CROPLANDS

OPERATORS MANUAL
PINTO
4000 & 3000 LT MODELS

WWW.CROPLANDS.COM.AU

STOP
BEFORE COMMENCING operation, **ENSURE** you read & understand this manual, its contents, and any additional information supplied.

BT-OMPINTO-E

CROPLANDS IS CONTRIBUTING TO A SUSTAINABLE FUTURE

INTRODUCTION | GENERAL MANAGER'S WELCOME

Sean Mulvaney
General Manager

Dear Customer

Congratulations on the purchase of your new sprayer and thank you for supporting another true blue Australasian manufacturer.

For over 50 years Croplands have been delivering spraying solutions and ongoing support for a variety of applications whilst investing in long term partnerships with our suppliers, distributors, end users and local communities. These partnerships are absolutely key in our commitment to support our products into the future.

At Croplands, we are committed to sourcing the very best technology from around the globe and adapting these products to our specific requirements. When these products don't yet exist, we innovate through continuous investment in our own research and development.

Croplands is a wholly owned subsidiary of Nufarm Ltd, the largest supplier of crop protection products in Australasia. This brings a unique understanding and collaborative approach to new market developments, challenges and opportunities.

Please take the time to thoroughly read this manual before you operate your sprayer. This will provide direction to ensure safe usage and help optimise the performance of your investment. Your feedback is welcome and valued.

We trust you will be happy with your sprayer and the level of support - our goal is to be your preferred spraying solutions partner from this point onwards.

Yours Sincerely

Sean Mulvaney
General Manager

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SECTION 1
IMPORTANT INFORMATION

ABOUT THIS MANUAL

This manual provides assembly, setting up, operating and maintenance instructions for the Pinto series of sprayers.

In addition to this manual, the sprayer will be delivered with the General Safety Manual (GP-SAFE-A) and all other relevant manuals.

Some features and options explained in this manual may not be installed on your sprayer.

Please pass on this manual with the sprayer at the time of resale for usage by the new owner.

This manual, BT-OMPINTO-E was first published in January 2024, replacing all previous versions including BT-POM00210.

Check online as there may be more recent revisions of this manual. **www.croplands.com.au**

TERMINOLOGY

These terms/symbols used throughout this manual:

NOTE	This Note sign is in place to convey useful information and will help you to identify the best possible way to operate the machine.
CAUTION	This Caution sign shows the potential for incident. An incident may include damage to the machine itself, or possible injury to the operator.
WARNING	This Warning sign shows the potential for risk or injury and highlights the need for steps to be taken to protect ones safety.
DANGER	This Danger sign will be used in areas where the highest risk is present. Always read the information on these signs and ensure you are taking steps to prevent risk or injury.

NOTE

To convey useful operating information.

CAUTION

To highlight potential injury or machinery damage.

WARNING

To stress potential dangers and the importance of personal safety.

DANGER

Probability of death or serious injury if an accident occurs

BEFORE OPERATING YOUR SPRAYER

1. Before attempting to use your sprayer, make sure you read all Operator Manuals for this sprayer including but not limited to:

   This Operator's Manual, **and all other supplied manuals** for items such as controller, pump and PTO etc.

   

   And properly understand:

   - All Safety Issues.
   - Assembly & Installation instructions.
   - Calibration of the sprayer.
   - Sprayer Operation.
   - Sprayer Maintenance.

   For details not covered by the manuals, please contact Technical Support on 1300 650 724.

2. Read and follow instructions on chemical manufacturers' labels.
3. Always wear applicable protective clothing.

INTENDED USE

Croplands sprayers are designed to be used for multipurpose spraying of herbicides, pesticides and fertilisers. The sprayer must not be used for any other purpose.

SECTION 1
IMPORTANT INFORMATION

WARRANTY POLICY

Each sprayer module will be delivered with a Specifications, Safety, Warranty & Delivery Booklet which includes:

- the sprayer's specification sheet including the sprayers unique serial number,
- a safety induction checklist,
- a delivery checklist and customer induction,
- the Croplands Warranty policy and warranty registration form.

We ask that our customers complete these forms in the presence of a Dealer and/or Croplands representative as a part of the sprayer's delivery process.

Always contact your Croplands Dealer first and foremost for warranty matters.

NOTE

For full conditions of warranty and warranty policy, please see the Specification, Safety, Warranty & Delivery booklet provided with this sprayer.

SECTION 2
SAFETY

SAFETY FIRST

Please read and understand all supplied manuals, guides and safety decals before operating this sprayer. This includes the **Croplands Operators Safety Manual** – as pictured here.

This manual is available on the Croplands website, or for printed versions contact Croplands customer support and ask for part number GP-SAFE-A (or later version if available).

STOP
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SECTION 2
SAFETY

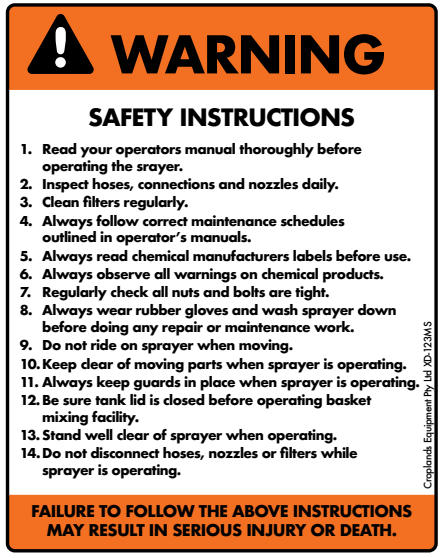
SAFETY SIGNS AND DECALS

All signs and decals for sprayer safety and operation must be maintained in good order and replaced if damaged or missing. Most Croplands labels have a part number printed on the decal to aid identification and replacement.

Some examples are shown below.

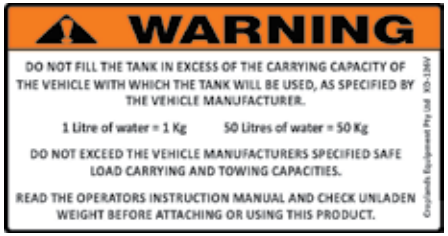
Part No: XD-181

Part No: XD-22V



Part No: XD -123

Part No: XD -125V



Part No: XD -126V

Part No: XD -175

Part No: XD -176

Part No: XD-190

Part No: XD-182

Part No: XD -124V

Part No: XD-125

Part No: XD -177

Part No: XD-178

SECTION 3

PRODUCT IDENTIFICATION, SHIPPING & SPECIFICATION

Machine specifications are subject to change without prior notification

GENERAL

The Pinto 4000 & 3000 trailed sprayers represent the Croplands design philosophy of simplicity, functionality and high durability, the Pinto 4000 and 3000 models deliver exceptional results year after year.

All standard units feature an AR160 PTO driven pump (with PTO shaft), Bravo 180S 3 section auto rate controller, suction probe, 275 litre flushing tank, 60 litre Chem-e-Flush, 15 litre fresh water tank, parallelogram boom lift combined with a choice of 16 to 24-metre hydraulic fold boom.

PRODUCT IDENTIFICATION

Always use the serial number of the sprayer (also refer to the Sprayer Specifications, Safety, Warranty & Delivery booklet) when requesting service information or when ordering parts.

Early or later models may use different parts, or it may be necessary to use a different procedure for specific service operations.

The serial numbers of all controllers, pumps etc should be recorded for future reference.

SECTION 3

PRODUCT IDENTIFICATION, SHIPPING & SPECIFICATION

Machine specifications are subject to change without prior notification

SHIPPING INFORMATION

The following shipping information is provided but variations can occur without prior notification.

Approx Weights

Total Weight - dry
4000 litre (21 m boom) = 2730 Kg
3000 litre (18m boom) = 2250 Kg

Total Weight - all tanks full
4000 litre (21 m boom) = 6940 Kg
3000 litre (18m boom) = 5360 Kg

Drawbar Weight - dry & folded
4000 litre (21 m boom) = 280 Kg
3000 litre (18m boom) = 245 Kg

Drawbar Weight - full & boom open
4000 litre (21 m boom) = 1125 Kg
3000 litre (18m boom) = 820 Kg

Dimensions

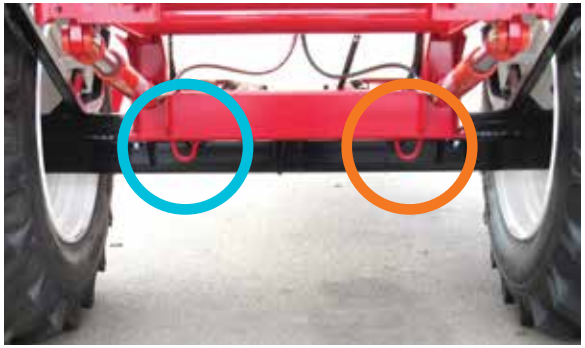
Model, W x L x H (boom folded)
4000 litre (21 m boom), 2.74 m x 7.21 m x 3.32 m
3000 litre (18m boom), 2.7 m x 6.6 m x 3.29 m

Machine specifications are subject to change without prior notification.

Transport

All provided tie down points (and more) should be used to help secure the sprayer for transporting

Do not exceed 25 kph when towing on roads.



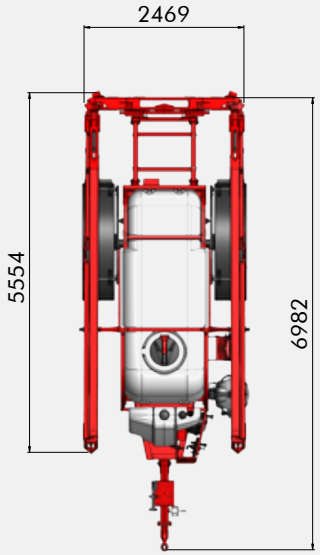
Each unit is shipped with a "red box" of relevant documentation, manuals, controllers, special components, safety chains etc.

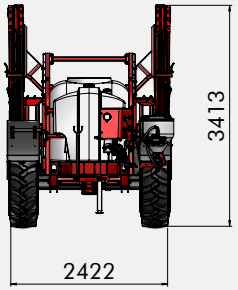
SECTION 3

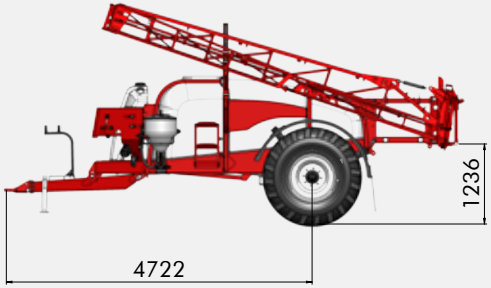
PRODUCT IDENTIFICATION, SHIPPING & SPECIFICATION

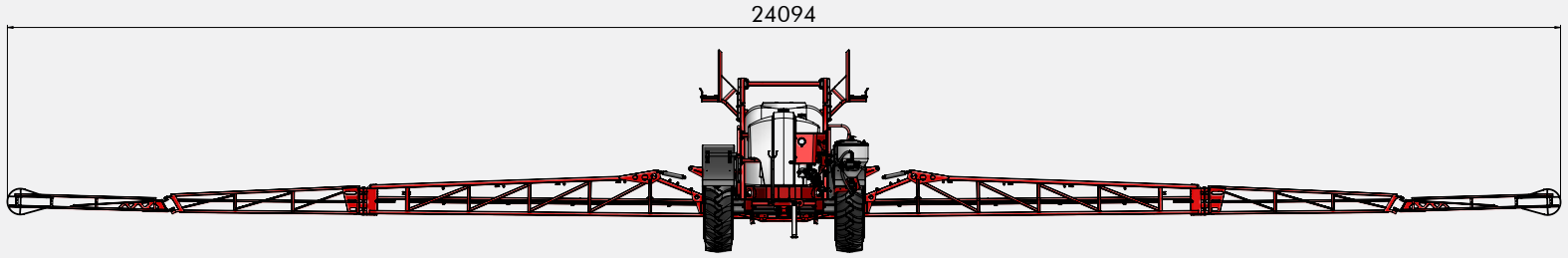
Machine specifications are subject to change without prior notification

DIMENSIONS - PINTO 4000







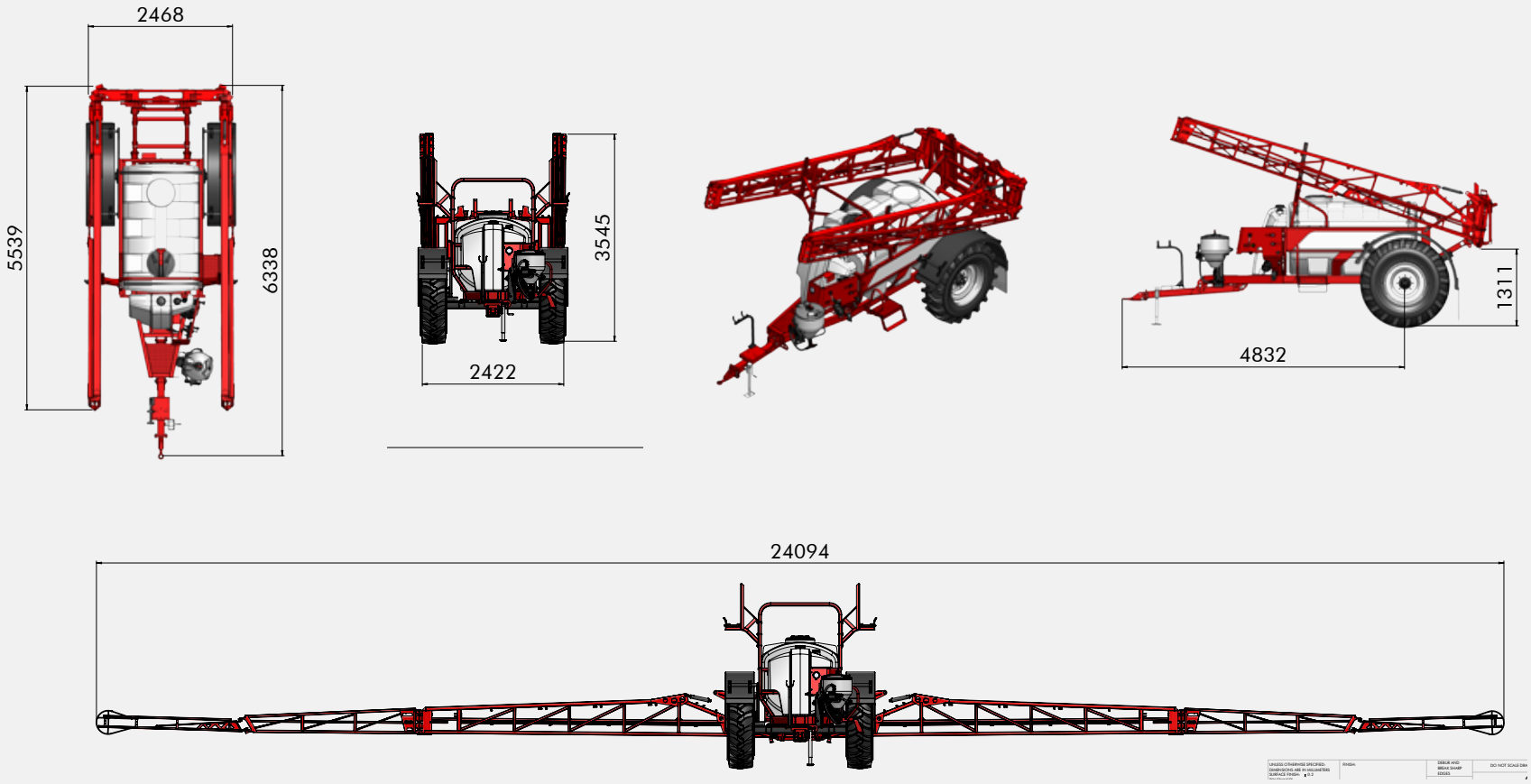


SECTION 3

PRODUCT IDENTIFICATION, SHIPPING & SPECIFICATION

Machine specifications are subject to change without prior notification

DIMENSIONS - PINTO 3000



SECTION 3

PRODUCT IDENTIFICATION, SHIPPING & SPECIFICATION

Machine specifications are subject to change without prior notification

SPECIFICATIONS

Tanks

All tanks are constructed of impact-resistant polyethylene and UV stabilized.

Main tank capacities of 3,000 or 4,000 Litres and feature ...

- Flip open filling lid with large basket strainer.
- Quick fill system (camlock direct fill).
- Calibrated sight tube for filling level indication.
- Drain completely via a large drain valve and sump - (3000 models uses a pull drain valve).
- Both models are supplied with a 275 Litre fresh water "Flushing" tank.
- Both models are supplied with a 15 Litre Hand-wash / Freshwater tank with conveniently positioned tap as a part of the operator's panel.

Chassis

Strong, solid fabricated chassis designed for maximum durability and reliability. Height adjustable hitch design, "wide-rail" chassis for superior strength and ride.

The 4000 model uses vertical side rail supports for the tank and parking bracket; the 3000 model uses horizontal side rail supports for the tank.

Adjustable, cast swivel eye and safety chain.

Heavy duty, adjustable jacking stand

Axles & Wheels

The **Pinto 4000** model features a standard axle with trailing arm rubber mount suspension (shown below) or a smoother ride and improved boom stability.

Fitted with 18.4 x 30 in. single wheels and tyres, mudguards and mudflaps. Optional 18.4 x 38 wheels, (BT-SW3).

The **Pinto 3000** model is fitted with single fixed axle. Optional axle – trailing arm rubber mounted suspension (BT-ASTR).

Fitted with 18.4 x 30 in. single wheels and tyres, mudguards and mudflaps.

Booms

16, 18, 21 and 24 metre hydraulic fold boom – designed for smoother, more accurate spraying and long life.

- Hydraulic accumulator suspension system protects the boom and improves the boom ride.
- 1500mm hydraulic parallelogram lift.
- Self-leveling is standard.
- Adjustable boom breakaways with 90° self-returning boom ends. Boom hydraulically side-folds and locks for transport.
- Nozzle protection, boom skids and wing tip protection are standard.
- Chemical and corrosion resistant finish.

SECTION 3

PRODUCT IDENTIFICATION, SHIPPING & SPECIFICATION

Machine specifications are subject to change without prior notification

Pump

AR160 pump is standard on all models.

Positive displacement, oil bath diaphragm pump with chemical resistant diaphragms. 166 L/min, maximum pressure 15 Bar / 217 psi. Optional AR250 (20 Bar).

PTO drive is standard. Optional hydraulic drive (with flow controls) in lieu of PTO drive.

Agitation

The generous 160-litre/min diaphragm pump provides excellent bypass agitation to the front of tank plus a "Superflow" agitator at the rear of tank.

Spray Sections & Nozzles

Supplied Standard with 3 spray sections (Left, Centre & Right) plus left and right fence line nozzles.

Plumbed with 1/2" stainless steel boom tubes, fitted with non-drip, quick-release single nozzle bodies every 50cm.

Fitted with drift reducing Agrotop AirMix® low pressure air-induction nozzles, 110° #02 (yellow).

Filtration

4 filtration points:

- Basket 18 mesh
- Suction 50 mesh
- Pressure 80 mesh
- Boom in-line 100 mesh

Controls

Easy to use operator control station fitted with rotary selection valves.

Fill, probe, chemical induction, agitation, spray, rinse and flushing operations are all actioned via the control panel.

Pressure manifold with master pressure regulator, dump, servo, pressure filter & flowmeter are a part of the panel.

Chemical handling

Integrated suction probe transports chemical directly into the tank without putting neat chemical through the pump.

60 litre Chem-e-Flush induction hopper is standard and delivers chemical directly into the tank.

Controllers & Sensors

- Bravo 180S automatic, 3-section spray controller.
- Hydraulic switch-box for boom control options.
- Wheel based proximity sensor for travel speed.

FACTORY FITTED OPTIONS

- Both models are ISOBUS compatible, and compatible with Trimble, Topcon and Greenstar
- Atlas GPS for travel speed
- AR250 pump in lieu of AR160
- Hydraulic drive for AR160 pump / AR250 pump
- Electric Fenceline kits
- Independent outer wing lift fold
- 5 & 7 section boom plumbing

Refer Broadacre buyers guide for the complete list of options.

TRACTOR REQUIREMENTS

Tractor size / power required is dependent upon a combination of tractor weight, sprayer weight (with full tanks), boom size, farm conditions (soil and terrain) and road (or inter-farm) travel requirements.

As a general rule, under ideal conditions, the gross sprayer weight should not exceed 150% of the gross tractor weight and the tractor front axle weight should not be less than 20% of gross tractor weight ... (refer New Zealand Agricultural Vehicles Guide 2017).

Determining the correct tractor should be done in consultation with the tractor dealer.

Minimum tractor hydraulics required;

- Std sprayer = 20 L/min,
- hydraulic driven AR160 = 30 L/min and
- hydraulic driven AR250 pump = 48 L/min.

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

BOOMS

Booms

16, 18, 21 and 24 metre hydraulic fold boom – designed for smoother, more accurate spraying and long life.

- Self-leveling is standard.
- Fully adjustable boom breakaways with 90° self-returning "breakaway" boom ends. Boom hydraulically side-folds and locks for transport.
- Independent outer wing lift fold.
- Optional hydraulic wing lift.

Wing tip and skid protection standard on all booms.

Parallelogram boom lift, 1500mm

The hydraulic boom lift provides smooth height control, so the correct spraying height is always at the operator's fingertips.

Boom function switch box

Arag multi function switch box is used for higher end hydraulic boom fold and lift functions. Refer section 5 for operation.

Plumbing

On centre, 1/2" stainless steel tube nozzle rails with boom flushing taps fitted to all boom sections.

Standard plumbing is 3 section with 5 sections available as an option. Protected nozzle bodies with AirMix® 02 nozzles on 500mm spacing. Also refer p. 28.

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

PINTO 4000 MODEL

The 4000 Litre Main tank is constructed of translucent, UV stabilized, impact-resistant polyethylene.

Fitted with ...

- Calibrated level indication clear sight gauge hose with float
- Large flip open lid with basket
- T-bar tie downs
- Ball valve drain

Do not use this lid as a fill point unless the operator has a purpose-built platform to allow safe access to the lid.

The main tank lid sits within a spill containment recess with excess draining to the right side of the sprayer away from the operator's panel (refer image next page).

The photo below shows the rear agitator and tank rinse nozzle. These functions are activated from the control panel.

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

Both the 275 litre Flushing and 15 litre Hand-wash tanks (shown below) are constructed of translucent, UV stabilized, impact-resistant polyethylene fitted with breather equipped lids. Note both tanks should ONLY be filled with clean, fresh water.

The Hand-wash tank (filled via the breather lid) is plumbed to a tap mounted to the control panel.

The axle used on the 4000 model features rubber suspension with shock absorber and a stroke limiting chain.

The 4000 models are fitted with fold down steps and grab rail to allow visual inspection to the top of the sprayer, tank lids, LH parking bracket etc.

Shown below in the folded up / parked / stowed position. The steps should always be stowed in the up position before proceeding to spray.

Note the rubber bump stop latch (circled).

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

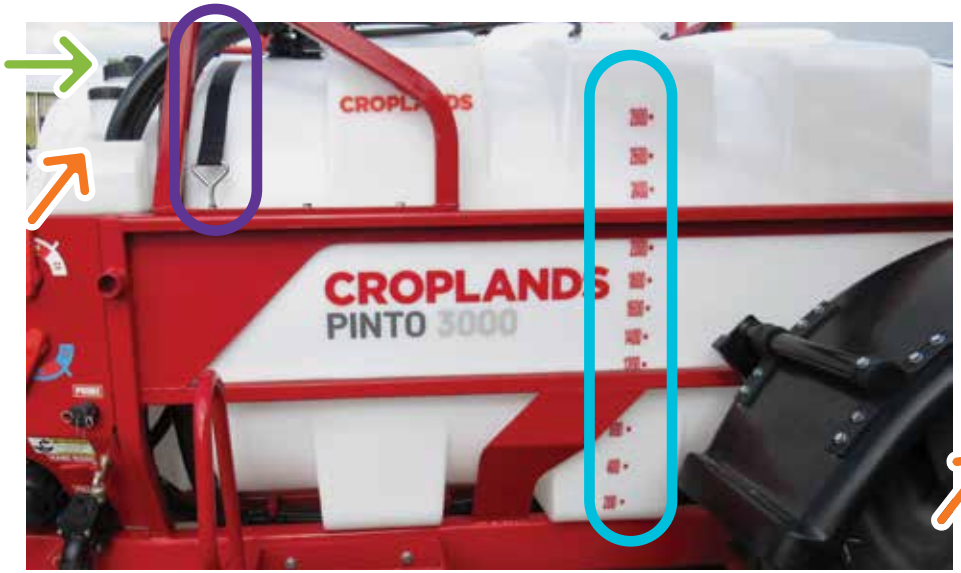
PINTO 3000 MODEL

The 3000 Litre Main tank is constructed of translucent, UV stabilized, impact-resistant polyethylene.
Fitted with ...

- Calibrated level indication marks on the tank side **(blue rectangle)**
- Large flip open lid with filter basket. (same as 4000 model)
- Strap tie downs, front & rear. Front shown **(purple rectangle)**
- Pull drain system (**red arrow** - refer next page)

Both the 275 litre Flushing **(green arrow)** and 15 litre Hand-wash tanks **(orange arrow)** are constructed of translucent, UV stabilized, impact-resistant polyethylene fitted with breather equipped lids.

Note both tanks should ONLY be filled with clean, fresh water.



SECTION 4
PRODUCT FEATURES/FAMILIARISATION

The pull drain handle is located towards the front left hand side of the main tank in a position that can be accessed from the steps.

Not shown are the rear agitator and tank rinse nozzle. These functions are activated from the control panel.

Fixed steps and grab rail to allow visual inspection to the top of the sprayer, tank lids etc, as shown below.

The 3000 model uses a fixed axle.

Optional rubber suspension with shock absorber and a stroke limiting chain.

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

PUMP

Croplands Pinto sprayers use quality AR pumps.

The Annovi Reverberi (AR) range of reliable and robust diaphragm pumps have been industry leaders for more than 60 years and have partnered with Croplands for more than 40 years.

The standard pump for all Pinto's is the AR160 ... a positive displacement, oil bath diaphragm pump with chemical resistant diaphragms – maximum flow 166 L/min, maximum pressure 15 Bar.

AR pumps come fitted with an identification label with extra information re ...

- Model number
- Serial number
- Maximum rpm
- Pressure and flow ratings
- Oil type

For "standard" models the pump is driven via a PTO shaft connection to the tractor. Details of this shaft can be found in the Warranty booklet, specification page. Normally supplied is the SH4AG /1200 PTO driveshaft with safety covers and quick release pins.

A separate manual is supplied with each shaft.

Refer section 5 re set-up of the PTO shaft between tractor and pump.

Available as an option;

Hydraulic drive with flow control valve for AR 160 pump - in lieu of PTO drive. Refer to section 5 re set-up.

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

SPRAY CONTROLLERS

Arag, Bravo 180S automatic, 3-section spray controller as standard. Optional 5 and 7 sections.

SPRAY CONTROLLER OPTIONS

BT-B180	Bravo 180S auto rate controller (3 section / optional 5 & 7 sections).
BT-GSIP	Green Star loom option (no console or module supplied)
BT-JD2000	Adapter loom to suit JD RC2000 module (no console or module supplied)
BT-TRIMFIQEL	Trimble ready option. Field IQ module included. No console, cables to drawbar only.
BT-ISOBUSARAG	ARAG IBX ISOBUS interface (no console supplied with this option)
BT-ISOBUSRAVRCM	Raven RCM ISOBUS interface (no console supplied with this option).

RCM modules etc are generally mounted to the back face of the control. Raven example shown.

Refer to Section 6 for more information re spray controller operation.

Models prior to September 2023 used the BA5000 spray controller.

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

PLUMBING SYSTEM OVERVIEW

The control panel is at the heart of the sprayer operations / plumbing system. It controls filling, agitations, chemical induction, spraying and flushing.

If handling chemicals (probe, fill or filters), always wear the appropriate PPE (personal protection equipment).

A Always ensure the HAND-WASH tank is filled with fresh-water before any other actions. The tank is connected to the tap (A) on the panel.

Fill Circuit

B The FILL valve is used to select the Main tank - or Flushing tank to be filled from an external source.

C Fill is preferably via the 2" camlock fitting at the bottom of the panel.

Refer to Section 6 (Spray Operations) re adding chemical.

- Make sure the main tank drain tap is closed before filling.

An alternative fill method is via the main lid, however this is not recommended as the fill point is above the operators head.

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

Suction Circuit

D The SUCTION SELECTION valve is used to determine the water source / supply to the suction side of the pump (**yellow arrow** below).

Fresh water from the Flushing tank to the left and spray chemical from the Main tank (as shown below) to the right.

E The Suction FILTER is plumbed between the Suction valve and the Pump. Blue 50 mesh filter.

Pressure / Spray Circuit

The pressure (spray) circuit begins with the output side of the pump (**pink arrow** below), and onto ...

F The master / MANUAL PRESSURE REGULATOR (PRV) is used to set the overall maximum pressure - usually set 10 ~ 15% above the maximum spraying pressure. Maximum working pressure should not exceed 7 Bar.

Refer to Section 5 for re setting the pressure.

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

Pressure / Spray Circuit Cont ...

G Downstream (to the left) from the manual PRV is the PROBE tap. To the right of the panel is the Probe connection via camlock fitting. Refer to Section 6 for more information re probe operation.

H The AGITATOR tap is adjacent the probe tap. The sprayer is equipped with a single rear agitator. Further agitation is achieved via the pressure relief bypasses.

Shown below in the ON position (probe is off).

Refer to Section 6 for more information re agitator operation.

Next in the pressure circuit is the rotary Function valve - refer I, J, K & L.

- OFF
- Tank Rinse
- Chem-e-flush and
- Spray

I The rotary Function Valve when set to the OFF position (refer to photo below) will bypass flow back to the main tank. Note, if the probe and / or agitators taps are on, they will be active but ineffective, hence they are usually turned off.

J The rotary Function Valve when set to the TANK RINSE position (refer to photo below) will send flow to the spinning tank rinse nozzle positioned in the middle of the tank. Note, if the probe and / or agitators taps are on, they will be active but ineffective, hence they are usually turned off.

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

K The rotary Function Valve when set to the CHEM-E-FLUSH position (refer to photo below) will send flow to the chemical hopper.

Note, if the probe and / or agitator taps should be turned off as leaving them on may significantly slow down the Chem-e-flush's performance.

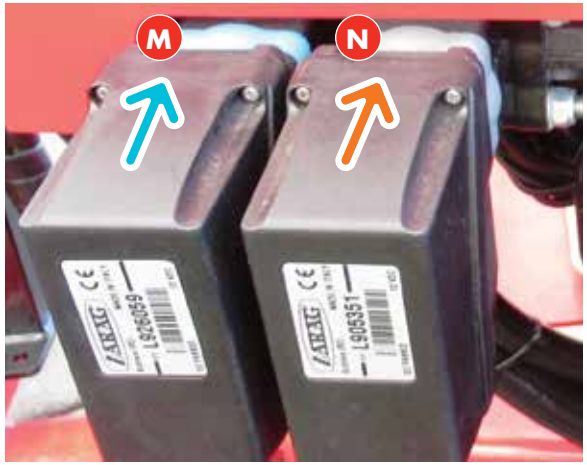
Refer to Section 6 for more information re Chem-e-flush operation.

L The rotary Function Valve when set to the SPRAY position (refer to photo below) will send flow to the Spray Control Manifold (refer next column).

Normal spray practice is to leave the agitator on and probe off.

The Spray Control Manifold comprises of the "dump" (M), PRV "servo" (N), pressure filter (O) and flow meter (P). From there the flow is routed to the spray section valves at the rear of the sprayer (Q) - refer page 27.

M The "dump" valve is a fast acting motor valve which when activated releases flow back to tank which stops spraying. The valve is identified by a blue band (as per the photo below).



N The "servo" valve is a slow acting (7 second) motor valve which operates as a pressure regulating valve. The valve is identified by a grey band (as per the photo above).

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

O The pressure filter body has a colour coded identification dot (circled) re the screen mesh size.

As pictured below, the yellow dot denotes a (yellow) 80 mesh filter screen.

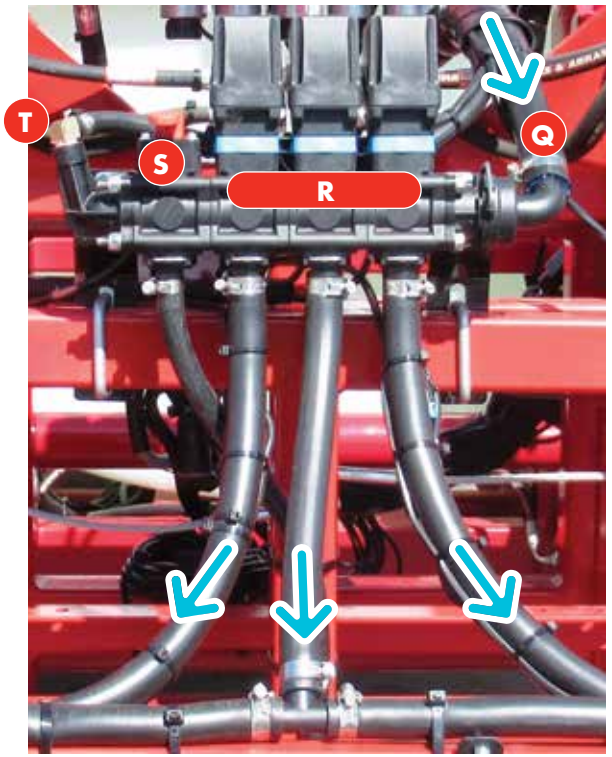
Always operate the filter's "self-cleaning" drain valve before opening the main filter body.

P Note the calibration number written on the flow meter (in the example below, it's 239). Refer to Section 7 for more information re the flowmeter.

Spray Circuit

Mounted at the rear of the sprayer, to the boom's centre section are the Boom (spray) Section valves - supplied via a hose (Q) from the spray control manifold (at the control panel).

R Standard boom configuration is 3 sections (Left, Centre and Right).



SECTION 4
PRODUCT FEATURES/FAMILIARISATION

Pictured below is the (optional) 5 section boom manifold.

S The boom section manifold is equipped with a "red" tap for the purpose of flushing / draining the manifold to enable cleaning boom line filters.

T The final connection is to the hose feeding the pressure gauge **U** installed at the front of the sprayer's control panel.

V At the rear of the pressure gauge / inside the control panel is a tap which should be activated on a regular basis to drain & clean this (dead ended) line to the gauge.

W The hose from section valve to each nozzle rail is fitted with a (green) 100 mesh filter.

X The boom is fitted with 1/2" stainless steel spray rails.

Y Fitted to the boom tubes, at 500mm spacings is a single (TeeJet) nozzle body using a 10mm nib.

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

Each nozzle body is fitted with a 0.7 bar diaphragm check valve. Standard with AirMix® 02 nozzles + cap & seal.

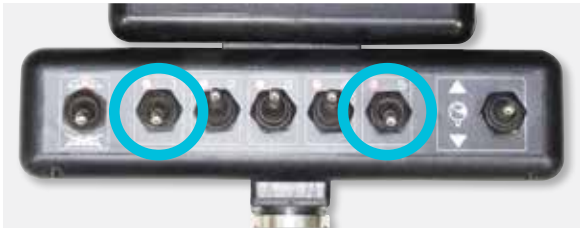
Y At the end of each nozzle rail is a drain tap and elbow. These are a vital part of boom flushing.

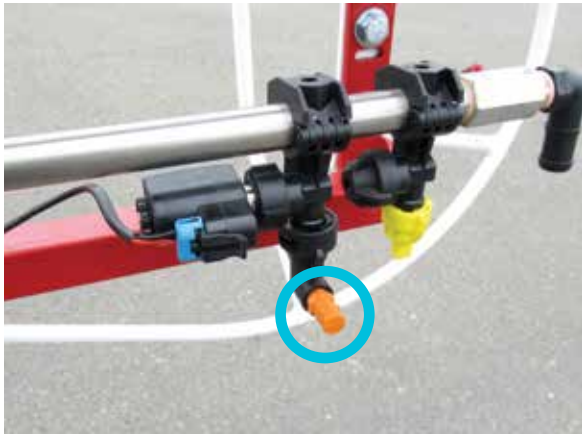
That completes the pressure / spay circuit.

FENCELINE NOZZLES

Dual fenceline nozzles are fitted as standard equipment. Electric actuation, using an off-centre nozzle.

With standard 3 section plumbing, the fencelines are actuated from the outer left & right (section) 1 & 5 switches. Shown below in the off (down) position.





SECTION 4
PRODUCT FEATURES/FAMILIARISATION

BT-XRT
Optional

Raven XRT 5 sensor radar based boom leveller system.

BT-LOADSENSE2
Optional

Load sense hydraulics for boom functions includes additional hydraulic block.

Refer to page 40 re different hydraulic systems

BT-LIGHTKIT
Optional

Trailer Light Kit connects to the round trailer plug available on most tractors.

BT-NORAC
Optional

Norac 5 sensor sonic based boom leveller system

BT-VISIO-LEVEL
Optional

Electronic tank level indicator with in cab VISIO display for when standard Bravo 180S has been ordered.

BT-LED
Optional

Two Blue LED Lights fitted across boom with individual switch-box

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

AGRUNNER 12-VOLT, FILL PUMP

Optional

AgRunner chemical transfer unit for easy and accurate chemical transfer.

12-volt chemical transfer pump complete with Micromatic couplings to hopper and drum fittings.

Refer to page 127 for the coupling information.

TRIPLEX NOZZLES

Optional

Triplex nozzles fitted with 02, 025 and 03 nozzles.

WHEEL OPTIONS

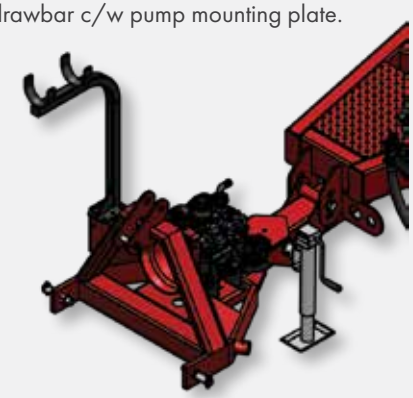
Optional

BT-SW3, 18.4 x 38 wheel option (4000 only)

BT-SDB

Optional

Self steering drawbar c/w pump mounting plate.



BT-ASTR, AXLE SUSPENSION

Optional

Pinto 3000 only.
Axle Suspension - trailing arm rubber mounted

BOOM OPTIONS

BTOWFGV	OUTER WING FOLD FOR WING LIFT BOOM
BTOWF	OUTER WING FOLD

SECTION 4
PRODUCT FEATURES/FAMILIARISATION

PUMP SPEED

The Pump speed option, via the below sensor, when using the Bravo 180S controller, will be displayed via a Visio display unit.

The Visio display unit requires a 12-volt connection and secure mounting in the tractor cab. It may be used with a multitude of options such as tank level display, pump speed etc.

HYDRAULIC PUMP DRIVE BT160H / BT250H

Optional

Hydraulic drive for AR160 or AR250 pump in lieu of PTO drive with flow control valve, RPM sensor.

5 OR 7 BOOM SECTIONS

3 Boom sections is standard - supplied with a 5 section controller.
Optional 5 boom sections (shown below) - uses the same “standard” controller.
Optional 7 boom sections also requires an upgrade to the 7 section controller.

SECTION 5
HOOK-UP & SPRAYER SET-UP

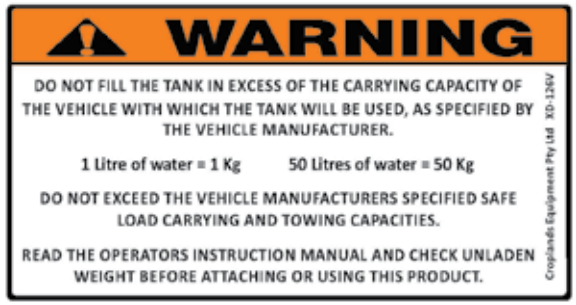
SECTION 5
HOOK-UP & SPRAYER SET-UP

From arrival on farm, hook up and prepare the sprayer for operation.

SAFETY FIRST

Before progressing further,

- Read and understand the Safety Manual (part no. GP-SAFE-A) supplied with this sprayer.
- Read and understand this manual to better familiarise yourself with the sprayer.
- Ensure the tractor to be used to tow this sprayer is fit for purpose (tow ratings etc). If in doubt consult the tractor dealer/manual. Also refer to page 13 re specifications.



HOOK UP

The sprayer has been fully tested before leaving the Croplands factory. Some components will require further assembly after shipping from the factory/dealer;

Always connect the sprayer in a parked horizontal position and on firm, level ground. Use wheel chock's if required.

1. Determine the correct hitch etc
2. Adjust Drawbar heights
3. Connect to the tractor
4. Add safety chains
5. Once the sprayer is connected to the tractor always ensure the jacking stands are removed or (if applicable) folded to the horizontal position before moving
6. Connect PTO Shaft (if fitted)
7. Connect the hydraulics
   a. Hydraulic hose colour codes
   b. Standard (base model)
   c. Electric / Hydraulic valves (if fitted), and ...
   d. Hook up boom function switchbox
   e. Connect Pump hydraulics (if fitted)
   f. Open / Closed centre hydraulic systems
8. Electrical connections (controller, lights etc)

1. HITCH TYPE

The **Pinto 3000** sprayer uses a 6 bolt tow eye connection. If requires height can be adjusted up by one hole, or via flipping the assembly 180 degrees. Recommended nut torque - 504 Nm

The drawbar uses a bolt-on 45mm swivel tow eye, hence the drawbar pin should not be less than 33mm diameter.

3000 Hitch - 3 bolts per side

The **Pinto 4000** sprayer uses an 8 bolt tow eye connection. If required, the height can be adjusted by flipping the assembly 180 degrees. Recommended nut torque - 504 Nm

The drawbar uses a bolt-on 50mm swivel tow eye, hence the drawbar pin should not be less than 38mm diameter.

SECTION 5
HOOK-UP & SPRAYER SET-UP

4000 Hitch - 4 bolts per side

2. ADJUST DRAWBAR

Adjustments may be necessary to match the tractor and sprayer drawbar requirements

As can be seen in the photo below, the drawbar has 3 height adjustment positions. Default position is in the middle.

Check the tractor and sprayer are on level ground.

For the **Pinto 3000**, level is when the tank side rails are horizontal / tank contents can fully drain.

For the **Pinto 4000**, level is when the parking bracket uprights are vertical.

Make the necessary drawbar adjustments to achieve the required alignment - matching the tractor's drawbar connection. Until the sprayer is connected, always use wheel chocks on the sprayer, moving the tractor (not the sprayer) as required for alignment.

To adjust the height of the hitch:

a. Use a jack to support the front of the Pinto chassis and then, remove the hitch height adjustment bolt **(blue circle).**

b. Raise or lower the Pinto chassis using the support jack until the correct (hole) height is reached.

c. Replace and tighten the hitch height adjustment bolt.

3. CONNECT TO TRACTOR

Connect to the tractor drawbar using the correct diameter drawbar pin.

Insert & lock the drawbar pin in position ensuring it cannot come out while transporting or operating.

4. SAFETY CHAIN

Each unit is shipped with safety chain + shackles - note the sprayers shackle connection point **(purple circle)**. Ideally the chains should cross over (left side of sprayer to right side of the tractor etc).

5. JACKING STAND

The jacking stand must be stowed in the horizontal position, or removed, after the sprayer has been hitched to the tractor.

