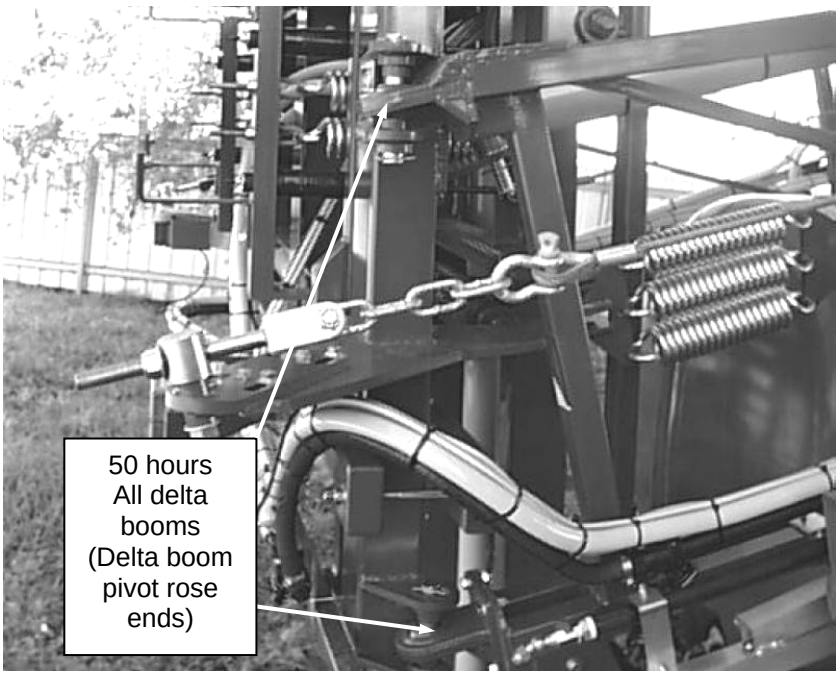
It is important to keep the lubricant and lubricant applicator clean. Wipe all dirt from the fittings before use. GoldAcres recommends that multi-purpose grease should be used for all lubrications. Make sure all open-end bearings are lubricated their full length by forcing lubricant into them until it begins to appear at the sides.



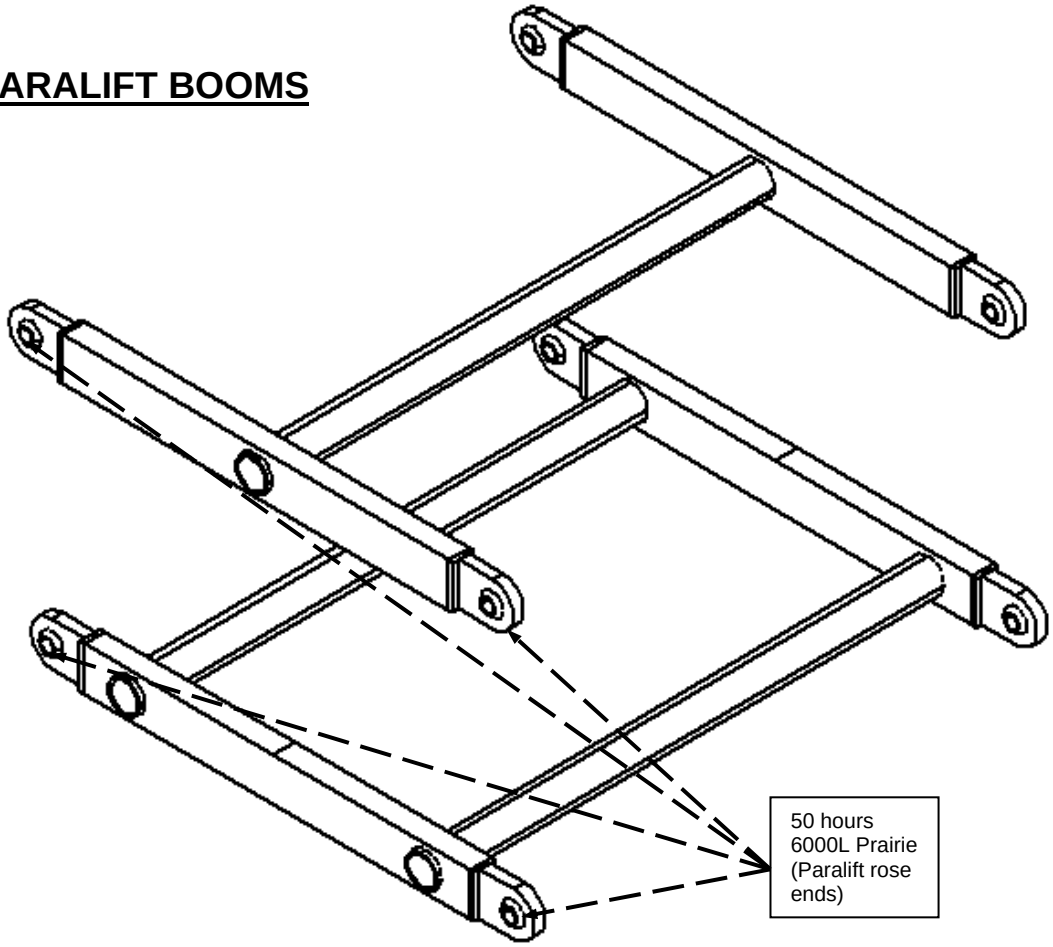








PARALIFT BOOMS



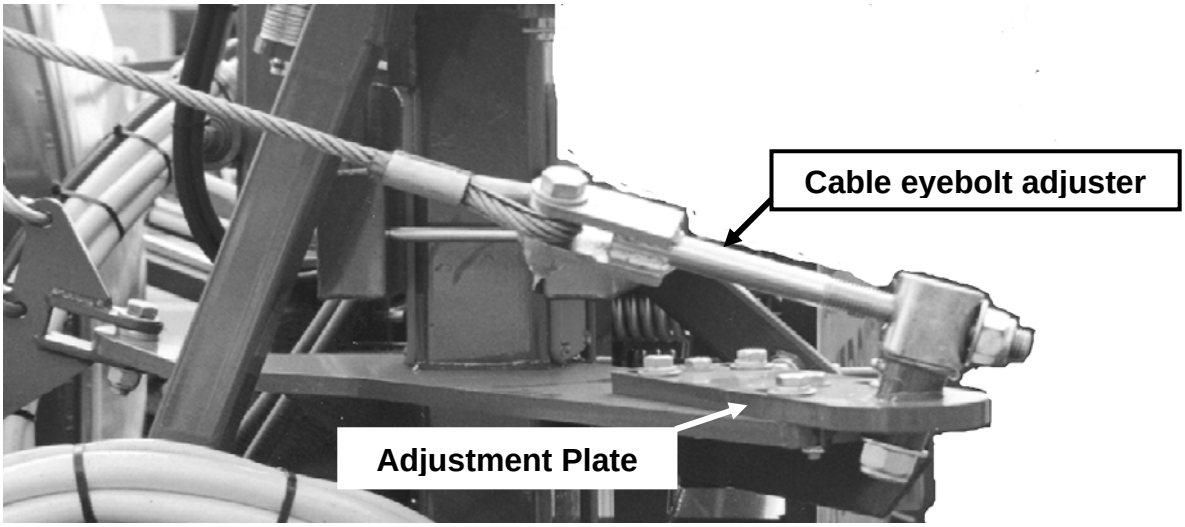
6000 AND 8000 LITRE WIDE TRACK MACHINES HAVE PARALIFT BOOMS, WHICH USE A HYDRAULIC ACCUMMULATOR SYSTEM TO PROVIDE BOOM SUSPENSION.

THE HYDRAULIC ACCUMMULATOR IS SET AT 70 BAR BY THE FACTORY AND MUST BE CHECKED FOR THE CORRECT PRESSURE EVERY 12 MONTHS.
FAILURE TO MAINTAIN CORRECT PRESSURE IN THE ACCUMMULATOR WILL REDUCE THE AMOUNT OF SUSPENSION IN THE BOOM, AND MAY RESULT IN DAMAGE TO THE BOOM.

OUTER BOOM ARM ADJUSTMENT PLATE. (24m + delta booms)

- The eyebolt cable adjuster aligns the outer boom arm in the working position; the adjustment plate (see photo) is designed to adjust the outer boom arm in the **folded position**.
- When installed correctly the eyebolt adjuster will follow the same orientation as the boom when folding and unfolding. For example, when the boom is in the operating position the eyebolt adjuster should be horizontal in line with the boom. With the boom folded, the eyebolt adjuster should be pointing forward in a raised position, again following the line of the boom. (see photo)
- Fold in the boom. If the outer boom arm does not come in all the way against the inner boom arm and contact the bump stop then the adjustment plate will need to be moved out. If the outer boom arm contacts the bump stop too early and places too much tension on the cable (**see note below**) then the adjustment plate needs to be moved inwards.
- To adjust the plate the boom has to be in the working position. Have someone pull back on the outer boom arm to release the tension on the cable whilst you make adjustments to the plate. When adjustment is completed ensure the outer boom arm is released carefully so it does not spring forward dangerously. Re-adjust the cable eyebolt to realign the outer boom arm whilst still in the working position before folding the boom and re-checking the alignment in the folded position.
- Repeat the procedure if necessary until the outer boom arm assumes the correct alignment in both the working and folded positions. When this has been achieved drill the two non-slotted holes through the bottom plate install the bolts and tighten.

Note: If the outer boom arm contacts the bump stop too early and too much tension is placed on the cable, then the hydraulic ram may fail to bring both arms all the way in, or damage the boom arms and cable.



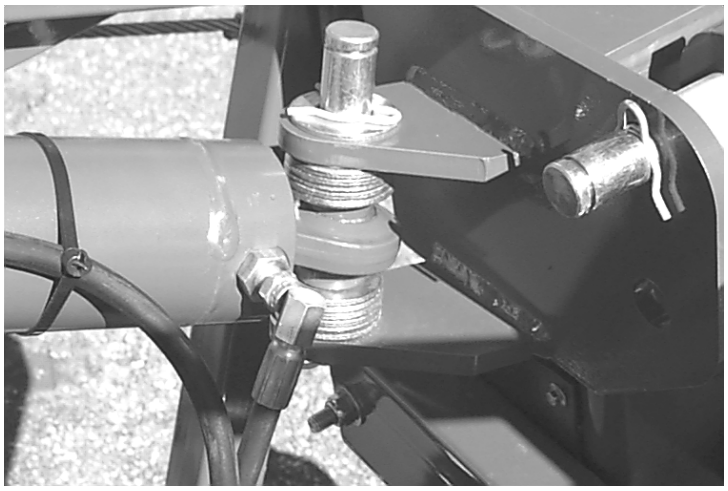
Eye Bolt Cable Adjuster with boom in folded position

Figure 2

Outer arm adjustment plate

ADJUSTING THE TRAVEL OF THE INNER BOOM

The travel of the inner boom can be adjusted by moving the packing washers from the top to the bottom of the ram rose end, or vice versa.