SECTION 5
HOOK-UP & SPRAYER SET-UP

6. CONNECT PTO SHAFT (IF FITTED)

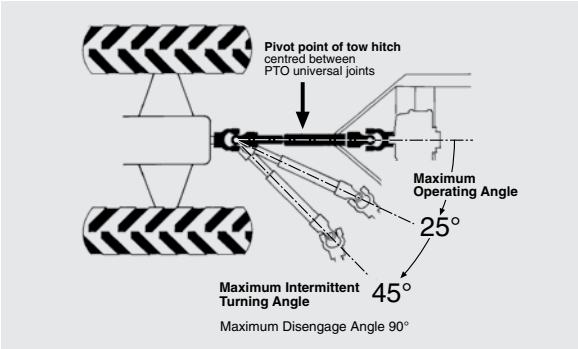
Follow the instructions below to fit the PTO shaft onto the Pinto after transit

NOTE

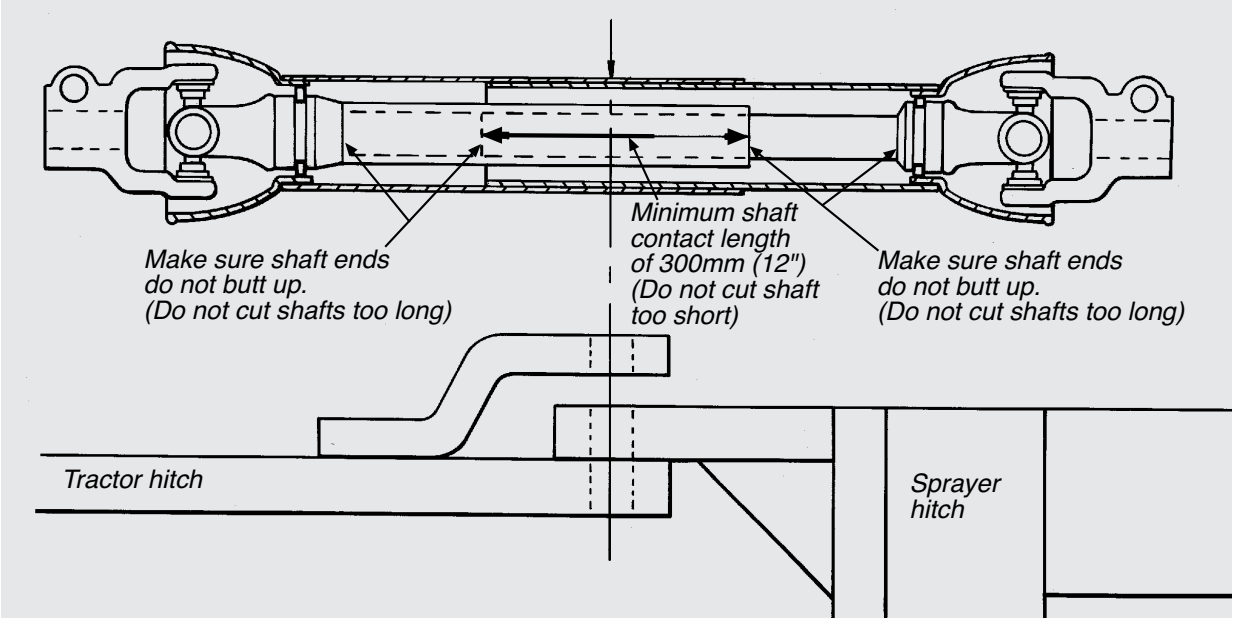
Incorrect hitching of PTO shaft will result in excessive pump vibration and damage to the pump.

NOTE

IMPORTANT: Do not allow more than 10% difference in the two halves of drawbar length. If more than 10% difference occurs, a wide angle shaft must be used.



Standard PTO Operating Limits



On Standard PTO shafts, the drawbar pin connecting the tractor & Pinto should be centred between the two universal joints of the PTO shaft

SECTION 5
HOOK-UP & SPRAYER SET-UP

Fitting the PTO shaft

A new standard-length PTO shaft is supplied with the sprayer. In most cases this will require cutting to a shorter length - specific to the tractor & sprayer dimensions.

Note for new installations, the dealer will oversee the fitting of the new shaft.

Follow the instructions below to fit a PTO shaft onto the sprayer. Also refer to the user manual that is supplied with every new PTO shaft.

A. Remove the PTO shaft which is strapped to the Pinto frame.
B. Check the PTO shaft has not been damaged in transit.
C. Measure and fit the PTO to the Pinto ensuring the locking pin is correctly located. Make sure you read and understand "The important factors for fitting the PTO shaft" on the next column.
D. Grease the universal joins and telescoping shafts.
E. Fit the PTO to the Pinto ensuring the locking pin is correctly located.
F. Before operating the drive shaft, be sure that all safety guards are in place.

Important Factors when Fitting the PTO Shaft

The following three factors must be correct to avoid pump damage and maximise PTO operating life:

- When travelling straight ahead, the point at which the sprayer drawbar pin is joined to the tractor should be halfway between the universal joints of a Standard PTO shaft, as illustrated.

  The tractor is then able to make maximum turns with minimal bending of the universals.

- When the tractor is towing the sprayer straight ahead, the two telescopic sections of the power take-off shaft are at maximum extension.

  When turning or crossing an inversion, the telescopic shaft sections close up.

CAUTION

Ensure that the drive shaft is the correct length to avoid any "butt up" damage to the pump.

- The height difference between the tractor PTO spline and the PTO spline of Pinto should not be more than 100mm.

  This ensures PTO joint angles are approx equal and do not exceed limits. If greater than 100mm, a wide angle (constant velocity) PTO should be used.

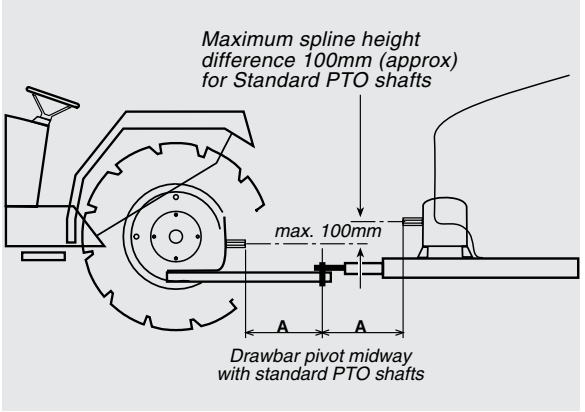
CAUTION

Pump warranty is not valid for damage caused by incorrect PTO shaft mounting.

Heed the Operating Limits of the Standard PTO Shaft

The standard Pinto is fitted with a STANDARD PTO shaft.

The maximum intermittent turning angles of the Standard PTO shaft is only recommended where should not exceed 45° turning angle of the PTO.



Standard PTO Operating Limits

SECTION 5
HOOK-UP & SPRAYER SET-UP

7. CONNECT HYDRAULIC HOSES TO THE TRACTOR

A. Hydraulic hose information

Every Pinto will have at least one set of hydraulic hoses that require connection to the tractor.

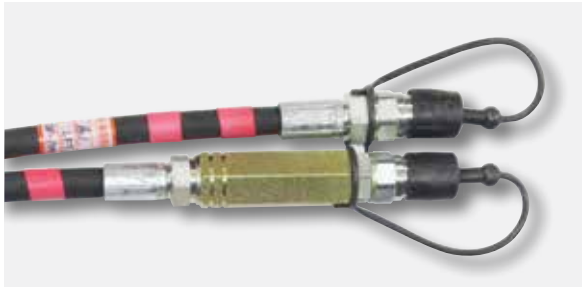
The hoses are banded and colour coded as per all Croplands Broadacre sprayers - refer below.

- **Pressure** hoses to have **two colour bands**.
- **Return** lines to have **one colour band**.

Blue	= FILL PUMP
Red	= FOLD or ELEC/HYD
Yellow	= Product Pump
White	= Lift

Note the return lines (single colour band) are fitted with one way valves to prevent reverse flow hook-up.

It's suggested the tractor remotes should also be identified / tagged to ensure consistent connection / reconnection



B. Standard (base) model

The standard Pinto boom provides simultaneous unfolding of boom sections (red band hoses) and hydraulic lift adjustments of boom height (white band hoses) via direct connection to tractor remotes.

C. ELECTRIC / HYDRAULIC valves

If your sprayer is fitted with wing-lift, and/or independent outer wing fold, the hydraulic system on the sprayer uses electric over hydraulic (CETOP) valves to enable all boom functions to be operated from one set of hydraulic remotes.

Connect hydraulic hoses to the tractor remotes.

CETOP valves are mounted to the parallelogram centre frame.

Connect the red banded hydraulic hoses to the tractor remotes.

The hydraulic connection to the CETOP valve block is shown above in the **yellow circle.**

DIN plug connectors **(yellow arrow)** from the multi function switch box (refer next page) are connected to each individual function.

WARNING

ALWAYS double check that hydraulic return lines are properly connected before engaging hydraulics. Failure to comply with this instruction can lead to catastrophic hydraulic failure.

SECTION 5
HOOK-UP & SPRAYER SET-UP

D. Hook-up boom function Switch-box

The Boom Function Switch-box is fitted to all Pinto models with wing-lift, and/or independent outer wing fold boom functions and hence also fitted with the CETOP electric/ hydraulic block (refer previous page).

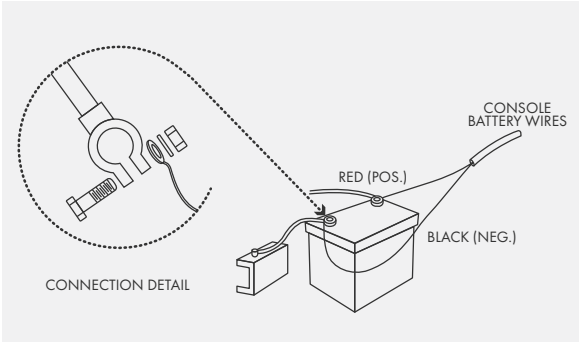
- Confirm the **(red band)** hydraulic hoses are connected to the tractor remotes.
- Connect the switch-box plug to tractor side plug. Both sides are identified with a red cable tie.
- Install the switch-box in the cab, in a suitable location.
- Connect the switch-box power leads to a suitable power source. Also refer to page 42

  Where possible, connect to the 12-volt tractor battery, or alternatively to the in-cab auxiliary power source.

Note the auxiliary source must be rated for a minimum of 10 amps, and only be active in-line with ignition switching.

WARNING

Prior to operating the boom hydraulics, ensure sprayer tow hitch is securely connected to the tractor drawbar.



Refer to page pages 50 ~ 51 for testing & confirming the hydraulic boom functions.

Double check for any boom locking device before operating.

SECTION 5
HOOK-UP & SPRAYER SET-UP

E. Connect Pump hydraulic drive (if fitted)

If the pump is fitted with a hydraulic pump-drive, connect the (yellow band) hydraulic pressure and return lines to the tractor remotes. Refer next page re hydraulic systems.

The pump will have been tested and pre-set at the factory to run at 540 rpm. However this can vary from tractor to tractor and should be checked upon delivery.

NOTE

Consult your Croplands dealer if you require assistance with determining pump RPM. The dealer will be able to calibrate this using an RPM meter or tachometer.

NOTE

Please read the following page to ensure your know if your tractor has open or closed centre hydraulics. This is very important to ensure your pump drive works correctly.

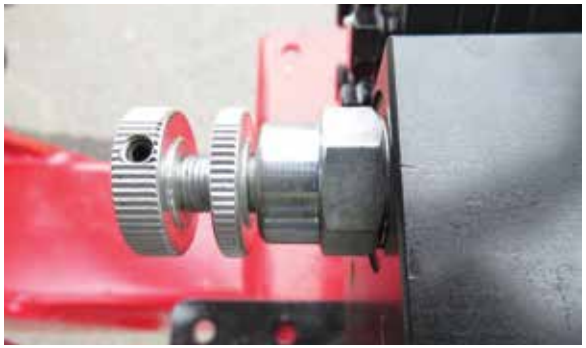
F. Open Centre System

To set the pump rpm....

a. Set the speed flow control to slower than expected.

- Loosen the locking nut and wind the valve out (anti clockwise) to the fully open / maximum speed position. Then ....
- Wind the valve in (clockwise) x 2 full turns. This should be a slower than required setting.

This must be done prior to engaging the tractor hydraulics. Note this valve can sometimes be difficult to adjust when powered up.



b. Power up the tractor to a fast idle and engage the pump's hydraulic remotes. Confirm the pump is operating.

Note the spray mode must be set to "HOLD".

c. Slowly bring the tractor rpm up to normal operating speed whilst monitoring the pump speed.

d. Slowly turn the flow control valve anti-clockwise until the desired RPM of the pump is reached. Re-lock.

Pump speed MUST NOT exceed 540 rpm.

If the sprayer is not fitted with the Pump Speed option (refer page pages 20 & 31), the speed can be checked using a digital tachometer as shown above.

SECTION 5
HOOK-UP & SPRAYER SET-UP

G. Closed Centre System

To set the pump rpm....

Leave the control valve open on the pump and adjust from the tractor hydraulics to achieve the desired speed.

Pump speed MUST NOT exceed 540 rpm.

NOTE

Please read the following page to ensure your know if your tractor has open or closed centre hydraulics. This is very important to ensure your pump drive works correctly.

H. BT-LOADSENSE2

Load sense hydraulics for boom functions is available as a boom functions option.

Open Centre vs Closed Centre Hydraulics

For the best operation of your hydraulic drive diaphragm pump or hydraulic-drive filling pump, there are some adjustments that can be made by your dealer on your tractor hydraulics for best performance & lower heat generation to protect your tractor.

In general terms, there are three systems, which are described as follows:

Open Centre Systems

In an open centre system, the hydraulic pump on the tractor puts out a constant flow. If the pump puts out more oil than the hydraulic-drive motor can use, a portion of the oil must be bypassed around the motor.

When the oil is bypassed around a loop and does no work, the energy put into it by the pump turns into heat. Therefore, the amount of oil bypassed should be kept to a minimum.

Tractor adjustments may be necessary, i.e. limiting flow at the remotes ... consult your dealer if you are unsure.

Closed Centre (Pressure Compensated) Systems

The closed centre pressure-compensated system has a variable displacement pump which will deliver flow at the necessary rate to maintain a specified pressure.

It is best to have the pump operating at around 1800 to 2100 psi with the relatively low-flow hydraulic drive motor fitted to the Pinto (if fitted).

Tractor adjustments may be necessary, consult your dealer if you are unsure.

Closed Centre Load Sensing Systems (Flow and Pressure Compensating)

The closed centre flow-compensated system is a variation of the pressure compensated system, designed primarily for more efficient operation and the generation of less heat.

It works on the principle of maintaining a constant pressure drop from the pump to the work port of the selector valve.

Any variation in the demand at the motor will cause a change in flow.

The system senses this change in flow due to the change in pressure drop across the valve, and causes the pump to compensate by varying the pump flow.

No restricter is required in the pressure line and no oil is bypassed.

Check with your dealer to see if your tractor has this system.

SECTION 5
HOOK-UP & SPRAYER SET-UP

8. ELECTRICAL CONNECTIONS

Where possible, all electrical connections should be to the 12-volt tractor battery.

Alternatively to the in-cab auxiliary power source (not recommended for the spray controller).

- Must at least 10 gauge / 2.5 mm wiring, fused for a minimum of 10 amps, and only be active in-line with ignition switching.

Requirements may vary with options - always check with relevant manuals.

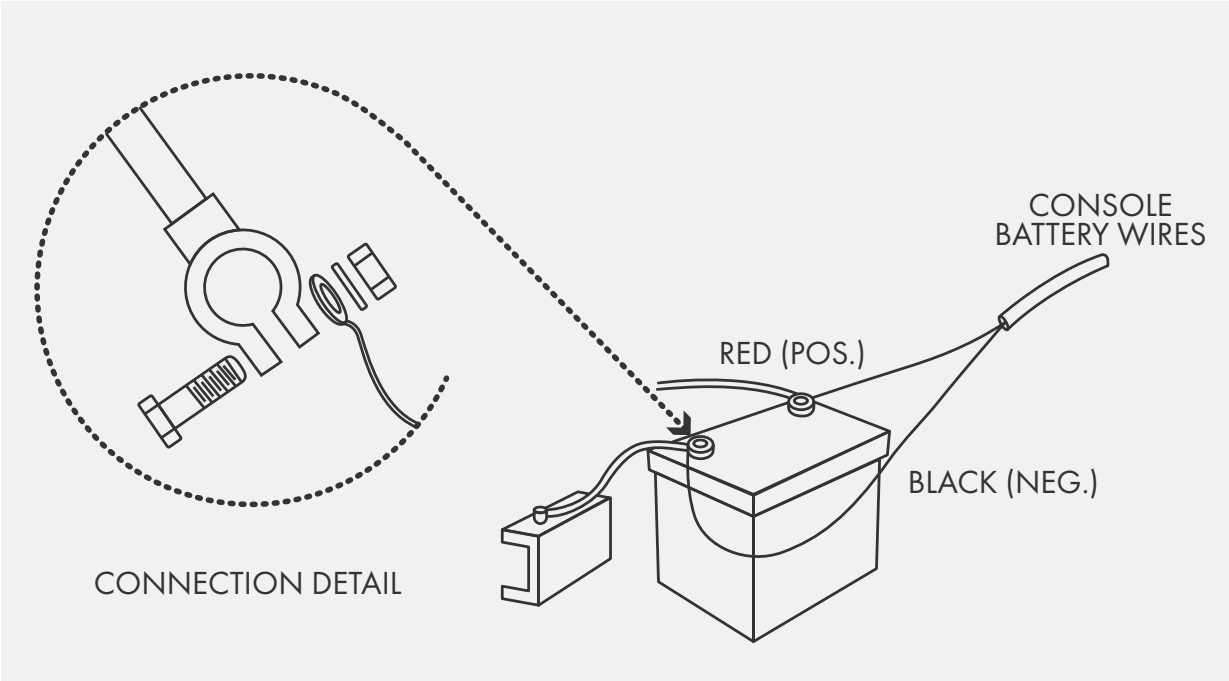
WARNING

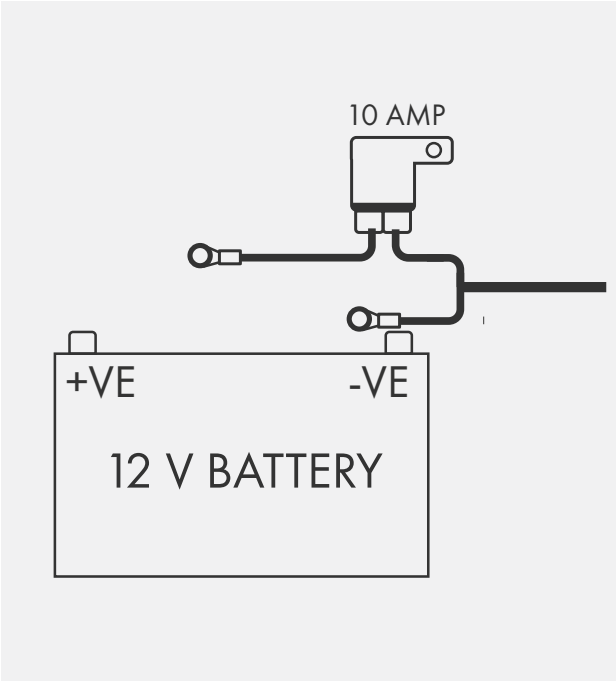
Make absolutely certain that:
- **Red leads are connected to the positive terminal, and**
- **Black leads are connected to the negative terminal.**

Damage can occur to units if power leads are reversed or incorrectly fitted.

NOTE

Only qualified persons should assemble / disassemble or service electrical equipment.





SECTION 5
HOOK-UP & SPRAYER SET-UP

a. Installing spray controller(s)

The Pinto is fitted standard with a BRAVO 180S, 3 section controller. Other options are available (refer to page 21).

Controllers are fitted and fully tested at the factory then disconnected and packed for transit.

NOTE

The supplied spray controller manual / operating instructions is dependent upon the model / options ordered.

Note Arag's BRAVO 180S #467180501 controller instruction manual is only available online. www.aragnet.com/EN/INT/246/products/?PRD=108671

To fit the Spray Controller

1. Unpack the Spray Controller and cables.
2. Place all switches in the OFF position (down).
3. Connect the wiring loom to the Spray Controller (Bravo 180S shown) - actual connections will vary from controller to controller.
4. Fit the Spray Controller console into the tractor cab in a convenient and safe location for the operator.

5. Connect and lock together the main loom / tractor side loom at the rear of the tractor. Ensure the wiring cannot interfere with the PTO shaft or any tractor functions.
6. Connect the power looms to the tractor's battery - connecting the red wire to the positive terminal and the black wire to the negative terminal (refer to previous page).

SECTION 5
HOOK-UP & SPRAYER SET-UP

b. Boom function switch box connection

Refer to page 38.

c. Connect LIGHTS / trailer plug

d. Connect all remaining electrical looms

As required / if applicable.
Refer to next section for start up / testing

UN-HOOK

Unhitching the Pinto from the Tractor.

To disconnect the Pegasus sprayer from the tractor, follow procedure as laid out below:

1. Ensure the booms arms are in the fully folded in position. **THIS IS IMPERATIVE FOR SAFE UN-HOOKING OF THE SPRAYER.**

WARNING

Boom arms MUST be in the folded position prior to un-hooking the sprayer. Failure to complete this operation correctly MAY result in INJURY or even DEATH.

2. Locate sprayer on level ground and chock wheels so that sprayer does not roll when drawbar pin is removed.
3. Fold down and pin the hitch jack. Adjust the height be baring some of the weight.
4. Disconnect and stow the PTO shaft (if fitted)
5. Remove the drawbar pin (or hitch link arms).
6. Ensure all electrical and hydraulic fittings are capped / protected from the weather and dust etc.

SECTION 5
HOOK-UP & SPRAYER SET-UP

BOOM SET-UP

Refer to Page 15 for a summary of boom features and options. Also refer to the 9 point checklist on page 50 re boom set-up.

The 16, 18, 21 and 24 metre hydraulically side-fold booms require adjustment for optimum operation and wear life:

The initial boom alignment has been carried out by the factory and checked by the dealer upon delivery.

All hydraulic boom (fold & lift) functions feature lock-outs to prevent creep.

Parallelogram style lift, with 1500mm range of motion uses hydraulic accumulator suspension. The accumulator is pre-set at the factory to 40 Bar. Refer to Croplands Technical support if requiring further assistance.

Trapeze style 'Self-levelling" is standard.

Adjustable boom breakaways with 90° self returning boom ends is adjustable.

Refer to page 51 re operating the boom.

The "standard" Pinto booms use a "Gull-Wing" fold with both the inner and outer arms folding in unison.

Sprayers fitted with the independent outer wing fold / CETOP block, use the more conventional outer fold before the main arm fold.

WARNING

Ensure there are no people, things or power lines within range of the spray boom when folding or unfolding.

NOTE

The initial boom alignment is carried out at the factory and checked by your dealer.

Photo shows main zones of boom adjustment

SECTION 5
HOOK-UP & SPRAYER SET-UP

All boom adjustments should be performed with the sprayer connected to the tractor, parked on flat ground and clear of obstacles / power lines etc.

1. Centre Section

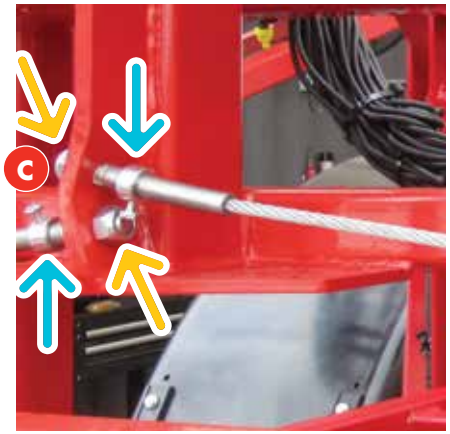
There are multiple adjustments points on the centre section of the boom.

Turnbuckle (A) is used to adjust the horizontal level the boom centre section. Adjust the centre section before adjusting the boom arms.

Note the left hand side is a fixed length rod (B).

(C) the cables of the balancing device must be near tight when parked. Adjust the nylock nuts (yellow arrow) to suit. Note these cable are loose in the open / spray position. The (blue arrow) locking nuts are to prevent an excess rod feeding through when cable is loose (boom open).

(D & E) The boom slide wear pads (left & right) need checking for wear and adjustment to suit. Must have free motion without being loose.



SECTION 5
HOOK-UP & SPRAYER SET-UP

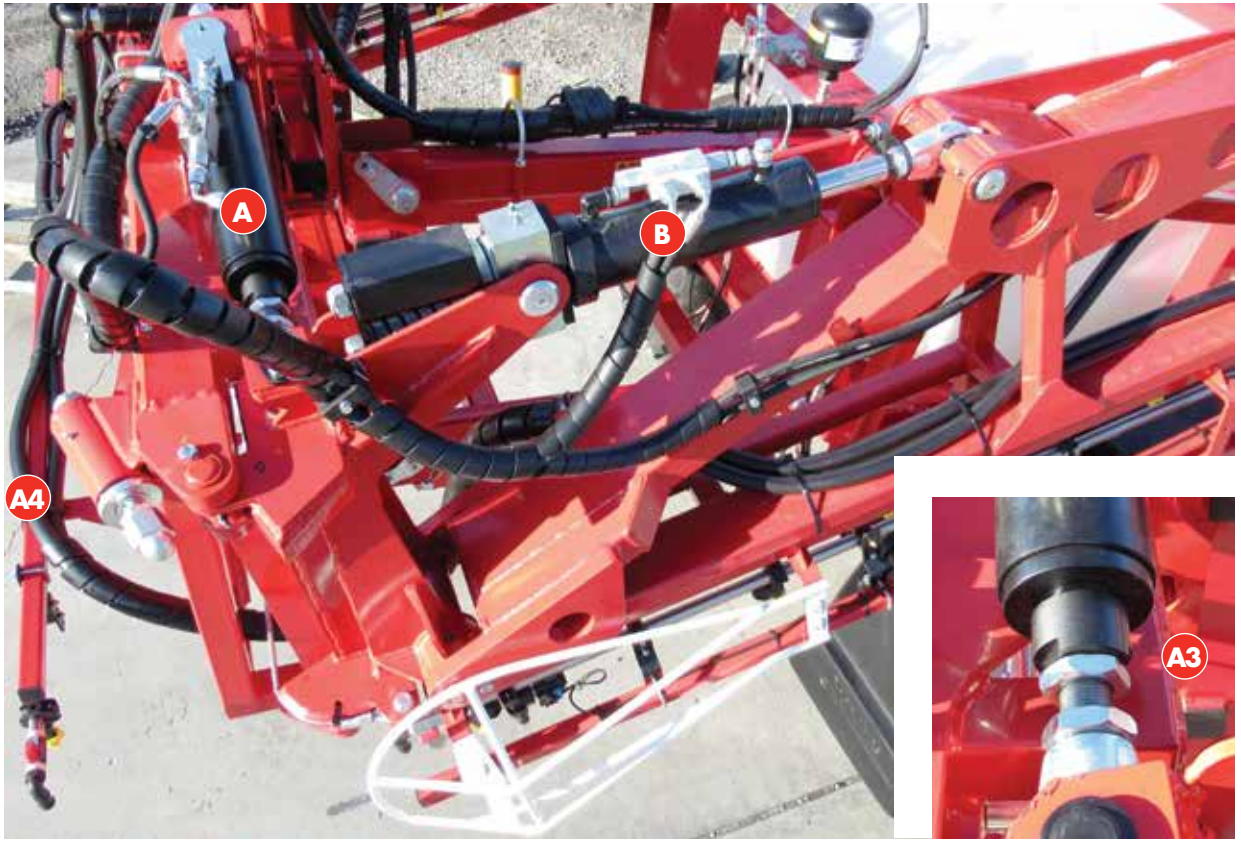
2. Centre Section + First Arm Shoulder

The junction of the boom's first (inner) arm to the centre section is fundamental to boom functionality as it incorporates the primary "wing" alignment, boom suspension, lift and folding connections.

Shown is the right hand shoulder of a 24.5 m GVAR boom in the parked position. Details will vary from boom to boom, but the general design remain the same.

Both the Boom Fold ram (A) and "Wing Lift" ram (B) feature multiple suspension and adjustment points.

The Boom Fold ram (A) uses an assembly of Belleville (disk spring) washers (refer photo A1) to create a suspension action. Generally no need to adjust. At the opposite end are dual length adjustments - the clevis rod end (refer photo A2 - shown in the boom open position) is used to adjust boom arm height (to be parallel to the level ground), and A3 threaded ram stroke fitting is set (lock nut) when the boom is parked and the boom arm is resting against the parking bracket. Refer next page re boom open adjustment.



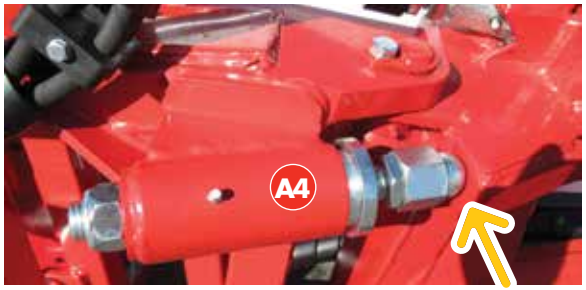
SECTION 5
HOOK-UP & SPRAYER SET-UP

With the boom arms open, the arms should be adjusted to angle forwards (in plan view - refer to the exaggerated sketch at the bottom of the page).

From the factory the boom tips are set forwards of the centre section by 200 ~ 400mm (depending on the boom size).

The inner arm position is set via the boom stop unit (A4). Note the boom stop unit utilizes internal springs and adjustable ends to (1) set the correct boom alignment (yellow arrow) and (2) provide suspension.

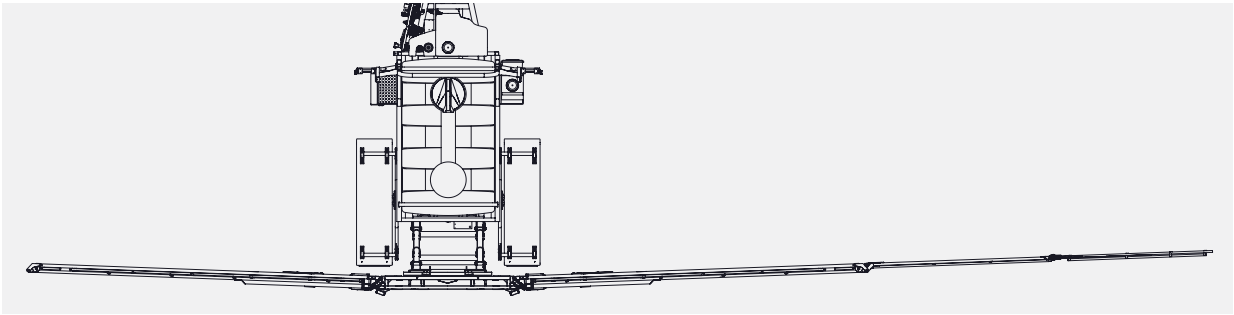
Shown below in the boom open position (and shown on the previous page in the boom parked position).



The Wing Lift ram (B) features a heavy duty suspension spring box (B1) plus length adjustable clevis end (B2). This ram controls the boom (horizontal) level and wing lift functions.

Making ram rod / clevis adjustments will require the load to be taken off of the boom before making the adjustments.

For units with the wing lift option, a graduated scale label (B3) plus position rod is also fitted - refer image below.



Note the wing lift ram position for 16 ~ 21m booms.

SECTION 5
HOOK-UP & SPRAYER SET-UP

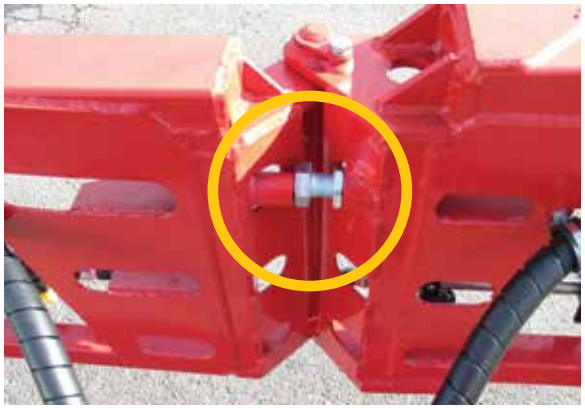
The first arm / second arm junction is the mid boom fold point from which the second arm + tip section fold as one piece to the outside of the first arm.

This junction incorporates several adjustment points.

A) The fold ram has adjustable rod clevis end. Adjust the clevis to ensure the outer arms fold correctly against the inner (first) arm.

B) The forward facing side of the boom junction has an adjustable bolt + stop which sets the outer boom arm(s) alignment (in yaw).

The outer arm should continue the slightly forwards angle as established by the first arm. The stop must be (just) engaged before the ram reaches it's full travel.



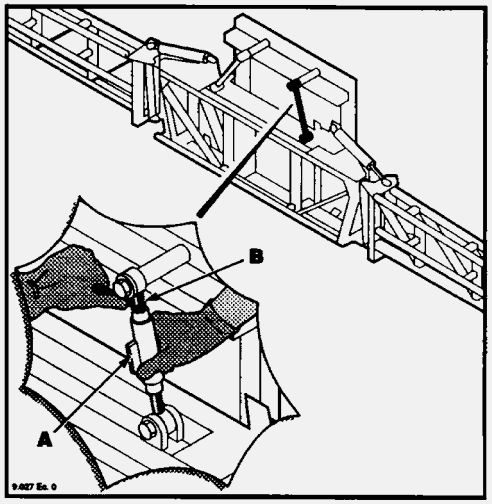
Tip section

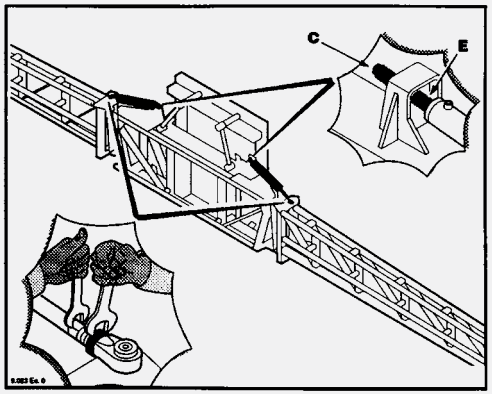
The boom features a breakaway boom tip section. The breakaway force is determined by the spring compression - adjust and lock to suit.

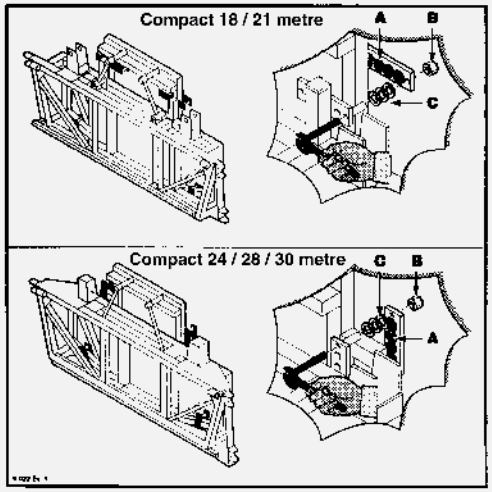
If adjusted too tight the "knuckle" at the base will have insufficient travel to function correctly - always test the breakaway functionality after making adjustments.

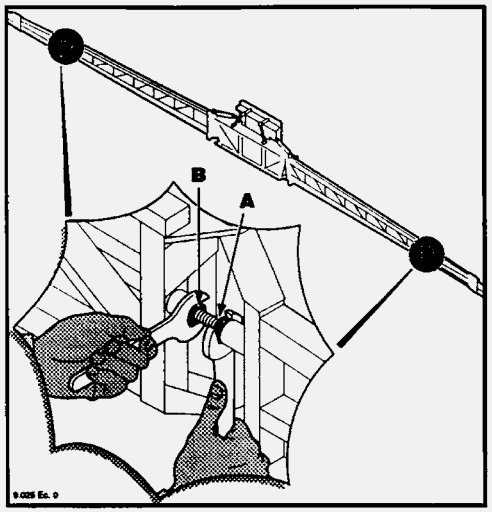
SECTION 5

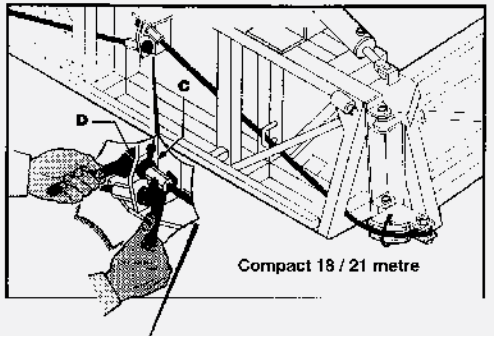
HOOK-UP & SPRAYER SET-UP

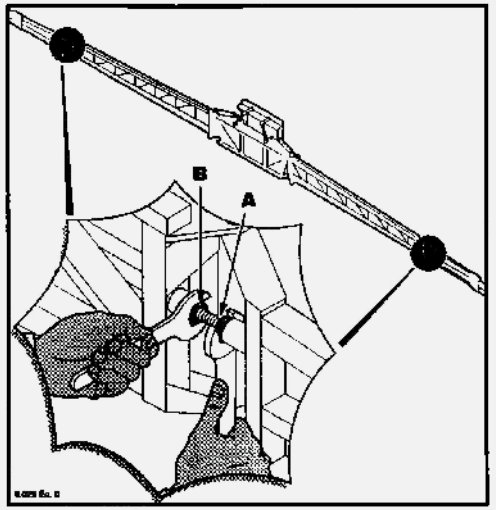












SECTION 5
HOOK-UP & SPRAYER SET-UP

Boom Set-Up, 9-point Checklist

Use this checklist upon delivery / set-up for the first time, and for regular maintenance / inspections.

Where possible perform these checks on flat ground. Sprayer must be connected to the tractor.

1. Centre section is level (check with spirit level - adjust with turnbuckle).
2. Check balancing device cables. With the centre section level and boom parked, the cable must be nearly & evenly tight - and loose when boom is open.
3. When folded - check the ram stroke nut (refer p.46, A3) adjustment. As the boom arm touches the parking bracket - the nut touches the ram body.
4. When open, check the boom arms are level with the ground (or as required) - as many operators will set the tip to be higher compared to the centre section.
5. Check boom slide / wear pads. Adjust as required.
6. When open, check the boom arms are set forwards (yaw) by 1 ~ 2 degrees.
7. Check the tip breakaway is functioning correctly.
8. Check boom arm tilt functions (if fitted).
9. If required, grease all grease nipples (up to 50) and both tip section breakaway knuckles.

SECTION 5
HOOK-UP & SPRAYER SET-UP

WARNING

Make sure there are no people, things or power lines within range of the spray boom when folding or unfolding.

BOOM OPERATION / PARKING

To open the sprayer boom from transit to spraying position:

For models fitted with electric / hydraulic switch box.

Note the general principles are the same for boom operation of "standard" units.

Prepare for boom operation

1. Connect the sprayer to the tractor. Follow instructions from the earlier pages of this section ...
   - connect hitch (& stow the jacking stand)
   - connect hydraulic switch box / looms
   - connect red banded hydraulic hoses

If required for spray operations, also connect the pump and spray controller.

2. Move the unit onto level ground for opening the boom.
3. Check for the presence of transport tie down straps or cable ties etc. Normally the white tip skid is cable tied to the inner boom sections.
4. The red light "On" in the centre of the boom controller panel shows the power is connected for boom controls.
5. Start up and set the tractor to a fast idle, before engaging the tractor hydraulic remote.

CAUTION

Check for obstructions as the boom arms open.

SECTION 5
HOOK-UP & SPRAYER SET-UP

To OPEN the boom from parked.

1. Lift the boom to full height - clearing the outer parts of the parking bracket.

   Push up and hold BOOM LIFT toggle switch.

2. Open the inner wings (both sides simultaneously), all the way.

   Push down and hold the INNER FOLD toggle switch until fully open.

3. Open the outer wings (both sides simultaneously), all the way.

   Push down and hold the OUTER FOLD toggle switch until fully open. Shown below part open(ing).

SECTION 5
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4. Lower the boom (both sides simultaneously), to the working height.

   Push down and hold the BOOM LIFT toggle switch until the correct working height is achieved.

   The boom is now unfolded and ready to go.

To PARK the boom from spraying position

Folding the boom to the parked position is the opposite of opening the boom.

1. Fully raise the boom via the BOOM LIFT function. Do not partially raise the boom as it may hit the cradle side of the parking bracket when folding.

2. Close the outer wings (both sides simultaneously), all the way via the OUTER FOLD function.

3. Close (fold) the inner wings (both sides simultaneously), to the parked position via the INNER FOLD toggle switch until the boom arm meets the inner upright of the parking bracket.

4. Lower the boom (both sides simultaneously), into parking bracket via the BOOM LIFT function.

CAUTION

Check for obstructions as the boom arms close. Be careful that the boom clears the outer side of the parking bracket as it travels into position.

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The boom is now parked.

WARNING

Ensure there are no people, things or power lines within range of the spray boom when folding or unfolding.

Wing Lift function

Available as an option, the boom may be fitted with the GVAR / independent wing lift function.

This enables the operator to raise (up to 11 degrees) and lower (won't go below horizontal) the boom arms to suit operational (undulating) terrain. Shown below with the centre section raised and second arm + tip folded.

ALWAYS return GVAR back to level before parking,

SECTION 5
HOOK-UP & SPRAYER SET-UP

FIRST PRE-SPRAY CHECKS

With the hook up and boom set-up completed, the spray functions need to be tested before using the sprayer with chemicals.

It's advised that a freshwater test be done to check for leaks and to familiarise the operator(s) with the sprayer and set the sprayer to maximise results in the field.

These checks have been conducted in the factory prior to shipping, however, there is a chance that transit could have loosened some fittings.

Clean the filter before or after running the spray system. Wear GLOVES and appropriate PPE.

With the following tasks (where applicable) completed;

- sprayer hitched,
- hydraulics connected,
- spray controller connected,
- boom function switch box connected,
- filters checked and cleaned,
- main tank drain valve closed,
- water in the main tank (refer to Section 6, p. 62)
- main control panel set to ...
  - Suction function set to; MAIN
  - Pressure function set to; OFF (shown below in Spray)
  - Agitator = OFF
  - Probe = OFF

1. Start the tractor, and whilst at a fast idle speed....
   - if fitted, confirm the boom function controller is powered up (red light on).
   - un-park and open the boom to the spraying position. Refer to pages 51~54 for boom operation.

2. Confirm the spray controller is powered up, ESC turned on **(red circle below)** and in hold mode - toggle down - **(yellow arrow below)**.

3. The spray pump can now be activated (PTO or Hydraulic).

At this point all pumped liquid should be bypassing the pressure manifold straight back to tank via the rotary valve. Check operation.

4. Set the pressure function valve to SPRAY mode (as pictured to the left).

Liquid should now be routed via the pressure manifold but dumping back to the main tank.

Check operation, and check for leaks before progressing to increasing pump speed to 540 rpm.

SECTION 5
HOOK-UP & SPRAYER SET-UP

5. Set system pressure
    a. Set the pump to the required operating speed (note this might vary from 450 rpm to 540 rpm depending on spray manager requirements).
    b. Turn on all spray sections (toggle up), as per photo below.
    c. Turn the master spray switch to on (toggle up), **blue arrow**.

d. Increase pressure **(toggle up and hold)** until maximum pressure is achieved. Hold for at least 10 seconds (to allow the system to react & settle).

- Note the sprayer will have been set to a maximum system pressure of 6 Bar at the factory.

The system's manual PRESSURE REGULATOR (PRV) is used to set the overall maximum pressure - usually set 10 ~ 15% above the maximum spraying pressure. Maximum working pressure should not exceed 7 Bar.

If the spray manager has specified say 4.5 bar operating pressure, it's suggested to set the (green knob) PRV to 5 Bar.

For operation in MANUAL spray mode, final / fine adjustments of the spray pressure via the controller's pressure adjust switch.

Fence-lines are operated via the section switches on the Bravo 180S. Switch position will vary depending on the controller and number of sections used.

If supplied with 3 spray sections and a 5 section Bravo 180S controller - the left and right fence-lines are activated via section number 1 and 5.

If supplied with 5 spray sections, the left and right arrows (refer to photo / yellow ovals) are used.

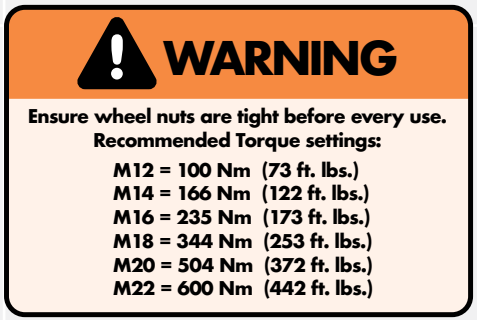
6. System checks.
    - Check all sections and fence-lines are operating correctly.
    - Check all nozzles for correct operation. Clean nozzles as required.
    - Check the agitator operation.
    - Confirm system pressure with the agitator, all sections and fence-lines turned on.

To stop spraying - flick the master down, turn off the controller (ESC button) and disengage the pump.

SECTION 5
HOOK-UP & SPRAYER SET-UP

PRE-OPERATION CHECKLIST

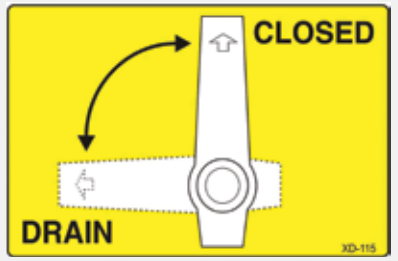
	All chemical & safety guides have been read, understood and acted upon.
	Operator is familiar with all control functions.
	Sprayer securely connected to the tractor – jockey wheels stowed away.
	Wheel nuts (M18) checked for correct torque.



	Check tyre pressures are even on both sides. All tyres will have maximum rating listed on the tyre sidewall. From the factory, sprayers are delivered with 40 ~ 50 psi in each wheel (will vary from model to model).
	PTO connected, and safety guards correctly installed.
	Confirm hydraulic hoses are correctly connected. **Double check the return line connections.**
	Spray and boom controller correctly connected and operational.

	Check pump(s) oil levels.
	Confirm the spray pump operation.
	Manual pressure regulator is set.
	Check for wear and tear on all chemical and hydraulic hoses and wiring looms.
	Ensure fill, suction & pressure filters are clean. **Be safety aware** as some spillage is likely.

	Check that nothing is loose or damaged.
	Check the alignment of all booms.
	Check that all tanks and spray lines are clean and empty, and the drain tap is closed.



SECTION 6
SPRAY OPERATIONS

EMERGENCY ACTION PLAN

Never operate the sprayer without an action plan in place for when things go wrong ...

"Take 5" to evaluate the risks

Actions for most foreseeable machine issues such as breakages start with ...

"Drop the speed"

"Dump the pressure"

then evaluate further.

To stop spraying at any stage, flick the switches down. The MASTER OFF is on the left hand side.

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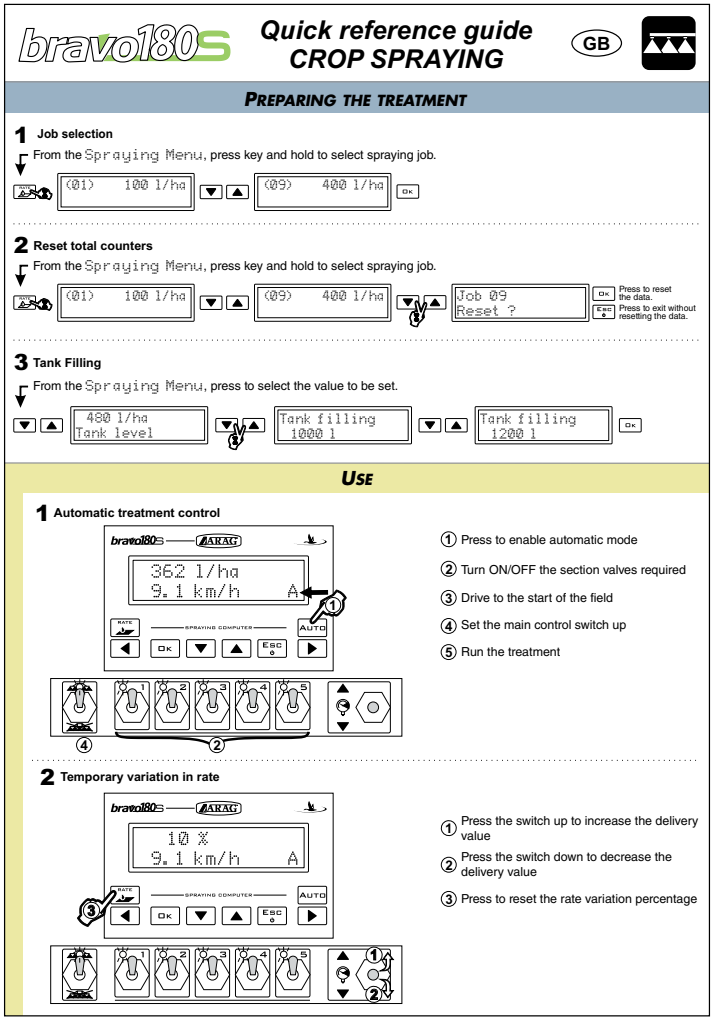
Consult your spray controller manual for further spray function operation.

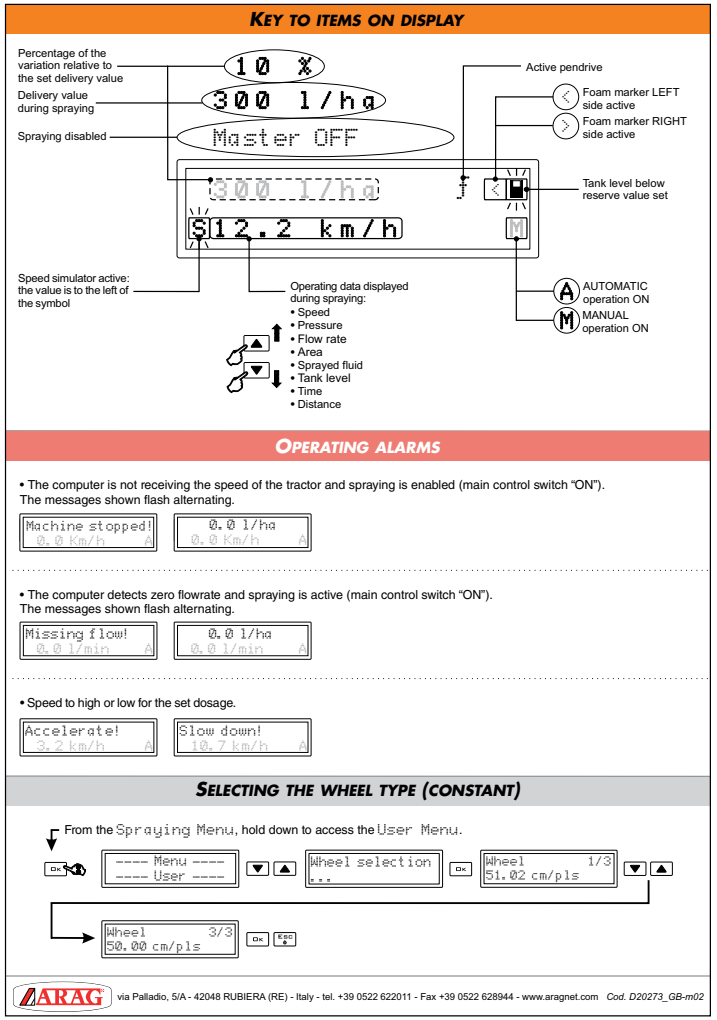
The supplied spray controller manual / operating instructions is dependent upon the model / options ordered.

The “standard” Arag BRAVO 180S #467180501 full controller instruction manual is only available online at;

https://www.aragnet.com/EN/INT/246/products/PRD=108671

A 2 page Bravo 180S Quick Reference Guide (as shown on this page) is also available from Croplands customer support or the Arag web site.





SECTION 6
SPRAY OPERATIONS

GENERAL NOTES ON AUTO-RATE CONTROLLERS

Function of Auto-rate Spray Controllers.

Your Pinto is fitted with a Bravo 180S controller.

An auto-rate controller, regardless of manufacturer, uses on the- go inputs to determine the spray rate being applied at that moment in time.

It is designed to adjust an electric bypass valve (usually referred to as the "Servo" valve) to either return excess flow to the tank, or force more liquid out the nozzles & therefore onto the crop/canopy you are spraying.

The servo valve, along with the inputs of flow & speed, are the components most likely to give problems if they are not working correctly. To identify where a problem exists with a controller, performing a pre-field check by operating the controller in manual mode will often provide the answer.

Inputs

The auto-rate controller requires a speed input from a wheel sensor, and a flow input from a flowmeter. Using this information, along with row width data, the controller can display the actual flow rate in litres per 100 metres or in litres per hectare, depending on your choice of application monitoring.

Functions

If the speed of the tractor changes, the controller senses the change & sends power to the servo valve to either open or close the servo valve. If the tractor slows down, the servo will open to allow more flow to return to the tank, thereby reducing the flow to the nozzles.

Liquid will always take the easiest path, and as the servo bypass line is unrestricted to the tank, the liquid will bypass rather than flow out of the nozzles.

Conversely, if the tractor speeds up, the servo will close and force a lift in pressure, ensuring the liquid must pass through the nozzles, which in turn ensures the spray rate to the crop/canopy is maintained.

The flowmeter sends information to the controller at the same time as the speed input, ensuring that when the correct flow to match the determined spray rate is reached, the servo "locks on" to that position and maintains the required rate.

Common faults

If the controller does not receive the flow input, speed input, or if the servo cannot function, the controller cannot reach it's programmed spray rate or shuts down altogether.

These three faults are the most common cause of problems.

Another problem that can occur is when the nozzles installed on the sprayer cannot work within the parameters you have asked the controller to work within.

Simply put, if the nozzles are too small or too large to attain your pre-set spray rate, the controller cannot deliver or bypass sufficient liquid to function.

Pre-field check

By testing the controller in manual mode, we can determine if it is (a) correctly set up so it will perform properly in auto mode, and (b) find out where a problem exists if the controller is not functioning correctly.

The Bravo 180S, can be set to MANUAL (or MAN) mode by pressing the appropriate key on the console. (refer to the controller manual to identify key functions).

Once in MANUAL mode, the sprayer can be operated in a stationary position, and the operator can take control of the servo valve.

In **Manual** mode, with the pump running & liquid spraying out of the nozzles, the "+" & "—" keys (or ▲&▼keys) will manually open and close the servo.

By performing this function, the operator can observe the pressure on the sprayer gauge, and the flow on the console readout to see if this matches the desired pressure & flow to achieve the desired spray rate.

This test also determines if the servo is working correctly, and if the flowmeter is registering the correct liquid output or if there is in fact no flow showing (indicating

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a faulty sensor or flowmeter). This step is important for troubleshooting.

By increasing the flow & pressure with the "+" & "—" keys (or ▲&▼ keys), the operator can also check that the manual regulating/pressure relief valve is set in the right position to allow correct flow for the system.

If the manual PRV (pressure regulating valve) is not set right, the pressure or flow your nozzles require may not get to the desired level if the PRV is allowing too much liquid to bypass.

Likewise, if the PRV is adjusted too tightly, the servo may not be able to bypass enough liquid when fully open, resulting in over-application.

By opening and closing the servo in manual mode with the "+" & "—" keys (or & keys), the range of pressure & flow can be checked.

As a rule of thumb, you should close the servo fully (hold the "+" or ▲key until maximum pressure/flow is reached).

If this is not what you require to achieve your upper level, then adjust the PRV by turning it clockwise. If the upper level is too high in pressure or flow, turn the PRV anticlockwise until your upper limit of pressure or flow is reached.

Then press the "—" or ▼key to check the controller can reach an acceptable low level of flow/pressure - this will ensure in auto mode that the servo can bypass adequate liquid when the tractor slows right down.

Lastly, check the speed input by simply driving the unit along and ensuring a speed input is being logged by the controller.

If the controller works in Manual mode, it should operate perfectly in Auto-mode provided calibration data is correct and a speed input is being received.

These notes are a general explanation of the system functions of the Bravo 180S.

For more detailed information, consult your operator's manual for the controller, or your service agent or dealer.

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SPRAY OPERATIONS

FILLING THE PINTO TANKS

The Pinto has tanks which require filling. Each tank (main tank, flush tank, freshwater tank) can be filled via its top lid.

The main tank and flushing tank can also be filled via a top/bottom-filling inlet.

1. Main Tank

Use clean, fresh water (preferably rainwater), free of suspended organic matter or clay. Some chemicals are deactivated when they contact these materials.

Always calculate the correct water quantity required, and when filling, allow sufficient water quantity for adding and mixing chemicals.

If necessary top up the tank to required quantity after adding chemicals.

Open the main tank lid for top-filling

Top Filling (Fresh water only)

To top-fill the main tank:

A. Open the main tank lid and ensure the basket filter is in place.

B. Fill the main tank with the required amount of water.

C. Close the main tank lid.

A step is located on the left-hand side of the sprayer. This step should not be used for anything other than general observation of the sprayer.

For access to lids or any other parts of a sprayer not readily accessed from the ground, the operator should use an appropriate platform step.

Bottom-Filling (Preferred option)

Bottom-filling requires a pressured water source.

Note there is a one way valve at the panel.

To bottom-fill the main tank:

1. Remove the end cap from the fill inlet & connect the filling hose. Requires 2″ camlock fitting.

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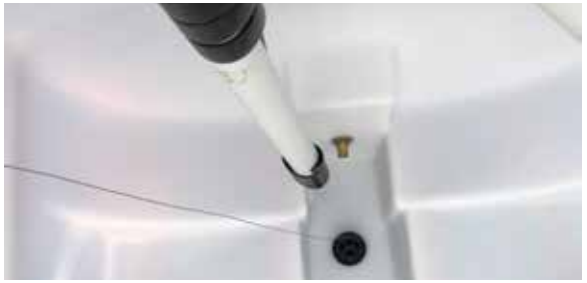
2. Turn the Fill Selector Valve to the main tank.

3. Fill the main tank with the amount of water required.
4. Disconnect filling hose and replace the end cap.

Note the fill hose routed to the top of the tank, discharging into the base of the tank via an internal anti-siphon "dropper tube".



2. Flush Tank

Use clean, fresh water (preferably rainwater) in the 275 litre flush tank.

The tank's 6" lid is vented - always keep the tank lid area clean and chemical free.

Always fill the flushing tank before spraying.

Top Filling

To top-fill the flush tank:

a. Unscrew the flush tank lid.
b. Fill the flush tank.
c. Replace the flush tank lid.

Bottom-Filling

Bottom-filling requires a pressured water source.

Note; the speed of bottom filling (and suction from) the flush tank needs to be moderated to avoid exceeding the venting capability of the lid.

To bottom-fill the Flush tank:

d. Remove the end cap from the fill inlet & connect the filling hose. Requires 2" camlock fitting.

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e. Turn the Fill Selector Valve to the flush tank.

f. Fill the flush tank with the amount of water required. Take care to moderate the fill speed.

The fill is plumbed to the bottom of the flush tank, with an overflow hose at the top of the tank (adjacent the lid).

g. Disconnect filling hose and replace the end cap.

3. FRESHWATER (Hand-wash) Tank

Use clean, fresh water (preferably rainwater) in the 15 litre freshwater / hand-wash tank.

The tank's 4" lid has a diaphragm breather. Always keep the lid area clean and chemical free.

Always fill the freshwater tank before spraying.

To top-fill the freshwater tank:

a. Unscrew the freshwater tank lid.

b. Fill the freshwater tank.

c. Replace the freshwater tank lid.

The freshwater tank is plumbed direct to the freshwater tap on the operator's panel.

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CLEANING FILTERS

Filters are used to stop solids entering the liquid system and blocking lines, nozzles or damaging the pump.

The Pinto main tank is fitted with a **Basket Filter.**

The system also incorporates a large suction filter, pressure filter and boom line filters.

1. Always ensure the basket filter is in place when filling the main tank through the lid.

2. All filters should be cleaned regularly or after each spraying period.

If the filter screen is damaged, replace with a new screen.

WARNING

Always wear protective gloves when cleaning filters containing toxic chemicals.

Suction Filter

The suction filter should be cleaned regularly or after each main tank has been emptied.

To clean the suction filter:

1. Completely STOP all sprayer functions.
2. Turn the Suction Selector Valve to "Off" position to shut Off liquid from the main tank.

NOTE

Be careful not to damage or deform the mesh or O-ring while cleaning and refitting the filters.

3. Drain any residual content from the filter via the drain tap. Shown below in the OFF position.

4. Remove the outer filter screw and bowl from the suction filter, and then remove the filter element.
5. Thoroughly clean the filter parts, then re-assemble the filter.
6. Return the Suction Selector valve to source from the main tank.

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Pressure Filter

The Pressure line filter (located on the control panel) should be cleaned regularly or after each main tank has been emptied.

To clean the pressure line filter:

1. Completely STOP all sprayer functions.
2. Open the valve at the bottom of the filter to ensure all pressure is removed from the filter.

3. Remove the outer filter bowl, and then remove the filter and thoroughly clean it before re-assembling the filter.

Boom Filters

The Boom line filters (located on the boom, one filter per section), should be cleaned regularly or after each main tank has been emptied.

To clean the boom line filters:

1. Completely STOP all sprayer functions.
2. Remove the outer filter bowl, and then remove the filter and thoroughly clean it before re-assembling the filter.

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TANK AGITATION

When chemical is added to the main tank, the pump and agitator must be operating at all times to ensure chemical does not settle in the tank.

The sprayer is equipped with a single agitator at the rear of the tank (**red arrow** below).

Red arrow points to the Agitator Nozzle.
Blue arrow points to the Tank Rinse (spin) Nozzle.

Shown at the left in the AGITATOR ON position.

Check to see that tank agitation is correctly adjusted. If agitation causes too much foaming in the tank, try closing OFF the agitator to reduce foaming.

Note, further agitation is achieved via the pressure relief bypasses. For explanation, refer to Section 4, page 26.

If chemical settles, through pump break down or another reason, start up the sprayer after the fault has been rectified and let the mixture in the tank agitate for a length of time to ensure thorough mixing of the chemical.

Ensure the site for draining, flushing and cleaning the sprayer meets with environmental and statutory regulations.

TANK DRAINING

PINTO 3000 utilizes a "PULL DRAIN" system, as shown below.

PINTO 4000 utilizes a ball valve drain tap and elbow mounted to the tank's sump (bottom photo).

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SPRAY OPERATIONS

FLUSHING AND RINSING

The Pinto is equipped with a flush tank for cleaning the sprayer when changing chemicals, and at the end of the day.

To flush the Pinto:

1. Ensure the site for flushing and cleaning the Pinto meets with environmental and statutory regulations.
2. Open main tank DRAIN (refer previous page).
3. Turn the Suction Selector Valve to source from the flush tank.

4. Turn the Function Selector valve to "Tank Rinse".

5. Check the agitator valve is open.

6. Start tractor and place sprayer controls in start up position according to the instructions of the controller fitted.
7. Engage tractor PTO (or hydraulic pump drive), and bring the pump speed up to 540 RPM. All pumped liquid is now being passed through the dump valve back into the tank. The system is not pressurised and tank agitators are not working (dump valve has priority).
8. Pressurise the system by placing the Master switch ON. Shown below on Arag Bravo 180S. This will operate the tank agitator.

9. Adjust pressure to desired operating pressure by adjusting pressure up or down (image next column).

10. Turn the spray boom sections ON. Fresh water now flushes through the suction line, suction filter, pump, agitator, pressure lines, boom section filters and nozzles. All water not exiting the nozzles flows into the main tank from the flush tank. Water remaining in the tank drains out of the tank through the drain outlet.

The end of each boom section is fitted with a tap to aid boom tube flushing.

11. On completion of flushing, shut down all controls and disengage the PTO / hydraulics.
12. Turn the Suction Selector valve to "Off" position to shut-off liquid from the main tank.
13. Clean all filters, and reassemble.
14. Adjust all valves back to operating mode:
    a. Turn the Function Selector valve to "Off".
    b. Release & close the tank drain valve.
15. Wash/hose down the outside of the sprayer.

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TANK CLEANING

If a cleaning agent is required (refer to the chemical label), as is often recommended when changing from one chemical group to another or as an end of season clean before storage.

Nufarm's Tank and Equipment Cleaner as pictured below is no longer available. Comparable cleaners are available from most good "spray shops".

Below is a generic guide procedure. Wherever possible follow the instructions provided with the cleaner used.

1. First, completely flush the sprayer with water as outlined in the previous FLUSHING section. Then ...
2. Fill the spray tank with freshwater.
3. Add cleaning agent into the main tank (use according to instructions).

Product now discontinued.

4. Open the AGITATOR valve.

5. Turn the Suction Selector Valve to source from the MAIN TANK.

6. Turn the Function Selector valve to TANK RINSE.

7. Start the Tractor
8. Make sure the controller / electric controls or auto rate controller is NOT in Spray mode. Ensure all sections are selected to enable all spray sections to be flushed.
9. Start the pump PTO / hydraulic drive.
10. Activate the controller SPRAY mode. This will pressurise the system and operate the tank agitator.
11. Adjust to normal operating pressures.
12. Turn ON all spray sections.
    - Make sure the area around the nozzles is clear of bystanders.
    - Make sure the nozzles are downwind of the operator.

12. After sufficient cleaning, turn OFF the spray sections. Also flush each boom section via the drain tap at the end of each boom section.
13. If you require the cleaning agent to soak or stand for a period, turn the spray booms OFF and completely shutdown the sprayer for the desired period.
14. When soaking is completed, start the machine following steps to flush the tank and spray lines
15. On completion of flushing, shut down all controls and disengage the hydraulic drive.
16. Open spray tank drain valve and allow cleaning mixture to drain from the tank.
17. Delay the final flushing of the sprayer (again) with freshwater as outlined in the previous page until just before the sprayer is next used – that might be in 1 hour or 6 months away if the sprayer is going into storage for the off-season.

SECTION 6
SPRAY OPERATIONS

CHEMICAL PROBE OPERATION

The chemical probe is designed to transfer liquid chemical, via a venturi system, straight from containers and into the main tank.

To add chemical using the probe.

- Make sure sufficient water (in excess of 500 Lt) is added to the main tank.
- Connect the probe to the sprayer.

- Select the Main Tank as the Suction water source

- Prepare the chemical source. Be especially vigilant of chemical safety. **Always wear safety gloves.**
- Start the Tractor - set to a fast idle speed. Excessive speed may burst lines.
- Make sure the Controller is NOT in Spray mode.
- Set the Function selector valve to RINSE

(Alternatively set the valve to Spray, with the spray controller set to RUN - but with all spray sections off).

- Start the pump by engaging the tractor PTO or hydraulics, (assuming the tractor hydraulics have been set-up as per Section 5 (p.33).

- Place / hold the probe's tube into the chemical source (usually a drum or bucket of chemical).

- To transfer chemical from the drum to tank, turn on the probe flick tap (circled in green). Speed of suction can be adjusted by (slowly) varying the tractor speed. Close the flick tap when completed.
- Rinse the probe and chemical containers with fresh water / transfer to tank via above procedure. Note the Probe connection has a one way valve behind the panel.
- Disconnect the probe and re-cap the camlock. Store the probe in a clean, safe place.

SECTION 6
SPRAY OPERATIONS

- Note, the AGITATOR valve must be engaged once chemical transfer is completed. Refer to page 67 for more information re agitation.

CHEMICAL HOPPER OPERATION

In addition to the chemical Probe, the (standard equipment) 60 litre Chem-e-Flush induction hopper can be used to deliver chemical directly into the tank without putting neat chemical through the pump.

A video guide to operating the chemical hopper is available on youtube here ...

https://www.youtube.com/watch?v=IJo27Jf33kk

NOTE

The chemical hopper uses an on-board water source (flush or main tank) via the product pump to agitate and mix the hopper contents with a swirling action. The mixture is then drawn from the hopper via venturi suction to the main tank.

To add chemical to the main tank, via the Chem-e-flush, follow the steps outlined:

1. Make sure sufficient water is added to the main tank and the flush tank.
2. Unlock the Chem-E-Flush drop-down leg via the latch handle on the right hand side. Lower the hopper to the filling position (as shown).

3. Set the Function selector valve to "Chem-E-Flush".

4. Turn Suction selector valve to source water from the MAIN tank.

Note the FLUSH tank can be used to fill the hopper but is of insufficient volume to also (venturi) transfer the hopper contents to the main tank.

SECTION 6
SPRAY OPERATIONS

5. Open the agitator valve.

6. Close the Transfer valve at the base of the hopper.

7. Start the tractor and operate the pump with the tractor engine at idling speed only.

WARNING

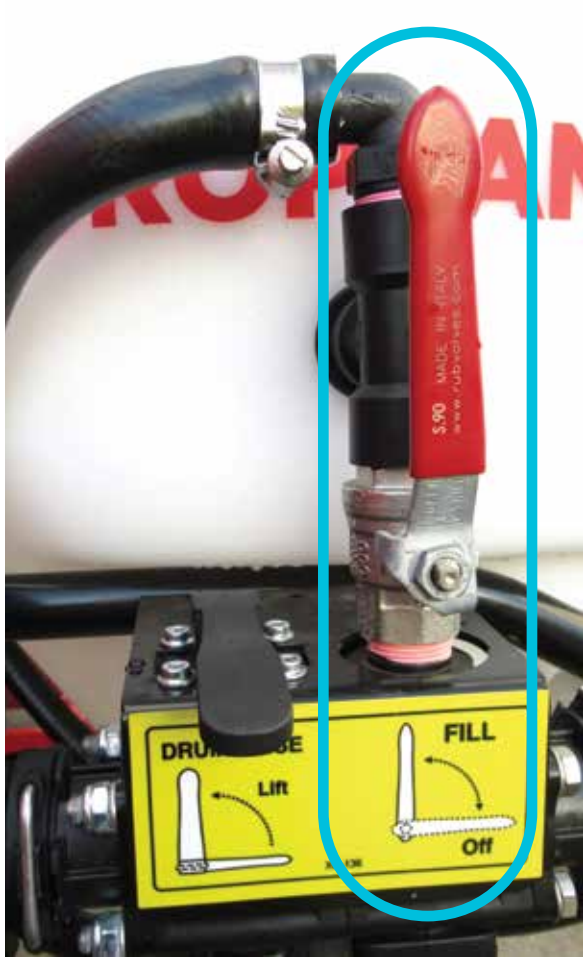
Operating the pump at faster than idling speed may burst lines.

8. Pressurise the pressure lines by switching the appropriate spray controller ON & in RUN mode with all boom sections OFF, as pictured below. (Refer to your controller operator manual for instructions).

9. Open the hopper lid & add chemical powder or liquid to the hopper.

10. Close the hopper lid & open the FILL valve to add water and mix the chemical.

Take care to NOT overflow the hopper.



SECTION 6
SPRAY OPERATIONS

To RINSE the hopper, follow the steps outlined:

1. Close the hopper lid.
2. Close the Transfer valve at the base of the hopper.
3. Close the Fill valve.
4. Open the Hopper Rinse valve (on top of the lid) to rinse the hopper. NEVER perform this function with the lid open.

5. Close the hopper rinse valve after rinsing the hopper.
6. After rinsing, transfer the rinse mixture to the spray tank, by opening the Transfer valve at the base of the hopper.
7. Repeat the rinse procedure, if necessary, to thoroughly cleanse the hopper.
8. Close the Transfer valve at the base of the hopper when transfer is completed.

NOTE

IMPORTANT! Ensure agitation of spray tank continues after chemical is added to the spray tank.

After completing the mixing procedures:

1. Check the Transfer valve at the base of the hopper is closed.

2. Rotate the Function selector valve to " Spray".

3. Turn the Suction Line valve to "Spray" position.

4. Return the hopper back to its transport position.

SECTION 6
SPRAY OPERATIONS

OPERATING POINTERS

Operating Methodology for Broadacre Spraying

It is always preferable to spray travelling across the wind direction.

This minimises any drift effect caused by the wind especially with flat fan nozzles because the wind only hits the narrow end of the pattern rather than the full face of the fan spray.

It also maximises the effect of the wind forcing droplets downwards into contact with the target.

Travelling with the wind increases the tendency of spray droplets to float away from the target, and travelling against the wind effectively multiplies the force of the wind (depending on speeds) increasing drift and reducing target contact.

Proceed to Spray

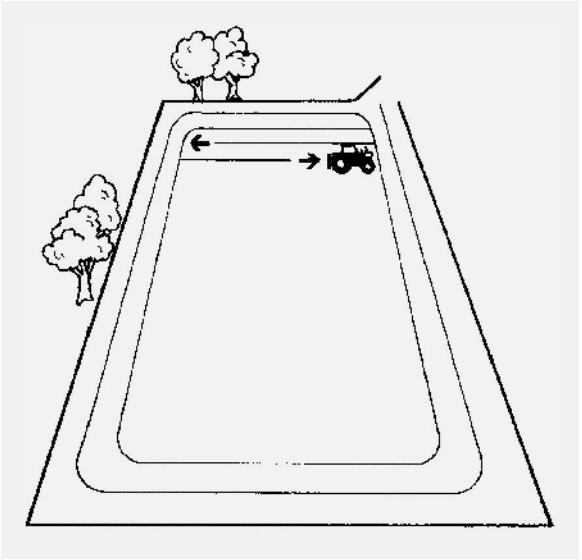
Once the chemical mixture is in the tank, proceed to spray:

1. Adjust the pressure to the correct operating pressure by adjusting pressure (up or down) according to the instructions of the Controller.
2. Turn spray booms ON and OFF as required to spray according to the instructions of the controller fitted.

Operating Pointers

While spraying, continually observe that:

1. Engine and PTO speed are correct.
2. Correct operating pressure is being maintained.
3. Ground speed is correct and within the operating range of the nozzles and application rates selected.
4. Continually monitor spray nozzle patterns for blockages. Clean as required.



5. The pressure gauge drain tap should be activated on a regular basis to drain & clean any sediment from this (dead ended) line to the gauge. Close again (as shown) before proceeding.

CAUTION

Running a diaphragm pump faster than specified will not improve performance, but will damage and wear out moving parts. Warranty will be made void by speeds in excess of those indicated on the pump name plate.

NOTE

The plumbing circuit of the Pinto incorporates a relief valve which automatically dumps pressure when the boom is switched off.

CAUTION

If working on steep terrain, please note the following:

- **Lock the balancing device (if the unit is provided with hydraulic locking).**
- **For vehicle stability, always unfold the up hill side boom before unfolding down hill side boom.**
- **Never operate with the down hill side boom lowered and up hill side boom folded.**
- **Refer to pages 51 - 54 for BOOM OPERATION functions.**

SECTION 6
SPRAY OPERATIONS

CALCULATE WATER & CHEMICAL QUANTITIES

Before spraying it is necessary to calculate the exact quantities of water and chemical needed to spray the required area of orchard or vines.

For **CHEMICAL required** expressed in litres or kg per hectare (land area), use the following formula:

Chemicals required (Litres (or Kg)) =

Tank Volume (L) x Recommended Chemical Rate (L/ha) or (Kg/ha)

Spray Application Rate (L/ha)

eg. 4500 x 0.8 ÷ 300 (L/ha)

= 12 Litres or (Kg)

For **tank VOLUME OF MIXTURE required** to spray the selected area,use the following formula:

Tank Volume Required (Litres) =

Area (ha) x Spray Application Rate (L/ha)

eg. 3.25 x 900

= 3000 Litres

For **AREA COVERED (ha),**

= Tank Volume (litres) + Spray Application Rate (l/ha)

eg. 4500 ÷ 300

= 15 hectares

For **CHEMICAL RATES** expressed in Litres or kg per 100 litres of water (water volume), use the following formula:

Chemicals Required (Litres) =

Tank Volume (Litres) x Recommended Chemical Rate (L/ 100 litres)

100

eg. 4500 x 0.8 ÷ 100

= 36 Litres

NOTE

Important: Be sure to mix only enough spray mixture to cover the area required. Avoid wastage and problems of needless chemical disposal.

PRE-SPRAY CHECKS

With the hook up and boom set-up completed, the spray functions need to be tested before using the sprayer with chemicals.

It's advised that a freshwater test be done to check for leaks and to familiarise the operator(s) with the sprayer and set the sprayer to maximise results in the field.

These checks have been conducted in the factory prior to shipping, however, there is a chance that transit could have loosened some fittings.

WEAR GLOVES

Clean the filter before or after running the spray system. Wear GLOVES and appropriate PPE.

With the following tasks completed;

- sprayer hitched
- hydraulics connected
- spray controller connected
- hydraulic switch box connected
- filters checked and cleaned
- water in the main tank and tractor running at an operational speed.

SECTION 7
SPRAYING INFORMATION & CALIBRATION

SECTION 7
SPRAYING INFORMATION & CALIBRATION

Spraying should be done in conjunction with an agronomist / spray manager / someone skilled in the art of spraying. The best setup might vary significantly from crop to crop, season to season etc.

SPRAYWISE

It's highly recommended that all operators of this sprayer and spray program managers should be fully conversant with the information supplied in the **Nufarm SprayWise Broadacre Application Handbook** (refer photo) before undertaking spray operations.

The book includes chapters discussing re;

- Droplet Size
- Nozzle Types
- Dilute Spraying
- Concentrate Spraying
- Coverage & Assessment
- Selecting Nozzles
- Drift
- Weather
- Adjuvants
- Formulations & Mixing Order
- Cleaning
- Calibration
- Record Keeping
- And more

This book is supplied with every sprayer, and is available from Croplands dealers, under the part number: SPRAYWISEBK.

Also available is the Spraywise Spray-Log book, part number; SPRAYWISELOG.

CALIBRATION

Applying the correct amount of chemical to a crop is only possible if **the sprayer is calibrated, operated and maintained correctly.**

The variables of spray application (distance, time, working width, liquid, and chemical volumes) must be measured and controlled accurately to ensure chemicals are applied at the correct rate.

Proper calibration involves setting up the sprayer (nozzle selection, pressure, speed), calculating chemical and water rates, and measuring the performance of the sprayer itself. Only then can you be totally confident in applying chemicals correctly.

Fully Automatic Spray Controller (Bravo 180S etc)

Automatic spray rate controllers maintain the application rate (as set by the operator) when operated in the Auto position.

The controller monitors speed of travel (speed sensor) and flow rate (flow meter) and automatically adjusts flow rate (via a pressure regulating or servo valve) to maintain the correct application rate irrespective of speed variations within the limits of the nozzles used.

IMPORTANT:

- It should be remembered that the spray controller does not eliminate the necessity to measure and check the accuracy of nozzle spray patterns and outputs. These must be checked regularly to ensure correct and uniform application rates because nozzles wear with use.

SECTION 7
SPRAYING INFORMATION & CALIBRATION

- Flow meters used by the Cropliner Sprayer need to be checked and calibrated on a regular basis.

The following demonstrates how to check & maintain the Rapid-check flowmeter (same process for the WOLF flowmeter). This should be done regularly during the spraying season.

FLOWMETER CALIBRATION

If optioned with auto rate controller, as a part of the initial factory testing / calibration, a value (pulses per litre) will have been recorded and written on the body of the flow meter see (WOLF) example here.

To check / improve the resolution of the flow meter calibration use the below method after having sprayed out a reasonable volume of liquid (the more sprayed the better the resolution);

- The current flow meter calibration number in the controller = X
- Take the total volume the controller says was sprayed and divided by the actual volume sprayed = Your new flow meter calibration.
- Then manually enter this number into the controller settings.

For example;

Current flow cal number (X) = 250. Controller says we have sprayed 4400L after having put 4000L in the tank.

250 x 4400 = 1100000

1100000 / 4000 = 275 (new flow cal number)

STEP 1 - ENSURE EQUIPMENT IS IN GOOD WORKING ORDER

Tank, pump, boom, filters and nozzles must be clean, free of leakages and functioning properly.

Follow the pre-operation checklist, maintenance and operating instructions in this manual.

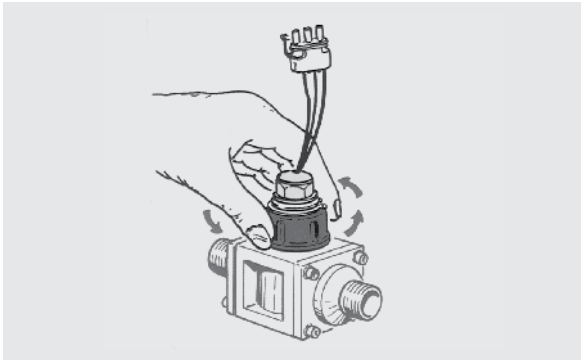
Install, calibrate and operate the spray controller according to the spray controller operators manual.

Inspections of the Flowmeter should be performed regularly.

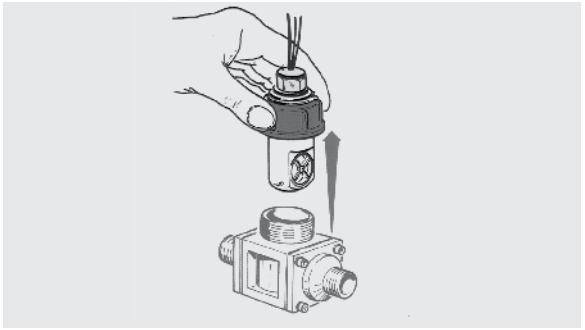
Daily Check & Maintenance of Flowmeter

This is to be performed every day after work is finished:

1. Unscrew the assembly that holds the Rapid Check unit in the body.
2. Remove the Rapid Check unit from the body.



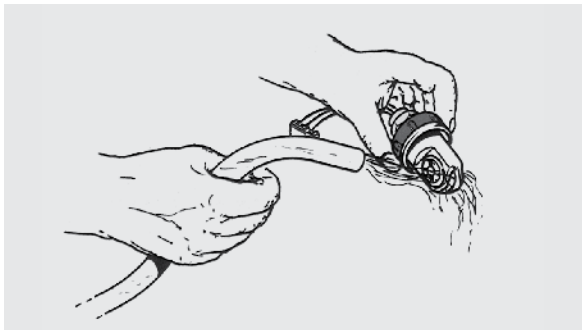
Unscrew the Rapid Check assembly



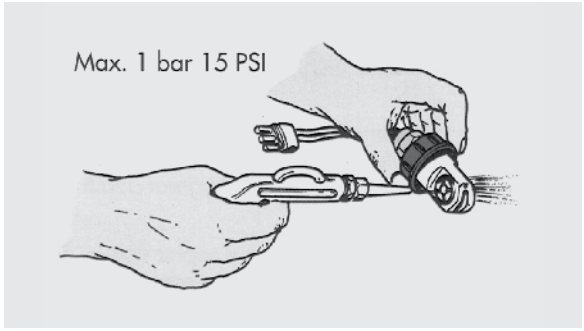
Remove the Rapid Check unit

SECTION 7
SPRAYING INFORMATION & CALIBRATION

3. Use clean water to wash any impurities out of the removable turbine unit.



Wash any impurities out of the removable turbine unit



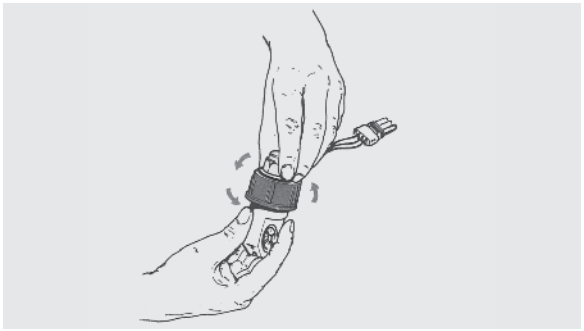
Use compressed air to check that the turbine unit rotates freely

4. Use compressed air to verify that the turbine unit rotates freely (maximum air pressure 1 BAR [15 psi]).

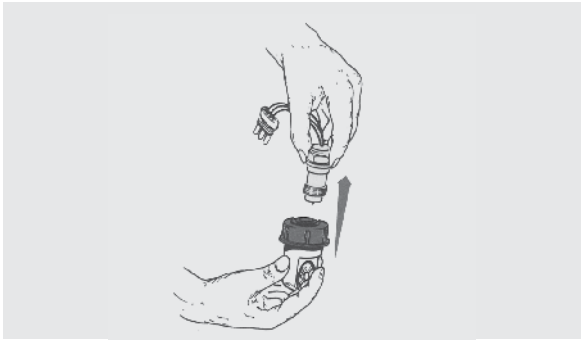
Every 50 Hours

Carry out the following procedure after every 50 hours of operation:

1. Unscrew the sensor.

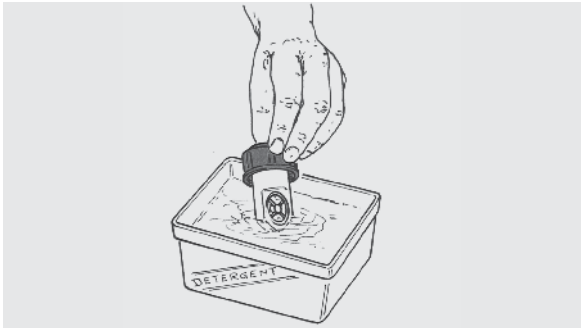


2. Separate the sensor from the Rapid Check unit.



Separate the sensor from the Rapid Check unit

3. Place the Rapid Check unit in a detergent bath for a few hours.

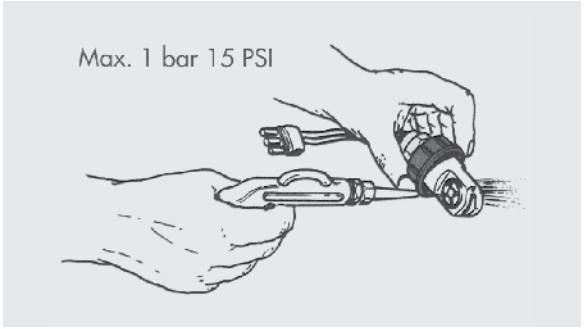


Place the Rapid Check unit in a detergent bath

4. Remove the Rapid Check unit from detergent bath.

   Use compressed air to verify that the turbine unit rotates freely (maximum air pressure 1 BAR [15 psi]).

   If necessary, replace the Rapid Check unit with a new one.

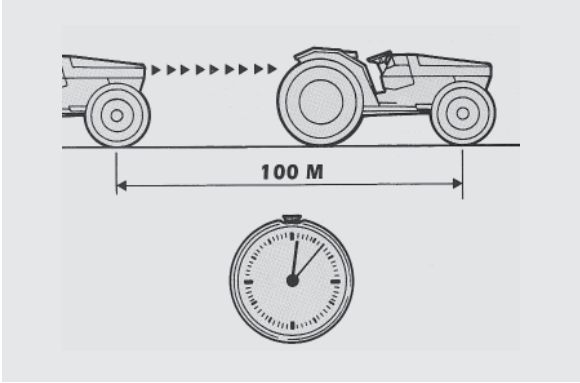


Use compressed air to check that the turbine unit rotates freely

SECTION 7
SPRAYING INFORMATION & CALIBRATION

STEP 2 - DETERMINING THE ACTUAL SPEED OF TRAVEL

If optioned with auto rate controller, your sprayer has been factory set with a calibration number. This should be fine tuned prior to commencement of spraying and checked by your dealer. This is done by traveling a known distance (usually 100 metres) and comparing the distance measured by the Spray Controller to the known distance. If there is a discrepancy, the Spray Controller Manual explains how to easily adjust the calibration number automatically.



To manual check the speed...

a. Half fill the sprayer tank with water and mark out a test strip of 100 metres (simulating spraying conditions).

b. Set the sprayer operating and record the time taken to travel 100 metres at your required spraying speed.

c. Calculate the actual speed of travel using the formula:

For SPEED, km/hr = using the following formula:

$$\frac{\text{Distance (m)} \times 3.6}{\text{Time (sec)}}$$

eg. 100 (m) x 3.6 ÷ 22.5 (seconds)

= 16 km/hr travel speed

STEP 3 - MEASURE SPRAY SWATH WIDTH

The spray controller requires the boom width to be entered for each of the boom sections fitted to your sprayer.

Measure the nozzle spacing and multiply nozzle spacing by the number of nozzles on each boom section to establish the width of each boom section.

eg. 0.5 m x 5 nozzles = 2.5 m
0.5 m x 6 nozzles = 3.0 m
0.5 m x 7 nozzles = 3.5 m

NOTE

Boom sections may vary on some booms.

STEP 4 - SELECT NOZZLE TYPE & SIZE

Agronomist / spray manager choices will take into account ...

- Chemical label recommendations
- Application rate required
- Pressure setting
- Swath width
- Chosen speed of travel - use actual speed of travel as per Step 2.

Refer next page ...

SECTION 7
SPRAYING INFORMATION & CALIBRATION

Nozzle type

The "standard" nozzle is the Agrotop AirMix® 02 (yellow) air-induction nozzles.

However many alternatives are available and may be fitted to your sprayer.

Below is a sample of the choices available - refer to the Croplands Compact Sprayers & Components Book (Buyers Guide) for more nozzle type details.

Nozzle size

There are two methods of selecting nozzle output;

a.Use the charts of this manual etc, or

b.Calculate required nozzle flow rate.

A. Using the charts.

Use the charts on pages 86 ~ 87 of this manual / Croplands Compact Sprayers Buyers Guide or the manufacturer's nozzle chart.

For example, using the charts on pages 64 & 65 of this manual, reference:

- Application rate (eg 60 L/ha),
- Speed of travel (eg 16 km/hr), &
- Pressure setting (eg 3 Bar), to find the nearest nozzle to suit your requirements.

Also check to see what speed variations are available for applying the same rate. It is usually best to select mid range pressure as this will allow the spray controller to adjust pressure up or down when speed variations occur.

AIRMIX®

TURBODROP CERAMIC

TURBODROP XL (D)

TDSF-4003

NOZZLE OPTIONS

KEY INFORMATION	PRESSURE RANGE: 1–6 BAR; SPRAY PATTERN: 110°	PRESSURE RANGE: 2–10 BAR; SPRAY PATTERN: 110°	PRESSURE RANGE: 1–8 BAR; SPRAY PATTERN: 110°	PRESSURE RANGE: 3 BAR; SPRAY PATTERN: 40°
	• **Ideal pressure range: 1–6 bar** • Uses: weed control and plant health • Up to 90% drift reduction	• **Ideal pressure range: 4–8 bar** • Uses: weed control, plant health and liquid fertilisers • Up to 95% drift reduction	• **Ideal pressure range: 2–4 bar** • Uses: weed control, plant health and liquid fertilisers • Up to 90% drift reduction	• **Ideal pressure range: 3 bar ONLY** • Low drift option for WEED-IT spot sprayers
KEY BENEFITS	• Excellent value • Proven performer • Predominantly coarse to medium droplets for good coverage • Compact design • Protected air inlets to avoid blockage • Two piece for easy cleaning, no seals • Also available as an off-centre nozzle	• Ceramic injector orifice and exit nozzle • Small droplet size variation over pressure range • Up to three times the life of polyacetal nozzles • Two piece for easy disassembly • Excellent penetration using high pressure	• Variable droplet spectra from coarse to fine as pressure increases • Excellent drift reduction at lower pressures • Two piece for easy disassembly	• Specifically designed for use with the WEED-IT optical spot sprayer • Excellent drift reduction • Two piece for easy cleaning, no seals

AIR-MIX & TURBODROP® NOZZLE CHART

Nozzle Type	Pressure Bar	Flow Rate L/min	Application Rate (L/ha with km/h @ 50cm nozzle spacing) 4	6	8	10	12	14	16	18	20
110-015	1	0.231	46.2	46.2	34.7	27.7	23.1	19.8	17.3	15.4	13.9
	1.5	0.283	84.9	56.6	42.5	34	28.3	24.3	21.2	18.9	17
	2	0.327	98.1	65.4	49.1	39.2	32.7	28	24.5	21.8	19.6
	3	0.4	120	80	60	48	40	34.3	30	26.7	24
	4	0.462	139	92.4	69.3	55.4	46.2	39.6	34.7	30.8	27.7
	5	0.517	155	103	77.6	62	51.7	44.3	38.8	34.5	31
	6	0.566	170	113	84.9	67.9	56.6	48.5	42.5	37.7	34
110-015	1	0.346	69.2	69.2	51.9	41.5	34.6	29.7	26	23.1	20.8
	1.5	0.424	127	84.8	63.6	50.9	42.4	36.3	31.8	28.3	25.4
	2	0.49	147	98	73.5	58.8	49	42	36.8	32.7	29.4
	3	0.6	180	120	90	72	60	51.4	45	40	36
	4	0.693	208	139	104	83.2	69.3	59.4	52	46.2	41.6
	5	0.775	233	155	116	93	77.5	66.4	58.1	51.7	46.5
	6	0.849	255	170	127	102	84.9	72.8	63.6	56.6	50.9
110-02	1	0.462	92.4	92.4	69.3	55.4	46.2		42.5		27.7
	1.5	0.566	170	113	84.9	67.9	56.6		49		34
	2	0.653	196	131	98	78.4	65.3		60		39.2
	3	0.8	240	160	120	96	80				48
	4	0.924	277	185	139	111	92.4		69.3		55.4
	5	1.033	310	207	155	124	103				62
	6	1.131	339	226	170	136	113		77.5		67.9

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SPRAYING INFORMATION & CALIBRATION

B. Calculate required nozzle flow rate.

If you know:

- the application rate required (eg 60 L/ha),
- speed of travel (eg 16 km/hr),
- swath width (eg 18 m), &
- the number of nozzles on the boom (eg 36).