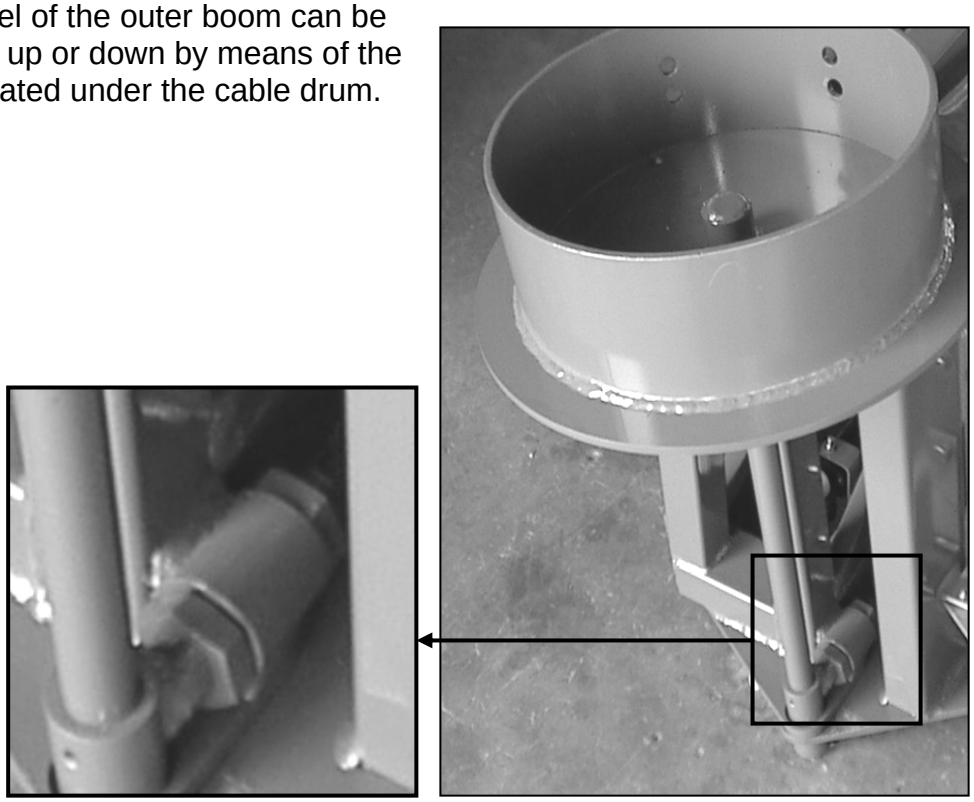


Barrel end mounted with washers top and bottom

- ✓ Adjust the outer ram brackets until the inner boom arms are aligned correctly in the working position.
- ✓ Tighten bolts.
- ✓ Fold boom to transport position.
- ✓ Check alignment. If the inner boom comes in too far transfer washers from bottom to top of ram rose end and vice versa.

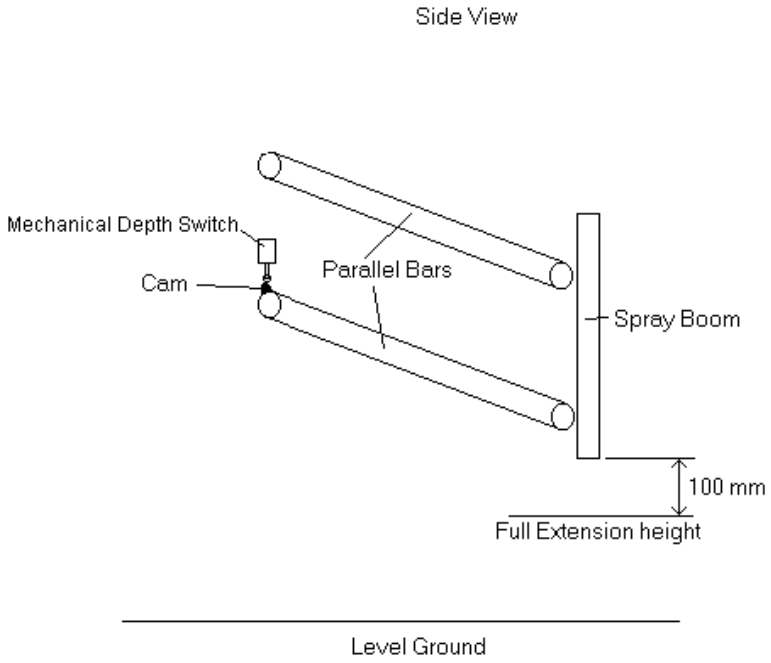
ADJUSTING THE HORIZONTAL LEVEL OF THE OUTER BOOM

The level of the outer boom can be adjusted up or down by means of the bolt located under the cable drum.



ADJUSTING THE BOOM MECHANICAL DEPTH SWITCH ON PARALIFT BOOMS (6000L PRAIRIE SPRAYER)

The boom mechanical depth switch is located on the top parallel bar that is used to support the boom. This switch is located above a cam on the end shaft. The switch should operate when the boom is a distance of 100 mm



above the fully lowered height as shown in the diagram below.
If the switch is set too low the boom may become damaged due to the reduced damping in the system or the proximity to the ground.

To adjust the switch:

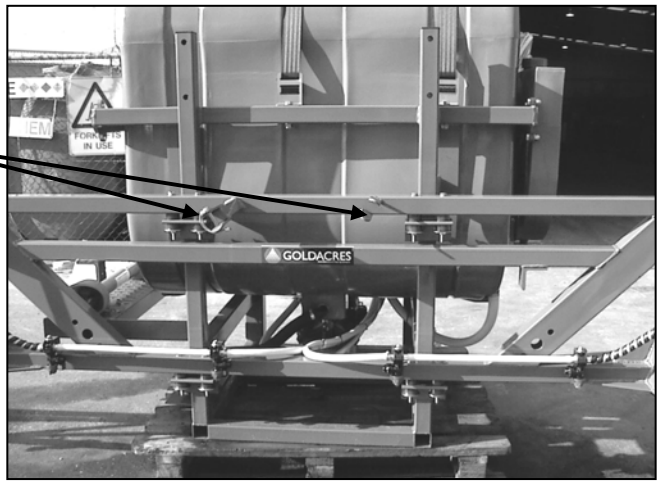
1. Rotate the cam around to prevent it contacting the mechanical depth switch when the boom is lowered.
2. Lower the spray boom to the bottom of its travel.
3. Raise the boom 100mm.
4. Loosen the screws on the cam.
5. Rotate the cam until the mechanical depth switch actuates.
6. Tighten the screws on the mechanical depth switch.

USING FIXED AND TWIN-LINK BOOMS

BOOM UNFOLD

Release the lynch pins that retain the inner booms and open the booms one at a time.

Replace the lynch pins into position so they are not misplaced.



Snap the outer booms into the holding catch.

Make sure that the holding catch has closed firmly over the bar on the outer boom.

Remove the lynch pin that retain the outer boom.

The outer boom features a spring activated breakaway which holds the boom into its final working position and this may pull the boom during the unfolding process.

Unfold the outer booms one at a time, working against the spring action and taking care to securely hold the outer boom.

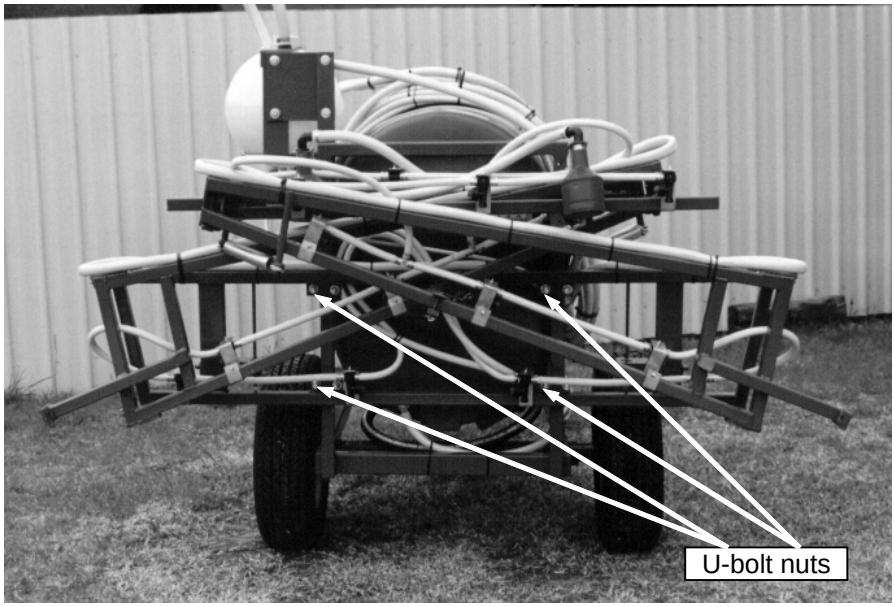
Replace the fold pins (with clips) back into position so they are not misplaced.

BOOM FOLD

Fold in outer wings.
Turn boom handles to release boom pin from latch.
Fold inner wings.
Lock boom into position by removing the fold pins, placing the boom in the fold clamps and then replacing the fold pins back into position.

BOOM HEIGHT ADJUSTMENT

To adjust the height of the boom, unscrew the nuts on the U - bolts clamping the boom to the frame. Raise or lower the boom to the desired height and then tighten the nuts on the U - bolts.



10 PR TANK, CHASSIS, WHEELS ETC - INDEX

TROUBLESHOOTING

"THE DRAWBAR OF MY SPRAYER IS BENT UP OR DOWN"

- ✓ All GoldAcres drawbars are fitted with a replaceable, hardened insert, which is internally tapered at the top and bottom to allow some pin movement.

- ✓ Using a pin that is too large will reduce the amount of movement, particularly when the sprayer and the tractor are at different angles. This may happen when the sprayer is towed through a ditch, or into a field from a road.

Maintenance Schedule Summary							
Item	Refer	Pre season	Daily	25 hours	Weekly	Monthly	End of season
Flush pumping system	Chapter 1, page 17		x				
Drain main tank	Chapter 1, page 18		x				
Flush main tank	Chapter 1, page 19		x				
Check flow meter	Chapter 2, page 16	x				x	
Clean flow meter	Chapter 1, page 23						x
Clean fill filter	Chapter 2, page 13		x				
Clean suction filter	Chapter 2, page 11		x				
Clean pressure filter	Chapter 2, page 12		x				
Grease PTO shaft	Chapter 3, page 5		x		x		
Diaphragm pumps							
Change pump oil	Chapter 3, page 8						
Replace diaphragms	Chapter 3, page 9						
Rinse Envirodrum line	Chapter 5, page 14		x				
Rinse chemical probe line	Chapter 5, page 14		x				
Rinse Trans-Cal	Chapter 5, page 15		x				
Rinse chemical induction hopper	Chapter 6, page 6		x				
Clean foam generator filter	Chapter 7, page 10		x				
Clean Exacta foam filter	Chapter 7, page 11		x				
Check one way valve in compressor/diverter unit	Chapter 7, page 11						
Drain foam marker tank	Chapter 7, page 11		x				
Clean foam marker compressor air filter	Chapter 7, page 15		x				
Inspect spray nozzles for wear	Chapter 8, page 3						x
Check boom cable tension	Chapter 9, page 20						
Grease delta boom	Chapter 9, page 20						
Check axle bolts	Chapter 10, page 4						
Check wheel bearings	Chapter 10, page 4			x			
Check tyre pressure	Chapter 10, page 5		x				
Check wheel nuts	Chapter 10, page 10		x				

✓

POLYETHYLENE TANKS

WARNING: × Never climb on top of the tank.

× Never enter the tank or allow children to enter the tank.

CARE AND CHARACTERISTICS

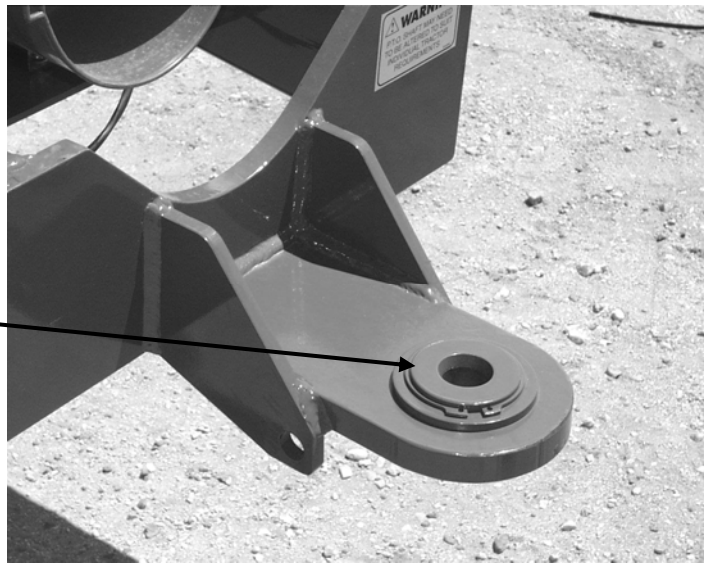
Polyethylene tanks have a very high chemical resistance and are ideal for use as chemical tanks. The tanks are made by rotating a specified amount of polyethylene in a mould, over heat, until a continuous layer of the required thickness is formed within the mould. This production technique produces smooth rounded edges within the tank and this facilitates easier removal of chemical residue. All tanks should be cleaned after every application and the correct decontaminating agent should always be used.