The following formula can be used to establish required flow rate per nozzle:

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

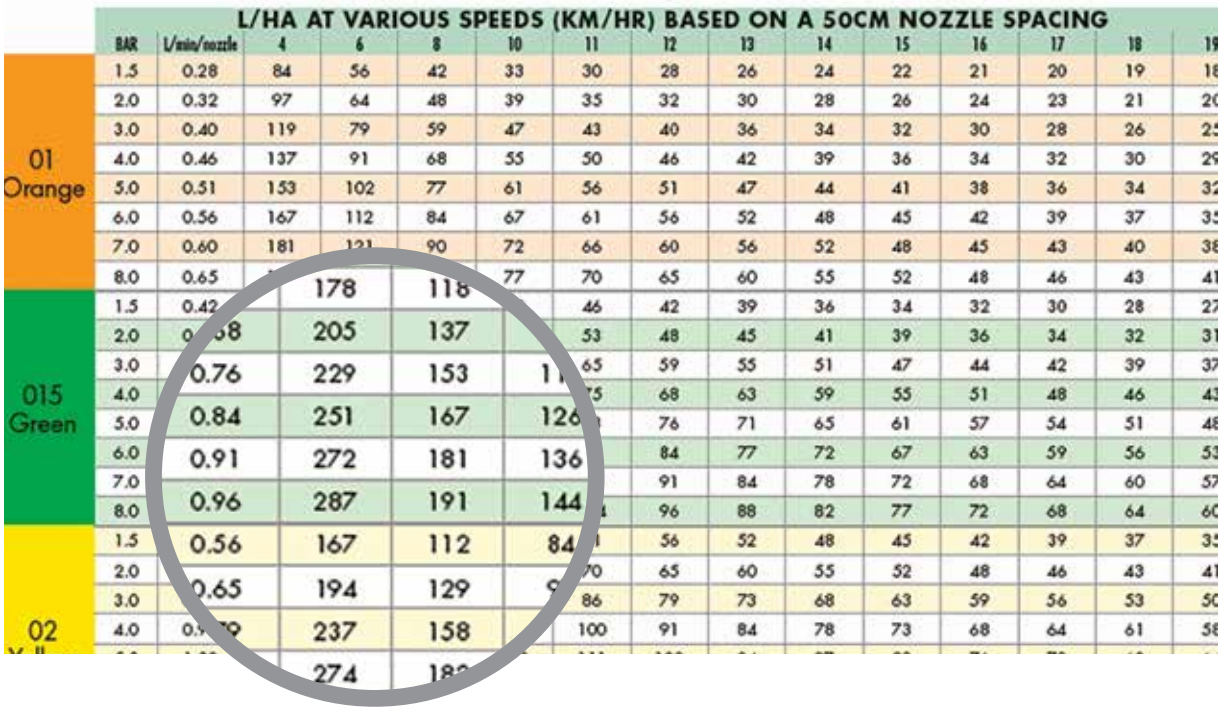
eg. [(12 x 18 x 50) ÷ 600] ÷ 36
= 0.5 L/min for each nozzle

An alternative formula is:

Nozzle Flow Rate (L/min) =
Speed (km) x Nozzle Spacing (cm) x Application Rate (L/ha) ÷ 60,000

eg. [12 x 50 x 50] ÷ 60,000
= 0.5 L/min

Now using the nozzle chart look down the nozzle capacity column (L/min) and select a nozzle to suit the output (eg 0.5 L/min). Refer to pages 64 for nozzle charts.



L/HA AT VARIOUS SPEEDS (KM/HR) BASED ON A 50CM NOZZLE SPACING

	BAR	L/min/nozzle	4	6	8	10	11	12	13	14	15	16	17	18	19
01 Orange	1.5	0.28	84	56	42	33	30	28	26	24	22	21	20	19	18
	2.0	0.32	97	64	48	39	35	32	30	28	26	24	23	21	20
	3.0	0.40	119	79	59	47	43	40	36	34	32	30	28	26	25
	4.0	0.46	137	91	68	55	50	46	42	39	36	34	32	30	29
	5.0	0.51	153	102	77	61	56	51	47	44	41	38	36	34	32
	6.0	0.56	167	112	84	67	61	56	52	48	45	42	39	37	35
	7.0	0.60	181	121	90	72	66	60	56	52	48	45	43	40	38
	8.0	0.65			97	77	70	65	60	55	52	48	46	43	41
015 Green	1.5	0.42		178	118		46	42	39	36	34	32	30	28	27
	2.0	0.[illegible]8		205	137		53	48	45	41	39	36	34	32	31
	3.0	0.76		229	153	1[illegible]	65	59	55	51	47	44	42	39	37
	4.0	0.84		251	167	126	[illegible]	68	63	59	55	51	48	46	43
	5.0	0.91		272	181	136		76	71	65	61	57	54	51	48
	6.0	0.96		287	191	144		84	77	72	67	63	59	56	53
	7.0							91	84	78	72	68	64	60	57
	8.0						[illegible]	96	88	82	77	72	68	64	60
02 [illegible]	1.5	0.56		167	112	84	[illegible]	56	52	48	45	42	39	37	35
	2.0	0.65		194	129	[illegible]	[illegible]70	65	60	55	52	48	46	43	41
	3.0						86	79	73	68	63	59	56	53	50
	4.0	0.[illegible]		237	158		100	91	84	78	73	68	64	61	58
	[illegible]			274	18[illegible]										

NOTE

Always use Actual Speed of Travel for speed in the above formula.

STEP 5 - FIT THE SELECTED NOZZLES TO THE BOOM

Fit the selected nozzles to the boom as per the nozzle manufacturers specifications.

NOTE

Remember when selecting nozzle outputs that higher pressures and wider spray angles usually give finer droplet sizes than lower pressures and narrower spray angles.

SECTION 7
SPRAYING INFORMATION & CALIBRATION

STEP 6 - CHECK NOZZLE ACCURACY & DETERMINE NOZZLE OUTPUT

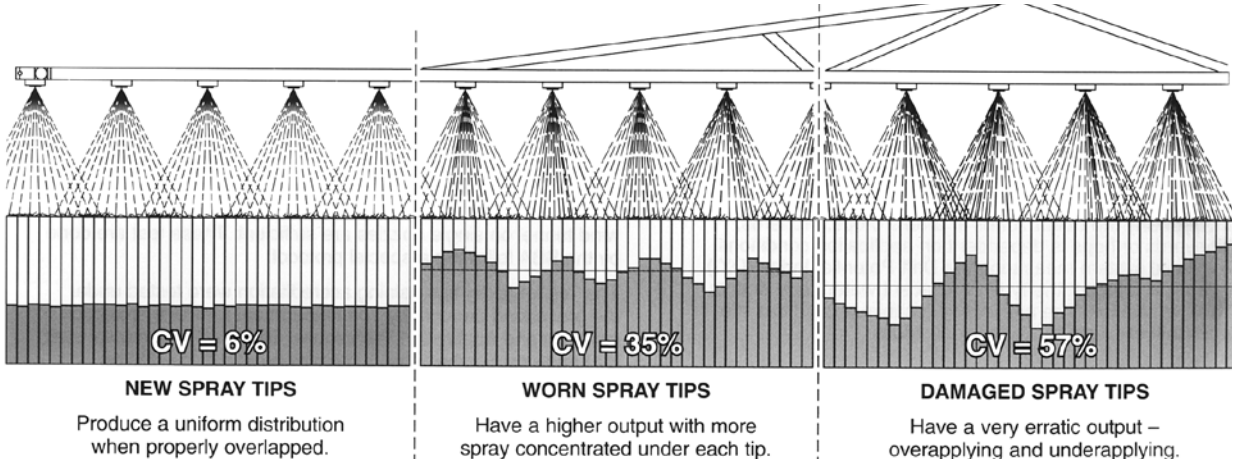
Test the actual output of the nozzles using the following procedure:

a. Ensure there is adequate water in the tank.

   IMPORTANT: Do not use mixed pesticides for testing.

b. Start the sprayer and set the spray Controller master switch into MANUAL position and adjust the operating pressure.

c. Collect and measure the volume of spray from one nozzle and adjust pressure so that the nozzle gives the specified output (eg 0.5 L/min).



WARNING

Do not use mixed pesticides for testing. Use only clean water. Use of pesticides when testing is hazardous to your health.

CAUTION

Do not use a worn nozzles to set the pressure setting and nozzle rates, otherwise inaccurate calibration will occur.

IMPORTANT:

Do not use a worn nozzle to set the pressure setting and nozzle rates.

If the boom is not fitted with new nozzles, fit one new nozzle and use it to set the flow rate and pressure setting.

This sets the standard flow rate, pressure setting and spray pattern with which to test the performance of other nozzles.

d. When the pressure is set to give a specified nozzle output (using a new nozzle), collect and measure the volume of spray from each nozzle for one minute in a collection jar or calibrating jug.

SECTION 7
SPRAYING INFORMATION & CALIBRATION

Specially designed nozzle testing equipment such as nozzle calibrating jugs can be used to simplify nozzle calibration.

e. Visually check nozzle spray patterns and spray angle for accuracy and, if necessary, replace any faulty nozzles.

f. Discard and replace any nozzle that deviates more than 10% from the specified output (eg with a 0.5 L/min specification- discard any nozzles 0.45 L/min and under or 0.55 L/min and over).

g. Check replacement nozzles by collecting and measuring output from each replacement.

h. Record the output of each nozzle on the boom. Add the outputs together and divide by the number of nozzles to get the required output of each nozzles in one minute.

eg. Total spray output 18 L/min ÷ 36 nozzles = 0.5 L/min per nozzle

STEP 7 - CALCULATE APPLICATION RATE

When operating the spray controller, the controller automatically calculates and shows the rate of application.

NOTE

Full instructions of controller operation are contained in your separate Controller Manual.

Application Rate (L/ha) = Spray Output (L/min) x 600 ÷ Speed (km/hr) x Swath Width (m)

eg. [18 x 600] ÷ [12 x 18] = 50 L/ha

STEP 8 - IF TESTED APPLICATION IS NOT SATISFACTORY:

a. In Auto mode - if application rate is not being achieved:

i. Operating pressure will climb if nozzles are too small or blocked or speed is too slow.

Likewise, if your pressure filter is blocked (even partially), you may experience excessive pressure at the pump.

Make adjustments accordingly.

ii. Operating pressure will fall if nozzles are too large or speed is too slow. Make adjustments accordingly.

b. In Manual mode - the Controller application rate can be altered by:

i. Adjusting pressure up or down to increase or decrease rate of application (use +/- keys).

i. Adjusting spraying speed up or down to decrease or increase rate of application.

iii. Changing to a different nozzle capacity.

STEP 9 - ADD THE CORRECT AMOUNT OF CHEMICAL TO THE TANK

a. For land area rates (litres or kg per hectare), use the following formula:

Chemical Required (litres) = Tank Volume (litres) x Recommended Chemical Rate (L/ha) ÷ Spray Application Rate (L/ha)

eg. [2000 x 2.0] ÷ 50 = 80 litres

b. If chemical recommendation is given in water volume rates use the following formula:

Chemical Required (litres) = Tank Volume (litres) x Recommended Chemical Rate (L/100 litres) ÷ 100

eg. [2000 x 4] ÷ 100 = 80 litres

c. For land area covered, use the formula:

Area Covered (ha) = Tank Volume (litres) ÷ Spray Application Rate (L/ha)

eg. 2000 ÷ 50 = 40 hectares

SECTION 7
SPRAYING INFORMATION & CALIBRATION

d. For tank volume required, use the formula:

$$\text{Tank Volume Required (litres)} = \frac{\text{Area (ha)} \times \text{Spray Application Rate (L/ha)}}{}$$

eg. $\frac{20 \times 50}{} = 1000 \text{ litres}$

STEP 10 - ADJUST BOOM HEIGHT

Boom height should be adjusted to suit the type of nozzle used, terrain and crop or soil being sprayed.
Minimum boom height recommendations depend on the nozzle spray angle and nozzle spacing.
Refer to Nozzle chart recommendations.

Optimum Spray Height

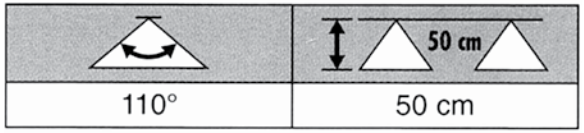


Image courtesy of www.TeeJet.com

STEP 11 - RECORD ALL DATA FOR FUTURE REFERENCE

Record all your calibration data on the work sheets given at the end of this section.

Photocopy the work sheets to obtain the number of work sheets required.

NOTE

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

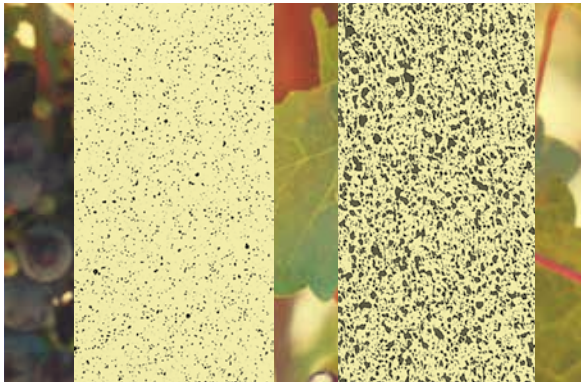
STEP 12 - COVERAGE ASSESSMENT

Operate your sprayer in the required orchard or vineyard to check the actual spray coverage achieved on foliage.

This is important because it is the only real measure you have of actual coverage and effective penetration of your sprayer.

Coverage checks can be done using:

- Water Sensitive Papers (as pictured) and available through Croplands dealers – see Croplands Buyers guide for further details.
- Clay Markers as available through Croplands dealers – see Croplands Buyers guide for further details.
- Fluorescent Dye system as available through Croplands dealers – see Croplands Buyers guide for further details.



It is recommended to test the unit using water only as a test run, and again when applying your chemical mixture.

Ensure water sensitive papers are strategically placed on both upper and lower surfaces.

Spray testing, evaluation and adjustment to the sprayer (say fan positions) or spray settings (say nozzles, pressures and rates) should be done in conjunction with an agronomist / spray manager / someone skilled in the art of spraying. The best setup might vary significantly from crop to crop, season to season etc.

SECTION 7
SPRAYING INFORMATION & CALIBRATION

AIR-MIX & TURBODROP® NOZZLE CHART

			Application Rate (L/ha with km/h @ 50cm nozzle spacing)														
Nozzle Type	**Pressure Bar**	**Flow Rate L/min**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**35**
110-015 Orange	1	0.231	46.2	46.2	34.7	27.7	23.1	19.8	17.3	15.4	13.9	12.6	11.6	10.7	9.9	9.24	7.92
	1.5	0.283	84.9	56.6	42.5	34	28.3	24.3	21.2	18.9	17	15.4	14.2	13.1	12.1	11.3	9.7
	2	0.327	98.1	65.4	49.1	39.2	32.7	28	24.5	21.8	19.6	17.8	16.4	15.1	14	13.1	11.2
	3	0.4	120	80	60	48	40	34.3	30	26.7	24	21.8	20	18.5	17.1	16	13.7
	4	0.462	139	92.4	69.3	55.4	46.2	39.6	34.7	30.8	27.7	25.2	23.1	21.3	19.8	18.5	15.8
	5	0.517	155	103	77.6	62	51.7	44.3	38.8	34.5	31	28.2	25.9	23.9	22.2	20.7	17.7
	6	0.566	170	113	84.9	67.9	56.6	48.5	42.5	37.7	34	30.9	28.3	26.1	24.3	22.6	19.4
110-015 Green	1	0.346	69.2	69.2	51.9	41.5	34.6	29.7	26	23.1	20.8	18.9	17.3	16	14.8	13.8	11.9
	1.5	0.424	127	84.8	63.6	50.9	42.4	36.3	31.8	28.3	25.4	23.1	21.2	19.6	18.2	17	14.5
	2	0.49	147	98	73.5	58.8	49	42	36.8	32.7	29.4	26.7	24.5	22.6	21	19.6	16.8
	3	0.6	180	120	90	72	60	51.4	45	40	36	32.7	30	27.7	25.7	24	20.6
	4	0.693	208	139	104	83.2	69.3	59.4	52	46.2	41.6	37.8	34.7	32	29.7	27.7	23.8
	5	0.775	233	155	116	93	77.5	66.4	58.1	51.7	46.5	42.3	38.8	35.8	33.2	31	26.6
	6	0.849	255	170	127	102	84.9	72.8	63.7	56.6	50.9	46.3	42.5	39.2	36.4	34	29.1
110-02 Yellow	1	0.462	92.4	92.4	69.3	55.4	46.2	39.6	34.7	30.8	27.7	25.2	23.1	21.3	19.8	18.5	15.8
	1.5	0.566	170	113	84.9	67.9	56.6	48.5	42.5	37.7	34	30.9	28.3	26.1	24.3	22.6	19.4
	2	0.653	196	131	98	78.4	65.3	56	49	43.5	39.2	35.6	32.7	30.1	28	26.1	22.4
	3	0.8	240	160	120	96	80	68.6	60	53.3	48	43.6	40	36.9	34.3	32	27.4
	4	0.924	277	185	139	111	92.4	79.2	69.3	61.6	55.4	50.4	46.2	42.6	39.6	37	31.7
	5	1.033	310	207	155	124	103	88.5	77.5	68.9	62	56.3	51.7	47.7	44.3	41.3	35.4
	6	1.131	339	226	170	136	113	96.9	84.8	75.4	67.9	61.7	56.6	52.2	48.5	45.2	38.8
110-025 Lilac	1	0.577	115	115	86.6	69.2	57.7	49.5	43.3	38.5	34.6	31.5	28.9	26.6	24.7	23.1	19.8
	1.5	0.707	212	141	106	84.8	70.7	60.6	53	47.1	42.4	38.6	35.4	32.6	30.3	28.3	24.2
	2	0.816	245	163	122	97.9	81.6	69.9	61.2	54.4	49	44.5	40.8	37.7	35	32.6	28
	3	1	300	200	150	120	100	85.7	75	66.7	60	54.5	50	46.2	42.9	40	34.3
	4	1.154	346	231	173	138	115	98.9	86.6	76.9	69.2	62.9	57.7	53.3	49.5	46.2	39.6
	5	1.291	387	258	194	155	129	111	96.8	86.1	77.5	70.4	64.6	59.6	55.3	51.6	44.3
	6	1.414	424	283	212	170	141	121	106	94.3	84.8	77.1	70.7	65.3	60.6	56.6	48.5

SECTION 7
SPRAYING INFORMATION & CALIBRATION

AIR-MIX & TURBODROP® NOZZLE CHART

			Application Rate (L/ha with km/h @ 50cm nozzle spacing)														
Nozzle Type	**Pressure Bar**	**Flow Rate L/min**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**35**
110-03 Blue	1	0.693	139	139	104	83.2	69.3	59.4	52	46.2	41.6	37.8	34.7	32	29.7	27.7	23.8
	1.5	0.849	255	170	127	102	84.9	72.8	63.7	56.6	50.9	46.3	42.5	39.2	36.4	34	29.1
	2	0.98	294	196	147	118	98	84	73.5	65.3	58.8	53.5	49	45.2	42	39.2	33.6
	3	1.2	360	240	180	144	120	103	90	80	72	65.5	60	55.4	51.4	48	41.1
	4	1.386	416	277	208	166	139	119	104	92.4	83.2	75.6	69.3	64	59.4	55.4	47.5
	5	1.549	465	310	232	186	155	133	116	103	92.9	84.5	77.5	71.5	66.4	62	53.1
	6	1.697	509	339	255	204	170	145	127	113	102	92.6	84.9	78.3	72.7	67.9	58.2
110-04 Red	1	0.924	185	185	139	111	92.4	79.2	69.3	61.6	55.4	50.4	46.2	42.6	39.6	37	31.7
	1.5	1.113	334	223	167	134	111	95.4	83.5	74.2	66.8	60.7	55.7	51.4	47.7	44.5	38.2
	2	1.306	392	261	196	157	131	112	98	87.1	78.4	71.2	65.3	60.3	56	52.2	44.8
	3	1.6	480	320	240	192	160	137	120	107	96	87.3	80	73.8	68.6	64	54.9
	4	1.848	554	370	277	222	185	158	139	123	111	101	92.4	85.3	79.2	73.9	63.4
	5	2.066	620	413	310	248	207	177	155	138	124	113	103	95.4	88.5	82.6	70.8
	6	2.263	679	453	339	272	226	194	170	151	136	123	113	104	97	90.5	77.6
110-05 Brown	1	1.155	231	231	173	139	116	99	86.6	77	69.3	63	57.8	53.3	49.5	46.2	39.6
	1.5	1.414	424	283	212	170	141	121	106	94.3	84.8	77.1	70.7	65.3	60.6	56.6	48.5
	2	1.633	490	327	245	196	163	140	122	109	98	89.1	81.7	75.4	70	65.3	56
	3	2	600	400	300	240	200	171	150	133	120	109	100	92.3	85.7	80	68.6
	4	2.309	693	462	346	277	231	198	173	154	139	126	115	107	99	92.4	79.2
	5	2.582	775	516	387	310	258	221	194	172	155	141	129	119	111	103	88.5
	6	2.828	848	566	424	339	283	242	212	189	170	154	141	131	121	113	97
110-06 Grey	1	1.386	277	277	208	166	139	119	104	92.4	83.2	75.6	69.3	64	59.4	55.4	47.5
	1.5	1.697	509	339	255	204	170	145	127	113	102	92.6	84.9	78.3	72.7	67.9	58.2
	2	1.96	588	392	294	235	196	168	147	131	118	107	98	90.5	84	78.4	67.2
	3	2.4	720	480	360	288	240	206	180	160	144	131	120	111	103	96	82.3
	4	2.771	831	554	416	333	277	238	208	185	166	151	139	128	119	111	95
	5	3.098	929	620	465	372	310	266	232	207	186	169	155	143	133	124	106
	6	3.394	1018	679	509	407	339	291	255	226	204	185	170	157	145	136	116

SECTION 7
SPRAYING INFORMATION & CALIBRATION

CALIBRATION WORK SHEET

Step 1

Check the Sprayer is in Good Working Order

Step 2

Determine Actual Speed of Travel

Follow Instructions on page 80 (Speed Calibration).	
Tractor model	
Gear	
Range	
Dual power	
Engine RPM	
Speed in Km/h	

Step 3

Measure Boom Widths

Boom section 1:	
Boom section 2:	
Boom section 3:	
Boom section 4:	
Boom section 5:	
Boom section 6:	
Boom section 7:	

Step 4

Select Nozzle Type & Size

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

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

____ x ____ x ____ ÷ 600 ÷ ____

= ____ L/min for each nozzle

Step 5

Fit Selected Nozzles to Boom

Nozzle Type:	
Nozzle Size:	
Nozzle Colour:	

Step 6

Check Nozzle Accuracy & Determine Nozzle Output

Thoroughly check nozzles & test the actual output of each nozzle.

Pressure Setting:	
Individual Nozzle Outputs:	
Sum of Nozzle Outputs:	

Step 7

Calculate Application Rate

The spray Controller automatically calculates and shows the rate of application.

Application Rate (L/ha) = Spray Output (L/min) x 600 ÷ Speed (km/hr) x Swath Width (m)

[____ x 600] ÷ [____ x ____]

= ____

Step 8

If Tested Application is Not Satisfactory - Make Changes & Repeat Procedure

Step 9

Add Correct Amount of Chemical

Chemical:	
Water Quantity:	
Chemical Added:	

Step 10

Boom Height

Step 11

Record Data

Date	
Farm location	
Crop to be sprayed	
Spray Volume L/ha	
Nozzle type	
Nozzle size & colour	
No. of nozzles used	
Nozzle pressure	
Tested Output in L/min	
Actual L/Hectare	

SECTION 7
SPRAYING INFORMATION & CALIBRATION

CALIBRATION WORK SHEET

Step 1

Check the Sprayer is in Good Working Order

Step 2

Determine Actual Speed of Travel

Follow Instructions on page 80 (Speed Calibration).	
Tractor model	
Gear	
Range	
Dual power	
Engine RPM	
Speed in Km/h	

Step 3

Measure Boom Widths

Boom section 1:	
Boom section 2:	
Boom section 3:	
Boom section 4:	
Boom section 5:	
Boom section 6:	
Boom section 7:	

Step 4

Select Nozzle Type & Size

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

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

_____ x _____ x _____ ÷ 600 ÷ _____

= _____ L/min for each nozzle

Step 5

Fit Selected Nozzles to Boom

Nozzle Type:	
Nozzle Size:	
Nozzle Colour:	

Step 6

Check Nozzle Accuracy & Determine Nozzle Output

Thoroughly check nozzles & test the actual output of each nozzle.

Pressure Setting:	
Individual Nozzle Outputs:	
Sum of Nozzle Outputs:	

Step 7

Calculate Application Rate

The spray Controller automatically calculates and shows the rate of application.

Application Rate (L/ha) = Spray Output (L/min) x 600 ÷ Speed (km/hr) x Swath Width (m)

[_____ x 600] ÷ [_____ x _____]

= _____

Step 8

If Tested Application is Not Satisfactory - Make Changes & Repeat Procedure

Step 9

Add Correct Amount of Chemical

Chemical:	
Water Quantity:	
Chemical Added:	

Step 10

Boom Height

Step 11

Record Data

Date	
Farm location	
Crop to be sprayed	
Spray Volume L/ha	
Nozzle type	
Nozzle size & colour	
No. of nozzles used	
Nozzle pressure	
Tested Output in L/min	
Actual L/Hectare	

SECTION 7
SPRAYING INFORMATION & CALIBRATION

CALIBRATION WORK SHEET

Step 1

Check the Sprayer is in Good Working Order

Step 2

Determine Actual Speed of Travel

Follow Instructions on page 80 (Speed Calibration).	
Tractor model	
Gear	
Range	
Dual power	
Engine RPM	
Speed in Km/h	

Step 3

Measure Boom Widths

Boom section 1:	
Boom section 2:	
Boom section 3:	
Boom section 4:	
Boom section 5:	
Boom section 6:	
Boom section 7:	

Step 4

Select Nozzle Type & Size

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

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

_____ x _____ x _____ ÷ 600 ÷ _____

= _____ L/min for each nozzle

Step 5

Fit Selected Nozzles to Boom

Nozzle Type:	
Nozzle Size:	
Nozzle Colour:	

Step 6

Check Nozzle Accuracy & Determine Nozzle Output

Thoroughly check nozzles & test the actual output of each nozzle.

Pressure Setting:	
Individual Nozzle Outputs:	
Sum of Nozzle Outputs:	

Step 7

Calculate Application Rate

The spray Controller automatically calculates and shows the rate of application.

Application Rate (L/ha) = Spray Output (L/min) x 600 ÷ Speed (km/hr) x Swath Width (m)

[_____ x 600] ÷ [_____ x _____]

= _____

Step 8

If Tested Application is Not Satisfactory - Make Changes & Repeat Procedure

Step 9

Add Correct Amount of Chemical

Chemical:	
Water Quantity:	
Chemical Added:	

Step 10

Boom Height

Step 11

Record Data

Date	
Farm location	
Crop to be sprayed	
Spray Volume L/ha	
Nozzle type	
Nozzle size & colour	
No. of nozzles used	
Nozzle pressure	
Tested Output in L/min	
Actual L/Hectare	

SECTION 7
SPRAYING INFORMATION & CALIBRATION

CALIBRATION WORK SHEET

Step 1

Check the Sprayer is in Good Working Order

Step 2

Determine Actual Speed of Travel

Follow Instructions on page 80 (Speed Calibration).	
Tractor model	
Gear	
Range	
Dual power	
Engine RPM	
Speed in Km/h	

Step 3

Measure Boom Widths

Boom section 1:	
Boom section 2:	
Boom section 3:	
Boom section 4:	
Boom section 5:	
Boom section 6:	
Boom section 7:	

Step 4

Select Nozzle Type & Size

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

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

_____ x _____ x _____ ÷ 600 ÷ _____

= _____ L/min for each nozzle

Step 5

Fit Selected Nozzles to Boom

Nozzle Type:	
Nozzle Size:	
Nozzle Colour:	

Step 6

Check Nozzle Accuracy & Determine Nozzle Output

Thoroughly check nozzles & test the actual output of each nozzle.

Pressure Setting:	
Individual Nozzle Outputs:	
Sum of Nozzle Outputs:	

Step 7

Calculate Application Rate

The spray Controller automatically calculates and shows the rate of application.

Application Rate (L/ha) = Spray Output (L/min) x 600 ÷ Speed (km/hr) x Swath Width (m)

[_____ x 600] ÷ [_____ x _____]

= _____

Step 8

If Tested Application is Not Satisfactory - Make Changes & Repeat Procedure

Step 9

Add Correct Amount of Chemical

Chemical:	
Water Quantity:	
Chemical Added:	

Step 10

Boom Height

Step 11

Record Data

Date	
Farm location	
Crop to be sprayed	
Spray Volume L/ha	
Nozzle type	
Nozzle size & colour	
No. of nozzles used	
Nozzle pressure	
Tested Output in L/min	
Actual L/Hectare	

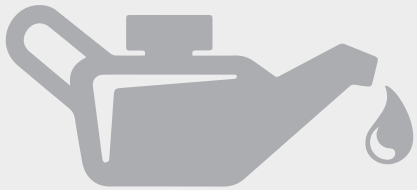
SECTION 8
LUBRICATION & MAINTENANCE

GENERAL MAINTENANCE

All the various maintenance operations must be carried out after each use and when the machine is not in operation.

1. Remove any foreign bodies lodged in the sprayer's structure / boom arms.
2. Remove / clean from the various parts any residue of the chemical products used, as they could damage the materials.
3. Periodically check the nozzles and replace any worn nozzles.
4. Have the sprayer unit checked once a year by qualified technical personnel.
5. Repairs should only be undertaken by suitably qualified personnel.

Do not operate with damaged components.



SECTION 8
LUBRICATION & MAINTENANCE

Check the tank straps

GREASING & SERVICE PROCEDURES

1. Clean suction line filter with each tank load.
2. Clean pressure line filter.
3. Check tyre pressure (350kPa / 50psi), and check (M18) wheel nuts, refer to page 100.
4. Check tank straps and tighten if necessary.
5. Clean flowmeter (refer to page 78, 79).

Clean the Flowmeter

NOTE

Ensure the sliding inner tubes of the PTO are greased every 8 hours (working around the clock equals 3 times/day), especially when doing a lot of tight turning.

6. Grease tractor to sprayer PTO universal joints every 8 hours.
   - Grease lightly until grease becomes firm in seals. Over greasing will break seals and allow dust and moisture to penetrate - increasing wear.
7. Grease PTO inner tubes every 8 hours.
   - To lubricate the inner tube, slide PTO shaft apart, clean the telescopic tubes, grease and reassemble.
8. Grease the PTO covers every 20 hours.
9. Check pump air chamber pressure on a regular basis. As a general guideline it should be 10%-20% of operating pressure (70-100 kPa [10-15 psi]). Refer to pump instruction manual for more information.
10. To ensure trouble free spraying, flush the sprayer with fresh water thoroughly each day, and before changing chemicals.

    Dispose of tank wash according to chemical manufacturers instructions.
11. Grease all boom joints, height adjuster points and other grease points (refer diagram on next page).
12. Grease the Pinto jack.

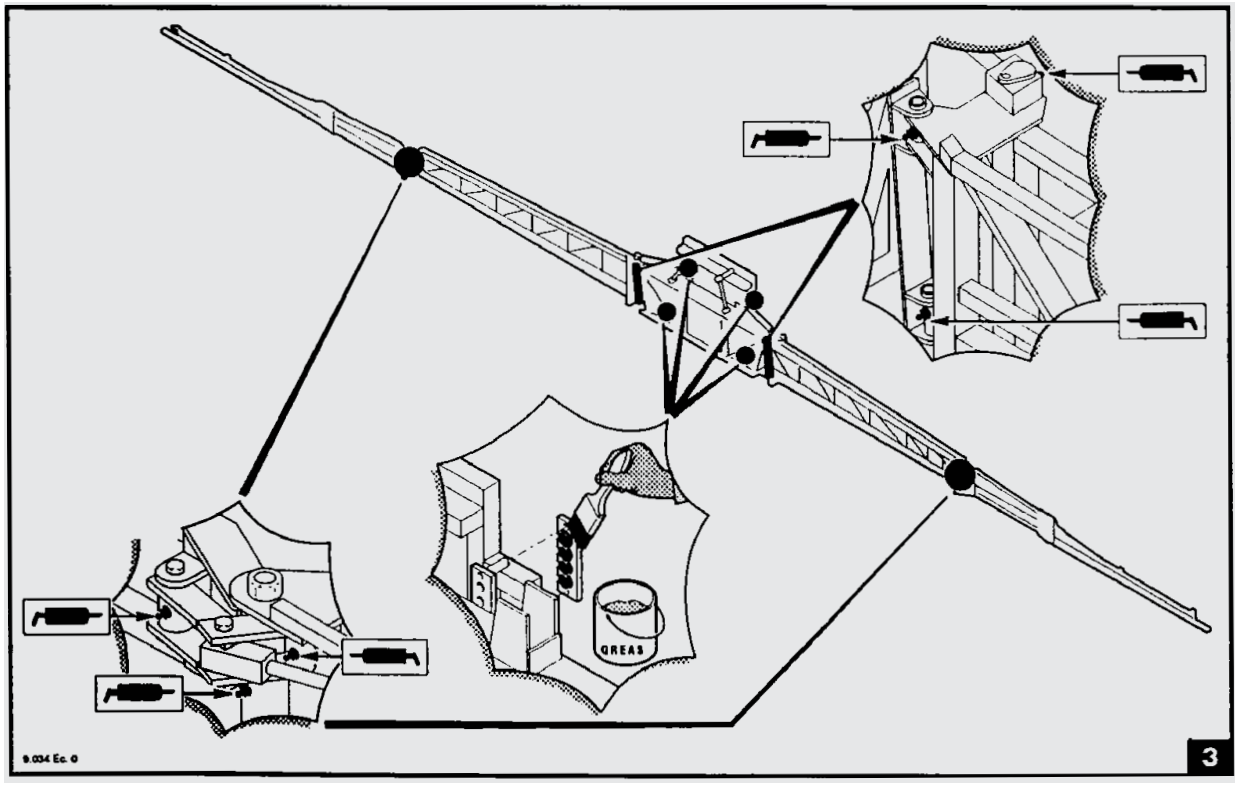
Grease the Pinto jack

Every 200 Hours

1. Lubricate quick release lock pins on PTO shaft.
2. Re-pack wheel bearings with grease.
3. Inspect the bushes & pins on the tandem axle (if fitted).
4. Change air filter for foam marker.
6. Grease all tank lid seals with vaseline.

Repack the wheel bearings at 200 hours

SECTION 8
LUBRICATION & MAINTENANCE



BOOM GREASE POINT DIAGRAM

There are approximately 50 grease points on every spray boom / parallelogram lift. Can you find them all ?

PUMPS

Diaphragm Pump Maintenance

Annovi & Reverberi (A&R) pumps are of the piston-diaphragm type. All parts in contact with the spray liquid, which are subject to corrosion, are protected, making them ideal for spraying (herbicides, insecticides, fungicides, fertilisers, etc.), disinfection and washing.

Daily Before Starting the Pump

1. Check that oil is visible in sight glass (half way up) and top up if necessary with good clean motor oil 20W/30 or 20W/40.
2. Clean all sprayer filters. Blocked or semi blocked filters place extra stress on diaphragms.
3. Start with zero pressure and the pump will self prime immediately and clear air locks in suction line.

Daily after Use

1. Flush pump with clean water.
2. Drain filters and clean. A high percentage of pump failures are due to blocked filters.

CAUTION

Running a diaphragm pump faster than specified will not improve performance, but will damage and wear out moving parts. Warranty will be made void by speeds in excess of those indicated on the pump name plate.

SECTION 8
LUBRICATION & MAINTENANCE

Every 50 Hours

Check surge chamber pressure and adjust as follows:

- Air pressure 70-100kPa (10- 15psi) [Should be 10-20% of operating pressure].

Vibration of the delivery hose usually indicates that the air pressure in the surge chamber is incorrect.

The main cause of surge chamber diaphragm fracture is low pressure in this chamber.

Surge chamber pressure can be checked with an ordinary tyre gauge.

The above pressure range is a guide to the correct pressure.

However, if difficulties recur, adjust the pressure until an even flow is obtained from the pump (no pulsing of liquid at operating RPM). The pressure is best increased with a bicycle pump.

Every 250 hours or Every Season - Whichever Comes Sooner

1. Change oil and refill with 20W/30 oil.

   Attention should be made to remove trapped air behind the diaphragms by rocking from side to side as instructed.

   It is also good practise to run the pump for 10 minutes without pressure, and then, top up with oil before working the pump.

2. When changing the pump oil, check diaphragms and replace them if they are showing signs of wear.

   This is normally a pre-season maintenance procedure which can be done easily as no special tools are required.

   You can avoid unnecessary down time in spraying seasons by carrying out the proper maintenance.

3. Also check inlet and outlet valves and replace if worn. Worn valves not only reduce the output of the pump, but may reduce the life of the diaphragms.

Excessive Diaphragm Failure

If you have excessive diaphragm failure check the following points. These will cause failure of diaphragms due to added stress or chemical attack.

1. Most Important - Pump not being flushed out daily with clean water after use.
2. Oil level too low allowing air between piston and diaphragm.
3. Air leaks in suction line.
4. Restricted suction line.
5. Restriction through suction filter.
6. Not cleaning suction filter regularly.
7. Worn suction and discharge valves.
8. Bypass line too small to carry full capacity of pump.
9. In cold climates - frozen suction/discharge lines or water remaining in the pump after flushing.
10. Incorrect air setting or no air in air chamber.
11. Agitator excessively restricting bypass from pump.
12. Diaphragm material construction incorrect for chemical or solution being pumped.
13. Chemicals containing toluene or other aggressive solvents may require viton diaphragms - particularly if the pump is not properly flushed after use.

Pre-Season Servicing

For thorough pre-season servicing - check all aspects of the Pinto and its operating components as outlined in the pre-delivery check list on pages 55 ~ 57 plus the "Warranty" booklet (refer page 5).

SECTION 8
LUBRICATION & MAINTENANCE

Pump Storage and Corrosion Protection

1. **Warm Climates**

   If you operate in a warm climate with no chance of frost in the winter, you will not have any problems with frost damage.

   If you are storing your sprayer between seasons, ensure your pump has been thoroughly flushed with clean water. A good idea is to run a mixture of 1% solution of summer mineral spraying oil through the pump and plumbing system. Summer spraying oil is water-soluble oil such as DC-Tron. This will coat and protect all internal pump parts. Ensure this mixture is flushed out before spraying commences in the new season.

2. **Cold Climates**

   For prolonged storage, an anti-freeze mixture can be flushed through the pump. Ensure this is thoroughly flushed out prior to the commencement of spraying again.

   If the pump is being stored overnight and a risk of freezing is imminent, drain all liquid from the pump and lines, including boom lines.

FILTERS

Filter Maintenance

Clean filters ensure that no solids enter the spraying system to block or damage pump or nozzles.

All filters should be cleaned regularly or after each spraying period.

Remove the outer screw and bowl of suction filter

Suction Filter

The suction filter should be cleaned regularly, or after each spray tank has been emptied.

Remove & clean the filter element & components

Reassemble & tighten the outer screw of suction filter

Pressure Filters

The pressure filters should be cleaned regularly, or after each spray tank has been emptied.

SECTION 8
LUBRICATION & MAINTENANCE

Remove & clean the non-drip diaphragms regularly

Non-Drip Diaphragms

Non-drip diaphragms should be cleaned regularly to prevent dripping from nozzles.

To clean the non-drip diaphragms:

1. Completely stop all sprayer functions.
2. Unscrew and remove the diaphragm cap.
3. Remove and clean any sediment off the diaphragm membrane.

   Replace the diaphragm membrane if damaged.
4. Refit the diaphragm.

NOTE

Do not over tighten the diaphragm cap. Over tightening the cap may impede flow through the diaphragm.

NOTE

Tank clamps should be checked two or three times a day when the sprayer is new and the tank and frame are bedding-in. Thereafter, the tank clamps should be checked regularly.

5-bank motor valves pictured

5. Refit the diaphragm cap and carefully tighten.

MOTOR VALVES

Electric Motor-Valve Maintenance

1. Flush system with clean water after each day's use, especially when using wettable powders.
2. Clean and drain the system for storage.
3. Do not apply lubricating oils or other petroleum products to the valves, as this may cause swelling of the rubber parts.
4. Check with the chemical manufacturer to be sure chemicals being used are compatible with the valve parts.
5. Check the ON/OFF operation of the valves periodically, especially if nozzles cannot be seen while operating.
6. Visually check electrical connections to ensure they are clean and secure.

SECTION 8
LUBRICATION & MAINTENANCE

BOOM MAINTENANCE

Careful and regular maintenance will ensure good, long operational life.

Also refer to Section 5, "Boom Set-up", pages 44 ~ 50.

Daily Maintenance

Clean the boom at the end of each working day or whenever the equipment is stopped for a period of time exceeding on hour. Rinse the plumbing lines and let clean water flow from the nozzles. Clean external surface with a water jet.

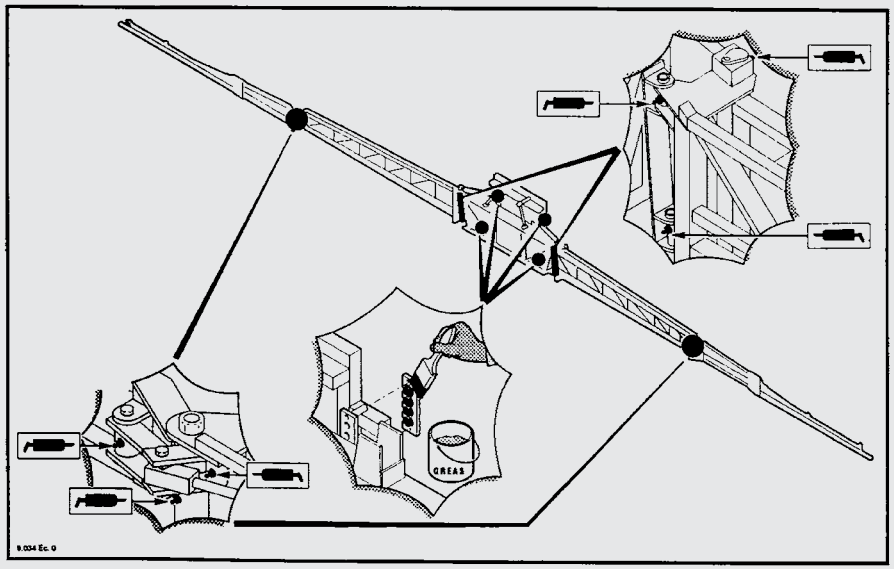
Ensure nozzles and nozzle bodies are correctly fixed and sealed when operating. Also ensure non-drip mechanism are working.

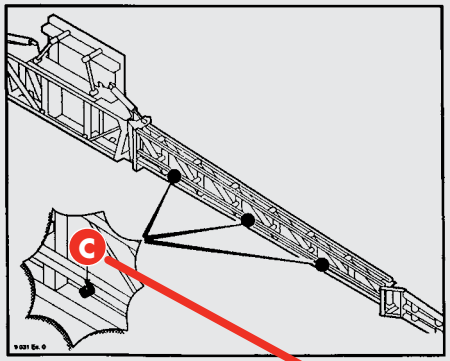
Grease all grease-points as indicated on these pages.

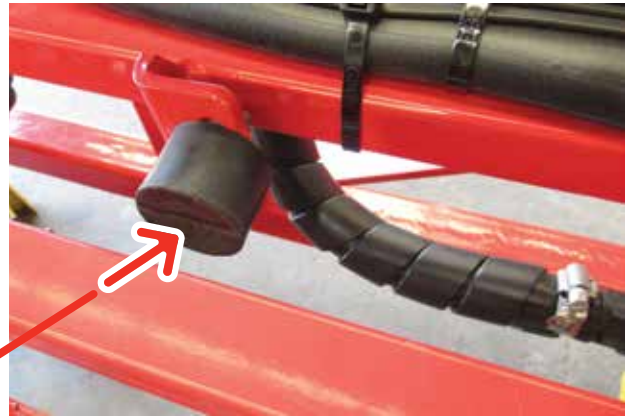
Every 50 Hours Maintenance

Carry out the following maintenance procedures every 50 hours:

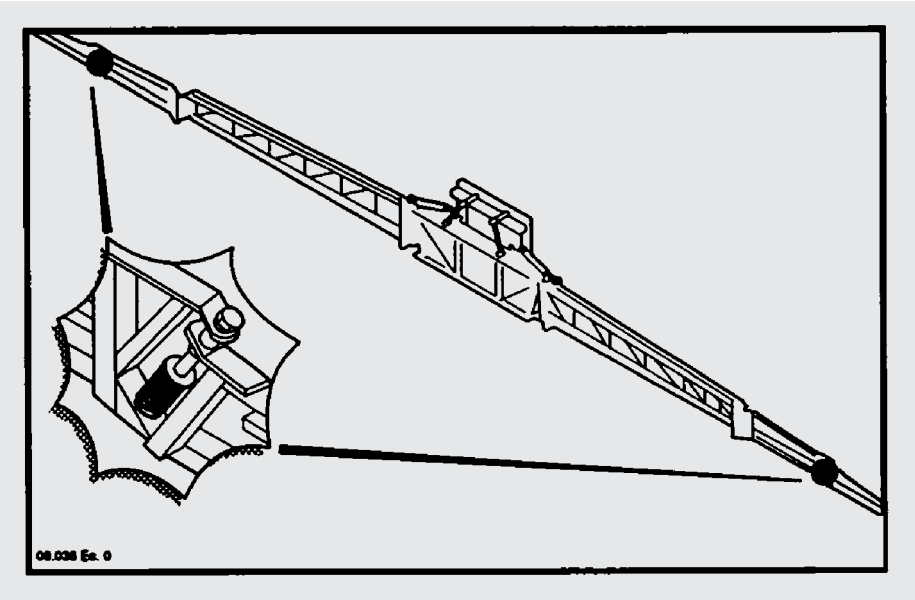
1. Make sure screws of all boom components are intact and tightened.
2. Retouch damage painted parts.
3. Check stop plugs (C). Replace them if necessary.
4. Check wear of sliding shoes/buttons. Adjust as required (move washers from inside to outside).
5. Grease the boom, as shown in figure 3 (right).
6. Grease the boom parallelogram lift & suspension pivot points.







SECTION 8
LUBRICATION & MAINTENANCE



Periodical Maintenance

1. Clean nozzles

   Remove nozzle clogging using compressed air or a soft bristle brush.

   Never use sharpened or pointed tools.
2. Check the function / elasticity of all springs and belleville washers. Replace as required / if these items are loosing performance.
3. Periodically check all hydraulic hoses and fittings for wear and replace if necessary.

End of Season Maintenance

1. Before storage clean all equipment thoroughly.
2. If necessary protect sprayer plumbing components with antifreeze fluid to avoid damage in severe temperatures.

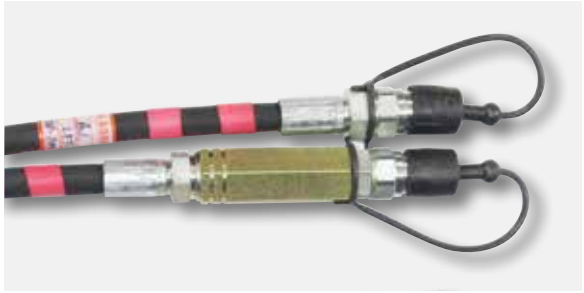
CAUTION

Always use protective gloves when cleaning nozzles.

SECTION 8
LUBRICATION & MAINTENANCE

It's now much easier to identify the correct hydraulic hoses.

We would expect that operators may also colour code their tractors to make it even easier to consistently hook up the correct hoses to the same fittings time and time again. Less chance of expensive accidents.



(A) **Pressure** hoses to have **two colour bands**.

(B) **Return** lines to have **one colour band**.

Blue	= FILL PUMP
Red	= FOLD or ELEC/HYD
Yellow	= Product Pump
White	= Lift

INSPECTION INTERVALS

MINIMUM RECOMMENDED TENSION INTERVALS FOR AG WHEELS

RETENTION AT

Initial fitment
4 hours of operation
9 hours of operation
16 hours of operation
24 hours of operation
48 hours of operation

Alternatively, after the first 50km & subsequently every 100km, the stud bolt nuts are to be tightened by means of a dynamometric key and with the torque values listed below. Male and female treads are to be dry, however small amounts of anti-corrosive oil covering is permitted. Ongoing inspection & re-tensioning should be done in accordance with daily wheel/tyre inspection procedures. These inspection periods may vary depending on vehicle operating conditions.

RECOMMENDED TORQUE VALUES FOR TITAN AUSTRALIA AXLES

Metric Wheel studs	
Stud Size	**Torque**
M12	73 ft.lbs (100 N.m)
M14	122 ft.lbs (166 N.m)
M16	173 ft.lbs (235 N.m)
M18 (Pinto)	253 ft.lbs (344 N.m)
M20	372 ft.lbs (504 N.m)
M22 Csk Nut	442 ft.lbs (600 N.m)
M22 Cap/w Nut	425 ft.lbs (575 N.m)
M24 Csk/Nut	562 ft.lbs (762 N.m)
M24 Cap/w Nut	540 ft.lbs (732 N.m)

Imperial Wheel studs	
Stud Size	**Torque**
7/16"	61 ft.lbs (83 N.m)
1/2"	86 ft.lbs (117 N.m)
9/16"	134 ft.lbs (182 N.m)
5/8"	176 ft.lbs (239 N.m)
3/4"	297 ft.lbs (404 N.m)
7/8"	482 ft.lbs (654 N.m)

These recommendations are supplied by Titan Australia – our major supplier for axles, wheels & tyres.

SECTION 9
TROUBLESHOOTING

SECTION 9
TROUBLESHOOTING

GENERAL SPRAYER PROBLEMS

PROBLEM	PROBABLE CAUSE	REMEDY
1. No spray when turned on.	1. Filter on the inlet side of the pump blocked. 2. Faulty pump.	1. Dismantle, clean & re-assemble. 2. Change pump.
2. Sprays for short time only.	1. Air inlet to tank blocked. 2. Filter on suction side of pump blocking or blocked.	1. Clean air vent. 2. Dismantle, clean & re-assemble the filter. If filter problem persists, clean out the tank & start again.
3. Spray is uneven around the boom.	1. Some nozzle filters or tips are blocked. 2. Nozzle tips worn. 3. Different pressure along the boom.	1. Remove, clean & check. Check output & for streaks. 2. Check nozzle output, replace worn nozzles. 3. Remove a nozzle in each boom section & check that flow rate is the same. If different, check for blockages.
4. Pressure going up - output going down.	1. Nozzle filters blocking.	1. Dismantle, clean & refit. Check pressure returns to normal. Check all filters and spray mixture.
5. Pressure falling.	1. Filter on suction side blocked. 2. Nozzle tips worn. 3. Pressure gauge faulty. 4. Pump worn.	1. Dismantle & clean the filter. 2. Check nozzle output, replace worn nozzles. 3. Check with new pressure gauge. 4. Repair or replace the pump.
6. Spray pattern narrow.	1. Pressure too low. 2. Pressure too low & spluttering.	1. Check that the correct nozzles are being used. 2. Check that the tank is not empty. If not, there is an air leak between the pump & tank or in the pump. Check plumbing & repair.
7. Foam in the tank.	1. Too much agitation.	1. Check that the return line is at the bottom of the tank. Partly close agitation and valve.
8. Spray pattern streaky.	1. Nozzle partly blocked.	1. Remove & clean. If it continues, the nozzle is damaged. Replace with same size tip, check flow rate of replacement nozzle.

SECTION 9
TROUBLESHOOTING

DIAPHRAGM PUMP PROBLEMS

PROBLEM	PROBABLE CAUSE	REMEDY
A. Pump does not draw or deliver liquid. Pressure gauge fluctuates badly.	1. One or more valves are not seating properly. 2. The pump is sucking in air through suction line. 3. Air has not been entirely evacuated from the pump. 4. Blocked suction filter. 5. Damaged or worn suction valves.	1. Clean valve seating. 2. Examine the suction hose and ensure it is firmly secured. 3. Rotate the pump with outlet hose and taps open. 4. Clean suction filter. 5. Replace suction valves.
B. Liquid flow is irregular (Also check items under A)	1. The air in the air chamber of the pump is incorrectly set. 2. Diaphragm split. 3. Damaged or worn valves. 4. Foreign matter holding valves open.	1. Check pressure in air chamber of pump. Set at 210-280Kpa (30-40 psi), or 10% of you average spraying pressure. 2. Replace diaphragm. 3. Replace valves. 4. Clean valves.
C. Pump delivers in sufficient pressure	1. Regulating valve: • Sticking open • Not set for pressure. • Damaged or worn seat or spring. 2. Cylinder diaphragm ruptured. 3. Pump valves blocked, worn or damaged. 4. Spray nozzles worn, missing or exceed pump capacity.	1. Fix the regulator: • Unstick the valves. • Set the pressure. • Replace the spring. 2. Replace diaphragms. 3. Unblock valves and or replace. 4. Replace spray nozzles with appropriate size.
D. Output drops & pump is noisy.	1. Oil level is too low.	1. Top up with oil to correct level (1/2 way up the sump sight glass).
E. Oil being discharged through delivery line or discoloured oil in sight glass of pump.	1. One or more diaphragms split or ruptured.	1. Immediately drain oil from pump and flush to remove all spray residues from sump. Remove pump heads & fit new diaphragms. Fill to correct level with motor oil 20W/30.

SECTION 9
TROUBLESHOOTING

DIAPHRAGM PUMP PROBLEMS

PROBLEM	PROBABLE CAUSE	REMEDY
SUCTION SIDE OF PUMP		
F. Suction hose vibration.	1. Air getting into suction.	1. Seal all joints securely with tape or sealant. Firm up clamps.
G. Pump valves hammering.	1. Suction tap partly turned off. 2. Suction strainer(s) blocked.	1. Turn tap fully on. 2. Clean filters.
H. No water flow on suction hose.	1. Obstruction in tank or suction line.	1. Clean foreign material from tank & suction line.
DISCHARGE SIDE OF PUMP		
I. Pressure gauge pointer swings violently.	1. Pressure control valve spindle doesn't move easily.	1. Lubricate with light oil or C.R.C.
J. Control valve leaking from spindle.	1. Split diaphragm or O-rings.	1. Remove 4 body set screws, replace diaphragm and O-rings.
K. Pressure gauge showing correct working pressure no pressure at nozzle.	1. Burst discharge line. 2. Blocked pressure filter where fitted. 3. O-ring(s) jamming flow in discharge line. 4. Ants, wasps build nests in discharge line or nozzles.	1. Replace discharge line. 2. Clean pressure filter. 3. Clean discharge line of foreign materials. 4. Clean nozzles of foreign materials with tooth brush

SECTION 9
TROUBLESHOOTING

MOTOR VALVE PROBLEMS

PROBLEM	PROBABLE CAUSE	REMEDY
A. Boom line valve opens when it should be closed and closes when it should be open.	1. Wiring incorrect.	1. Reverse polarity of valve by changing wires at the valve cap.
B. Water leaks past valve when valve is shut.	1. Worn seat.	1. Replace seat/hosetail and/or valve system if necessary.
C. Valve won't operate.	1. No power to valve. 2. Motor failure. 3. Valve clogged.	1. Check all connections, supply - loom. 2. Replace motor. 3. Clean internals of valve and/or put a new valve kit in the valve.
D. Servo valve not regulating flow.	1. Valve jamming. 2. No power. 3. Valve clogged	1. Clean our valve or replace. 2. Check all power leads and supply, or replace motor. 3. Clean out valve and/or put a new valve kit in the valve.
E. Dump valve not releasing pressure in system on shut-off.	1. No power to valve. 2. Valve motor failed. 3. Dump-line blocked.	1. Check power supply and all connections. 2. Check motor and replace if required. 3. Clean valve and return line.

SECTION 9
TROUBLESHOOTING

DUMP VALVE OPERATION

Start with the controller in "Manual" mode, the master switch in the 'Hold" position, at least one section switch in the spray position and the pump running at operating RPM. There should be minimal to no spray pressure on the gauge. Put the master switch into the "Spray" position and the gauge pressure will increase and the sections open will start spraying. Put the master switch back into the "hold" position and the gauge pressure will decrease. If this works then the dump valve is operating correctly.

If there is gauge pressure when the master switch is in the Hold" position and no gauge pressure with the master switch is in the "Spray" position then the dump valve is working backwards. There will either be a setting in the controller to reverse this or the wiring at the dump valve can be reversed.

If no change in gauge pressure happens when changing the position of the master switch then the dump valve mustn't be operating. The following pages show what voltage you should read at the dump valve to diagnose whether is it a faulty valve, wiring or controller.

Croplands use an Arag dump valve on the majority of their trailed/linkage sprayers. These come in two different styles and can be operated by 2 wire or 3 wire switching.

A8630001 & A8730001

Dump Valve Operation A8630001 & A8730001

2 Wire Operation

= Positive +12V DC

= Negative

Closed/Spray Position

Open/Dump Position

3 Wire Operation

= Positive +12V DC

= Negative

= Positive +12V DC

Closed/Spray Position

Open/Dump Position

Dump Valve Operation - A8710502

2 Wire Operation

= Positive +12V DC

= Negative

Closed/Spray Position

Open/Dump Position

3 Wire Operation

= Positive +12V DC

= Negative

= Positive +12V DC

Closed/Spray Position

Open/Dump Position

A8710502

SECTION 9
TROUBLESHOOTING

SERVO VALVE OPERATION

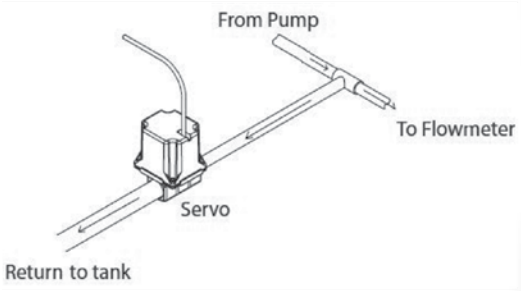
With the controller in "Manual" mode, the master switch in the 'Spray" position, all section switches turned on and the pump running at operating RPM. Press and hold the increase rate button/switch and the pressure on the gauge should increase. Press and hold the decrease rate button/switch and the pressure on the gauge should decrease. The Servo valve will take between 7-10 seconds to go for opened to closed and vise versa. If this works then the servo valve is operating correctly.

If the gauge pressure decreases while holding the increase button/switch and increases while holding the decrease button/switch then the servo valve is working backwards. There will either be a setting in the controller to change or the two wires at the servo valve can be reversed.

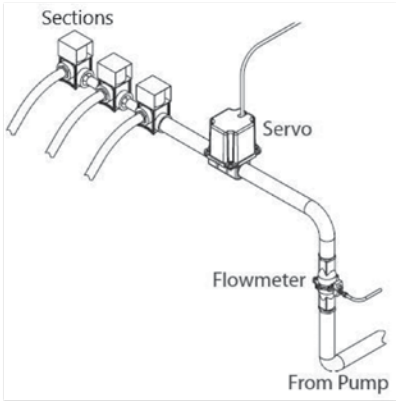
If no change in gauge pressure happens when the increase or decrease button/switch is held then the servo valve isn't operating. The next page shows what voltage you should read at the servo valve to diagnose whether is it a faulty valve, wiring or controller.

Croplands use an Arag servo valve on the majority of their trailed/linkage sprayers. These come in two different series called an 863 or 873 and can be plumbed in either an Bypass or In-line set up. The 873 series is generally fitted on centrifugal and diaphragm pumps with a flow rate of more than 250 litres per minute.

Bypass Plumbing



In-line Plumbing



Servo Valve Operation
A86300245 & A87300205

Bypass Plumbing

0 = Positive +12V DC

0 = Negative

Increasing Pressure

Decreasing Pressure

In-line Plumbing

0 = Positive +12V DC

0 = Negative

Increasing Pressure

Decreasing Pressure

SECTION 9
TROUBLESHOOTING

NO GROUND SPEED

WHEN THE SPRAY CONTROLLER ISN'T READING GROUND SPEED, FOLLOW THESE STEPS TO DIAGNOSE THE ISSUE.

-- Is the speed calibration number present/correct?

- Is the speed sensor mounted correctly? The sensor tip should be 5mm from the pickups.

- Check the speed sensor for any visible signs of damage.

-- Is 12 volts supplied to the speed sensor? Croplands wiring is Pin A = Signal, Pin B = Positive & Pin C = Negative.

You should read 12 volts on your multimeter between pins B & C and when possible check this with the sensor connected as some controllers lose their 12 volt supply when under load. If 12 volts is present move to the next step, if no 12 volts is present repeat the test at the next connector towards the controller. Continue on until you find a bad cable or until you reach the back of the controller. If the controller is not outputting 12 volts you can send it to Croplands to be repaired. Croplands have loan controllers so you can continue spraying while your controller is being repaired.

- Enter a speed calibration of 1cm per pulse and view the screen reading distance on the controller.

The controller should be in "Manual" mode and have at least 1 section turned on so the sprayer would actually be spraying if the pump was engaged. Start at the cable connecting to the speed sensor. With a small jumper wire (or paper clip), bridge a connection between the Ground and Signal wires using a "bridge, no bridge" motion. Each time a bridging connection is made the distance should increase on the controller, if this works replace the speed sensor and re-enter the correct speed calibration. If distance does not increase, repeat at the next connector towards the controller.

Continue on until you find a bad cable or until you reach the back of the controller. If the distance does still not increase you can send the controller to Croplands to be repaired. Croplands have loan controllers so you can continue spraying while your controller is being repaired.

HOW TO TEST A UP-402 PROXIMITY SPEED SENSOR

Power the speed sensor by supplying 12 volts to the Brown positive wire and an earth to the Blue ground wire. With your multimeter set to read DC voltage connect the multimeter's red terminal to the sensors signal wire and the multimeter's black terminal to the sensors ground wire. The multimeter will read 12 volts when no metal pickup is present and when a metal pickup is detected the multimeter will read 0 volts.

SECTION 9
TROUBLESHOOTING

NO FLOW RATE

WHEN THE SPRAY CONTROLLER ISN'T READING FLOW, FOLLOW THESE STEPS TO DIAGNOSE THE ISSUE.

- Is the flow calibration number present/correct?

- Is the turbine/paddle spinning freely?

- Check the flow sensor for any visible signs of damage.

- Is 12 volts supplied to the flow sensor? Croplands wiring is Pin A = Signal, Pin B = Positive & Pin C = Negative.

You should read 12 volts on your multimeter between pins B & C when the controller thinks it's spraying and when possible check this with the sensor connected as some controllers lose their 12 volt supply when under load. If 12 volts is present move to the next step, if no 12 volts is present repeat the test at the next connector working back towards the tractor. Continue on until you find a bad cable or until you reach the back of the controller. Please note that Croplands MT90 series looms only power the flow meter when spraying with an MT90LOOM/6 relay box on Broadacre sprayers and a diode pack or relay box on the section valve loom on Horticultural sprayers. If the controller is not outputting 12 volts you can send it to Croplands to be repaired.

Croplands have loan controllers so you can continue spraying while your controller is being repaired.

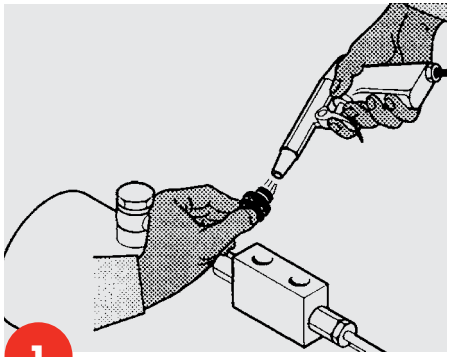
- Enter a flow calibration of 1 pulse per litre and view the total volume screen on the controller.

The controller needs to be in "Manual" mode and have at least 1 section turned on so the sprayer would actually be spraying if the pump was engaged. Start at the cable connecting to the flow sensor. With a small jumper wire (or paper clip), bridge a connection between the Ground and Signal wires using a "bridge, no bridge" motion. Each time a bridging connection is made the total volume should increase on the controller, if this works replace the flow sensor and re-enter the correct flow calibration. If total volume does not increase, repeat at the next connector towards the controller.

Continue on until you find a bad cable or until you reach the back of the monitor. If the total volume does still not increase you can send the controller to Croplands to be repaired. Croplands have loan controllers so you can continue spraying while your controller is being repaired.

SECTION 9
TROUBLESHOOTING

BOOM PROBLEMS



1

Problem:

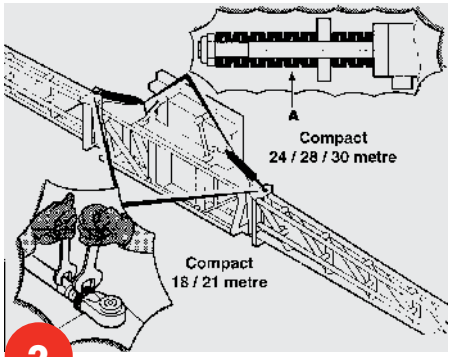
The boom unfolds halfway and then stops.

Probable Cause:

Impurity in calibrated joint during assembly of cylinders.

Remedy:

Disassemble joints and clean, shown in figure 1.



2

Problem:

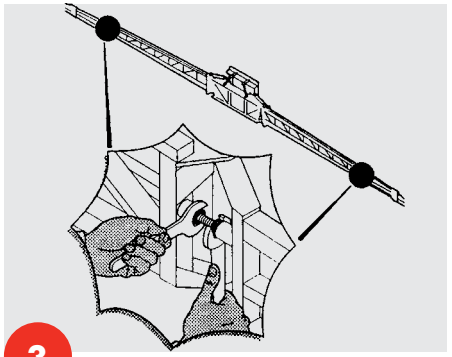
The boom does not align when unfolding.

Probable Cause:

1. Ball joint of the unfolding cylinder not adjusted.
2. Shock absorber springs (A) not adjusted or damaged.

Remedy:

1. Adjust the joint according to the "Wing Alignment" instructions on page 3.12 to 3.16.



3

Problem:

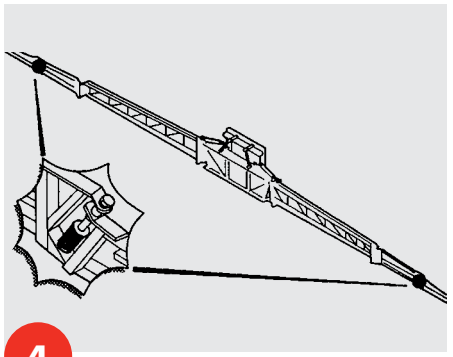
The wing extensions do not align when folding.

Probable Cause:

Stop bolt not adjusted.

Remedy:

Adjust the screw to obtain alignment, as shown in figure 3.



4

Problem:

The ball joint of the wing extension moves during the unfolding and folding operation.

Probable Cause:

Loose joint.

Remedy:

Compress the spring, as shown in figure 4.

SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

ALL PARTS INFORMATION is now listed on the Croplands website:

- Go to croplands.com.au
- Search in the Parts Information section linked to the home page.

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NOTE

Contact Croplands Technical Support for further information:
1300 650 724

SECTION 10

ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

PINTO 4000 TANK & CHASSIS ASSEMBLY

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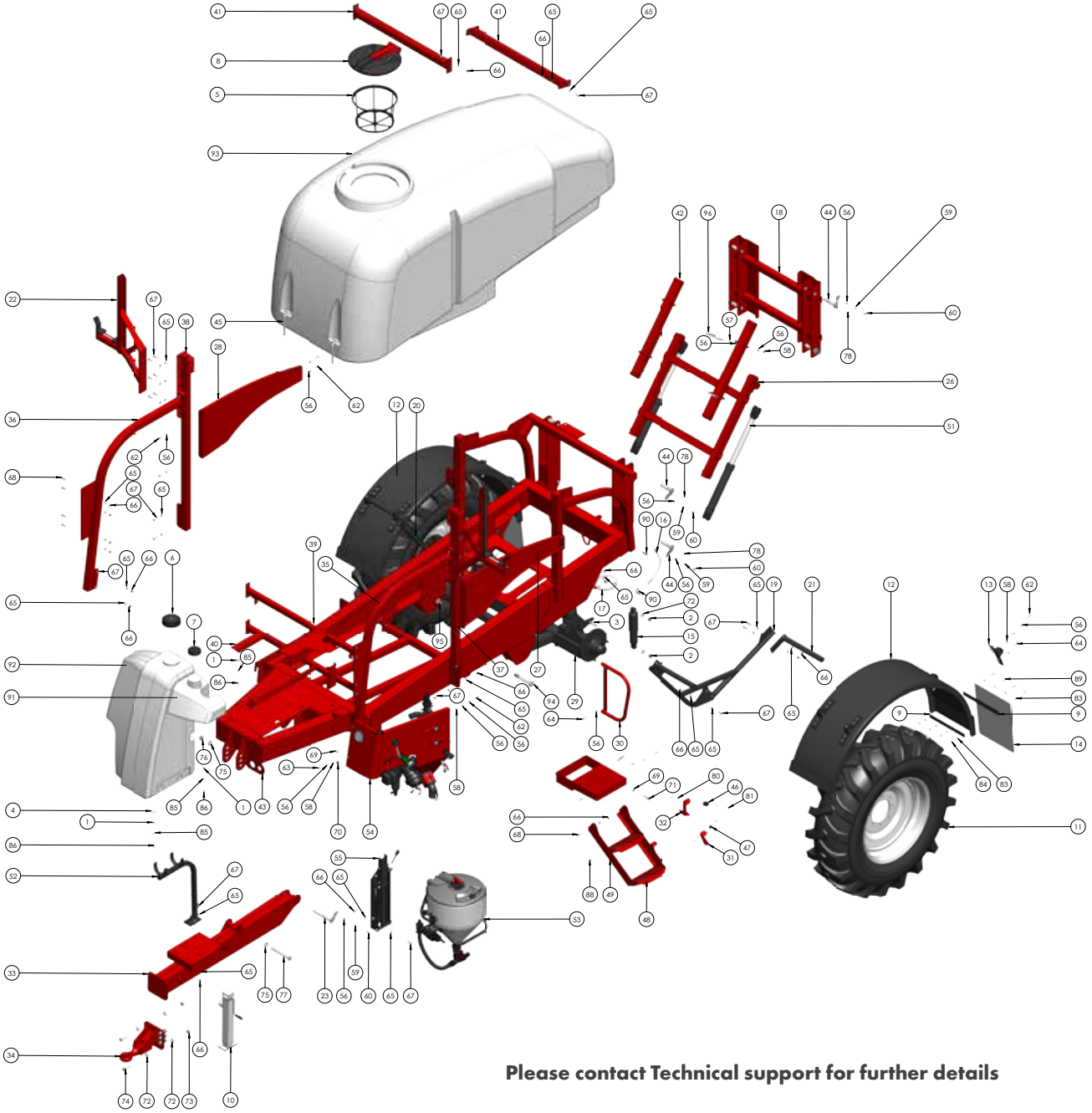

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SECTION 10

ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	0.3125FWASHER	5/16" X 1 1/4" 16G FLAT WASHER	10
2	0.75UNCNNUT	3/4" UNC NYLOC NUT HT ZP	4
3	0.75X4UNCBOLT	3/4" X 4" UNC BOLT HT ZP	2
4	40SQWASHER	40MM SQUARE WASHER	4
5	A300130	FILTER BASKET LARGE 254MM DEEP	1
6	A354010	LID 6" C/W SPRING BREATHER & OUTLET	1
7	A354030	LID 4" C/W BREATHER & SEAL	1
8	A356060	LID HINGE 455MM 180DEG	1
9	BP-180	MUDFLAP PLATE	4
10	BP-185	JOCKEY STAND PINTO 4000	1
11	BP-507	TYRE & WHEEL 18.4 X 30 10PLY	2
12	BP-526B	MUDGUARD POLY R850	2
13	BP-531A	MUDGUARD MOUNTING BRACKET	8
14	BP-542	MUDFLAP WHITE	2
15	BP-607	SHOCK ABSORBER AIR RIDE P126	2
16	BP-617A	LIMIT ROPE 6.3MM X 420LG	2
17	BP-628A	ADAPTOR PLATE AIRBAG	2
18	BP-650-11A	CENTRE FRAME PARALLELOGRAM PINTO	1
19	BP-650-13LPL	MUDGUARD BRACKET LH PINTO PAINTED	1
20	BP-650-13RPL	MUDGUARD BRACKET RH PINTO PAINTED	1
21	BP-650-14PL	MUDGUARD ARM PINTO PAINTED	4
22	BP-650-16PL	BOOM PARK BRACKET	2
23	BP-650-18	PIN, 30MM X 220MM	1
24	BP-650-6B-2	SAFETY CHAIN STEP 500LG	1
25	BP-650-6B	STEP PINTO 4000LT	1
26	BP-652-10P	PARALLELOGRAM H FRAME PINTO 4000	1
27	BP-652-11LP	SIDE PANEL L.H. PINTO 4000	1
28	BP-652-11RP	SIDE PANEL R.H. PINTO 4000	1
29	BP-652-12-0	AXLE RUBBER SUSPENSION PINTO 4000	1
30	BP-652-13P	GRAB RAIL PINTO 4000	1
31	BP-652-15	BRACKET M	1
32	BP-652-16	STOPPER STEP PINTO 4000LT	1
33	BP-652-2A	DRAWBAR PINTO 4000LT VER2	1
34	BP-652-3-0A	SWIVEL TOW HITCH ASSY PINTO 4000	1
35	BP-652-4LP	FRONT BRACE L.H. PINTO 4000	1
36	BP-652-4RP	FRONT BRACE R.H. PINTO 4000	1
37	BP-652-5LP	SUPPORT POST LH PINTO	1
38	BP-652-5RP	SUPPORT POST R.H. PINTO 4000	1
39	BP-652-6P	FRONT BRACE TOP PINTO 4000	1
40	BP-652-7A	FRONT BRACE BOTTOM PINTO 4000	1
41	BP-652-8P	UPPER SUPPORT BRACE PINTO 4000	2
42	BP-652-9P	PARALLELOGRAM ARM PINTO	2
43	BP-652A	CHASSIS XP PINTO 4000	1
44	BP-700-9AA	PIN 30MM X 155MM HAYLITE	8
45	BP-701	TIE DOWN BRACKET PEGASUS	4
46	BP-800-4-1	STEP BUMPER (0666-002/0666-001)	1
47	BP-800-4-1-001	STEP BUMPER MALE	1
48	BP-800-4-2P	STEP CAST 8000LT PEGASUS	2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
49	BP-800-4L	SIDE FRAME STEP LH	1
50	BP-800-4R	SIDE FRAME STEP RH	1
51	HP-022	HYDRAULIC DISPLACEMENT CYL 2.0 X 13	2
52	HP-024-7	CABLE HOLDER BRACKET	1
53	KB-1003A	CHEMICAL MIXING UNIT 60LT PROD	1
54	KB-1105A-2	PINTO PANEL SUB ASSEMBLY KIT AUTORATE	1
55	L-H9355A	DROPDOWN BRACKET VERSION 2	1
56	M10FWASHER	M10 FLAT WASHER ZP	115
57	M10HNUT	M10 HEX NUT HT ZP	4
58	M10NNUT	M10 NYLOC NUT HT ZP	55
59	M10SWASHER	M10 SPRING WASHER ZP	9
60	M10X20	M10 X 20 SET SCREW HT ZP	9
61	M10X25SHSCREW	M10 X 25 ALLEN HEAD SCREW HT ZP	2
62	M10X30	M10 X 30 SET SCREW HT ZP	13
63	M10X30BHSCREW	M10 X 30 BUTTON HEAD SCREW S/S	2
64	M10X40	M10 X 40 SET SCREW HT ZP	34
65	M12FWASHER	M12 FLAT WASHER ZP	116
66	M12NNUT	M12 NYLOC NUT HT ZP	64
67	M12X35	M12 X 35 SET SCREW HT ZP	52
68	M12X35BHSCREW	M12 X 35 BUTTON HEAD SCREW S/S	10
69	M16FWASHER	M16 FLAT WASHER ZP	8
70	M16NNUT	M16 NYLOC NUT HT ZP	6
71	M16X50	M16 X 50 HEX HEAD SET SCREW HT ZP	2
72	M20FWASHER	M20 FLAT WASHER ZP	36
73	M20NNUT	M20 NYLOC NUT HT ZP	8
74	M20X65	M20 X 65 SET SCREW HT ZP	8
75	M24FWASHER	M24 FLAT WASHER ZP	2
76	M24NNUT	M24 NYLOC NUT ZP	1
77	M24X210	M24 X 210 BOLT HT ZP	1
78	M6GNIPPLE	M6 GREASE NIPPLE	8
79	M6NNUT	M6 NYLOC NUT HT ZP	2
80	M6SSFWASHER	M6 FLAT WASHER SS	3
81	M6X25SSSCREW	M6 X 25 HEX HEAD S/S SCREW	1
82	M6X30	M6 X 30 SET SCREW HT ZP	1
83	M8FWASHER	M8 FLAT WASHER ZP	28
84	M8NNUT	M8 NYLOC NUT HT ZP	18
85	M8SWASHER	M8 SPRING WASHER ZP	10
86	M8X20	M8 X 20 SET SCREW HT ZP	10
87	M8X30	M8 X 30 SET SCREW HT ZP	2
88	M8X30BHSCREW	M8 X 30 BUTTON HEAD SCREW S/S	8
89	M8X35	M8 X 35 SET SCREW HT ZP	8
90	MP-564	DEE SHACKLE SIZE 10	4
91	P15-RAW	TANK 15LT POLY HANDWASH	1
92	P275-RAW	275LT PINTO FLUSH TANK	1
93	P4000-RAW	TANK POLY RAW PEGASUS 4000LT	1
94	WT1234	AIR RIDE AXLE BOLT M30 X 190	2
95	WT1235NL	AIR RIDE AXLE NYLOC NUT M30	2
96	XBMBB75-140	UBOLT 75 X 140 X 10 ROUND	2

NOTE

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SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

PINTO 3000 TANK & CHASSIS ASSEMBLY

NOTE

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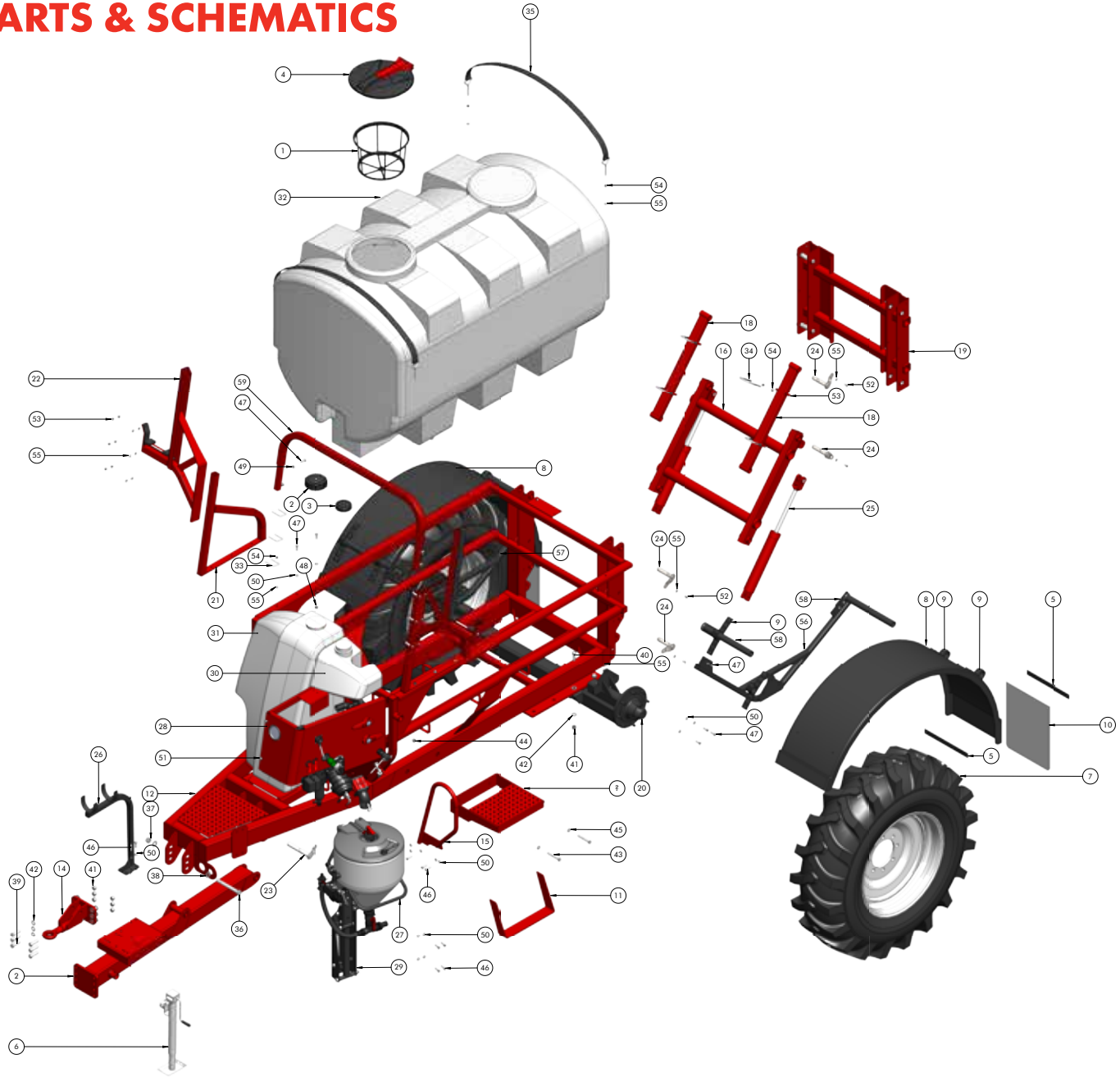

Please contact Technical support for further details

SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	A300130	FILTER BASKET LARGE 254MM DEEP	1
2	A354010	LID 6" C/W SPRING BREATHER & OUTLET	1
3	A354030	LID 4" C/W BREATHER & SEAL	1
4	A356060	LID HINGE 455MM 180DEG	1
5	BP-180	MUDFLAP PLATE	4
6	BP-184	JOCKEY STAND LONG PINTO	1
7	BP-507	TYRE & WHEEL 18.4 X 30 10PLY	2
8	BP-526B	MUDGUARD POLY R850	2
9	BP-531A	MUDGUARD MOUNTING BRACKET	8
10	BP-542	MUDFLAP WHITE	2
11	BP-601-4A	BOLT ON STEP HAYLITE	1
12	BP-650	TANK SUPPORT KIT PINTO	1
2	BP-650-2B	DRAWBAR 2000/3000LT (AUS)	1
14	BP-650-3-0	SWIVEL TOW HITCH ASSY PINTO 2000/3000LT	1
15	BP-650-5A	GRAB RAIL PINTO PAINETD 2000/3000LT	1
16	BP-650-10A	PARALLELOGRAM H FRAME PINTO 3000	1
17	BP-650-6A	STEP PINTO	1
18	BP-650-9A	PARALLELOGRAM ARM PINTO	2
19	BP-650-11A	CENTRE FRAME PARALLELOGRAM PINTO	1
20	BP-650-12-0	AXLE PINTO 3000LT 8 STUD 78" PAINTED	1
21	BP-650-15A	PARKING BRACE PINTO	2
22	BP-650-16PL	BOOM PARK BRACKET	2
23	BP-650-18	PIN, 30MM X 220MM	1
24	BP-700-9AA	PIN 30MM X 155MM HAYLITE	8
25	HP-018A	HYDRAULIC DISPLACEMENT 2.5 X 12	2
26	HP-024-7	CABLE HOLDER BRACKET	1
27	KB-1003A	CHEMICAL MIXING UNIT 60LT PROD	1
28	KB-1105A-2	PINTO PANEL SUB ASSEMBLY KIT AUTORATE	1
29	L-H9355A	DROPDOWN BRACKET VERSION 2	1
30	P15-RAW	TANK 15LT POLY HANDWASH	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
31	P275-RAW	275LT PINTO FLUSH TANK	1
32	P3000-RAW	3000LT TANK POLY W/OUT FITTINGS	1
33	XBMBB50	U-BOLT 50MM X 10	6
34	XBMBB75-140	UBOLT 75 X 140 X 10 ROUND	4
35	XSTRAP1770	TANK STRAP 1770MM	2
36	M24X210	M24 X 210 BOLT HT ZP	1
37	M24NNUT	M24 NYLOC NUT ZP	1
38	M24FWASHER	M24 FLAT WASHER ZP	2
39	M20X65	M20 X 65 SET SCREW HT ZP	6
40	M20X55	M20 X 55 SET SCREW HT ZP	4
41	M20NNUT	M20 NYLOC NUT HT ZP	10
42	M20FWASHER	M20 FLAT WASHER ZP	20
43	M16X110	M16 X 110 BOLT HT ZP	2
44	M16NNUT	M16 NYLOC NUT HT ZP	2
45	M16FWASHER	M16 FLAT WASHER ZP	4
46	M12X40	M12 X 40 HEX HEAD SET SCREW HT ZP	13
47	M12X35	M12 X 35 SET SCREW HT ZP	22
48	M12NNUT	M12 NYLOC NUT HT ZP	31
49	M12HNUT	M12 HEX NUT HT ZP	4
50	M12FWASHER	M12 FLAT WASHER ZP	62
51	M10X25SHSCREW	M10 X 25 ALLEN HEAD SCREW HT ZP	5
52	M10X20	M10 X 20 SET SCREW HT ZP	8
53	M10NNUT	M10 NYLOC NUT HT ZP	29
54	M10HNUT	M10 HEX NUT HT ZP	12
55	M10FWASHER	M10 FLAT WASHER ZP	38
56	BP-650-13LPL	MUDGUARD BRACKET LH PINTO PAINTED	1
57	BP-650-13RPL	MUDGUARD BRACKET RH PINTO PAINTED	1
58	BP-650-14PL	MUDGUARD ARM PINTO PAINTED	4
59	BP-650-17P	PARKING CROSS MEMBER PINTO	1

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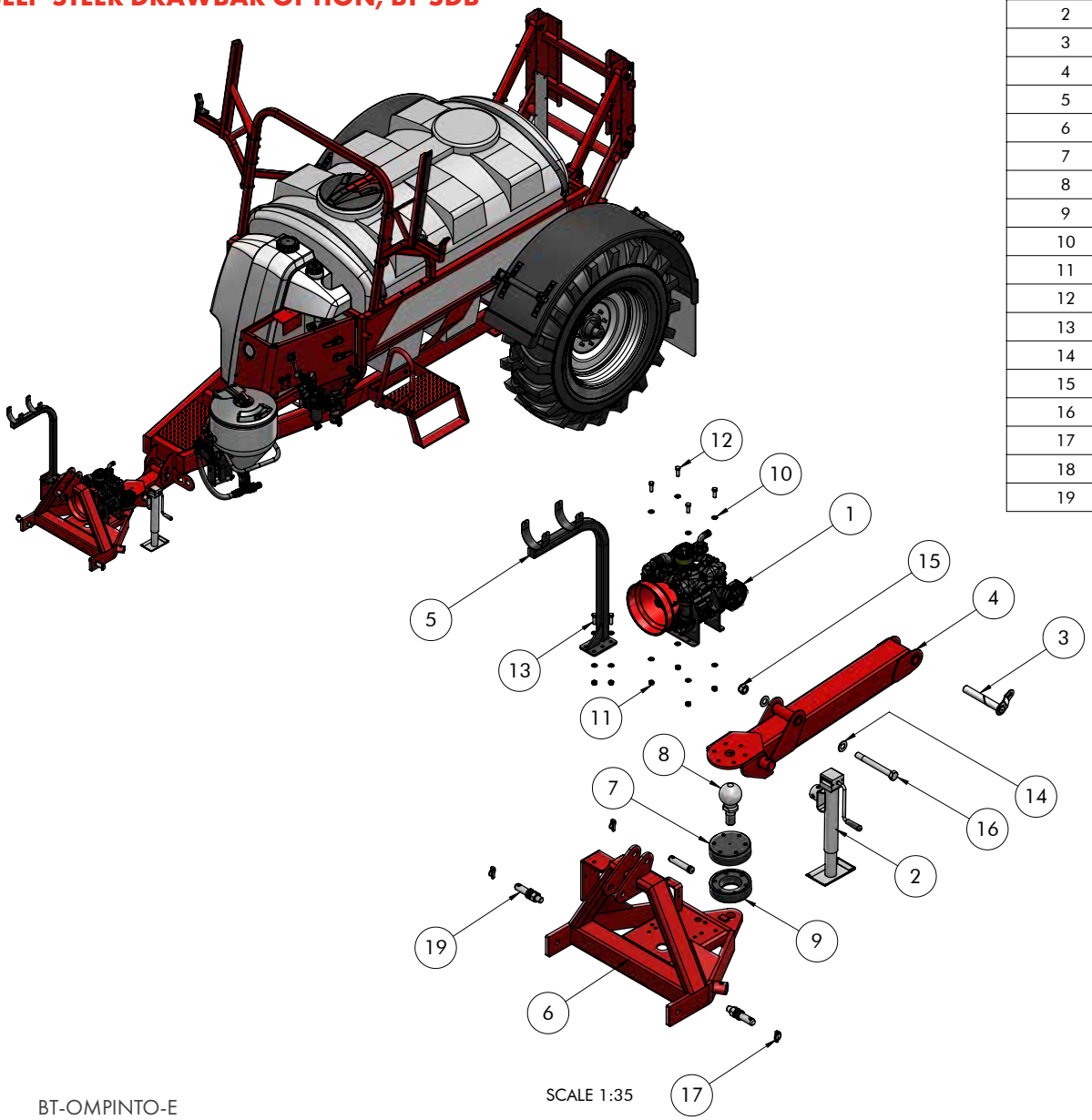
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