- An ultra-violet blocking agent is used in the GoldAcres polyethylene tanks to provide a strong degree of resistance against all ultra-violet rays.
- There is a high level of quality in the production process and the material provides a high resistance to impact damage.
- By its nature, polyethylene is a flexible material and loses structural strength with increases in temperature. **It is important to store the tanks out of direct sunlight, particularly in extremely hot conditions.**
- **The plastic has a "memory" meaning that if for any reason the tank does becomes out of shape or deformed, draining it and allowing it to cool will restore it to the original form.**
- **Leaving the tank with water in it overnight or for long periods will distort its shape and therefore should be emptied and decontaminated after use. The tanks should not be used for storage.**
- Due to the production technique, there can be variance in the overall dimensions of the tank, resulting in variations in tank capacity. **For this reason, level calibration markings should be used as a guide only.**
- For an accurate calibration of individual tanks, one effective method is to transfer a known quantity of water from one tank to the other. Successive additions will thus provide the required volume graduations. A Raven flow meter can also be used to calibrate the tank.

- It is good practice to keep the outside of the tank clean. Apart from looking unsightly, chemical residue on the tank can also be dangerous, especially if it is likely that an individual may come in contact with the tank.

PRAIRIE HITCH

The drawbar tongues on all Prairie tankers are fitted with a replaceable, hardened insert.



- ✓ The insert is internally tapered at the top and bottom to allow some pin movement.
- ✓ The standard fitting will take a 32mm drawbar pin. On request we can supply an insert for 40mm drawbar pins.

WHEEL / AXLE LUBRICATION

Check the condition of the wheel bearings regularly by determining how much sideways movement is present. Excessive movement usually indicates that the wheel bearing needs repacking, the axle nut needs tightening or that the bearing has been damaged.

Make sure the axle bolts are tight and that they securely fasten the wheel axles to the sprayer before moving sprayer.

The wheel hubs on most spray tankers have grease nipples fitted to facilitate regular and thorough lubrication. After every 25 hours of operation, remove dust cap and determine how much grease is needed. Then refit dust cap and pump the required amount of grease into the wheel hub.

TYRES

MAXIMUM SPEED WITH TANK LOADED IS 20 KM/H

MAXIMUM SPEED WITH TANK EMPTY IS 40 KM/H

All tyres used on GoldAcres sprayers have been designed to carry the maximum loaded weight of the sprayer when travelling at 20 km/h. The load capacity of the tyres decreases as travelling speed increases so it is important to heed this travelling speed limit.

- The tyre pressure also needs to be checked regularly (check every 8 to 12 hours of operation) and maintained at the required tyre pressure.
- There are many factors concerning the appropriate tyre pressure for a particular tyre and load. For example, the tyre size, rim type, tyre status (driven or free rolling), load, speed, haul length and ply rating all need to be considered when determining the tyre pressure.

TO DETERMINE THE CORRECT TYRE PRESSURE

To determine the correct tyre pressure for the sprayer;

- ✓ Determine the maximum weight of the sprayer when loaded (do not forget to add the weight of the rinse water tank and the foam marker tank when filled).
- ✓ Allow for each tyre to carry half the maximum loaded weight of the sprayer (this does not allow for any load on the tractor pull or cyclical loading, which provides for a safety margin).
- ✓ Determine what tyre size and ply is on the sprayer.
- ✓ Determine what appropriate tyre pressure will provide the load capacity required by the respective tyre as indicated in the following table.

Tare weight of sprayer:_____

Maximum loaded weight of sprayer (Note: 1 litre = 1 kilogram):_____

Tyre size:_____

Tyre ply:_____

Recommended tyre pressure:_____

The following table has tyre load limit capacities at various cold inflation pressures for a maximum loaded speed of 20 km/h.

NOTE:
If the speed is increased or the tyre pressure reduced, the load capacity will be reduced.

TYRE SIZE	**PLY RATING**	**MAXIMUM LOAD CAPACITY kg (MAXIMUM PRESSURE kPa)**
9.00 x 13	6 8	875 (175) 950 (200) 1030 (225) 875 (175) 950 (200) 1030 (225) 1090 (250) 1180 (275) 1250 (300)
11 x 15	4 8	1120 (240) 1330 (250)
11.5 x 15.3	12	2145 (410)
9.00 x 20	8 10	1120 (175) 1215 (200) 1320 (225) 1400 (250) 1500 (275) 1120 (175) 1215 (200) 1320 (225) 1400 (250) 1500 (275) 1600 (300) 1700 (325)
12.00 x 24	6 8 10	1550 (175) 1650 (200) 1550 (175) 1650 (200) 1800 (225) 1550 (175) 1650 (200) 1800 (225) 1950 (250) 2060 (275) 2180 (300)
14.9 x 24	6	2613 (190)
15.5/80 x 24	12	5197 (300)
24.5 x 32	14	7670 (280)
12.4 x 38	6 8	1910 (160) 2030 (180) 2180 (200) 1910 (160) 2030 (180) 2180 (200) 2320 (220) 2390 (240) 2450 (260)
14.9 x 38	6 8 10	2730 (160) 2730 (160) 2930 (180) 3110 (200) 3300 (220) 2730 (160) 2930 (180) 3110 (200) 3300 (220) 3470 (340) 3630 (260) 3800 (280)
16.9 x 38	6 8 10	2980 (140) 2980 (140) 3200 (160) 3460 (180) 3680 (200) 2980 (140) 3200 (160) 3460 (180) 3680 (200) 3880 (220) 4080 (240)
18.4 x 38	6 8 14	3630 (140) 4214 (180) 5040 (250)
20.8 x 38	14	----(250)
9.5 x 44 (Radial)	****	2580 (430)
11.2 x 44 (Radial)	****	3070 (430)
14.9 x 46	*****	3900 (290)

ADDITIONAL UNDERFRAME CLEARANCE ON PRAIRIE SPRAYERS

Current model Prairie sprayers (but not Specials) can be raised 200mm (8”) by rotating the axles 180º and fitting a 30mm spacer under the chassis to lower the pull.

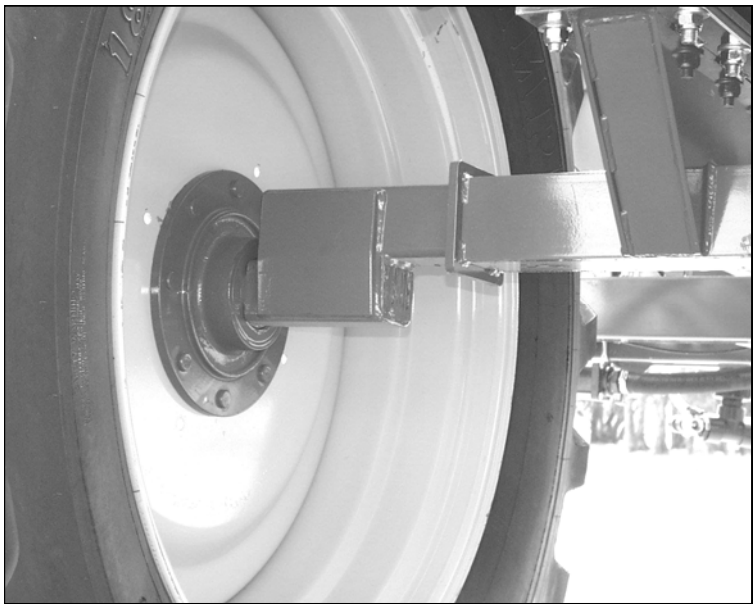


Figure 1. Axle in high position.

WARNING:
Axles must be turned 180º. If they are turned 90º, axle failure will result.

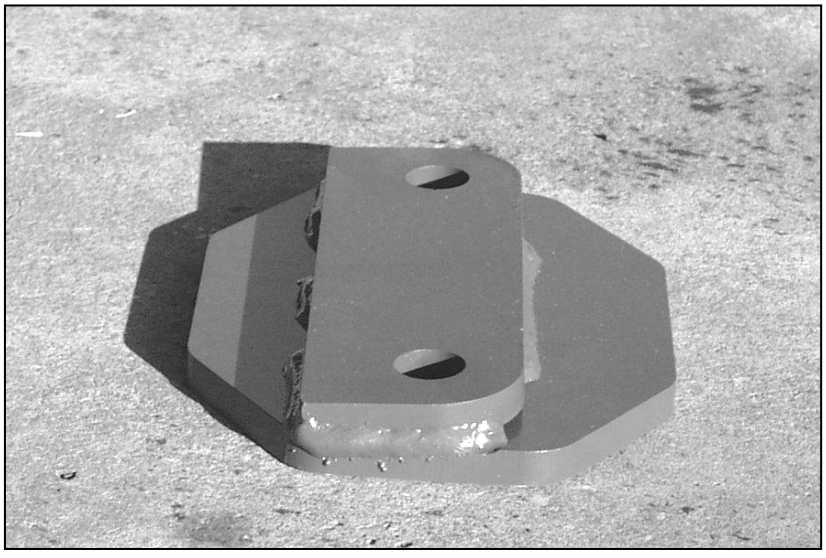


Figure 2. Spacer (Part number PRLB).

Figure 3. Underframe clearance.

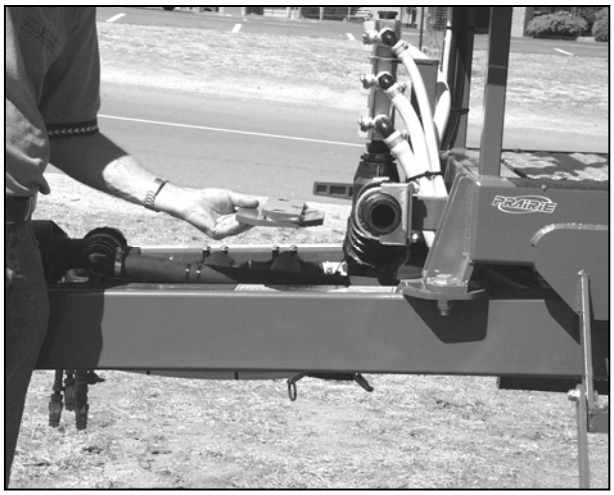


Figure 4. Spacer fits between pull and chassis.

Rotating the axles provides a substantial lift of the sprayer enabling high clearance over late sprayed crops.

Important points:

- ✓ Sprayers leave GoldAcres factory in the lowest position. This keeps overall height to a minimum for truck transport.
- ✓ The higher position will result in an increase of boom minimum operating height above ground.
- ✓ The sprayer pull may need to be height adjusted to match the change to the axle setting. This can be done by using the high clearance plates available as part number ***PRLB.***

ADDITIONAL TRACK ADJUSTMENT ON PRAIRIE SPRAYERS

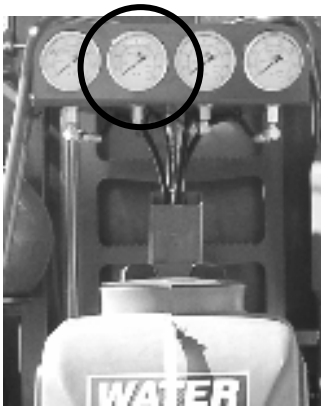
The height adjustment system for prairie sprayers, previously described, has also been designed to provide a system of track adjustment. A **maximum** of 300mm of extra track width (150mm per side) is available to allow fine tuning of the wheel tracks to match crop requirements.

ADJUSTING AXLE TRACK TO WIDTHS OUTSIDE THE RANGE OF MAXIMUM ADJUSTMENT MAY RESULT IN DAMAGE TO THE MACHINE

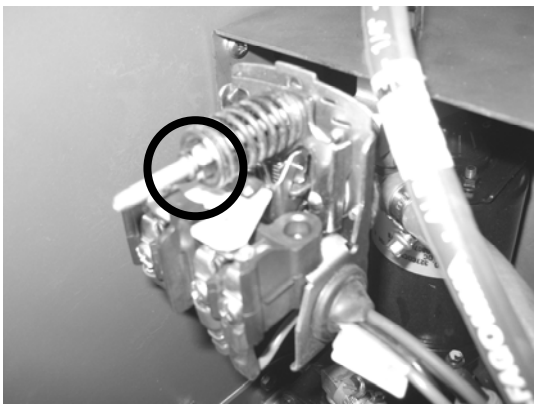
AXLES WITH AIRBAG SUSPENSION

Axles fitted with airbag suspension are available as optional equipment on 4000L and 5000L Prairie Advance sprayers and are fitted as standard equipment on 6000L and 8000L Prairie sprayers.