SELF-STEER DRAWBAR OPTION, BT-SDB



SCALE 1:35

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	AR160LFP-CF25	PUMP AR160 POLY C/FEMALE 25MM	1
2	BP-184A	JOCKEY STAND SHORT PINTO	1
3	BP-650-18	PIN, 30MM X 220MM	1
4	BP-650-2A	DRAWBAR PINTO	1
5	HP-024-7	CABLE HOLDER BRACKET	1
6	HP-024C-1	3PTL FRAME	1
7	HP-024C-2-001	BALL & HITCH ASSY HP-024C - 001	1
8	HP-024C-2-002	BALL & HITCH ASSY HP-024C - 002	1
9	HP-024C-2-003	BALL & HITCH ASSY HP-024C - 003	1
10	M12FWASHER	M12 FLAT WASHER ZP	12
11	M12NNUT	M12 NYLOC NUT HT ZP	6
12	M12x35	M12 X 35 SET SCREW HT ZP	4
13	M12x40	M12 X 40 SET SCREW HT ZP	2
14	M24FWASHER	M24 FLAT WASHER ZP	2
15	M24NNUT	M24 NYLOC NUT ZP	1
16	M24X210	M24 X 210 BOLT HT ZP	1
17	B0006	BARE LINCH PIN 7/16" DIA	3
18	B0076	TOP LINK PIN 3" X 7/16" S1040	1
19	B0102	IMPLEMENT PIN CAT 2	2

Note: Use PTO Shaft Part No. SH4AG/1200

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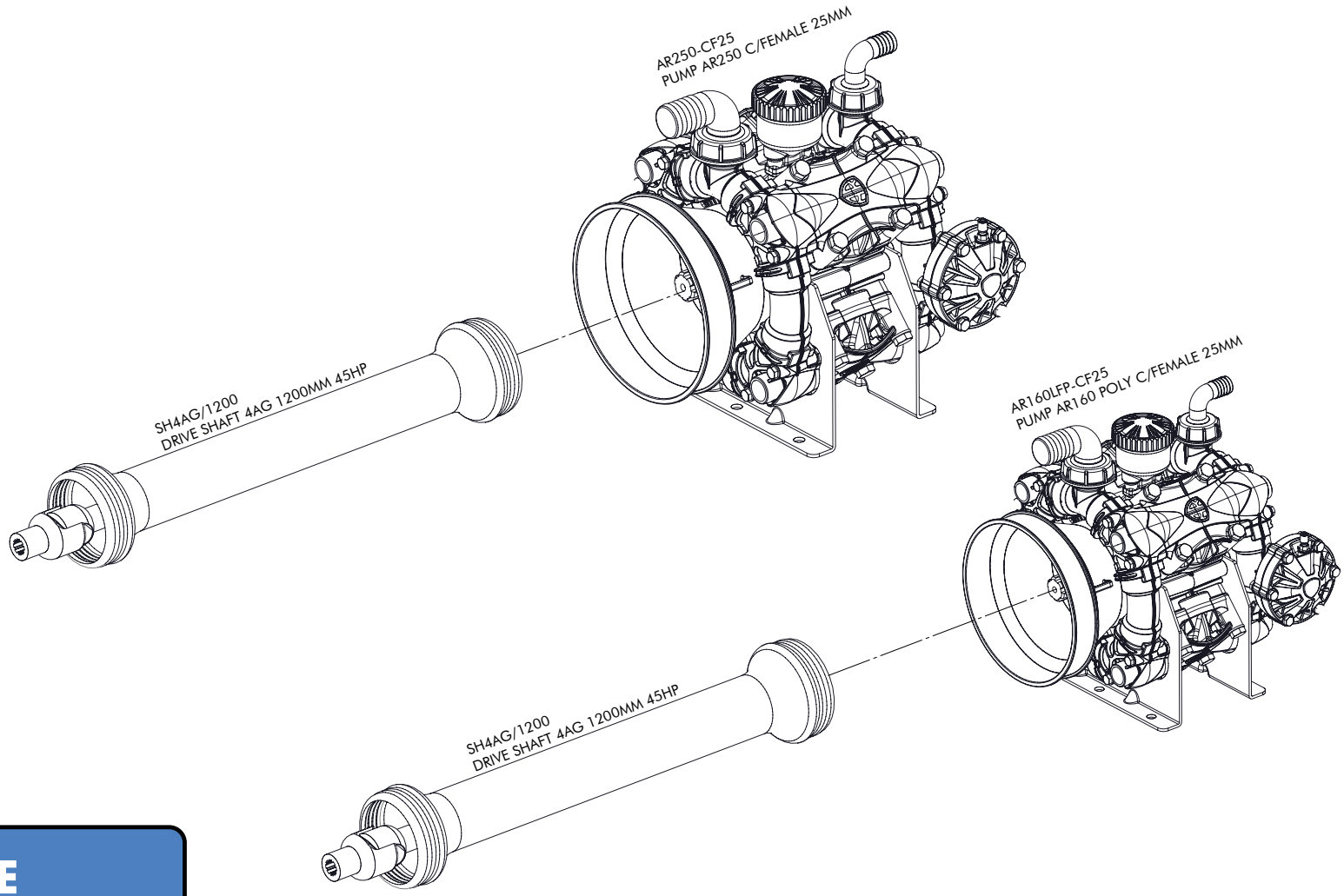
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

PUMP DRIVE - PTO SHAFT



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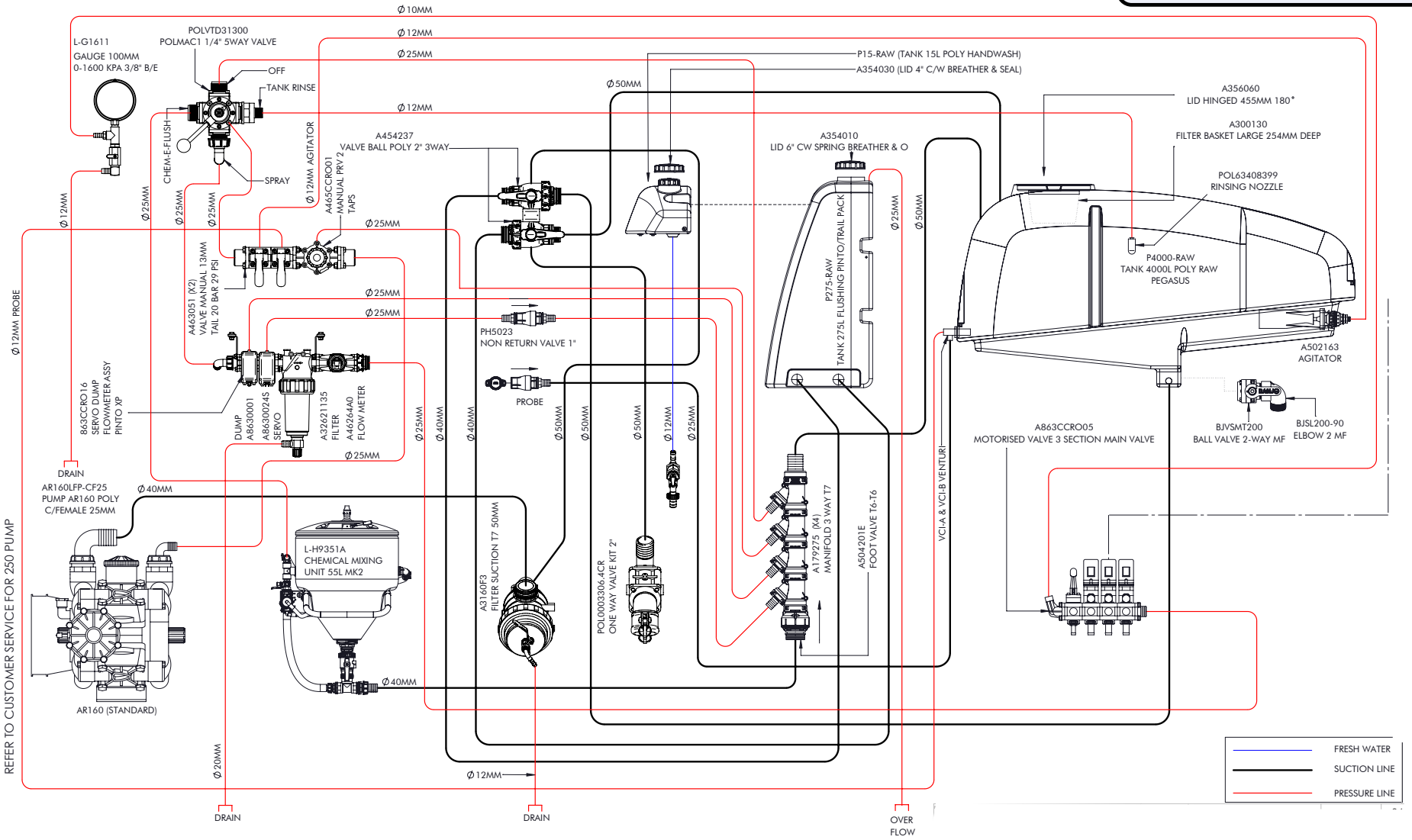
PINTO 4000 PLUMBING, AR160

Issue 04, 15/12/2023



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ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

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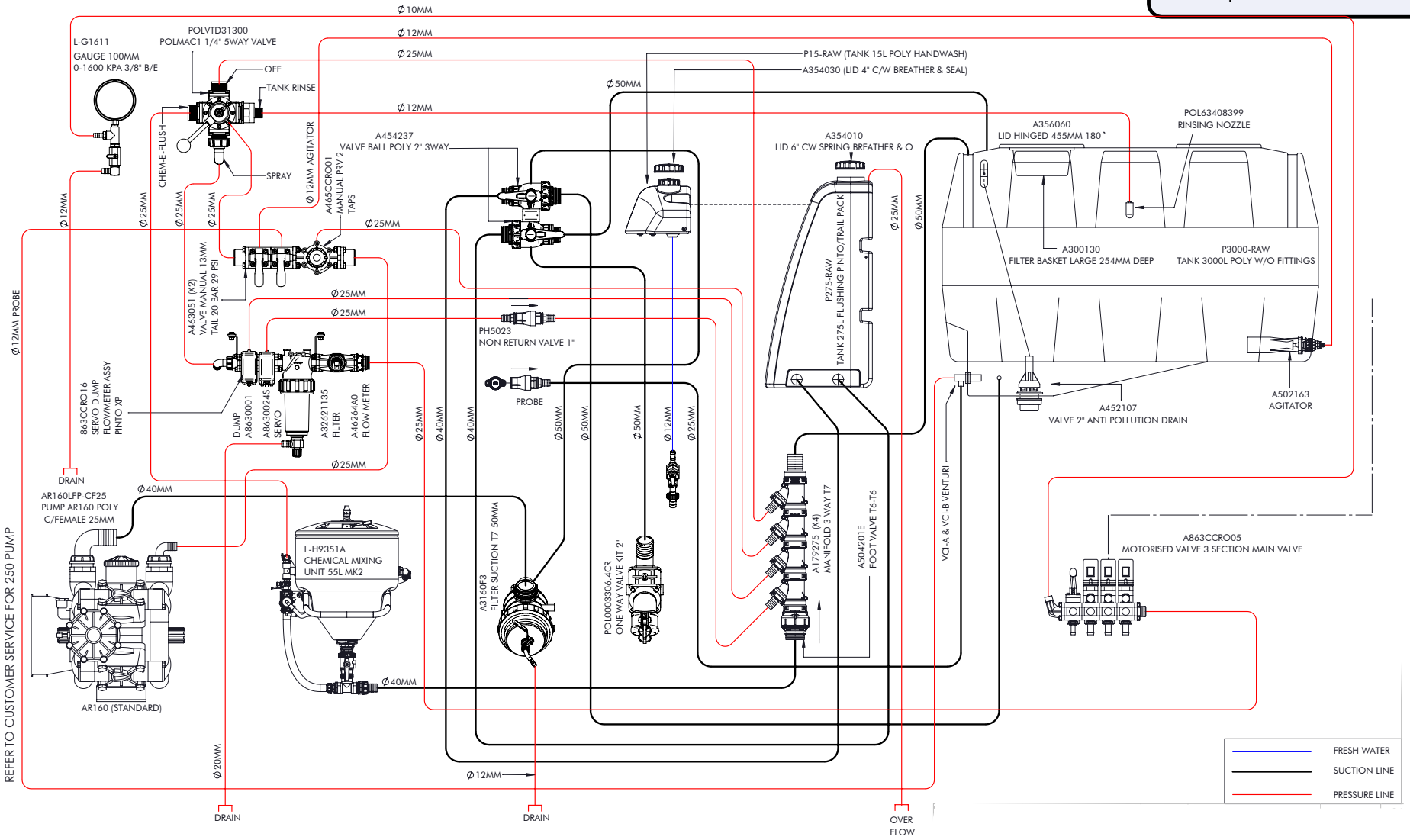
PINTO 3000 PLUMBING, AR160

Issue 04, 15/12/2023



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SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

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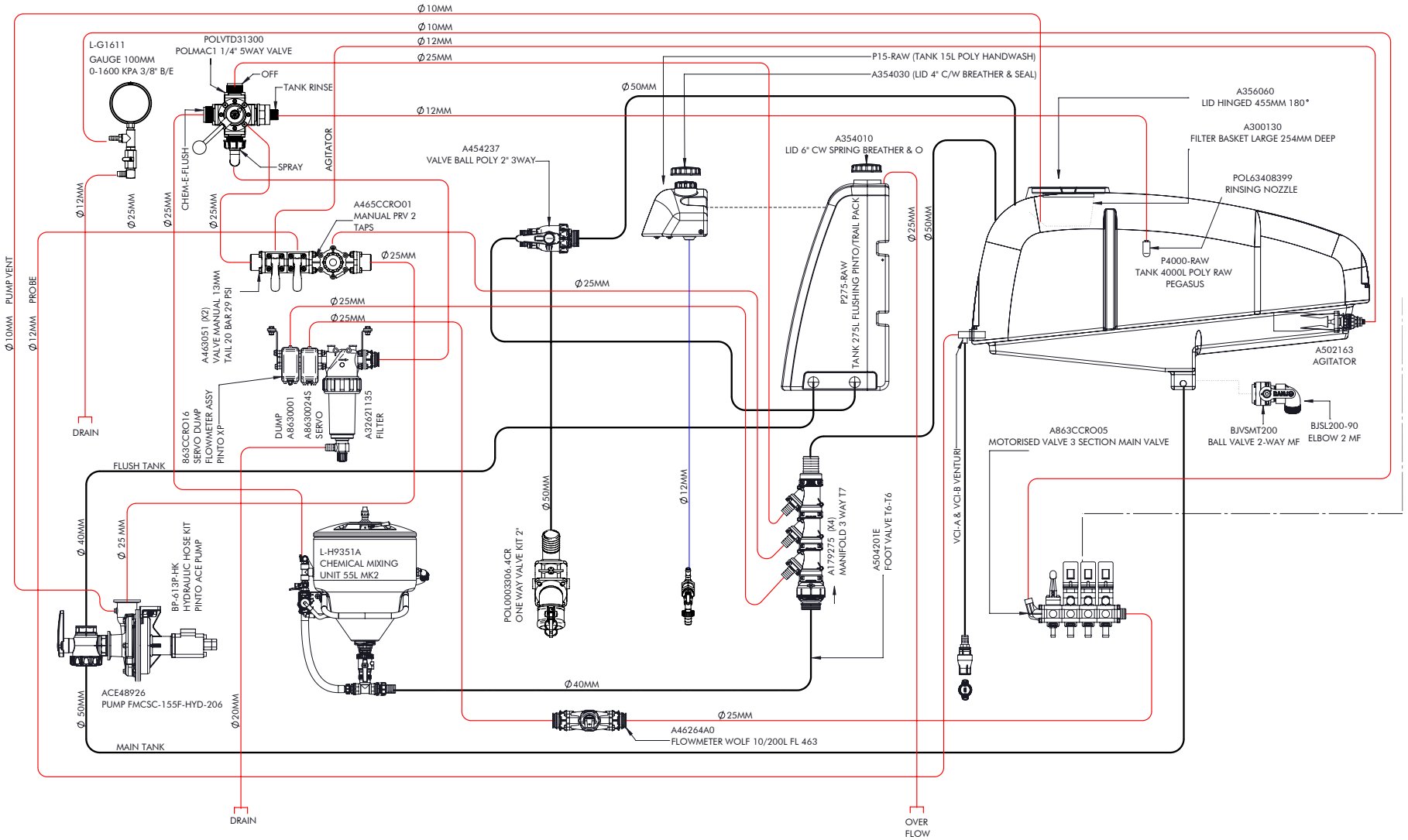
PINTO 4000 PLUMBING - CENTRIFUGAL PUMP

Issue 04, 15/12/2023



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SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

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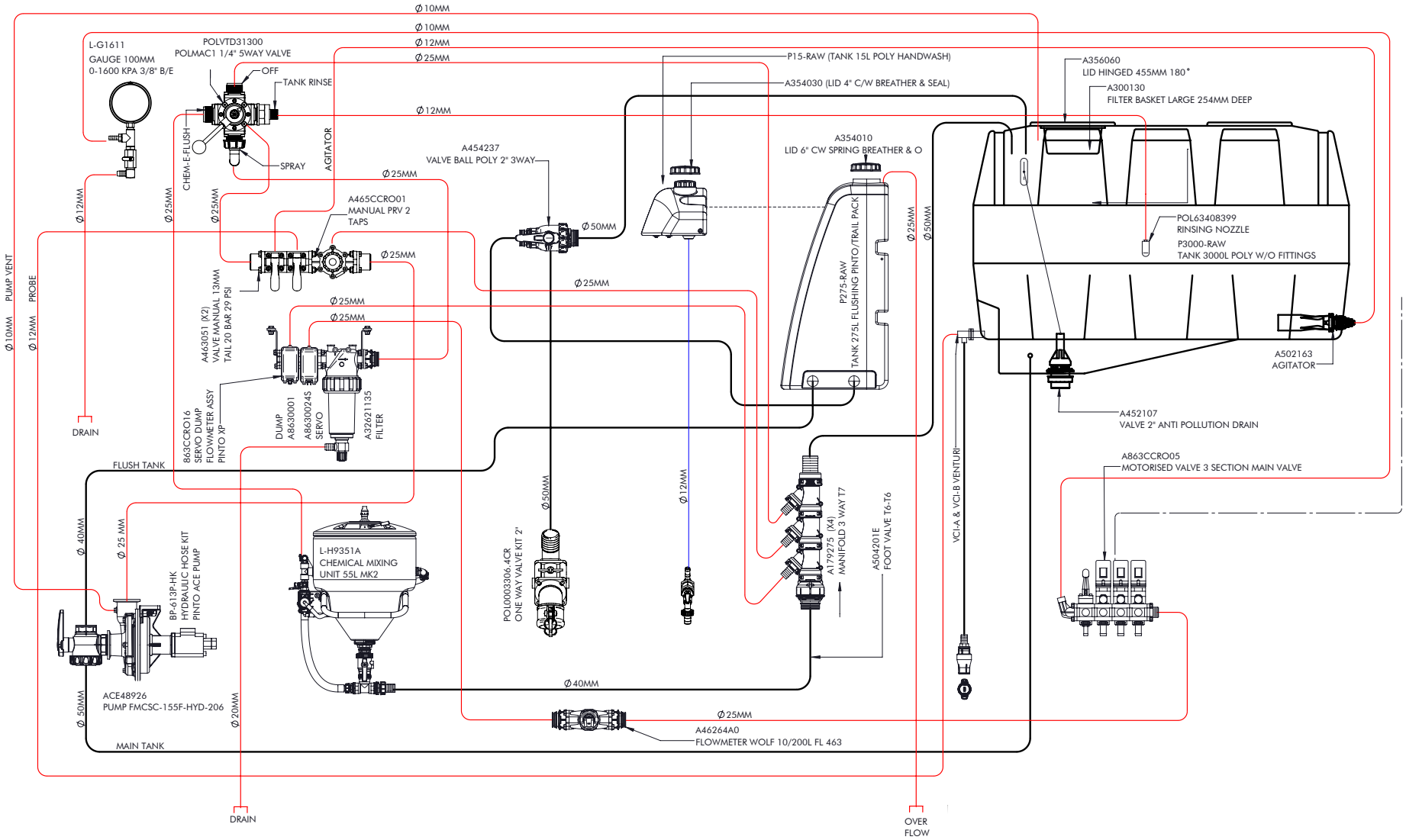
PINTO 3000 PLUMBING - CENTRIFUGAL PUMP

Issue 04, 15/12/2023



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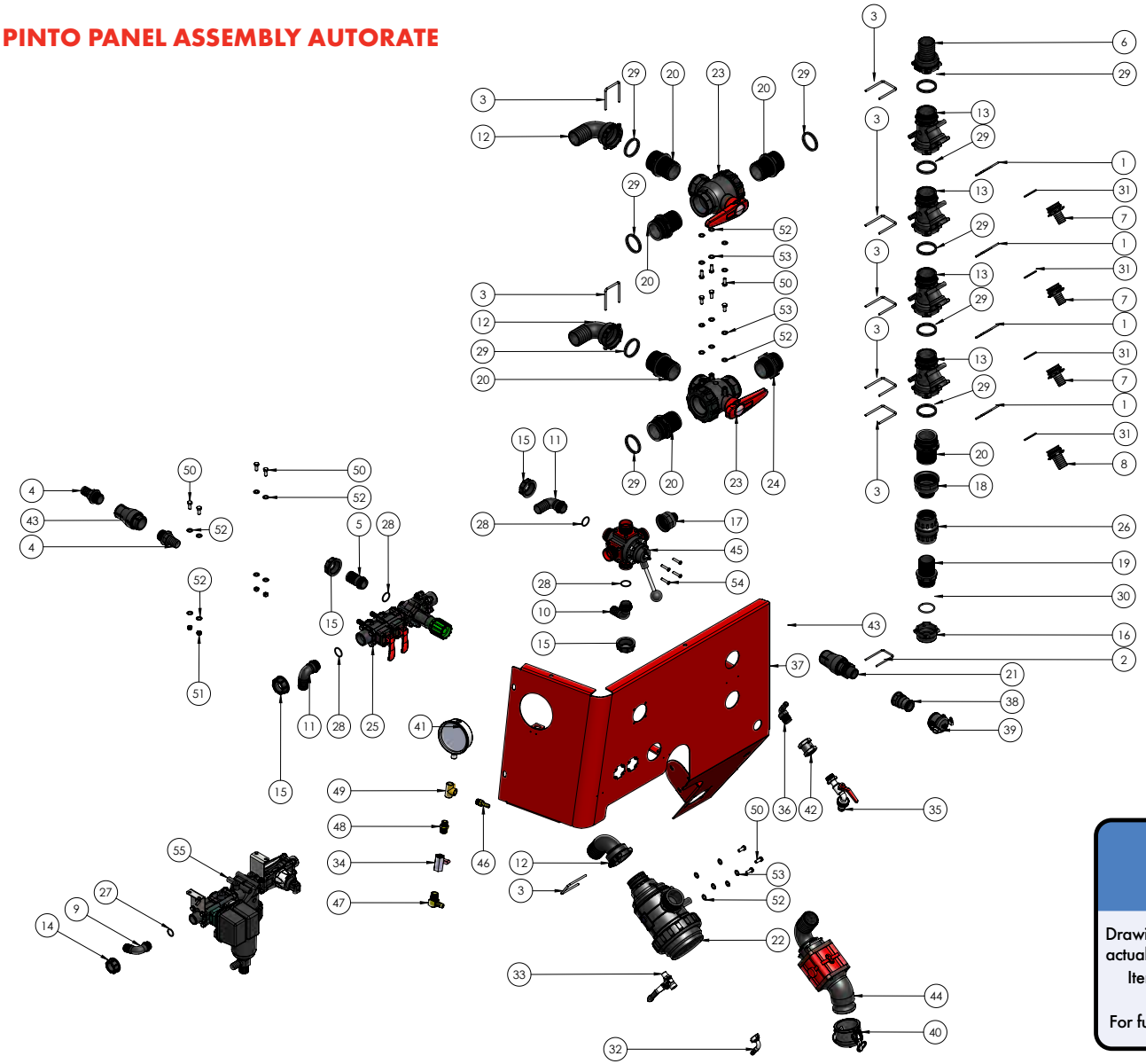
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

KB-1105A-2 - PINTO PANEL ASSEMBLY AUTORATE



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SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

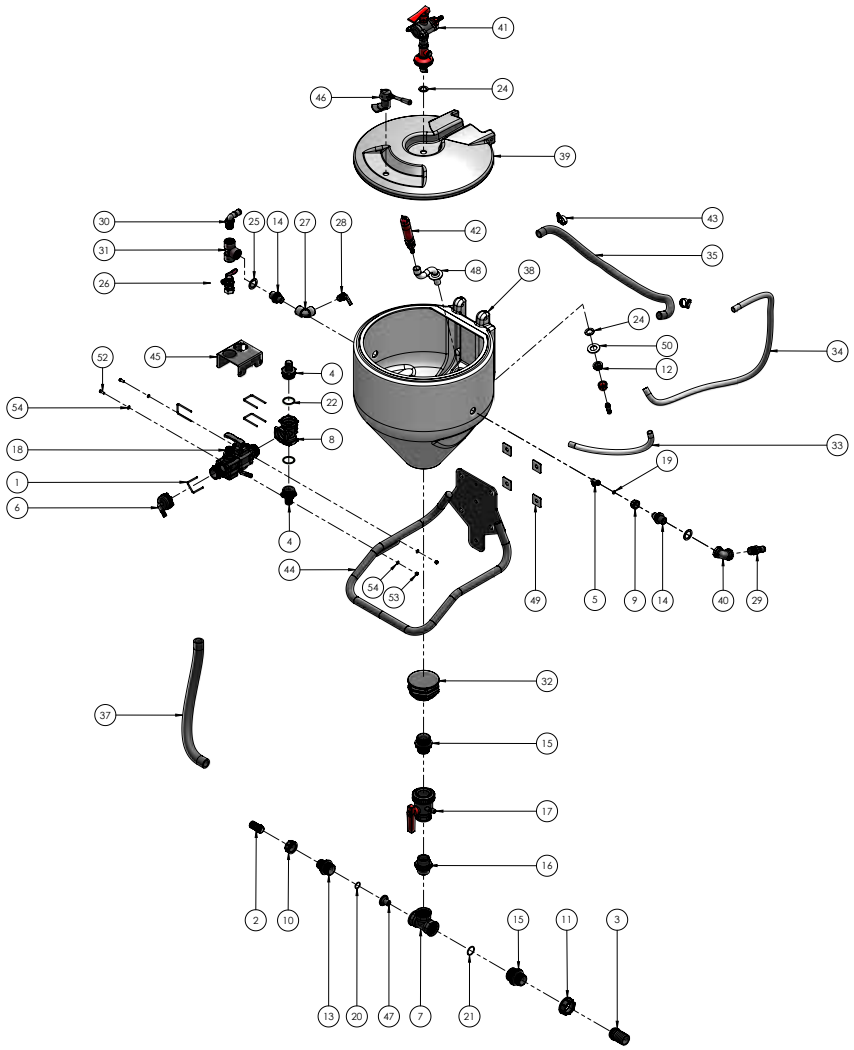
KB-1105A-2 (PANEL) BOM

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	A010005	INLET FORK	4
2	A010006	FORK 453 SERIES T6	1
3	A010007	FORK D.5 INTERN 0.59 T7	8
4	A103425	HOSETAIL MALE 1" X 1"	2
5	A106533	TAIL 1 1/4" TO 32MM	1
6	A1090750	ELBOW T7F D.50	1
7	A1091525	HOSETAIL T5M D.25	3
8	A1091530	HOSETAIL T5F D.30	1
9	A116425	ELBOW 0.25 FOR FLY	1
10	A116525	ELBOW 1 1/4" - 25MM HOSE	1
11	A116533	ELBOW 32MM HOSE	2
12	A1190750	ELBOW T7F D.50	3
13	A179275	MANIFOLD 3 WAY T7	4
14	A200040	FLY NUT 1"	1
15	A200050	FLY NUT 1 1/4"	4
16	A219060	END CAP T6F	1
17	A245035	REDUCER 3/4" MALE - 1 1/4" FEMALE	1
18	A245067	REDUCER 1 1/2" MALE - 2" FEMALE	1
19	A2491661	BULKHEAD T6M 1 1/2" M BSP	1
20	A2491771	BULKHEAD T7M 2" MALE	6
21	A250040	NIPPLE 1"	1
22	A3160F3	FILTER SUCTION T7 50MM	1
23	A454237	BALL VALVE POLY 2" 3 WAY	2
24	A2502070	NIPPLE 2"	1
25	A465CCRO01	MANUAL PRV 2 TAPS	1
26	A504015	NON RETURN VALVE 1 1/2" FEMALE	1
27	AG10041	O RING 1"	1
28	AG10051	O RING 1 1/4"	4

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
29	AG11017	O RING T7	20
30	AG11023	O RING	1
31	AG11063	O RING EPDM	4
32	B163.604.4	ELBOW 10MM 90DEG C/W 1/2" WING NUT	1
33	B165.1501.4	BALL VALVE 1/2" X 3/8" RH	1
34	BALL12F2M	BALL VALVE MINI 1/2" FF 2 WAY	1
35	BALL34BIB	BALL BIBCOCK 3/4"	1
36	BJHB075050-90	ELBOW 3/4" MALE 1/2"	1
37	BP-650-4A	CONTROL PANEL PINTO	1
38	K-100-A	CAMLOCK 1" FEMALE THREAD "A" POLY	1
39	K-100-CAP	CAMLOCK 1" CAP "DC" POLY GL	1
40	K-200-CAP	CAMLOCK 2" CAP "DC" POLY GLASS	1
41	L-G1611	GAUGE 100MM 0-1600KPA 3/8" B/E	1
42	PH4322	SOCKET 3/4"	1
43	PH5023	NON RETURN VALVE 1"	2
44	POL0003306.4CR	ONE WAY VALVE KIT 2"	1
45	POLVTD31300	POLMAC 1 1/4" 5 WAY VALVE	1
46	TFA3838	TAIL BRASS 3/8"BSPM X 3/8" TAIL	1
47	TFEL1212	ELBOW 1/2" BSPM X 1/2" TAIL	1
48	TFM1238	NIPPLE 1/2" X 3/8" BRASS	1
49	TFT3838FF	TEE 3/8" BSPF BRASS	1
50	M8X20	M8 X 20 SET SCREW HT ZP	13
51	M8NNUT	M8 NYLOC NUT HT ZP	4
52	M8FWASHER	M8 FLAT WASHER ZP	17
53	M8SWASHER	M8 SPRING WASHER ZP	9
54	M6X30BHSCREW	M6 X 30 BUTTON HEAD SCREW S/S	4
55	A463CCRO16	SERVO DUMP FLOW METER ASSEMBLY	1

SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

CHEM E FLUSH ASSEMBLY



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	A010005	INLET FORK	4
2	A106425	TAIL 1" TO 25MM	1
3	A106640	TAIL 1 1/2" TO 40MM	1
4	A1091525	HOSETAIL T5M D.25	2
5	A116210	ELBOW 10MM FOR FLY	1
6	A1190513	ELBOW T5F D.13	1
7	A1302050	TEE 1 1/4"	1
8	A139055	TEE T5F	1
9	A200020	FLY NUT 1/2" 12.5 MMD	1
10	A200040	FLY NUT 1"	1
11	A200060	FLY NUT 1 1/2"	1
12	A205020	BACK NUT 1/2"	1
13	A240045	NIPPLE 1"-1 1/4" REDUCING	1
14	A2402032	REDUCING NIPPLE 3/4" TO 1/2"	2
15	A2402065	REDUCER NIPPLE 1 1/2"-1 1/4"	2
16	A250050	NIPPLE 1 1/4"	1
17	A454135	VALVE BALL POLY 1 1/4" 2 WAY	1
18	A463CCRO017	MANUAL CONTROL UNIT 2W	1
19	A500000.170	O RING	1
20	AG10041	O RING 1"	1
21	AG10061	O RING 1 1/2"	1
22	AG11063V	O RING EPDM	2
23	AG4000B	FLAT SEAL 5/8" EPDM	1
24	AG40002	FLAT SEAL 1/2" EPDM	2
25	AG40003	FLAT SEAL 3/4" EPDM	2
26	B176.1501.11	BALL VALVE 3/4" MF	1
27	BJEL050-90	ELBOW 1/2" NPT FEMALE	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
28	BJHB050-038-90	ELBOW 1/2" NPT X 3/8" BARB	1
29	BJHB075	HOSEBARB 3/4" NPT X 3/4" BARB	1
30	BJHB075-90	ELBOW 3/4" NPT X 3/4" BARB	1
31	BJTEE075	TEE 3/4" FEMALE	1
32	BJTF150AV	ANTI VORTEX FITTING 1 1/2"	1
33	HPW12	12MM HOSE	1
34	HPW12	12MM HOSE	1
35	HPW20	20MM HOSE	1
36	HPW20	HOSE 20MM	1
37	HPW25	25MM HOSE	1
38	P60C-1	TANK 60LT CHEM-E-FLUSH	1
39	P60C-2	LID	1
40	PH4622	ELBOW 3/4" FEMALE	1
41	POL6340839P.CRO	RINSING NOZZLE WITH 1/2" TAIL	1
42	POL63408499	RINSING NOZZLE	1
43	TR34HC	HOSE CLAMP 20MM 3/4" WORM DRIVE	4
44	UP-105AB	CHEM-E-FLUSH MOUNTING BRKT SERIES 2	1
45	UP-105AB-1	VALVE BRACKET FOR UP-105AB	1
46	UP-113	LEVER LOCK CHEM-E-FLUSH LID	1
47	UP-116	NOZZLE 8.5 VENTURI CHEM E PLUS	1
48	UP-142C	STEM RINSING NOZZLE 60lt HOPPER	1
49	40SQWASHER	40MM SQUARE WASHER	4
50	1.00FWASHER	1" FLAT WASHER ZP	1
51	.75SSWASHER	3/4" STAINLESS STEEL WASHER	1
52	M6X16	M6 X 16 SET SCREW HT ZP	2
53	M6NNUT	M6 NYLOC NUT HT ZP	2
54	M6FWASHER	M6 FLAT WASHER ZP	4

NOTE

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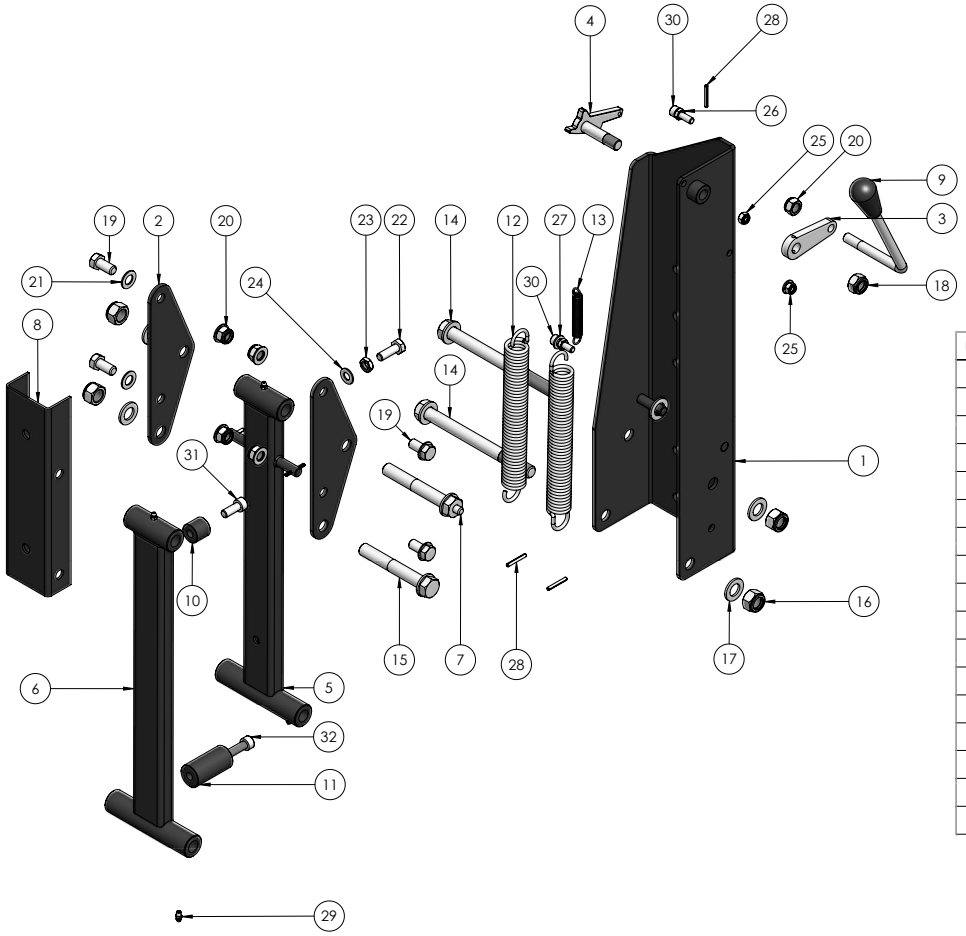
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

CHEM E FLUSH ASSEMBLY DROP DOWN ASSY



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	L-H9355A-1	MAIN FRAME	1
2	L-H9355A-2	HINGE PLATE	2
3	L-H9355A-3	LEVER	1
4	L-H9355A-4	LOCK PLATE	1
5	L-H9355A-5	ARM, INNER	1
6	L-H9355A-6	ARM, OUTER	1
7	L-H9355A-7	LOCK PIN	1
8	L-H9355A-8	BOLTING CHANNEL	1
9	L-H9355A-9	LOCK HANDLE	1
10	L-H9355A-10	STOPPER, TOP	1
11	L-H9355A-11A	STOPPER, BOTTOM	1
12	L-H9355A-12	SPRING 4.5 X 210 45 COILS	2
13	L-H9355A-13	SPRING 1.4 X 60 38 COILS	1
14	M16X180	M16 X 180 BOLT HT ZP	2
15	M16X110	M16 X 110 BOLT HT ZP	1
16	M16NNUT	M16 NYLOC NUT HT ZP	4
17	M16FWASHER	M16 FLAT WASHER ZP	10

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
18	M14NNUT	M14 NYLOC NUT HT ZP	1
19	M12X25	M12 X 25 SET SCREW HT ZP	4
20	M12NNUT	M12 NYLOC NUT HT ZP	5
21	M12FWASHER	M12 FLAT WASHER ZP	8
22	M10X30	M10 X 30 SET SCREW HT ZP	1
23	M10HHNUT	M10 HEX HALF NUT HT ZP	1
24	M10FWASHER	M10 FLAT WASHER ZP	1
25	M8NNUT	M8 NYLOC NUT HT ZP	2
26	M8HHNUT	M8 HEX HALF NUT HT ZP	2
27	M8FWASHER	M8 FLAT WASHER ZP	2
28	ROLLPIN4	ROLL PIN 4MM DIA ZP	5
29	M6GNIPPLE	M6 GREASE NIPPLE	4
30	M8X25SHSCREW	M8 X 25 ALLEN HEAD SCREW HT ZP	2
31	M10X25SHSCREW	M10 X 25 ALLEN HEAD SCREW HT ZP	1
32	M10X40SHSCREW	M10 X 40 ALLEN HEAD SCREW HT ZP	1

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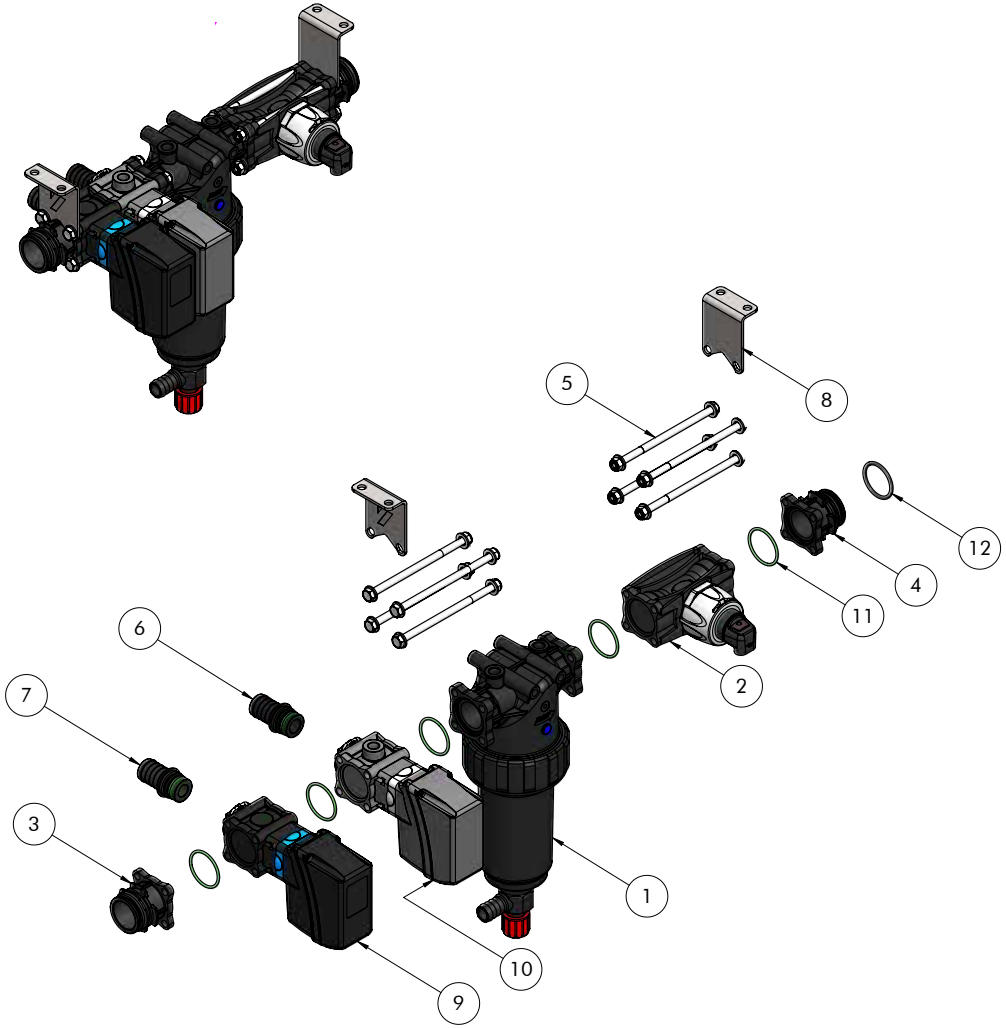
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

A863CCR016 SERVO / DUMP / FLOWMETER ASSEMBLY



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	A32691135	SELF-CLEANING LINE FILTERS SERIES 326	1
2	A46264A0	FLOWMETER WOLF 1"	1
3	A463000.056	ADAPTER M TYPE FOR VALVE SERIES 463 T5M	1
4	A463000.156	T5M ADAPTOR FOR VALVES 463	1
5	A463000.920	MOUNTING KIT 2 VALVE	8
6	A463001.A25	BY-PASS FITTINGS	1
7	A463001.A25M	BY-PASS FITTINGS	1
8	A463011.100	VALVE MOUNTING BRACKET	2
9	A8630001	ELECTRIC VALVE	1
10	A8630024S	PROP CONTROL VALVE 7 SEC	1
11	AG10071V	O RING 2" VITON	5
12	AG11063	O RING EPDM	2

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SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

BOOM FITTINGS

A. Boom Tubes

1/2" Stainless Steel, rolled BSP threads.