The air bag suspension consists of a 12 volt air compressor, two ride height valves, 2 air bags, shock absorbers, axle (used as air reservoir) and hosing. The 12 volt compressor is powered up when the ignition is switched on. A 20amp fuse is fitted to the ignition relay box to protect the compressor circuit.

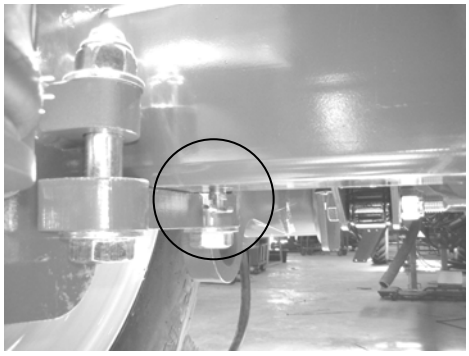


The compressor has a pressure cut out switch fitted to it which cuts the power to the compressor when the axles (reservoir) recommended pressure is achieved. When the pressure in the reservoir drops below 70psi the compressor will start again. The pressure cut out switch can be adjusted by turning the nut at the end of the spring to apply more or less pressure to the contact spring. The recommended maximum pressure to run in the air bag system is **90 psi**. If the compressor runs continually there may be an air leak present. All hoses and fittings must be checked and repaired if necessary.



The compressor draws its air through a paper element filter mounted on the boom rest “H” frame. This filter element must be cleaned daily. In dusty conditions this filter must be cleaned on a more regular basis. For machines that work in very dusty conditions the filter should be mounted as high up the boom rest frame as possible so it will be sucking clean air. Ground conditions, ground speeds and wind conditions can all be factors in determining what measures are necessary to supply clean air to the compressor.

The filter must be mounted on its side to prevent debris falling down the supply hose when the element is removed.



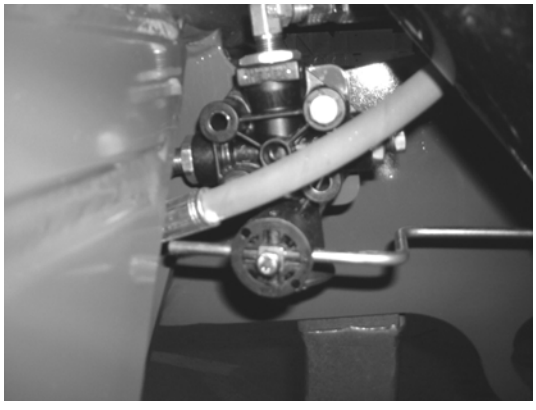
The axle is used as an air reservoir. Condensation is created when air is compressed, for this reason the air bag axle must be drained daily to expel any moisture.

The two ride height valves fitted to the axle allow air to flow in to or out of the air bags. This maintains a set ride height of the tanker as well as providing suspension. As the tanker weight increases, e.g. filling the tank, the ride height valve allows air to flow from the axle reservoir into the air bag, therefore increasing the pressure in the air bag. As the tanker weight decreases, e.g. emptying the tank, the ride height valve allows air to exhaust out of the air bag therefore decreasing air pressure in the air bags. The ride height valves are very important to maintain a smooth ride and to eliminate chassis roll. If the suspension had fixed springs or dampers, the ride of the tanker would be soft and rolling when empty, but hard and rigid when full. By using the ride height valves and air bags, a more stable even ride can be achieved between an empty and full tank.

A correctly functioning GoldAcres air bag system compressor will not run constantly. In normal operating conditions the compressor will cycle at approximately 10 minutes intervals.

ADJUSTING RIDE HEIGHT VALVES

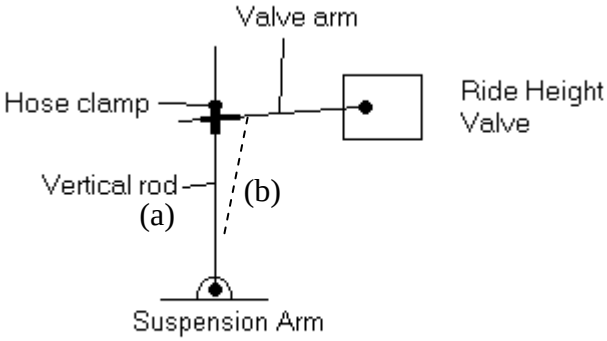
The ride height valves are used to adjust the air pressure within the air bags to maintain the correct ride height. The ride height valves are located on the suspension arm mounting plates. These must be adjusted to the exact same height on each side to prevent the airbags counteracting each other. If one air bag is higher than the other it will cause the opposite ride height valve to exhaust and air pressure will be lost from the air bag reservoir. This will cause the compressor to run constantly. The air bag height must be checked at regular intervals to maintain the system in good working condition.



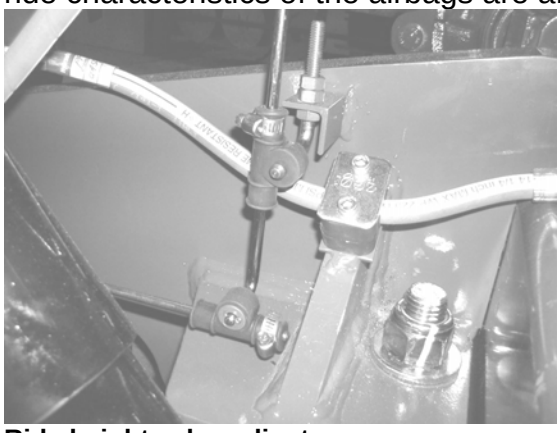
The ride height can be adjusted by loosening the hose clamp attached to the vertical rod on the end of the ride height valve and then moving the valve arm in the required direction.

- To raise the machine, this arm should be moved up the vertical rod.

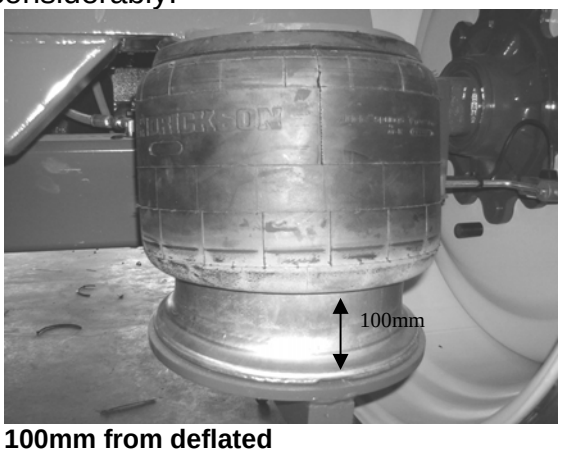
- To lower the machine, move the arm down the vertical rod.



Note: The recommended ride height of the airbags is 100mm from the fully deflated setting. It is also important to keep the Vertical rod (a) positioned vertically. Should the vertical rod lean backwards or forwards such as (b), the ride characteristics of the airbags are affected considerably.

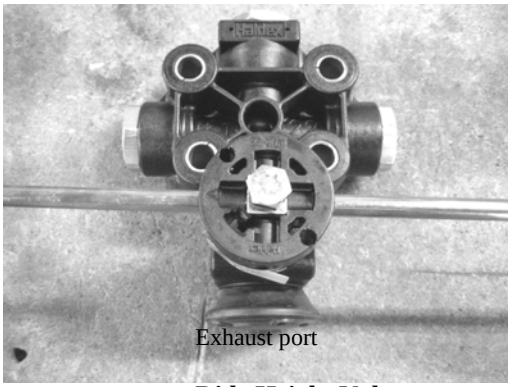


Ride height valve adjuster



100mm from deflated

The ride height valves have a “Dead Band” position on them. This is the position where the valve will sit when no air is being let in to the air bag or out of the air bag. Over time the seals may wear or harden and cause this “Dead Band” to decrease. If the dead band position decreases the ride height valve may leak air out the exhaust port. The air bag height should be changed slightly higher or lower if this eventuates. If the ride height valve continues to leak it must be replaced.

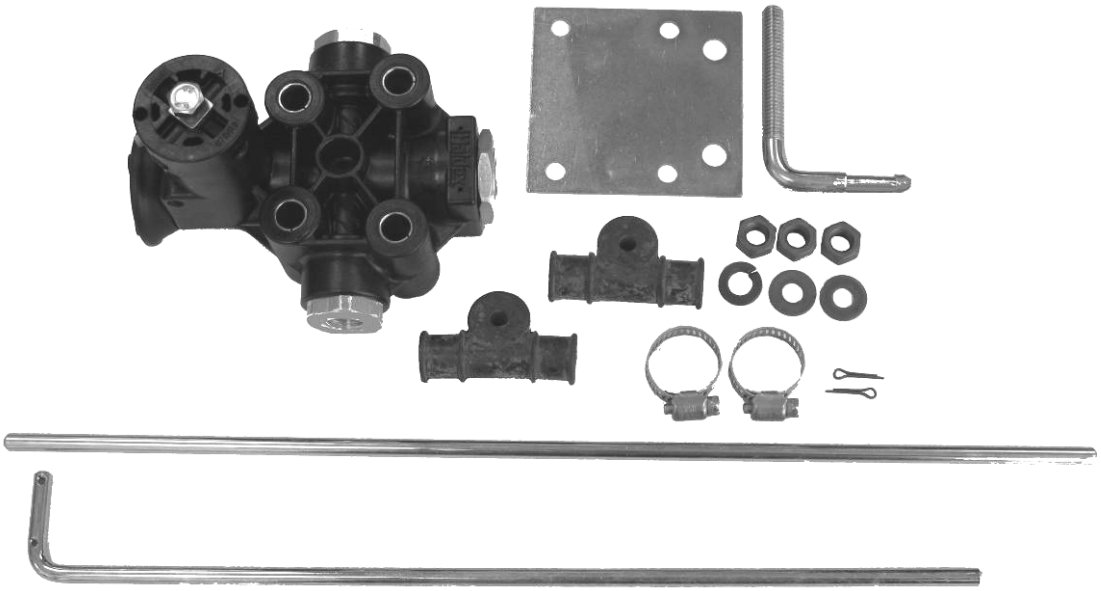


Ride Height Valve

To ensure correct boom alignment it is important that the air bag suspension is <u>level</u>.

GA5010867 - Ride height levelling valve replacement.

Fitting ride height levelling valve to airbag axle



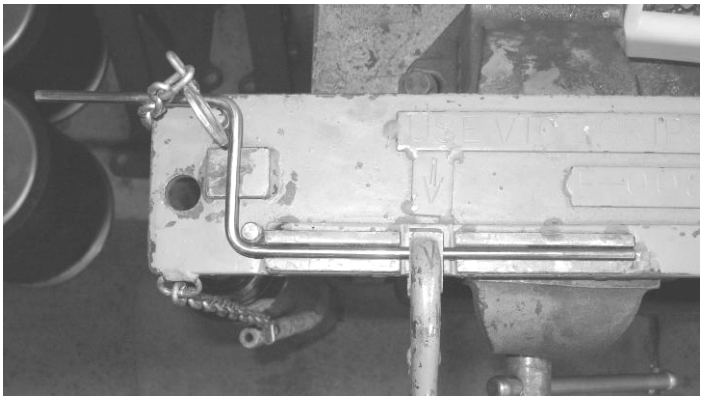
1. Fit the two S49-0404, 90 Deg Elbows to the valve so they are both on about 45° in the direction shown.