2-hole Part No: GB550200500
3-hole Part No: GB550300500
4-hole Part No: GB550400500
5-hole Part No: GB550500500
6-hole Part No: GB550600500

B. GB999900100
Z-Bracket with clamp, u-bolt & screw

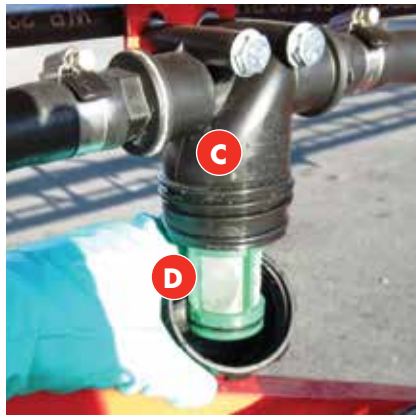
C. A324034
Filter Assy

D. A324004-030
100 Mesh Filter

E. QJ17560A-1/2-NYB
TeeJet nozzle body (excludes cap)

F. 219350-10-NY
Diaphragm cap + diaphragm 10 psi

G. CP21953-EPR
Diaphragm only



H. TDCAM-11002
Cap & nozzle assy

i. CP19438-EPR
Seal

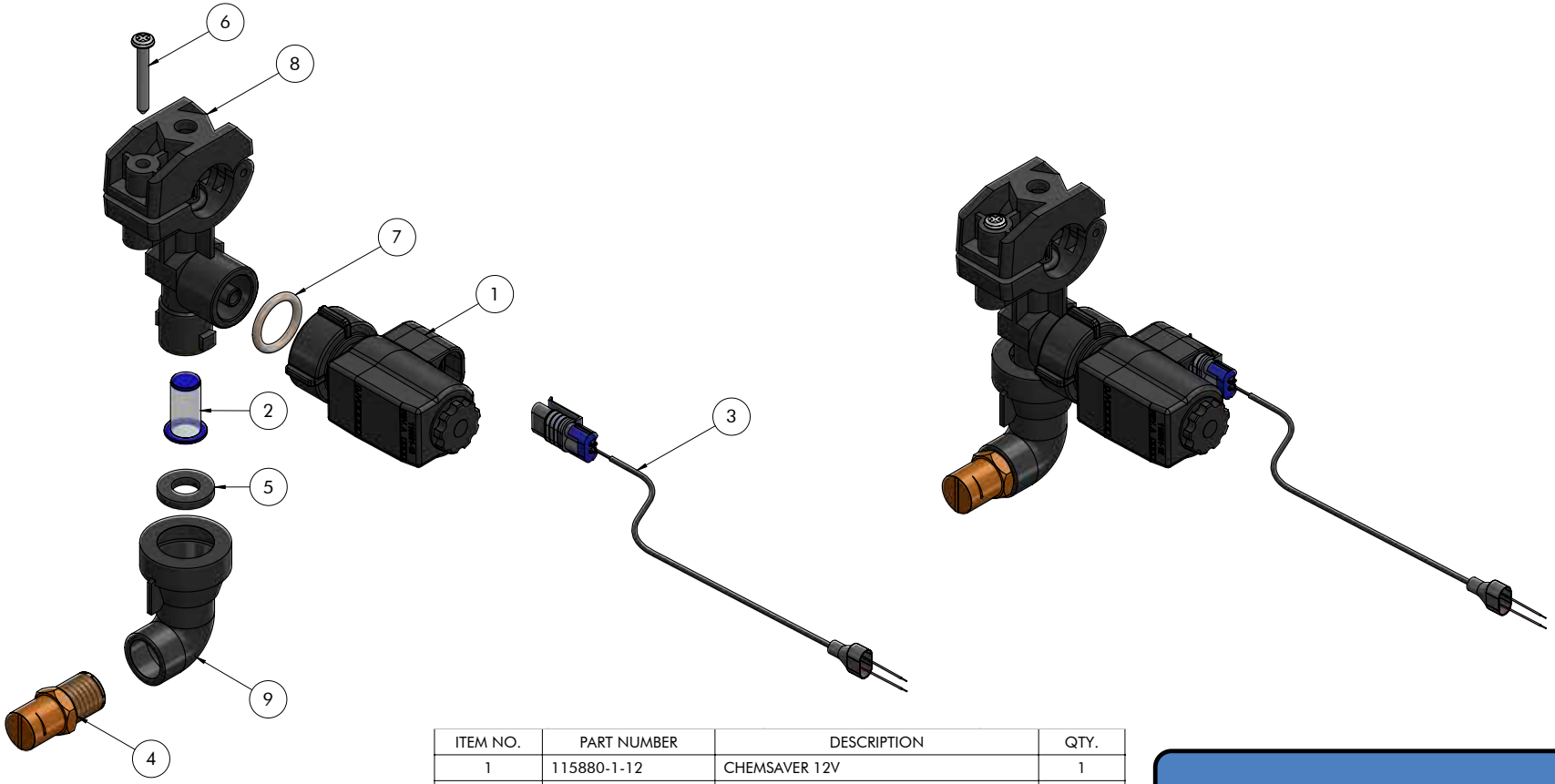
J. 114441-6-CELR
Cap & Seal

K. TDAM-11002
Nozzle Airmix 02

Please contact Technical support for further details

SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

FENCE LINE ASSEMBLY



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	115880-1-12	CHEMSAVER 12V	1
2	8079-PP-50	STRAINER TJ POLY 50 MESH C/W SS	1
3	98552-05	CONNECTOR 0.5 METRIPACK CABLE	1
4	B1_4XP10R-VP	XP BOOMJET NOZZLE	1
5	CP19438-EPR	SEAL FOR TIPS XCPT DISC AND CORE	1
6	CP48255-1144305	SCREW FOR FENCELINE NOZZLE BODY	1
7	CP7717-2116-VI	O-RING VITON	1
8	ECS17560A-1_2-N	EYELET 1/2" NON DRIP	1
9	QJ4676-90-14-N	QJ ADAPTOR 90 DEGREE	1

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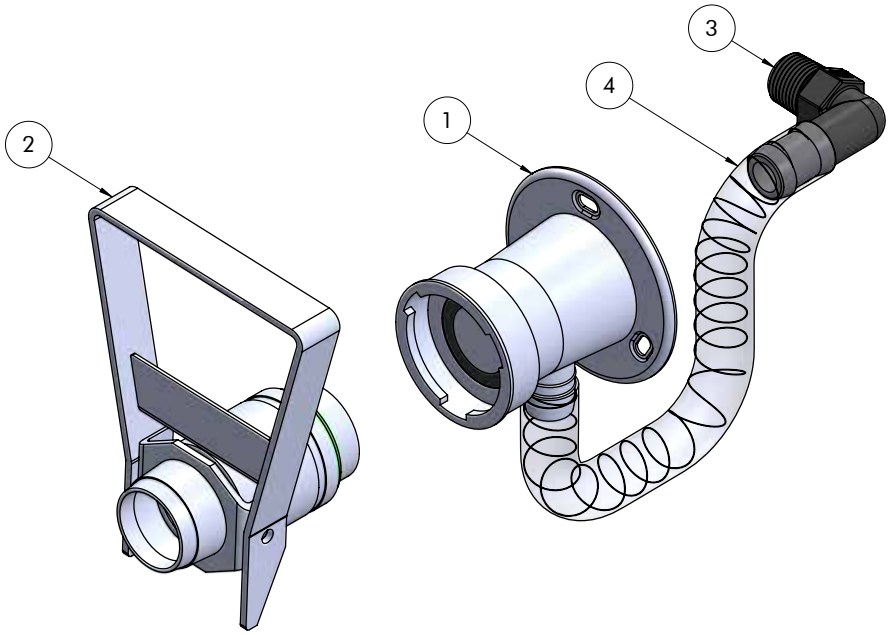
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

ENVIRO TRANSFER CONNECTIONS : L-H9556 & L-H9562

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	L-H9556	RINSING SOCKET K2DV1-002	1
2	L-H9562	COUPLER 3 PIN VIT FLO CONTROL	1
3	BJHB050-075-90	ELBOW 1/2" NPT x 3/4" BRB	1
4	HSC20	HOSE 20MM SUCTION	1



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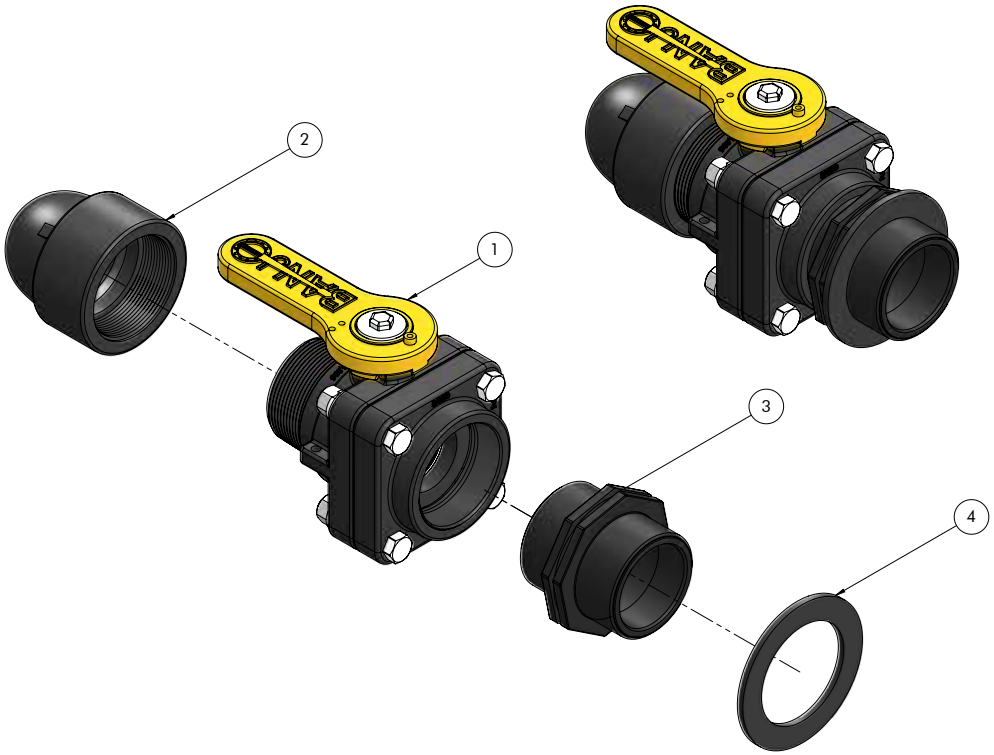
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

PINTO 4000 / KB-1107A DRAIN VALVE



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	BJVSMT200	BALL VALVE 2 WAY 2" MF	1
2	BJSL200-90	ELBOW 2" MALE FEMALE	1
3	A2502070	NIPPLE 2"	1
4	AG40007	FLAT SEAL 2" EPDM	1

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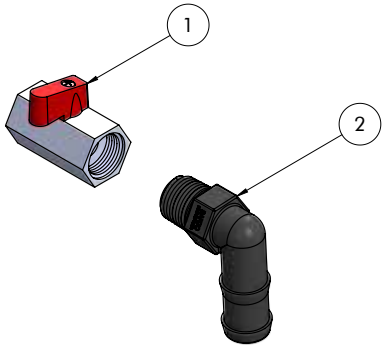
BOOM FLUSHING TAP



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	BALL12F2M	BALL VALVE MINI 1/2" FF 2 WAY	1
2	BJHB050-075-90	ELBOW 1/2" NPT x 3/4" BRB	1

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SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

SPRAY BOOM IDENTIFICATION

1. Refer to the boom information on the Sprayer Specification Sheet (page 5 of the Sprayer Specifications, Safety, Warranty & Delivery booklet (pictured below).
2. Identify the boom fitted to your sprayer (example circled below)
3. For further (parts etc) information refer to the parts section of the Croplands Web site.

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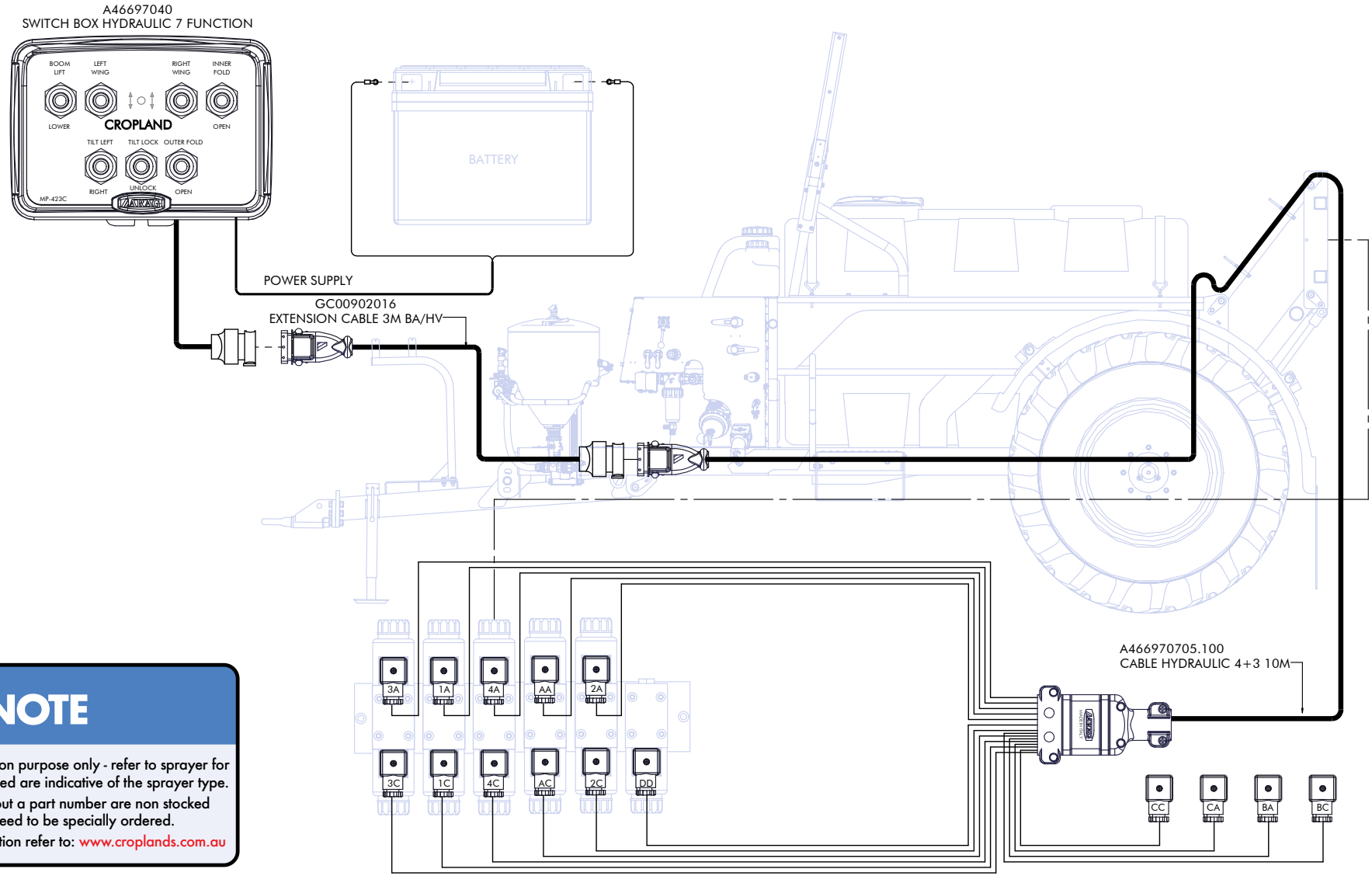
SPRAYER SPECIFICATIONS & FACTORY FITTED OPTIONS

IMPORTANT! Please keep this unique Serial Number & Sprayer Specification Sheet for future reference.

Serial Number:	BT40/24XPW/2***		
Model:	BT4000XP - PINTO 4000L	Hydraulic Fill Pump:	NOT REQUIRED
Axle:	BP-652-12-0 - SUSPENSION 4000L	Electric Fill Meter:	NOT REQUIRED
Wheels & Tyres:	BP-507 - 18.4" x 30" - 8 STUD/275PCD	Electric Fence-Line:	BTEF-TEEJET/LH - TEEJET LH/RH FENCELINE
Pump:	AR160LFP-CF25 - FEMALE SHAFT 25MM	Pump RPM Sensor:	NOT REQUIRED
Pump Drive:	SH4AG/1200 - PTO 1200MM	ChemTransfer Pump:	NOT REQUIRED
Boom Centre Section:	GBBDL-24C - CENTRE SEC 24M	Chemical Probe:	HT-PROBE - SUCTION PROBE
Boom Lefthand (RH):	GBBDLFIX245-LH (RH) - 24M GFIX	Trailer Light Kit:	KB-1010 - TRAILOR LIGHT KIT
Nozzles :	TDAM-11002 - SINGLE NOZZLE BODY	Mudguards:	BP-526B - PINTO 30" MUDGUARDS
Nozzle Bodies:	QJ175060A-1/2-NY – TEEJET 1/2" SINGLE	Oversize Sign:	NOT REQUIRED
Spray Controller:	G8410C0007 - BA5000 CONTROLLER	Chemi Flush:	KB-1003A - 60L CHEMICAL MIXER
Control Manifold:	A863CCRO16 - SERVO/DUMP/FLOW/FILTER	Lift cylinders:	HP-022 - CYLINDER 2.0" X 13" 4000L
Spray Manifold:	A863CCRO05 - 3 SECTION MOTOR VALVES	Boom in-line Filters:	A3242034 - FILTER 3/4" 100 MESH
Manual PRV:	A465CCRO01 - MANUAL PRV 2 TAPS	Drawbar & Hitch:	BP-650-2B/BP-652-3-0A - TOW EYE HITCH
Suction Filter:	A3160F3 - 2" SUCTION FILTER TT	Flow Meter:	A46264A0 - WOLF 10-200LPM
Control Panel:	KB-1105A-2 - AUTO RATE 3000/4000L	Hydraulic controller:	A46697D40 - ARAG SWITCHBOX 4+5
Wheel speed sensor:	GS02000009 - GEOLINE SPEED SENSOR	Hydraulic Manifold:	MP-630 - HYD MANIFOLD 4 FUNCTION
		Boom lights:	NOT REQUIRED
Special Requirements:			

SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

GVAR BOOM FUNCTION SWITCHBOX + CETOP ASSY



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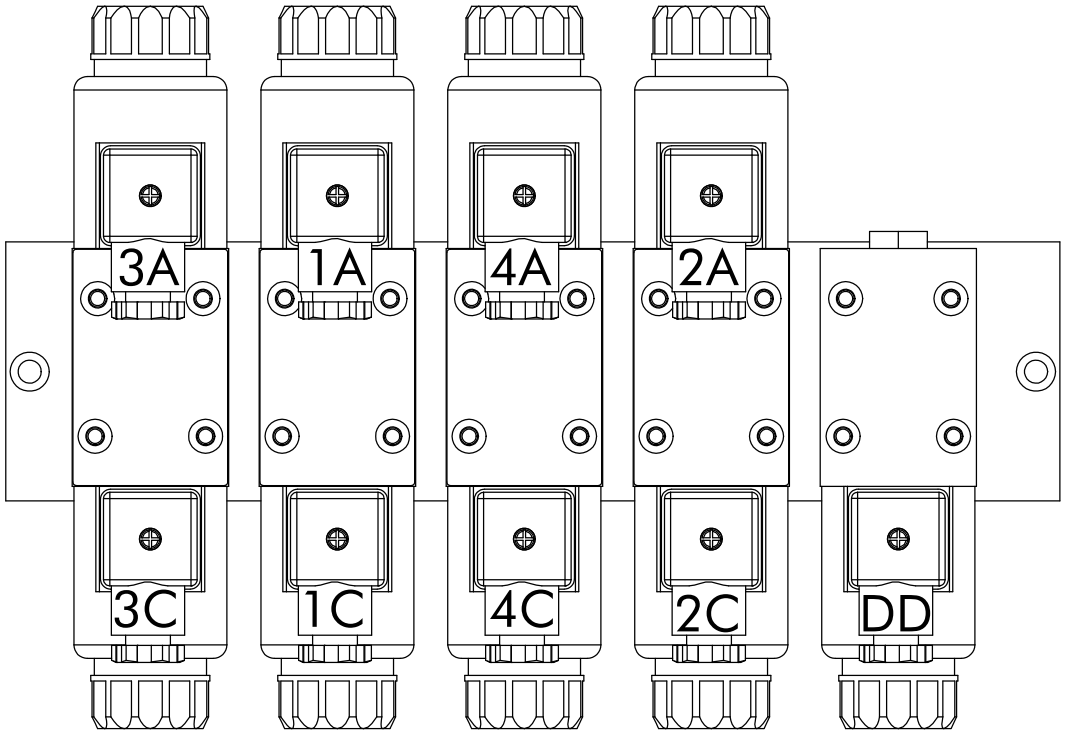
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

16 ~ 21M BOOM - CETOP WIRING

16-21M BOOM- PRESSURE TO CLOSE BOOM
MP-630 (HYDRAULIC VLAVE CETOP 3 4 FUNCTION)



PLUG	DISCRIPTION
3A&3C	R/H WING LIFT
1A&1C	LIFT
4A&4C	INNER FOLD
2A&2C	L/H WING LIFT
DD	DUMP

CLOSE -CABLE TIE	A
OPEN	B

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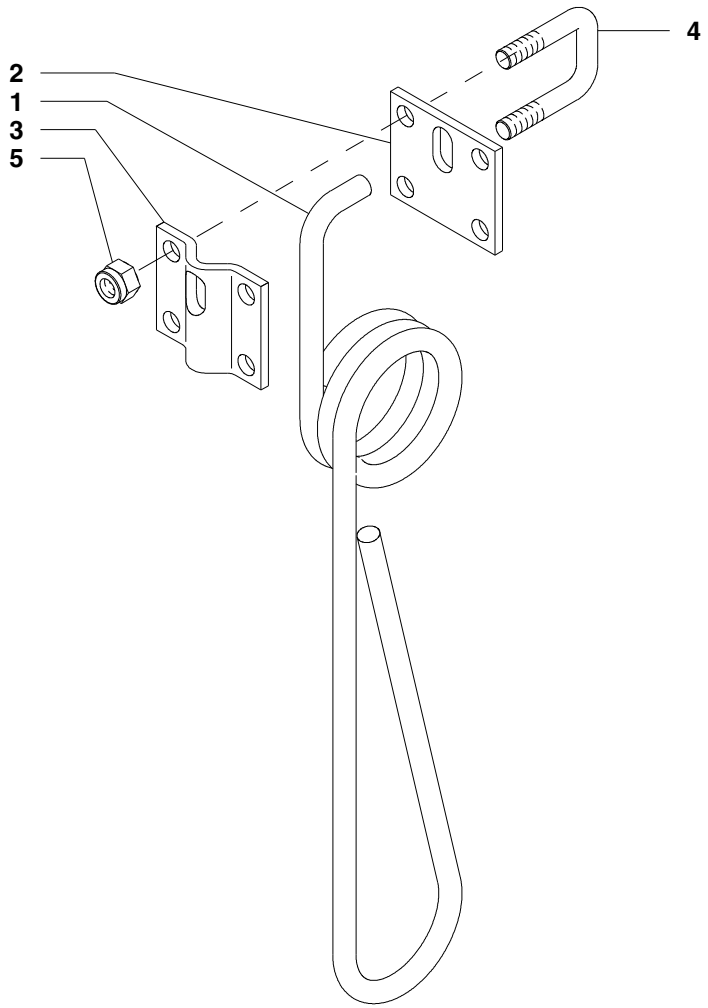
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

GB990902501 BOOM SKID



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POS	PART NO	DESCRIPTION	QTY
1	*GB919900030V*	*SKID SPRING*	*2*
2	*GB501100008V*	*BOOM PLATE*	*2*
3	*GB501100009V*	*SKID PLATE*	*2*
4	*GB500500003Z*	*U-BOLT*	*4*
5	*GB905400010*	*NYLOCK*	*8*

Note: ***Parts in italics are non-stock items and may need to be ordered.***

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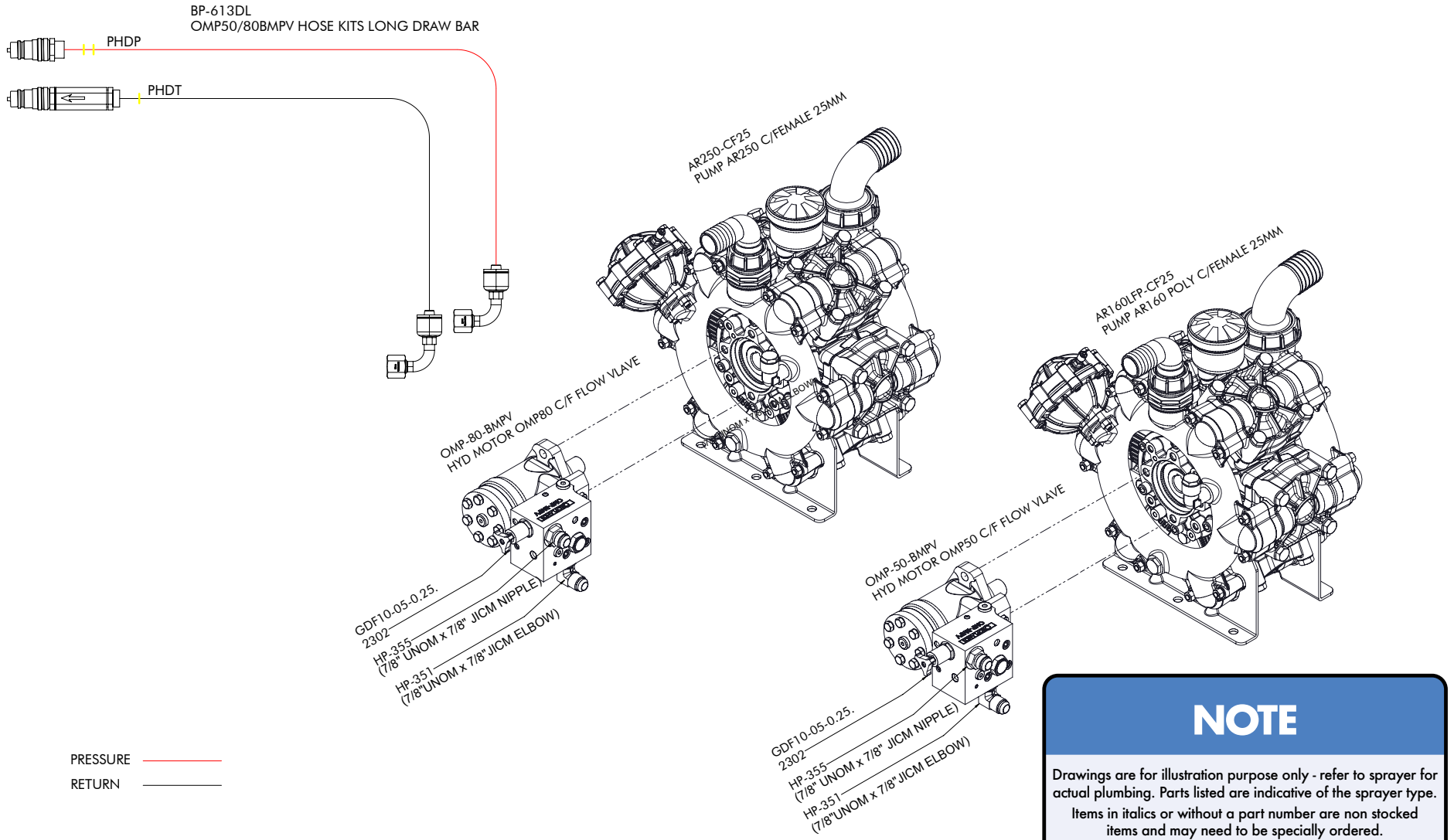
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

AR PUMP + HYDRAULIC DRIVE



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SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

PINTO 4000 - BRAVO 180S

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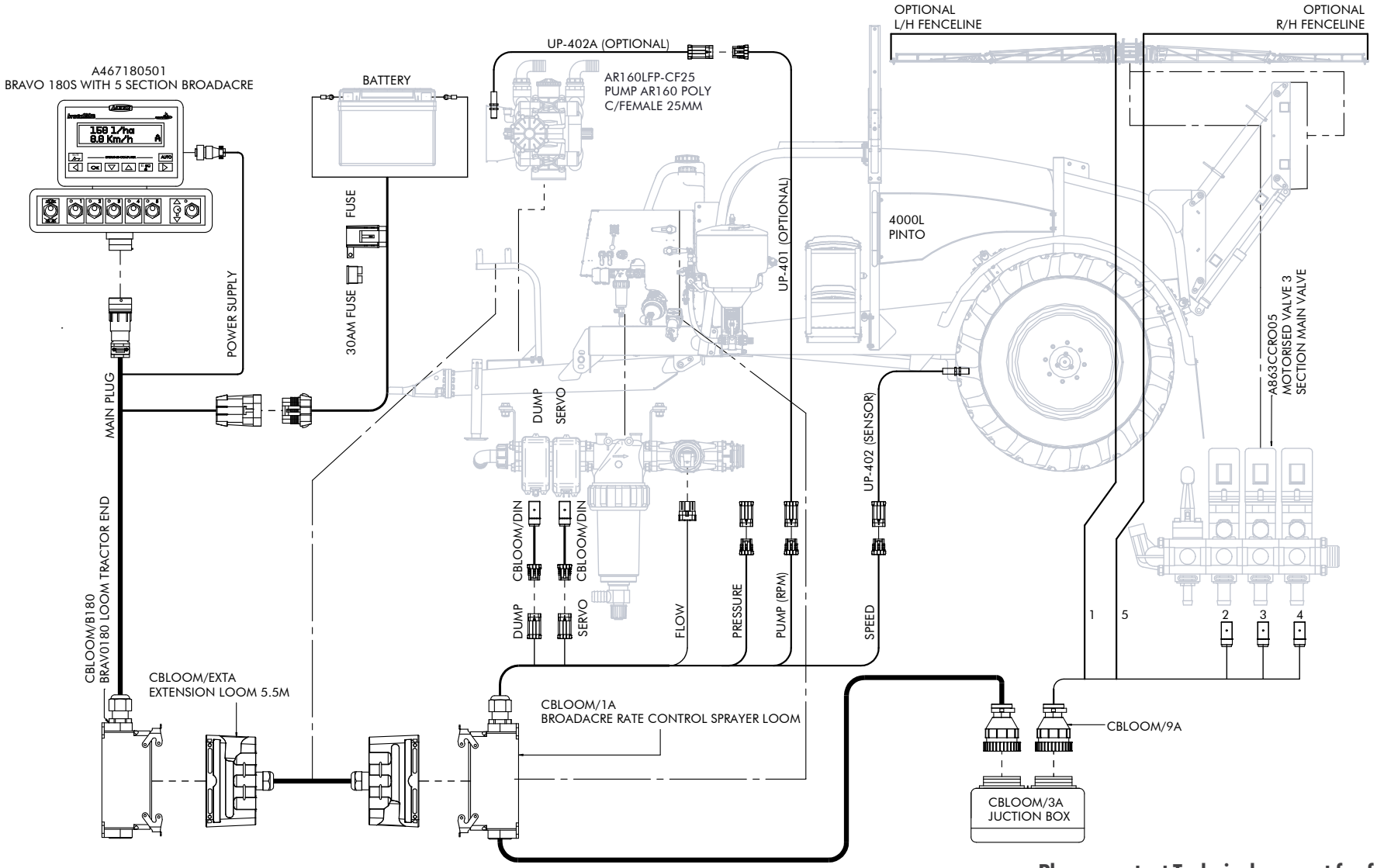

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SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

PINTO 3000 - BRAVO 180S

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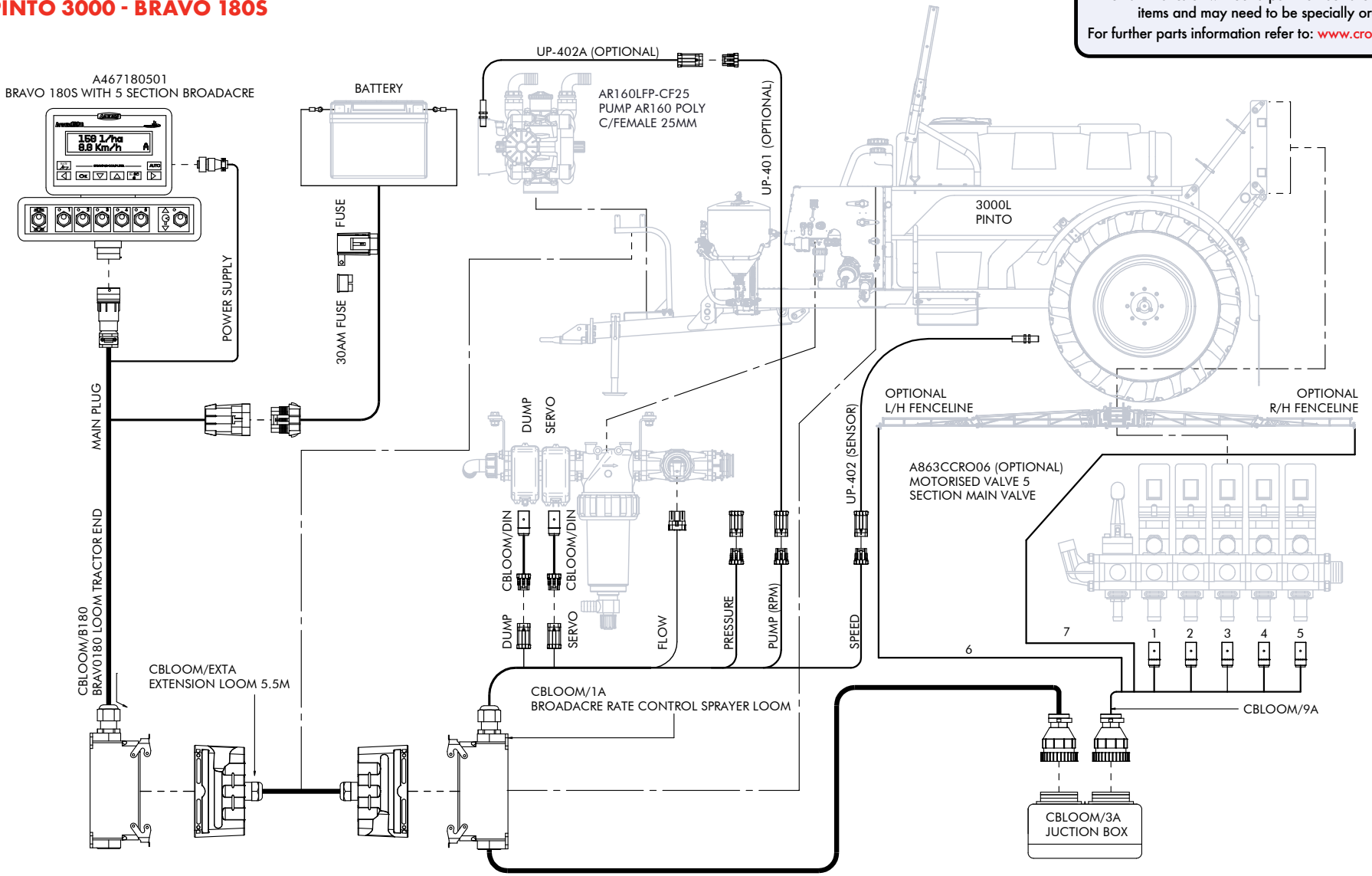

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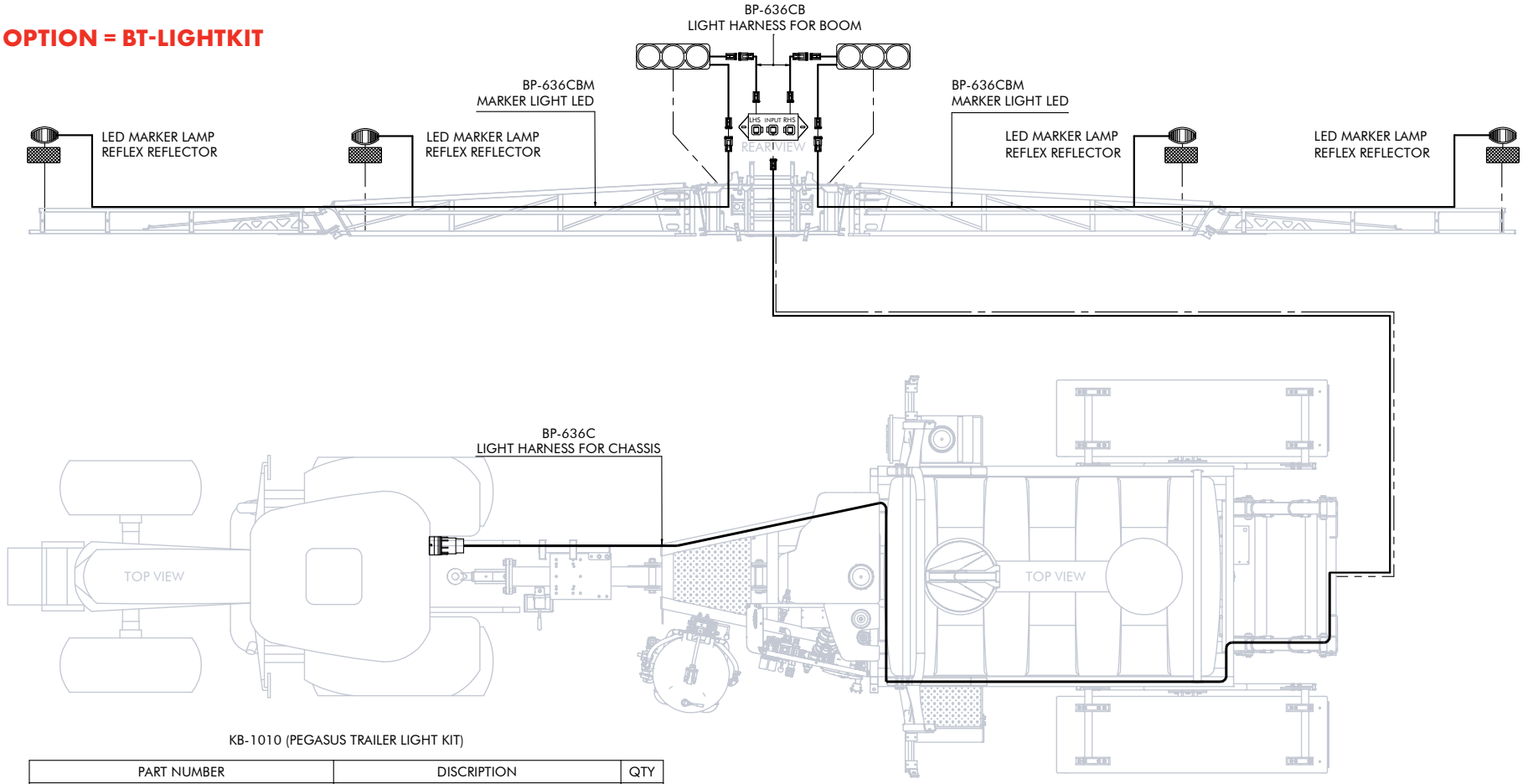
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

OPTION = BT-LIGHTKIT



KB-1010 (PEGASUS TRAILER LIGHT KIT)

PART NUMBER	DISCRIPTION	QTY
BP-635	MOUNT PLATE TAIL LIGHT	2
BP-636C	LIGHT HARNESS FOR CHASSIS	1
BP-636CB	LIGHT HARNESS FOR BOOM	2
BP-636CBM	MARKER LIGHT LED	2

NOTE

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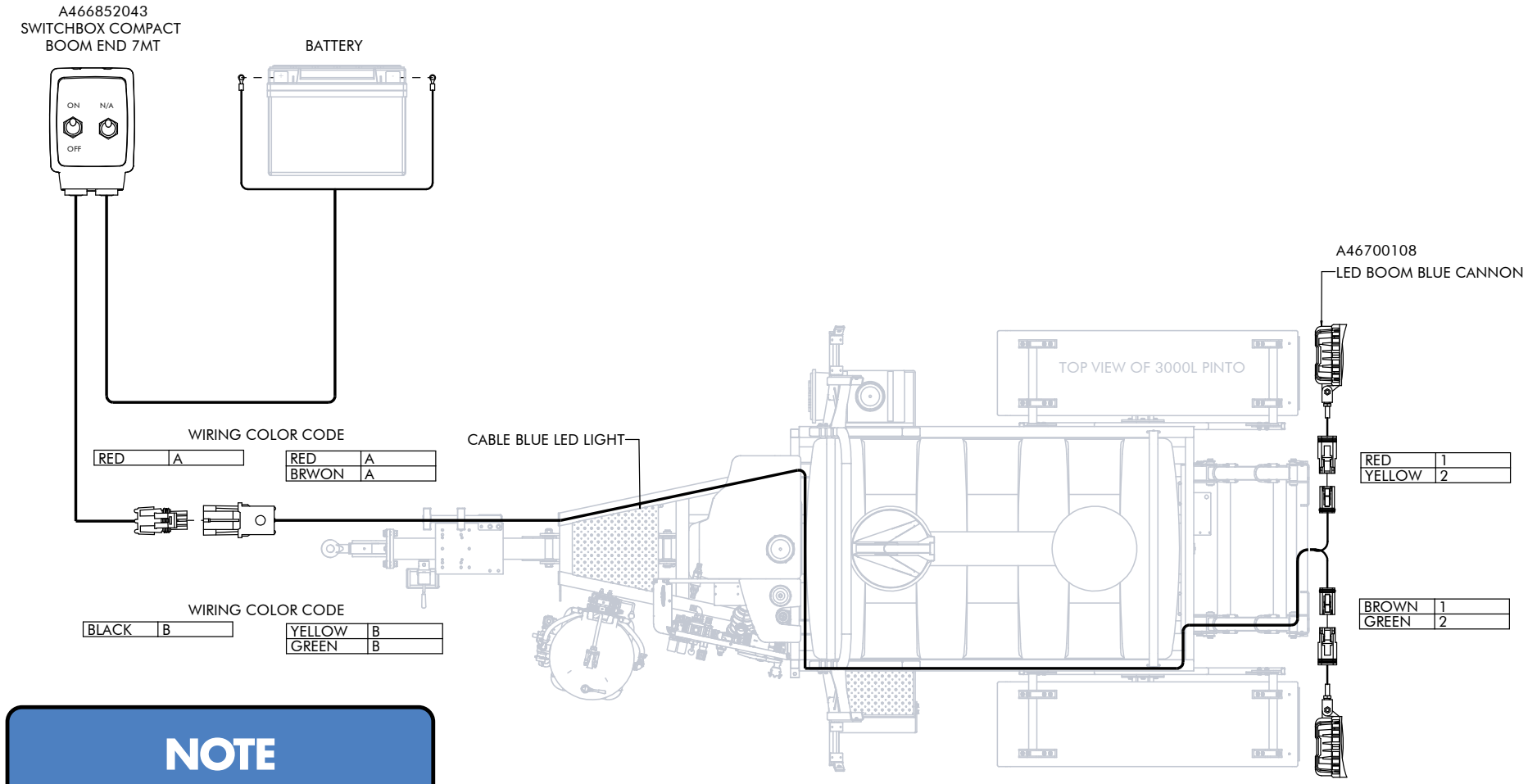
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