Port 1- Always air inlet
Port 21- Supply to Airbag (RH side only)
Port 22- Supply to Airbag (LH side only)

2. Fit the brass plug GA5048770, 1/4 NPT male taper plug

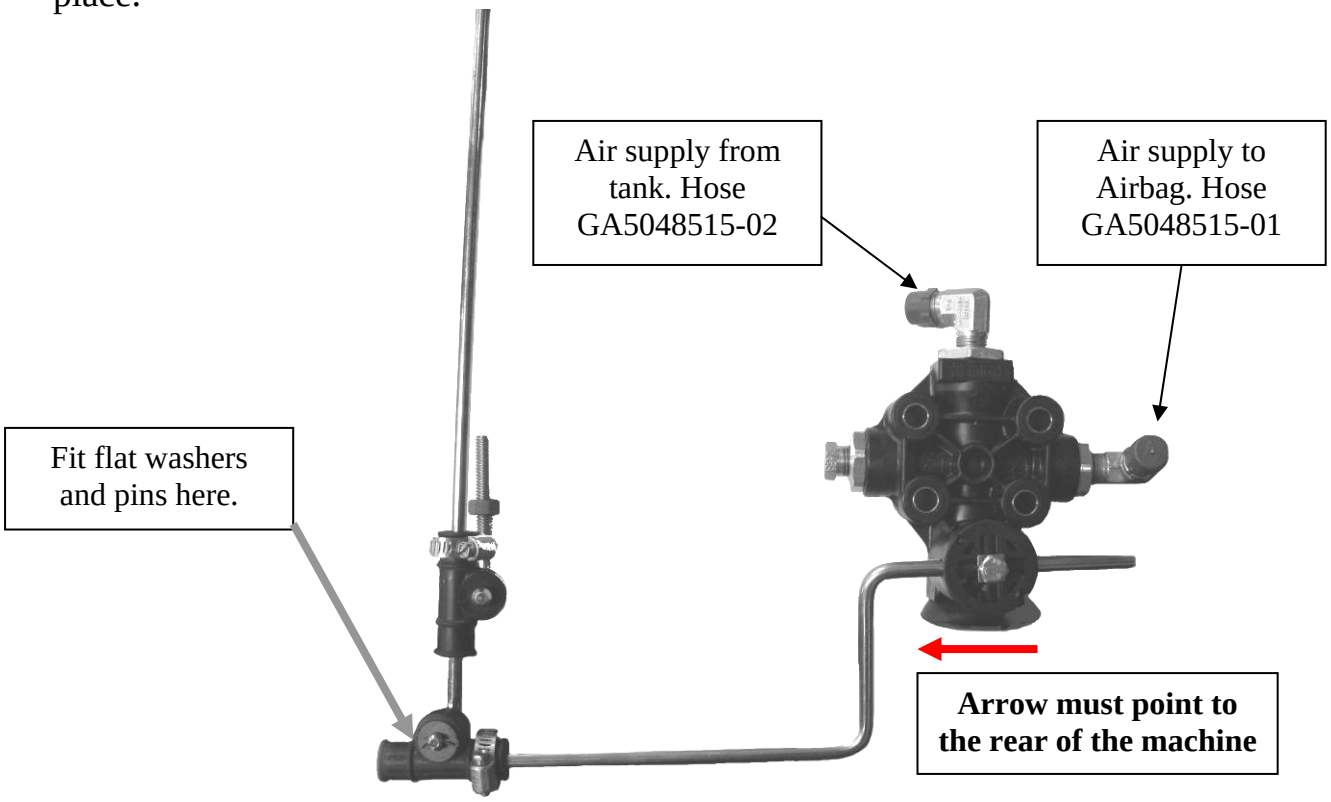
NOTE: There is one valve on each side of an airbag axle so therefore the valves must be assembled as a mirror image of each other.

3. The plain straight link rod must be manually bent as shown below using the Goldacres jig.

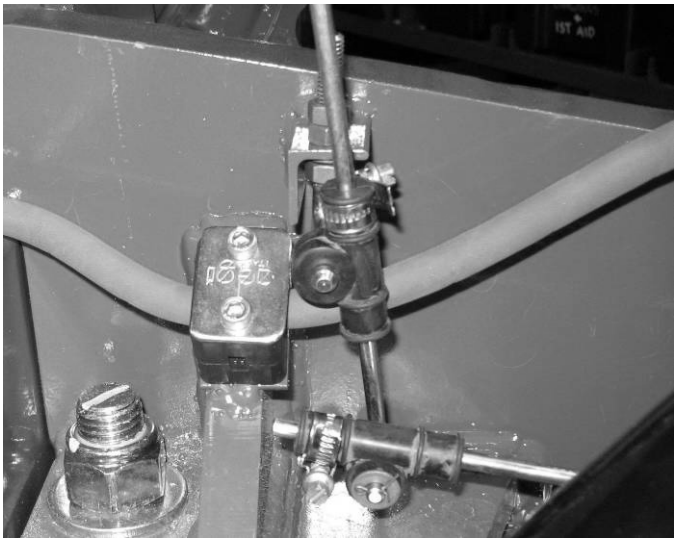


4. When fitting the link rod to the valve the **arrow must be pointing to the rear of the machine** in the direction shown above.

5. Assemble the links as shown below with the flat washers and pins in place.



6. Bolt the valve to the airbag frame using two M8 x 75 bolts and nyloc nuts. Put the links in place and insert the threaded rod through the bracket that is welded to the side of the airbag frame with one nut and the spring washer on the bottom. Lock this in place by screwing the other two nuts on and lock them together.



7. Adjustments may need to be made to the links to make the machine ride height correct and level.

TOWING IMPLEMENTS BEHIND SPRAYER

GoldAcres does not recommend towing any implement behind the sprayer except the GoldAcres trailing boom behind the spray tanker. An implement behind the sprayer may result in the load carrying capacity of the wheels on the sprayer being exceeded. Also an implement, such as harrows, can exert a considerable side thrust on the sprayer (especially when turning whilst harrows are lowered in the working position).

DO NOT TOW ANY IMPLEMENT BEHIND SPRAYER (EXCEPT TRAILING BOOM BEHIND SPRAY TANKER)

WHEELS

CHECK WHEEL NUTS REGULARLY

The wheel nuts need to be regularly checked and tightened if necessary (check every 8 to 12 hours of operation). The wheel nuts should be checked more frequently when the sprayer is new (i.e. every 2 to 4 hours).

The wheel nuts should be tightened alternately and evenly to a torque rating of 350 Nm.

REMOVING A WHEEL FROM SPRAY TANKER

MAKE SURE SPRAYER IS PROPERLY SUPPORTED WHEN CHANGING TYRE

NEVER CHANGE TYRE ON A SLOPE OR SOFT UNEVEN GROUND

NEVER GET UNDER THE SPRAYER WHEN IT IS SUPPORTED ONLY BY THE JACK

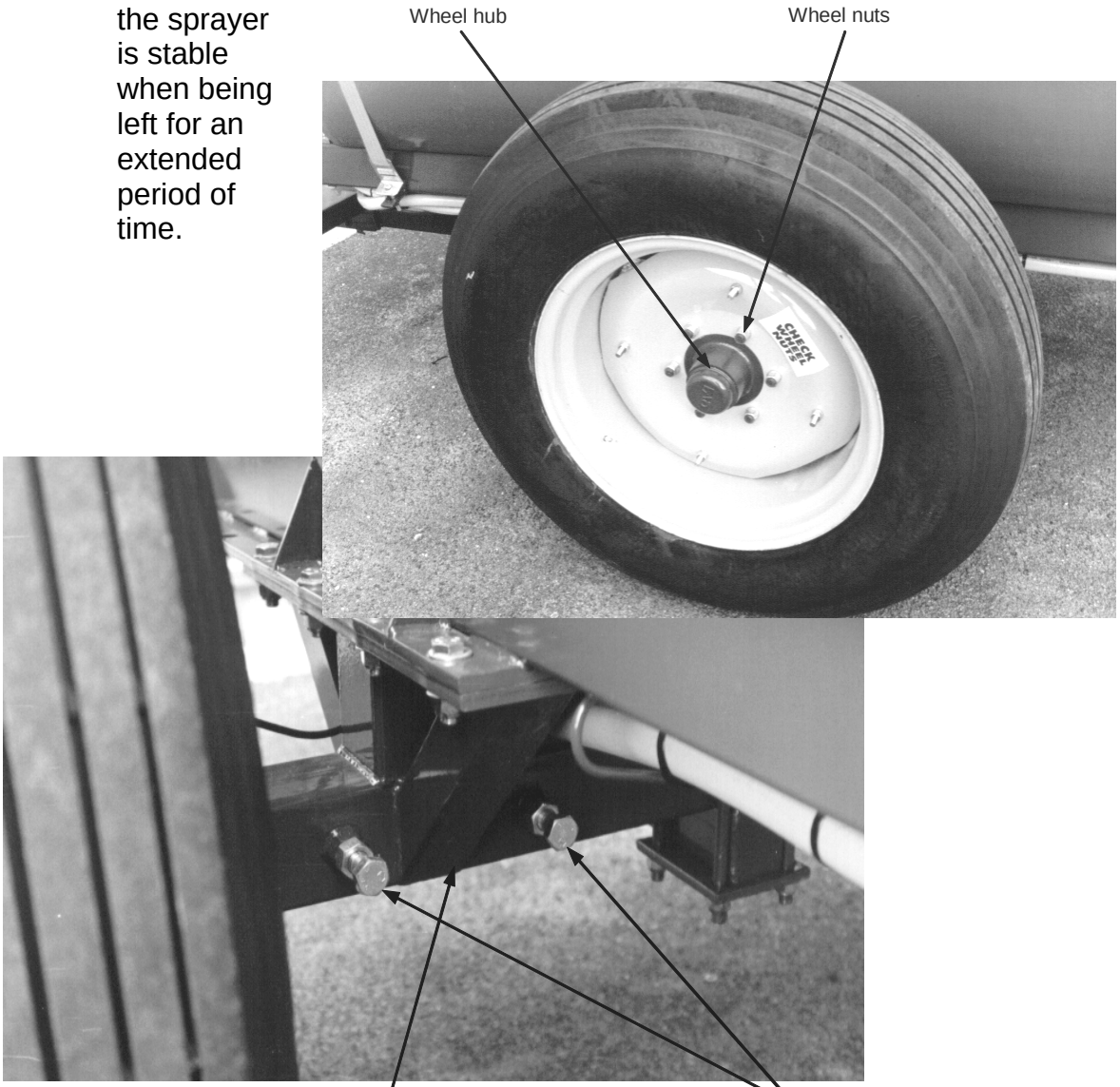
ALWAYS USE A JACK OF SUFFICIENT LIFTING CAPACITY

DO NOT SUPPORT SPRAYER WITH JACK UNLESS TANK IS EMPTY

To remove a wheel on the spray tanker, the following guidelines must be adhered to:

- The sprayer must be hitched to the appropriate towing vehicle.
- The engine of the towing vehicle must be turned off and the park brake applied.
- Chock the wheel(s) that is/are no to be removed with an appropriate obstacle to prevent the sprayer from moving.
- With a wheel nut wrench loosen all the wheel nuts on the wheel that you wish to remove (**Do not remove wheel nuts until the tyre is off the ground**).
- Place a jack on level firm, stable foundation under the sprayer axle and between the two axle bolts near the wheel to be removed. The jack may

- Use the jack to raise the sprayer axle such that the wheel is off the ground.
- Place an auxiliary jack block under the sprayer so that if the jack fails the sprayer will not fall.
- Remove all wheel nuts and remove wheel from sprayer. Be careful that the wheel does not fall on any person and cause bodily harm.
- Ensure that the sprayer is stable when being left for an extended period of time.



REPLACING A WHEEL ONTO SPRAY TANKER

To put the wheel back onto the spray tanker, the following guidelines must be adhered to:

- Make sure the sprayer is stable when supported with the jack and the jack block in place and hitched to the appropriate towing vehicle.
- Make sure the wheel is in a satisfactory condition to use and that the tyre is inflated to the correct tyre pressure.
- Clean the surface between the wheel and the hub.
- Carefully lift repaired/new wheel up so that the holes in the rim centre go over the wheel studs on the wheel hub.
- Carefully put the wheel nuts on and tighten them finger tight.
- With a wheel nut wrench tighten wheel nuts alternately and evenly to a torque rating of 350Nm.
- Remove the jack block under the sprayer.
- Carefully lower the sprayer slowly with the jack until the tyre touches the ground.
- Retighten the wheel nuts to the required torque rating.
- Let the jack completely down (so that all weight is taken off the jack) and remove jack (and any supports placed under the jack) from under the sprayer.
- Remove obstructions that were placed to the front and rear of the opposite wheel (to prevent it from moving).
- Check tyre pressure before moving sprayer.
- Retighten wheel nuts to the required torque rating one hour after fitting the tyre, before filling main spray tank and after the first tank load.

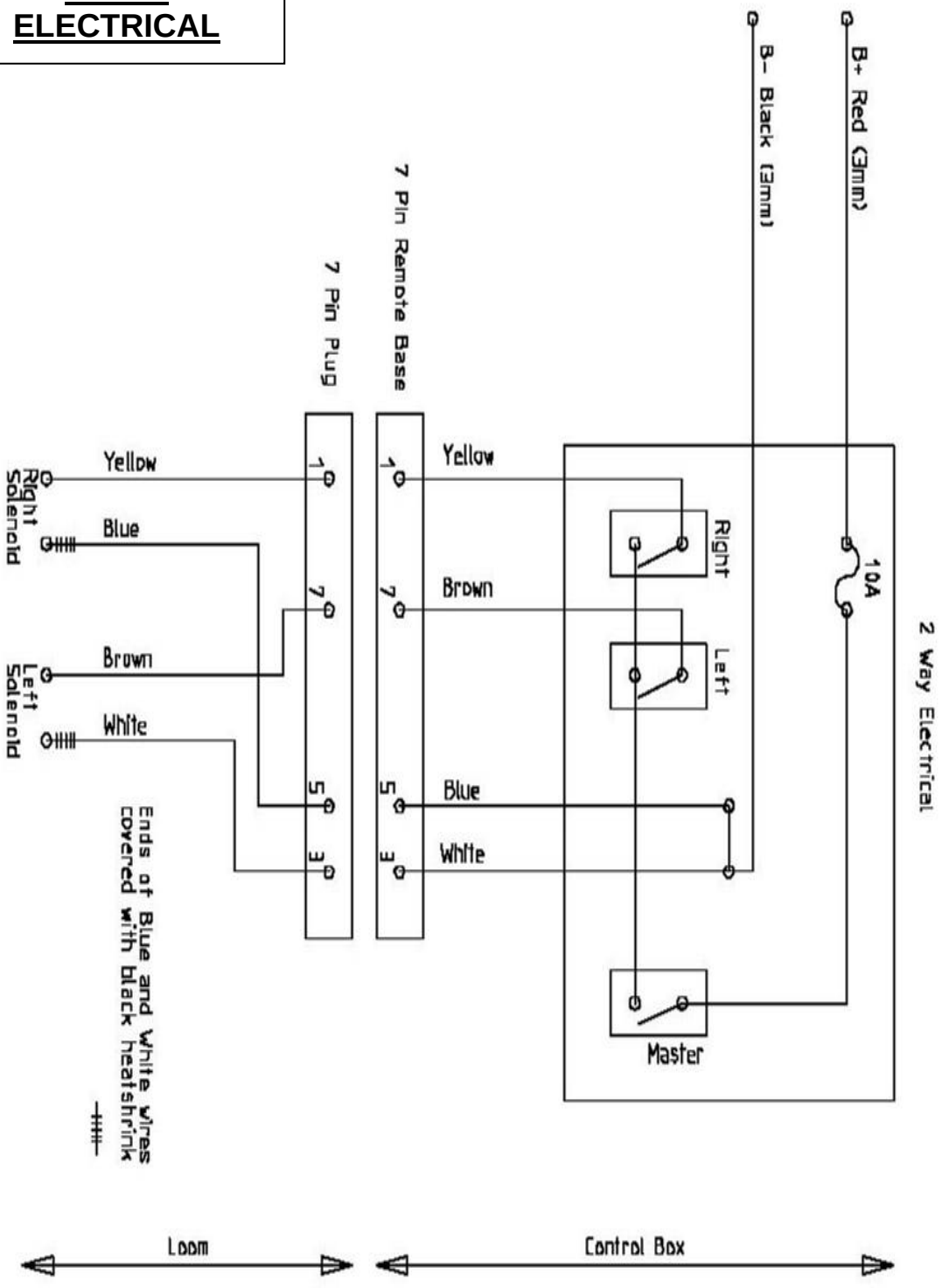
FLAT TYRE

If a tyre on the spray tanker becomes flat or under-inflated:

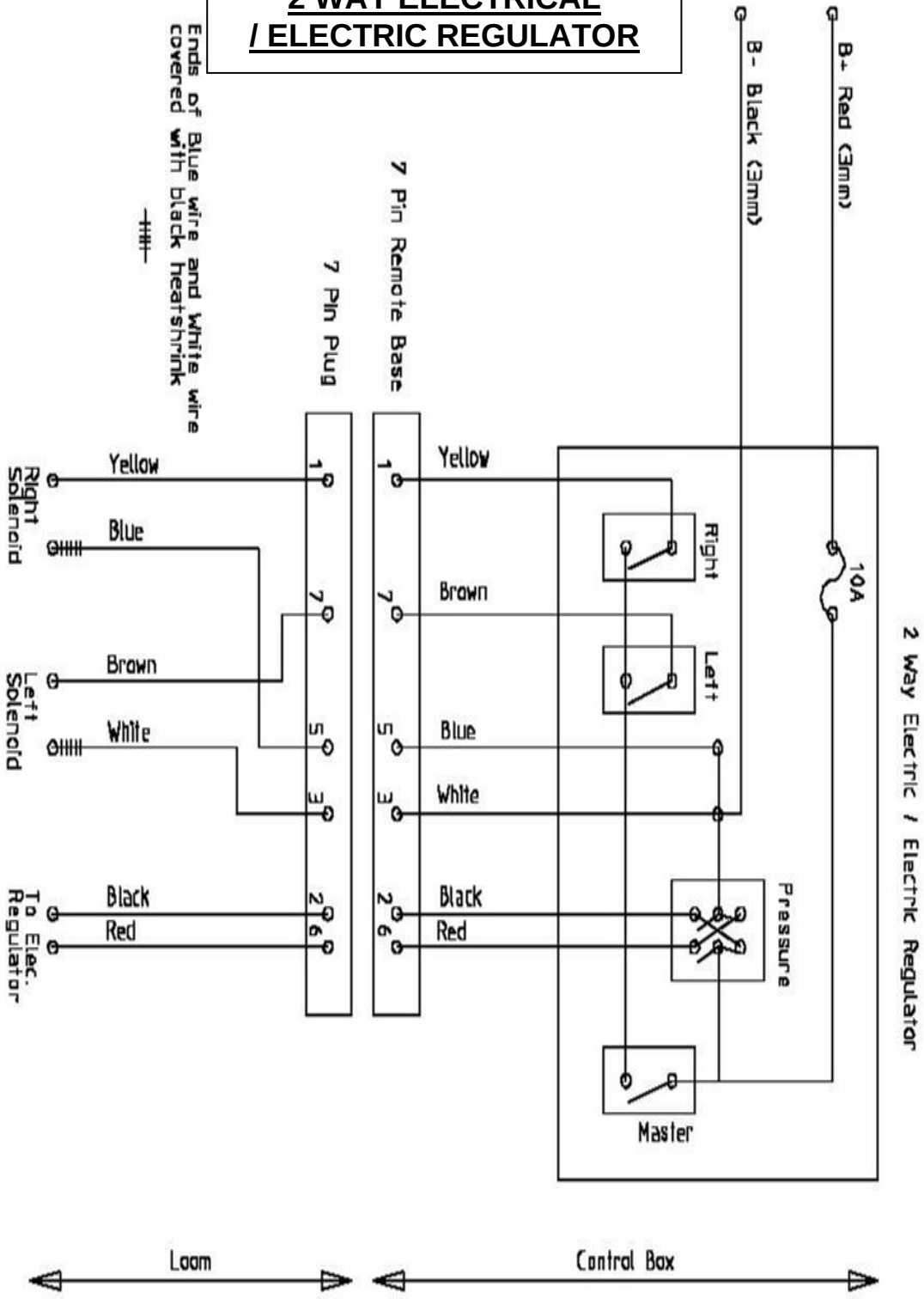
- Stop the towing vehicle immediately.
- Safely move the sprayer off the road away from any traffic.
- Turn on the vehicle hazard lights and the sprayer hazard lights (if tail lights are fitted).
- Park on a level firm surface.
- Apply the vehicle park brake and suitably block the sprayer wheels to prevent them from moving.
- Remove the wheel with the flat tyre from the sprayer via the procedure outlined under “Removing a wheel from spray tanker”.
- Repair or replace tube and/or tyre, refit the repaired tube and/or tyre to the wheel and reinflate to required pressure.
- Fit the wheel back to the sprayer via the procedure outlined under “Replacing a wheel onto spray tanker”.

ELECTRICAL WIRING DIAGRAMS

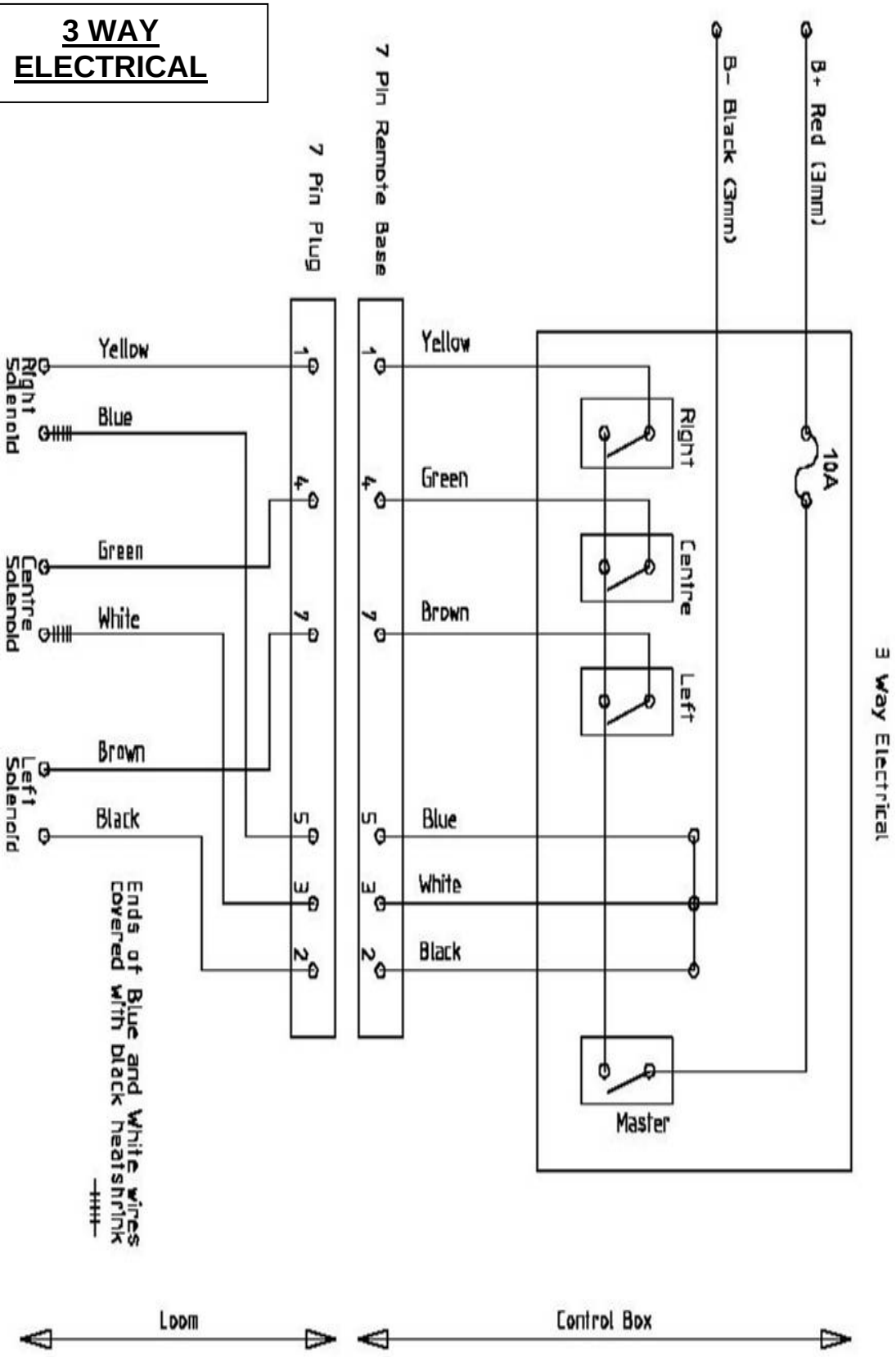
2 WAY ELECTRICAL



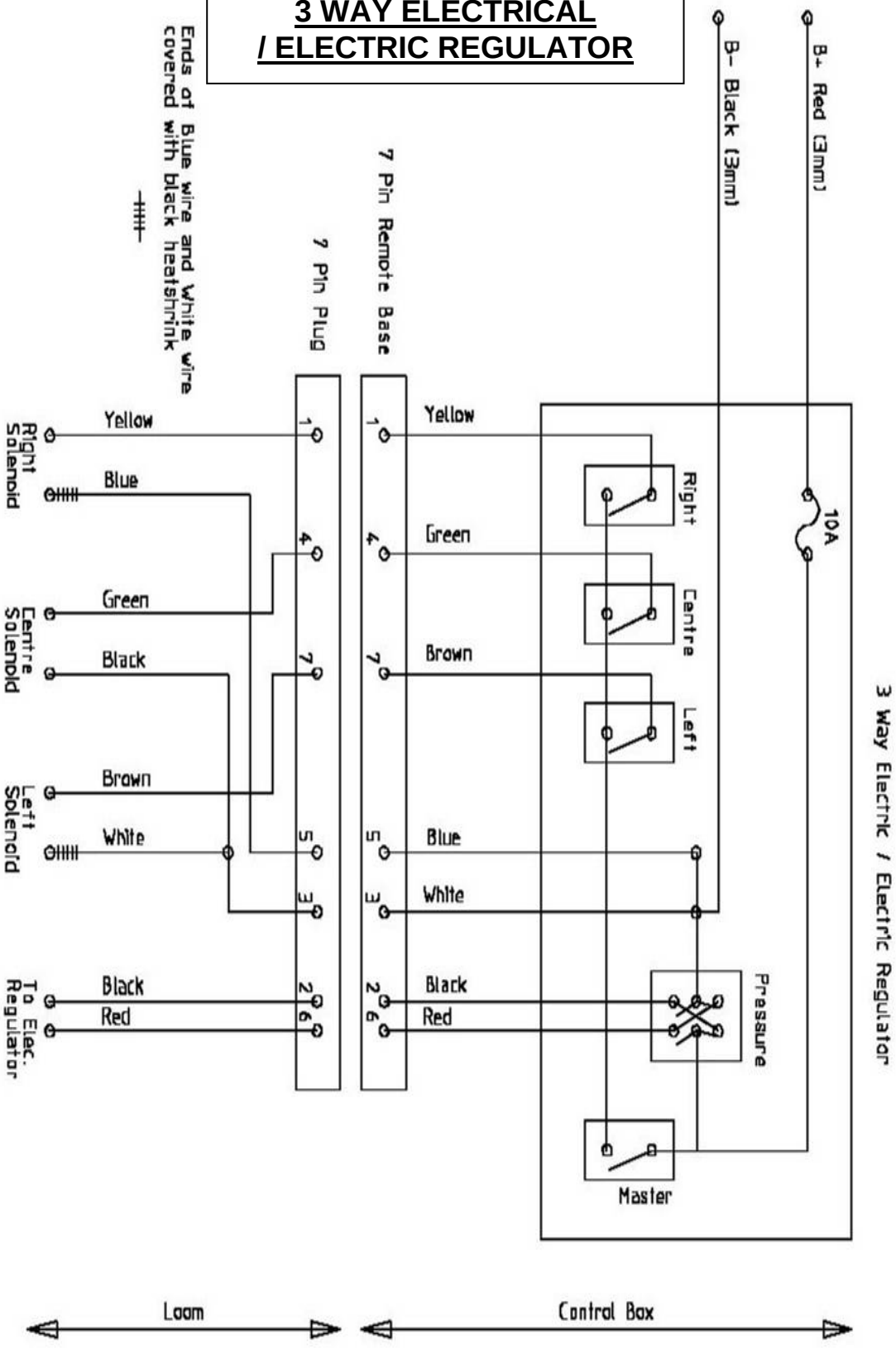
2 WAY ELECTRICAL / ELECTRIC REGULATOR



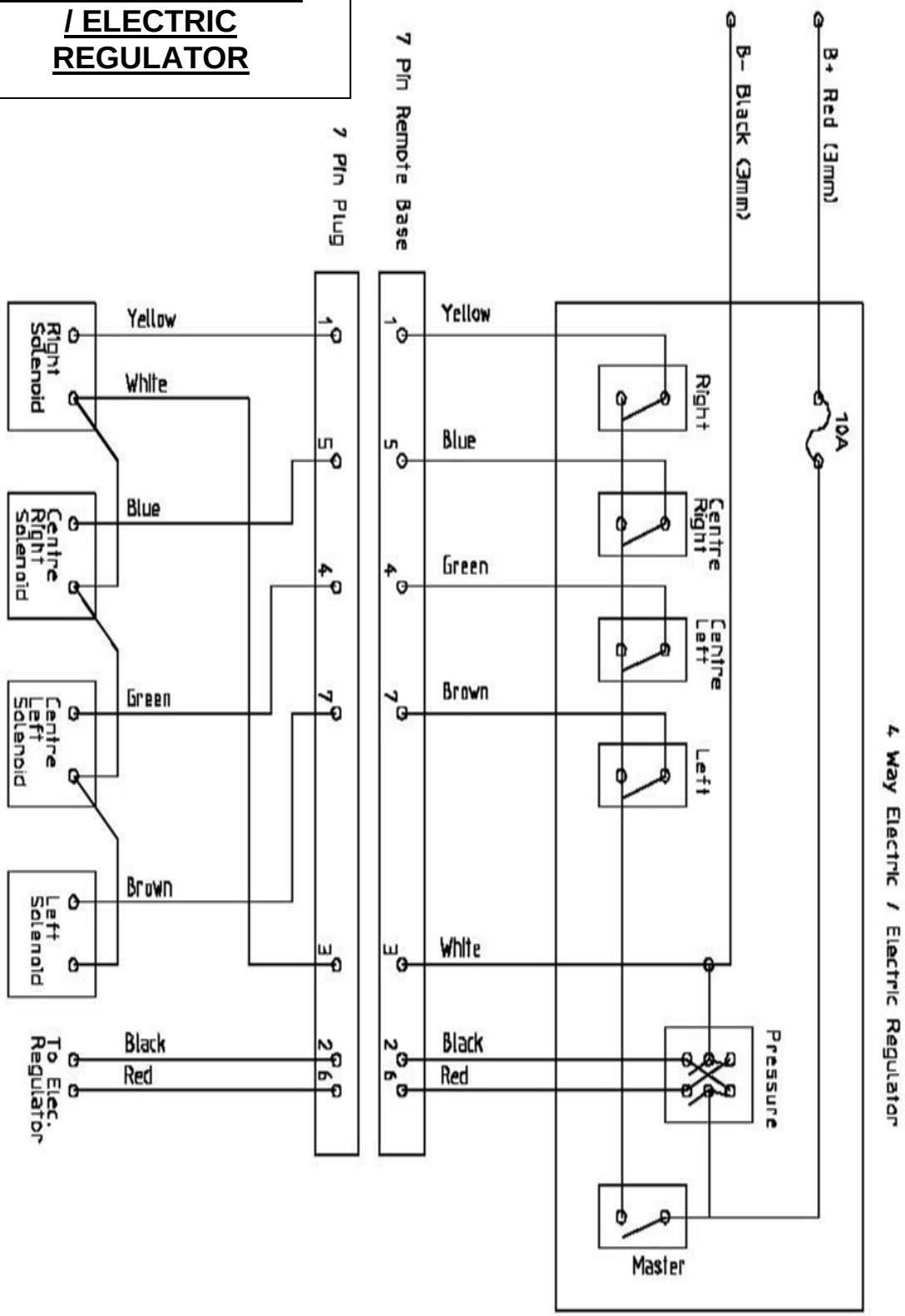
3 WAY ELECTRICAL



3 WAY ELECTRICAL / ELECTRIC REGULATOR

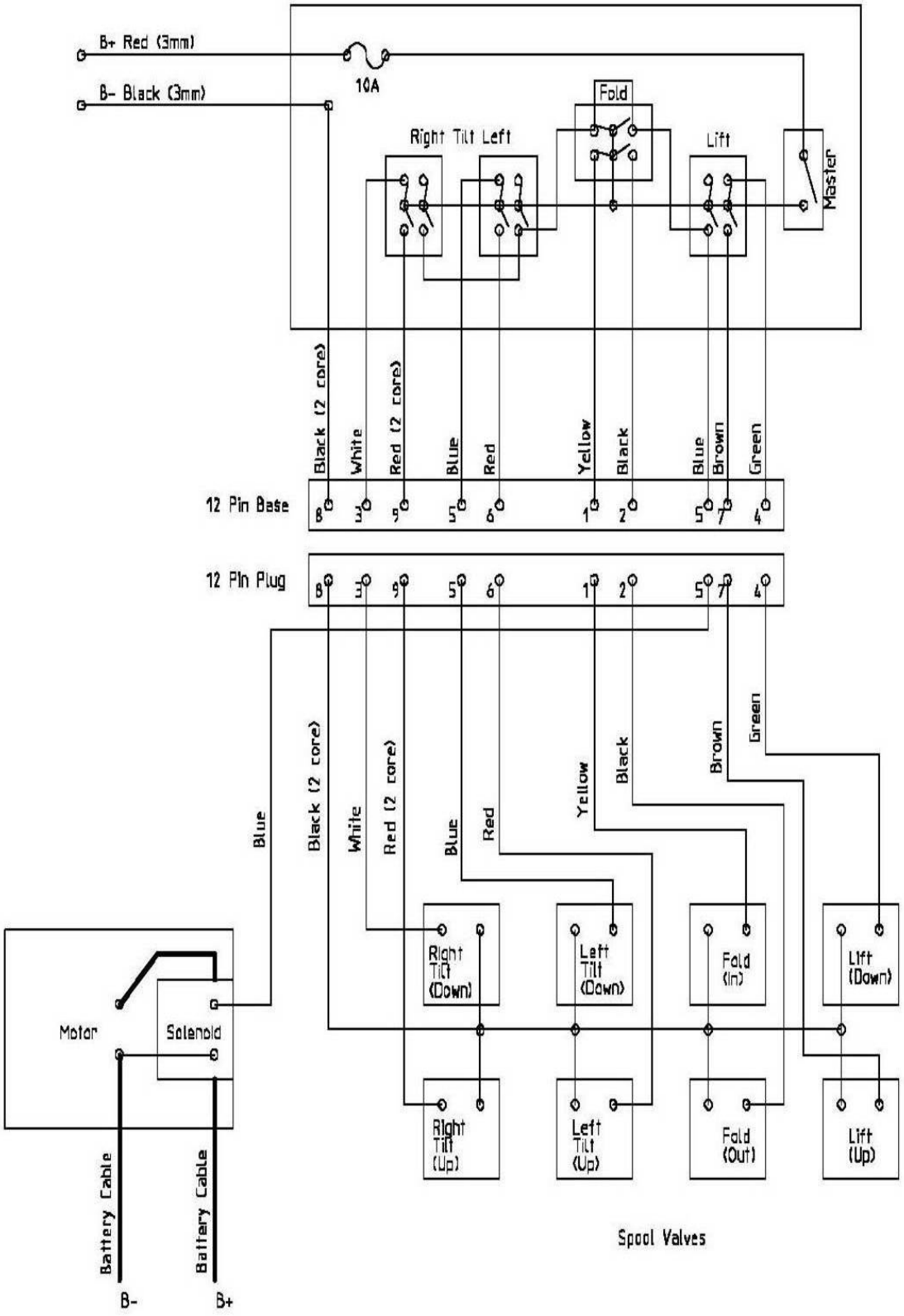


4 WAY ELECTRICAL / ELECTRIC REGULATOR

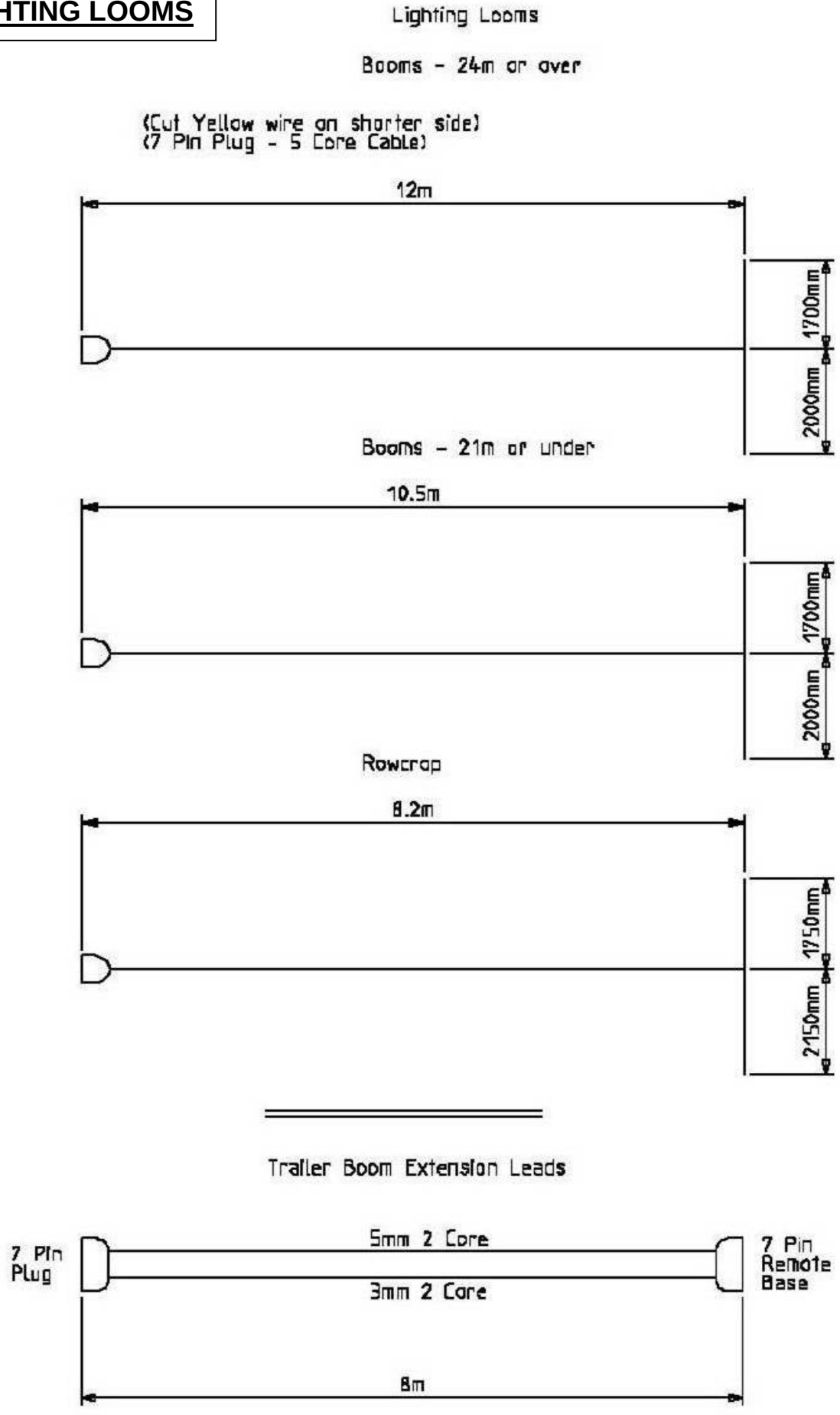


HYDRAULIC POWER PACK

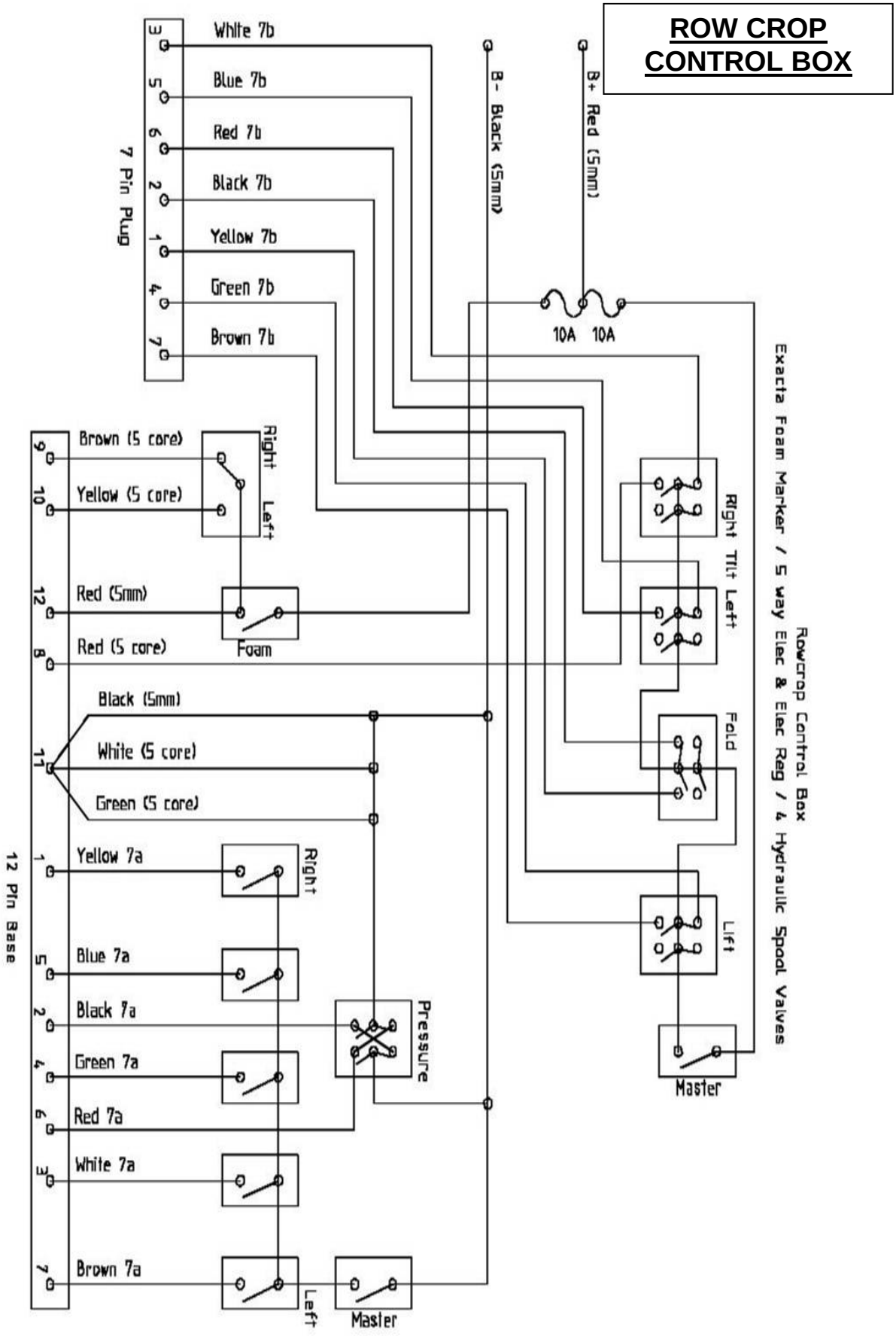
Hydraulic Power Pack



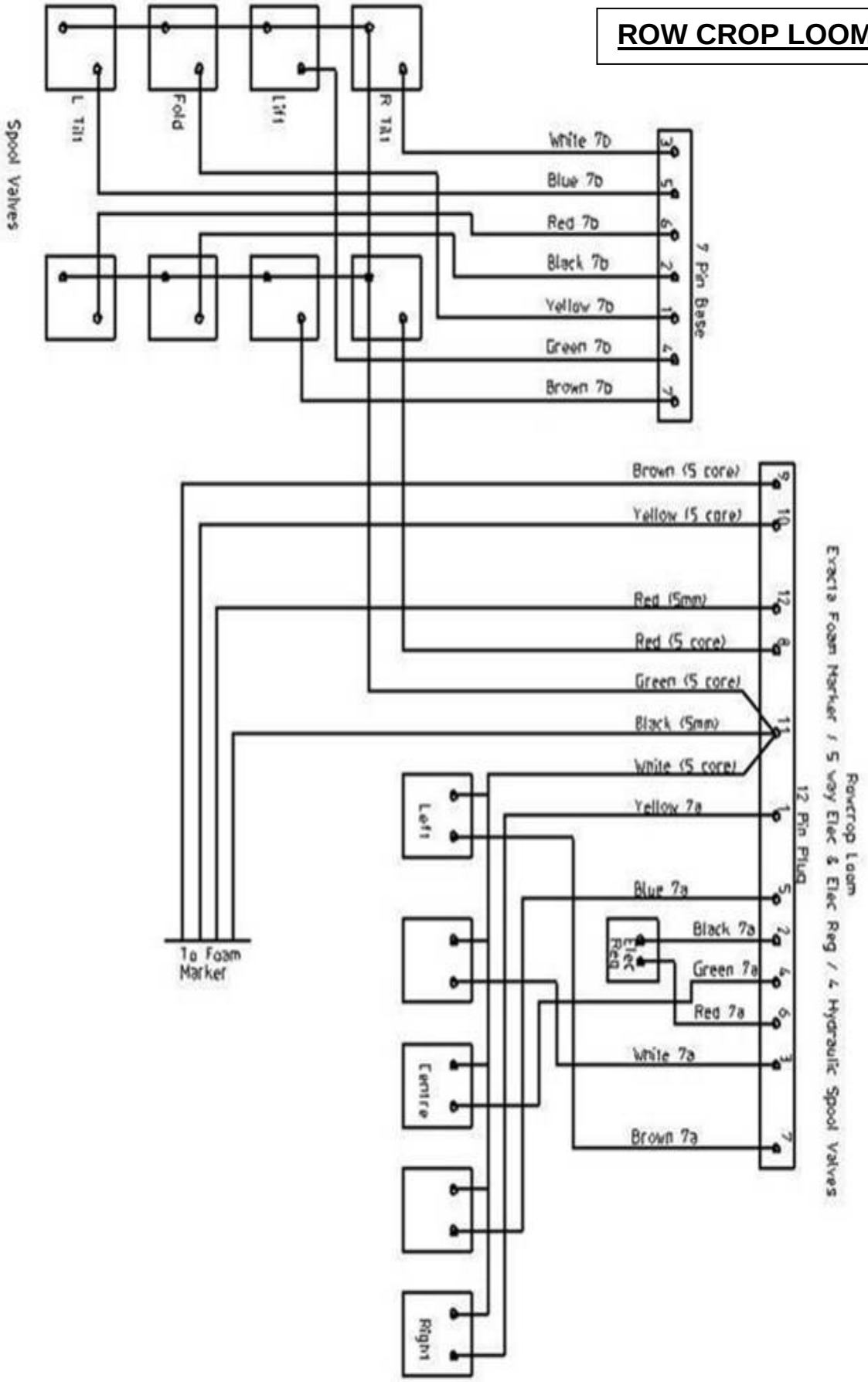
LIGHTING LOOMS



ROW CROP CONTROL BOX



ROW CROP LOOM



AIRBAG COMPRESSOR BOX