OPTION = BT-LED



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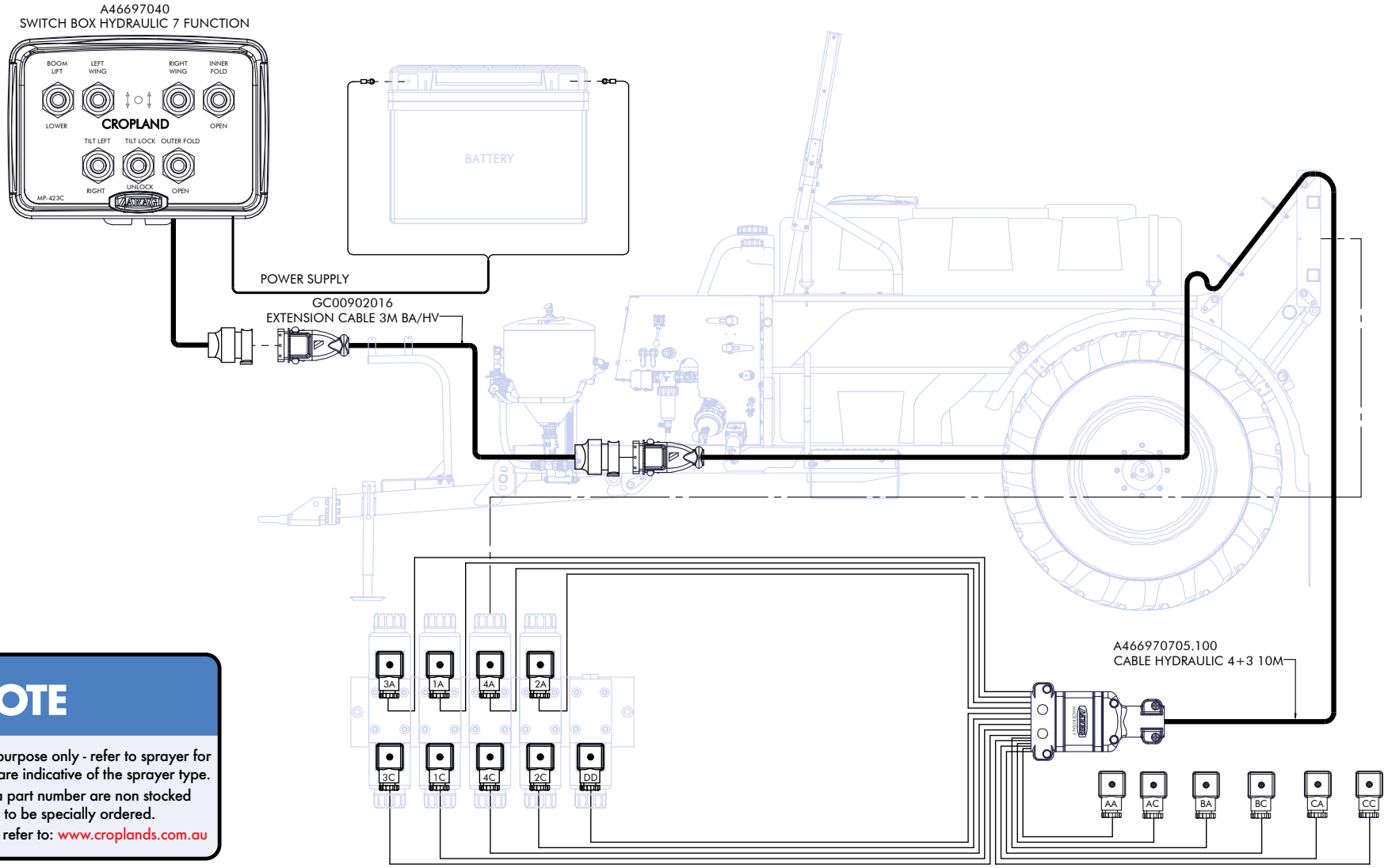
BOOM FUNCTION SWITCHBOX + CETOP ASSY; 5 FUNCTION



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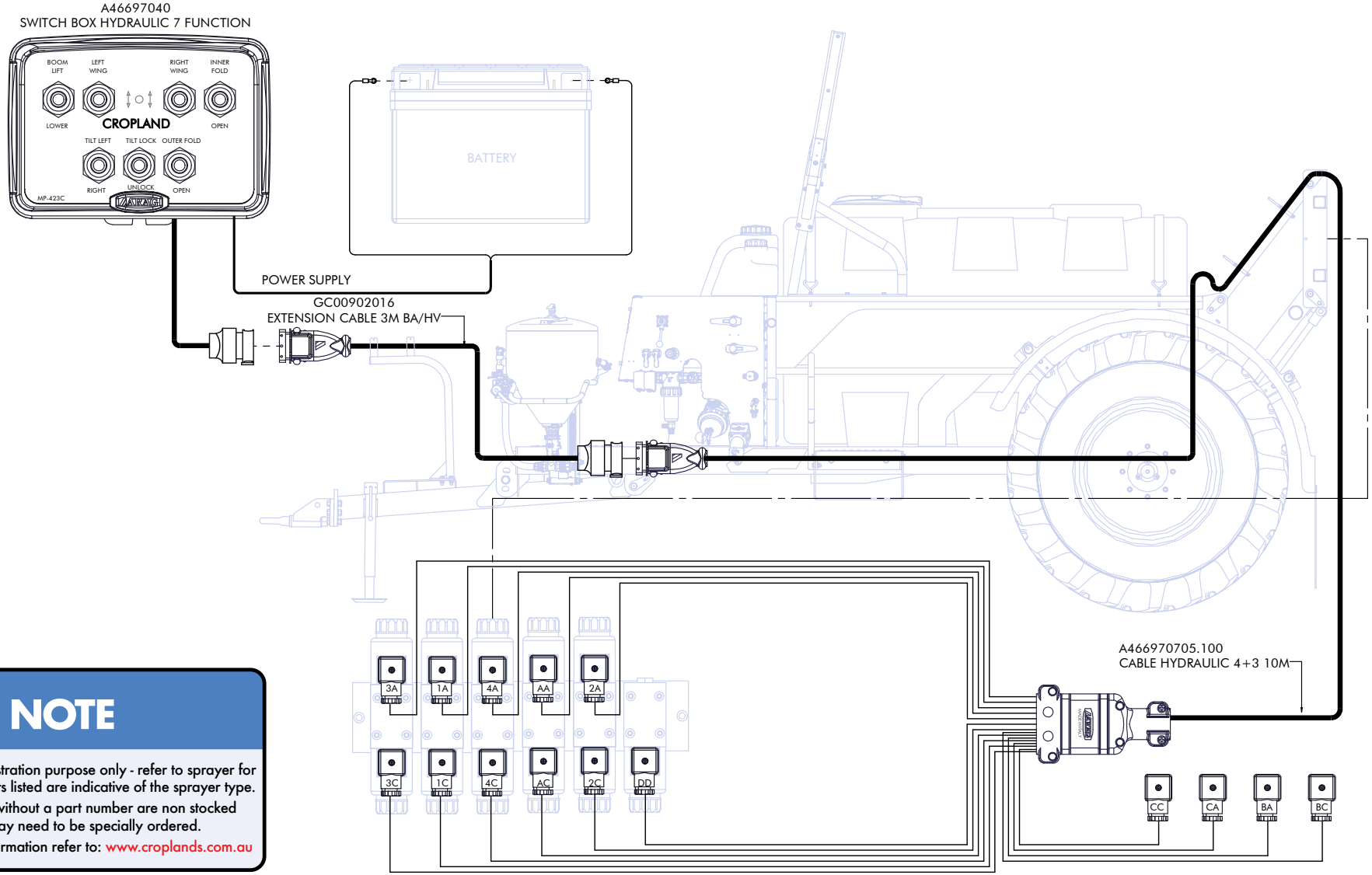
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

GVAR BOOM FUNCTION SWITCHBOX + CETOP ASSY; 4 FUNCTION



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SECTION 10
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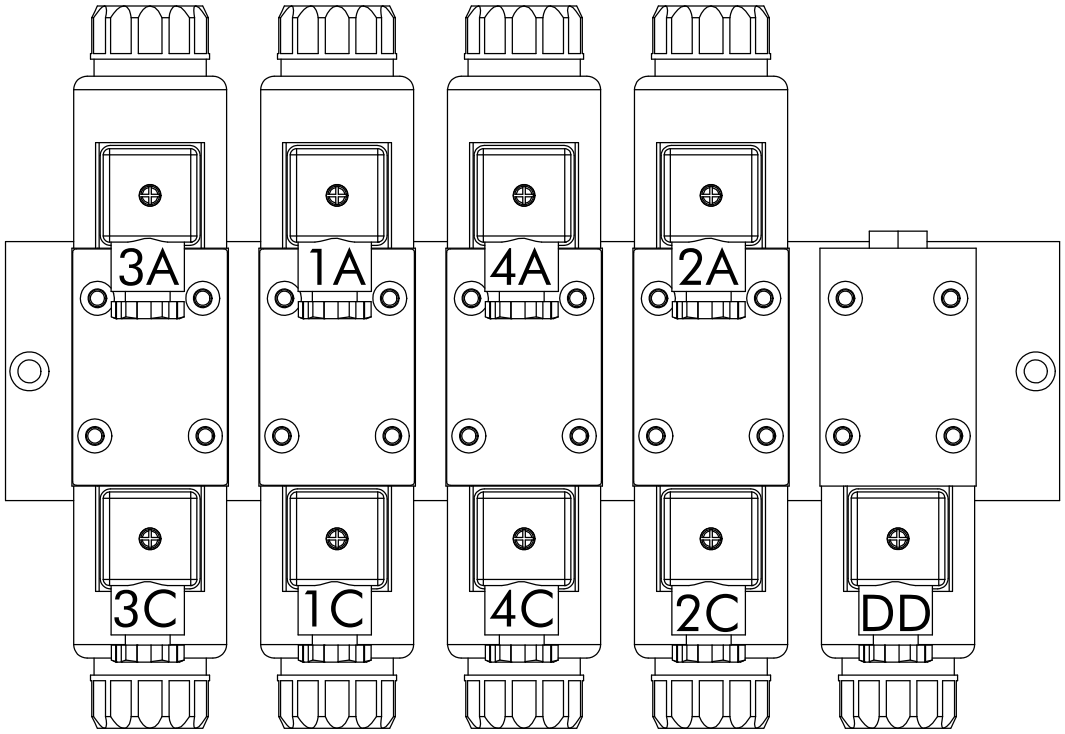
16 ~ 21M BOOM - CETOP WIRING; 4 FUNCTION

16-21M BOOM- PRESSURE TO CLOSE BOOM
MP-630 (HYDRAULIC VLAVE CETOP 3 4 FUNCTION)



PLUG	DISCRIPTION
3A&3C	R/H WING LIFT
1A&1C	LIFT
4A&4C	INNER FOLD
2A&2C	L/H WING LIFT
DD	DUMP

CLOSE -CABLE TIE	A
OPEN	B

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SECTION 10
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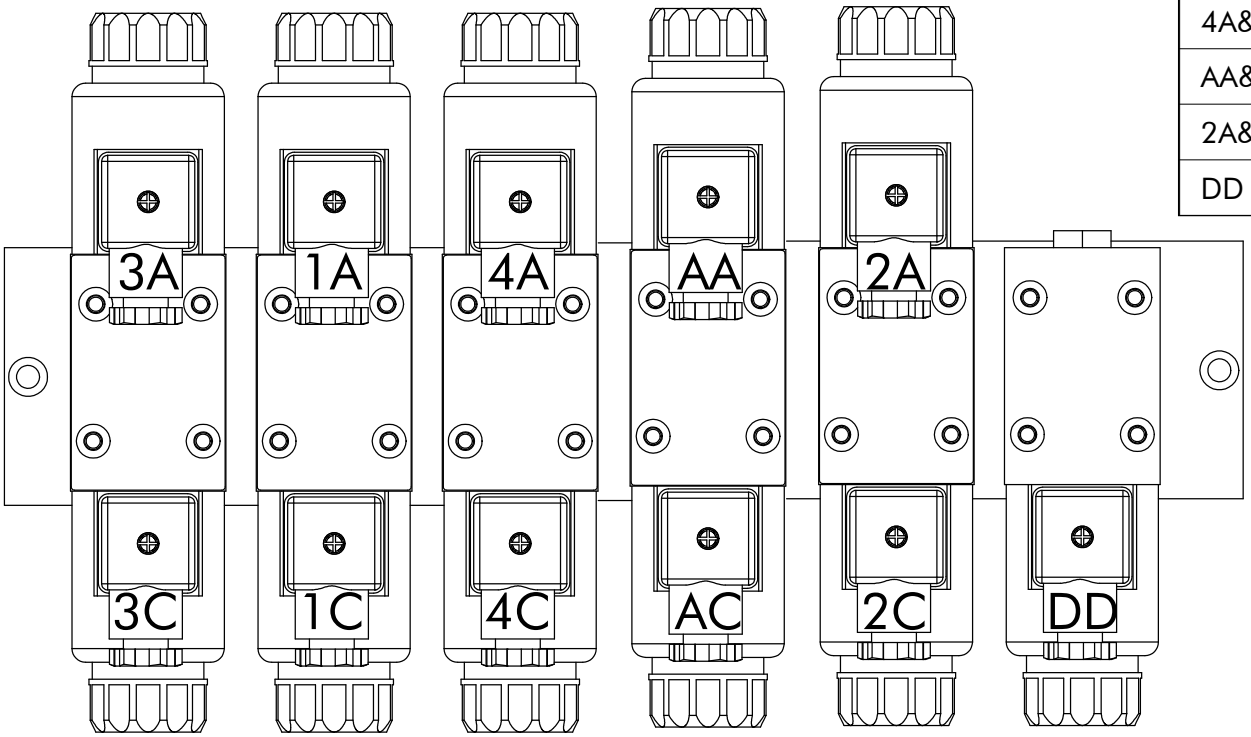
24M BOOM - CETOP WIRING; 5 FUNCTION

24M BOOM- PRESSURE TO CLOSE BOOM
MP-631 (HYDRAULIC VLAVE CETOP 3 5 FUNCTION)



PLUG	DISCRIPTION
3A&3C	R/H WING LIFT
1A&1C	LIFT
4A&4C	INNER FOLD
AA&AC	OUTER FOLD
2A&2C	L/H WING LIFT
DD	DUMP

CLOSE -CABLE TIE	A
OPEN	B

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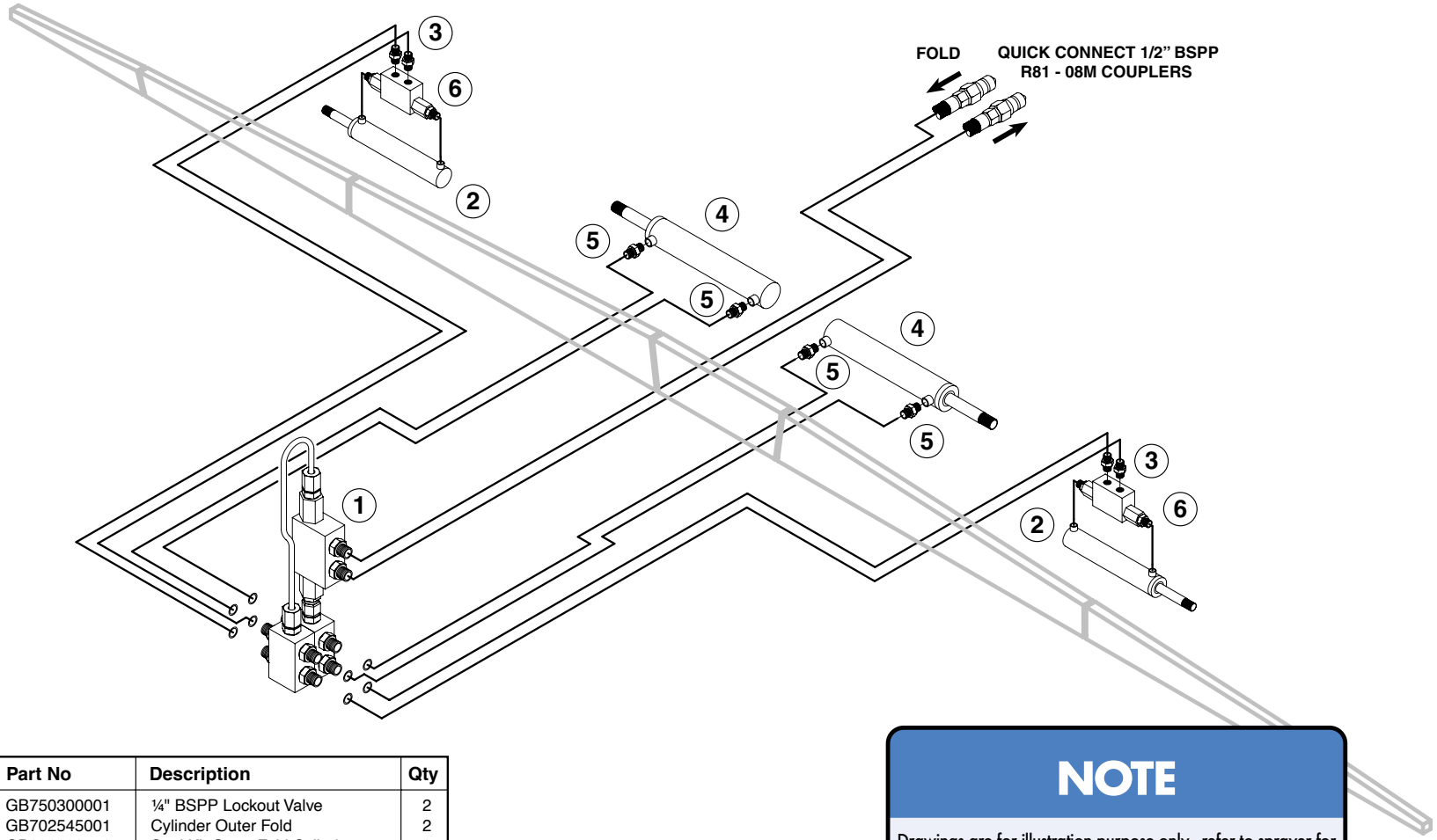
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

STANDARD FOLD - 16/18/21M BOOM FOLD OPTION, HYDRAULIC FOLD WITHOUT WING LIFT OPTION



Pos	Part No	Description	Qty
1	GB750300001	¼" BSPP Lockout Valve	2
2	GB702545001	Cylinder Outer Fold	2
2	GB996000176	Seal Kit Outer Fold Cylinder	2
3	GB570500006Z	Orifice Nipple Outer Fold 0.6mm	4
4	GBBG024889	Cylinder Inner Fold	2
4	GBBG024892	Seal Kit Inner Fold Cylinder	2
5	GB570500008Z	Orifice Nipple Outer Fold 0.8mm	4
6	GB750300009	¼" BSPP Lockout Valve (ST)	2

NOTE

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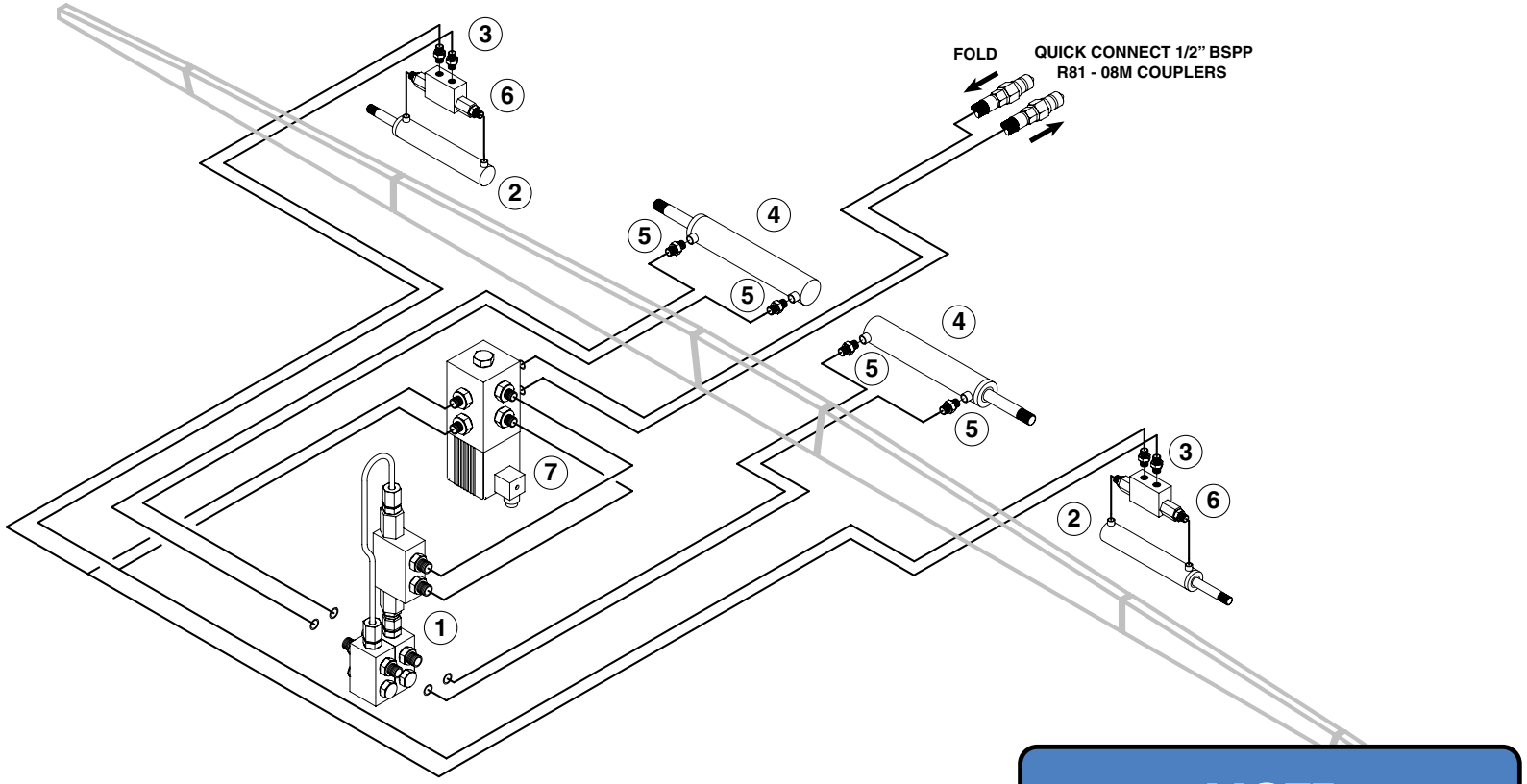
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

INDEPENDENT OUTER WING FOLD - 16/18/21M BOOM OWF OPTION, HYDRAULIC OWF WITHOUT WINGLIFT OPTION



Pos	Part No	Description	Qty
1	GB750300001	¼" BSPP Lockout Valve	1
2	GB702545001	Cylinder Outer Fold	2
2	GB996000176	Seal Kit Outer Fold Cylinder	2
3	GB570500006Z	Orifice Nipple Outer Fold 0.6mm	4
4	GBBG024889	Cylinder Inner Fold	2
4	GBBG024892	Seal Kit Inner Fold Cylinder	2
5	GB570500008Z	Orifice Nipple Outer Fold 0.8mm	4
6	GB750300009	¼" BSPP Lockout Valve (ST)	2

Pos	Part No	Description	Qty
7	MP-608B	Two Function Diverter Valve	1

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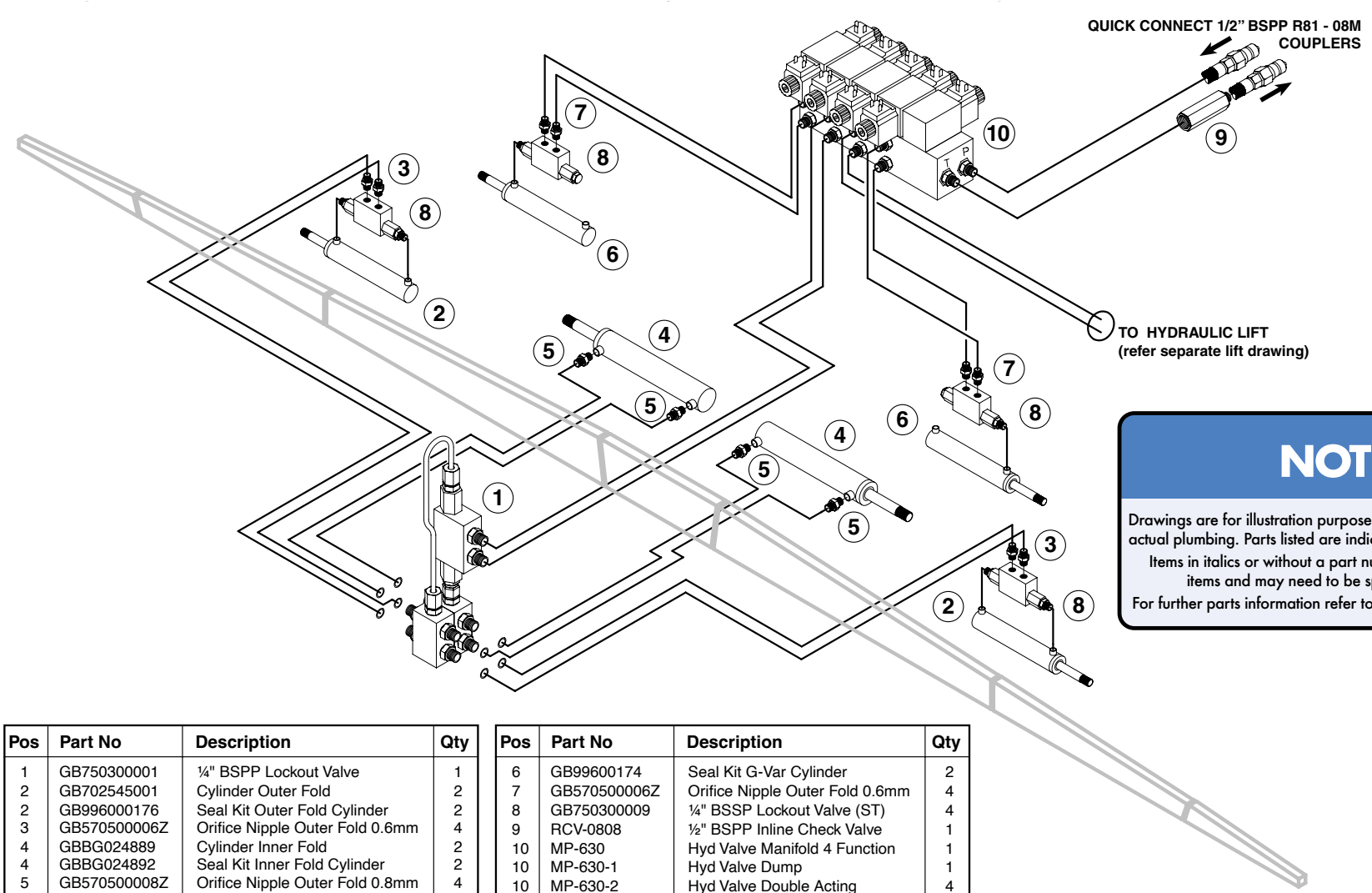
WING LIFT - 16/18/21M BOOM G-VAR OPTION, HYDRAULIC FOLD WITH WINGLIFT OPTION



Pos	Part No	Description	Qty
1	GB750300001	¼" BSPP Lockout Valve	1
2	GB702545001	Cylinder Outer Fold	2
2	GB996000176	Seal Kit Outer Fold Cylinder	2
3	GB570500006Z	Orifice Nipple Outer Fold 0.6mm	4
4	GBBG024889	Cylinder Inner Fold	2
4	GBBG024892	Seal Kit Inner Fold Cylinder	2
5	GB570500008Z	Orifice Nipple Outer Fold 0.8mm	4
6	GBBG007491	Cylinder G-Var	2

Pos	Part No	Description	Qty
6	GB99600174	Seal Kit G-Var Cylinder	2
7	GB570500006Z	Orifice Nipple Outer Fold 0.6mm	4
8	GB750300009	¼" BSSP Lockout Valve (ST)	4
9	RCV-0808	½" BSPP Inline Check Valve	1
10	MP-630	Hyd Valve Manifold 4 Function	1
10	MP-630-1	Hyd Valve Dump	1
10	MP-630-2	Hyd Valve Double Acting	4
10	MP-630-3	Valve Coil 12v	9

NOTE

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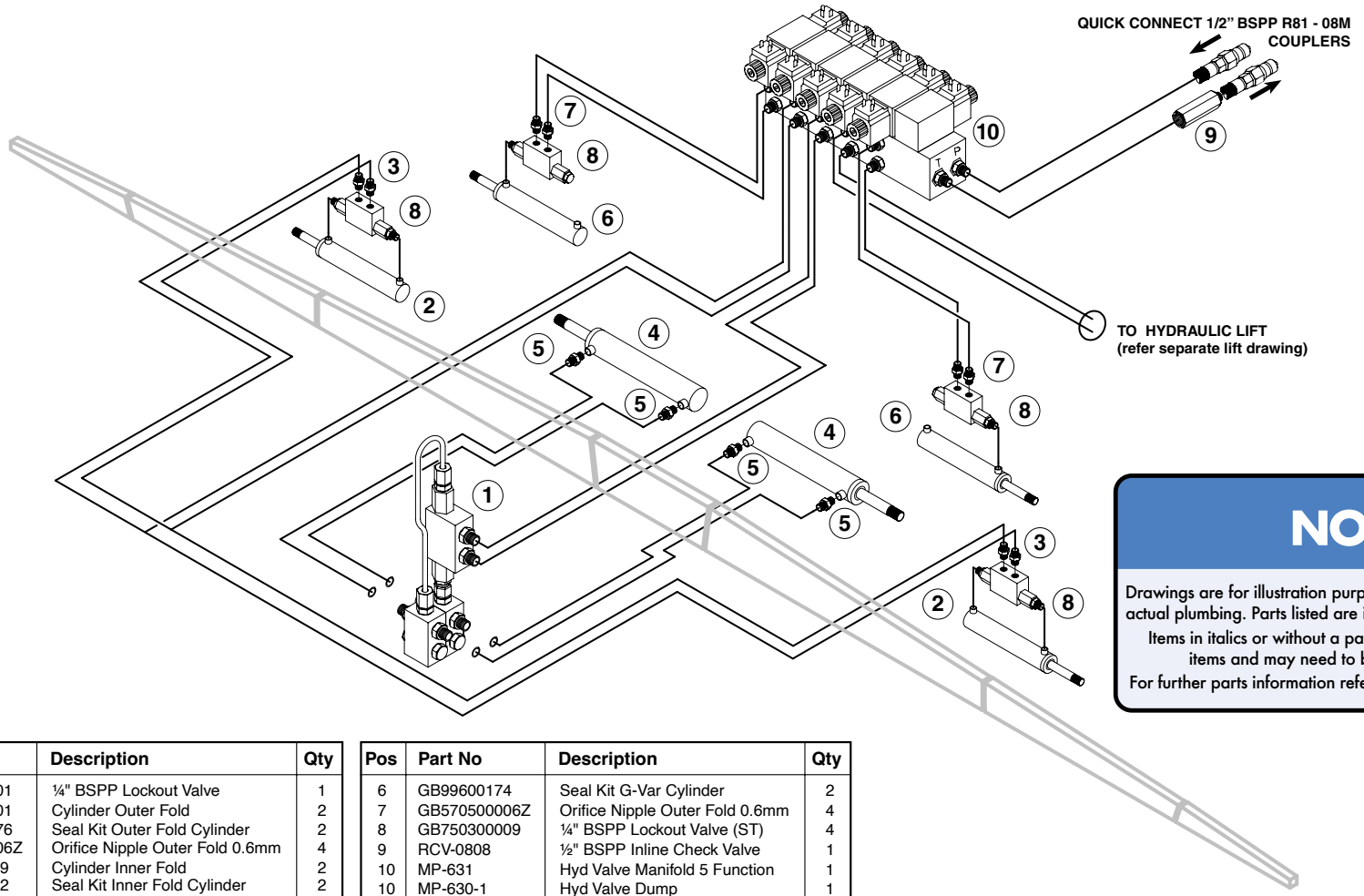
SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

WING LIFT WITH INDEPENDENT OUTER WING FOLD - 16/18/21M BOOM G-VAR WITH OWF OPTION, HYDRAULIC FOLD WITH WINGLIFT & OWF OPTION



Pos	Part No	Description	Qty
1	GB750300001	¼" BSPP Lockout Valve	1
2	GB702545001	Cylinder Outer Fold	2
2	GB996000176	Seal Kit Outer Fold Cylinder	2
3	GB570500006Z	Orifice Nipple Outer Fold 0.6mm	4
4	GBBG024889	Cylinder Inner Fold	2
4	GBBG024892	Seal Kit Inner Fold Cylinder	2
5	GB570500008Z	Orifice Nipple Outer Fold 0.8mm	4
6	GBBG007491	Cylinder G-Var	2

Pos	Part No	Description	Qty
6	GB99600174	Seal Kit G-Var Cylinder	2
7	GB570500006Z	Orifice Nipple Outer Fold 0.6mm	4
8	GB750300009	¼" BSPP Lockout Valve (ST)	4
9	RCV-0808	½" BSPP Inline Check Valve	1
10	MP-631	Hyd Valve Manifold 5 Function	1
10	MP-630-1	Hyd Valve Dump	1
10	MP-630-2	Hyd Valve Double Acting	5
10	MP-630-3	Valve Coil 12v	11

NOTE

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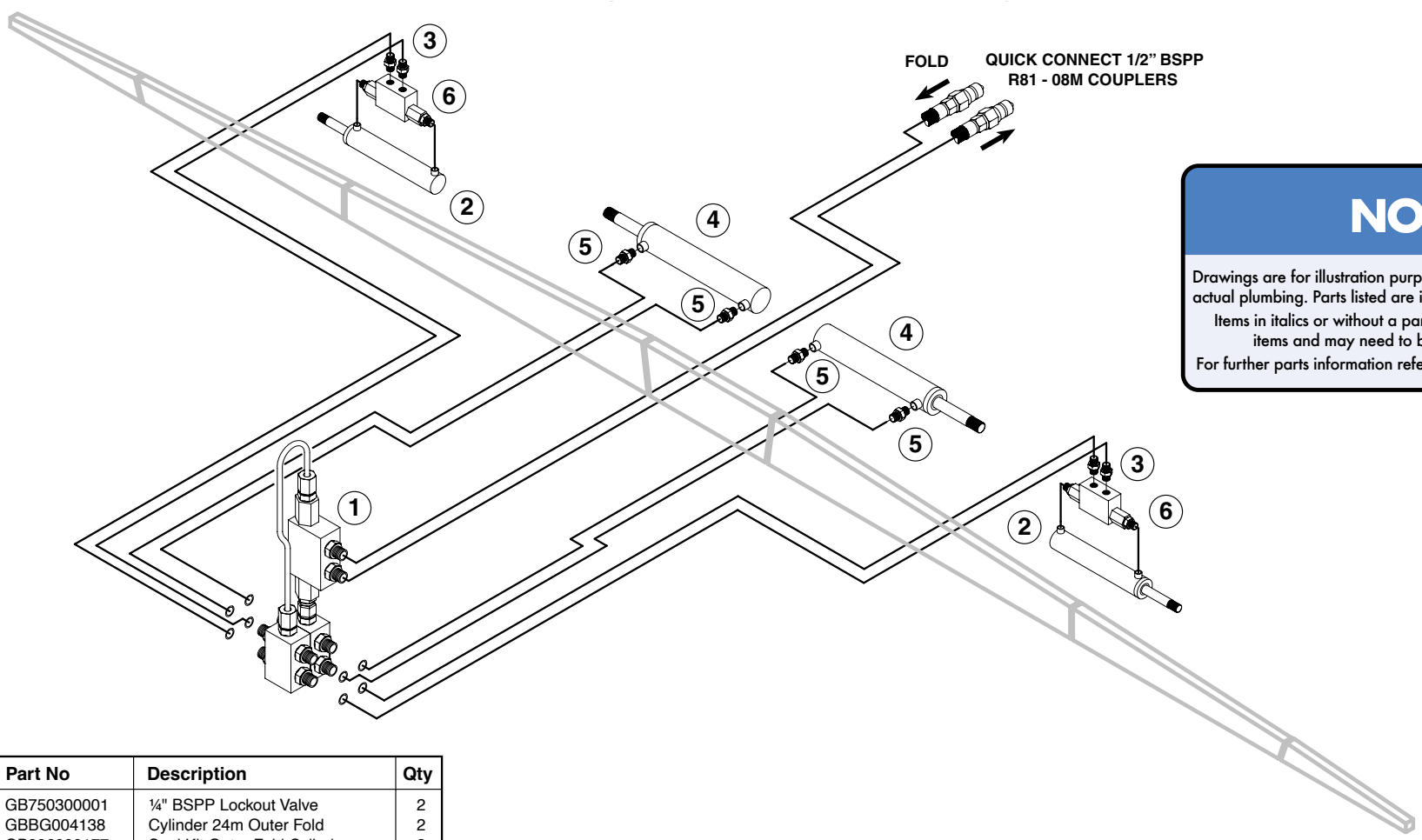
WING LIFT - 16/18/21M BOOM G-VAR OPTION, HYDRAULIC FOLD WITH WINGLIFT OPTION



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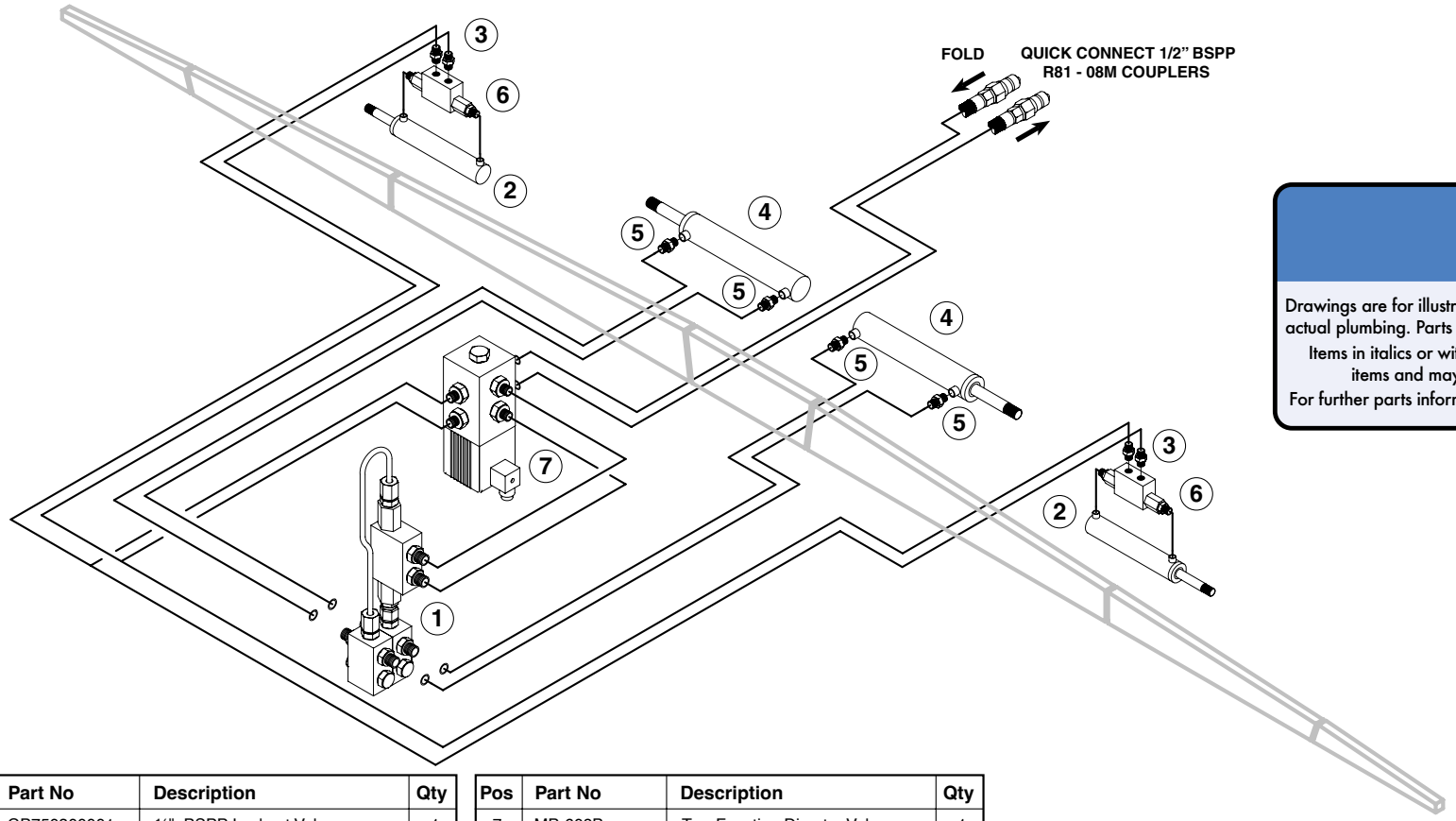
Pos	Part No	Description	Qty
1	GB750300001	¼" BSPP Lockout Valve	2
2	GBBG004138	Cylinder 24m Outer Fold	2
2	GB996000177	Seal Kit Outer Fold Cylinder	2
3	GB570500007Z	Orifice Nipple Outer Fold 0.7mm	4
4	GBBG016908	Cylinder 24m Inner Fold	2
4	GBBG016913	Seal Kit Inner Fold Cylinder	2
5	GB570500008Z	Orifice Nipple Outer Fold 0.8mm	4
6	GB750300009	¼" BSPP Lockout Valve (ST)	2

Please contact Technical support for further details

SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

STANDARD FOLD - 24M BOOM FOLD OPTION, HYDRAULIC FOLD WITHOUT WING LIFT OPTION



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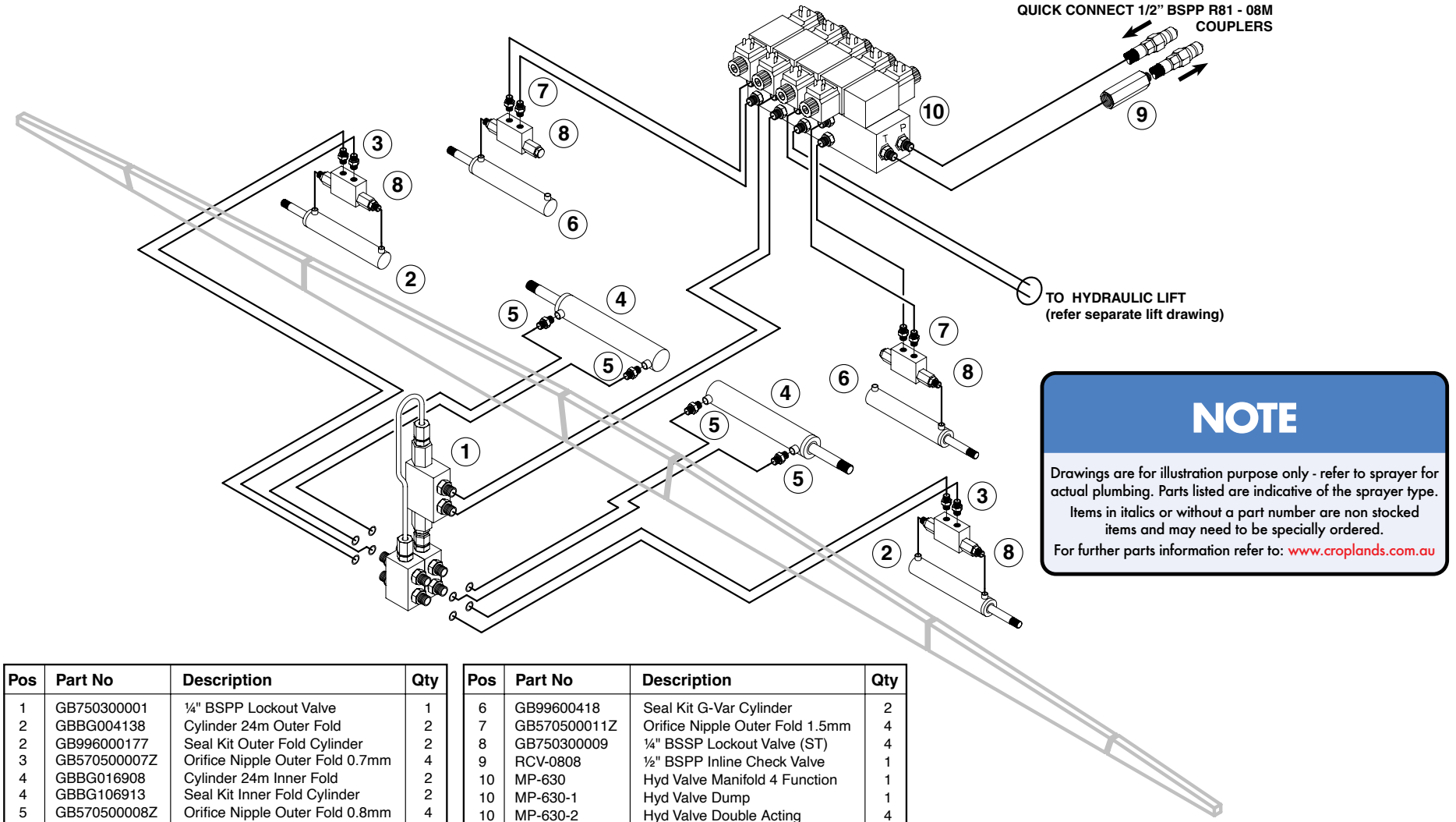
Pos	Part No	Description	Qty
1	GB750300001	¼" BSPP Lockout Valve	1
2	GBBG004138	Cylinder 24m Outer Fold	2
2	GB996000177	Seal Kit Outer Fold Cylinder	2
3	GB570500007Z	Orifice Nipple Outer Fold 0.7mm	4
4	GBBG016908	Cylinder 24m Inner Fold	2
4	GBBG016913	Seal Kit Inner Fold Cylinder	2
5	GB570500008Z	Orifice Nipple Outer Fold 0.8mm	4
6	GB750300009	¼" BSPP Lockout Valve (ST)	2

Pos	Part No	Description	Qty
7	MP-608B	Two Function Diverter Valve	1

SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

STANDARD FOLD, 24 MTR BOOM WITH HYDRAULIC WINGLIFT



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Pos	Part No	Description	Qty
1	GB750300001	¼" BSPP Lockout Valve	1
2	GBBG004138	Cylinder 24m Outer Fold	2
2	GB996000177	Seal Kit Outer Fold Cylinder	2
3	GB570500007Z	Orifice Nipple Outer Fold 0.7mm	4
4	GBBG016908	Cylinder 24m Inner Fold	2
4	GBBG106913	Seal Kit Inner Fold Cylinder	2
5	GB570500008Z	Orifice Nipple Outer Fold 0.8mm	4
6	GBBG703070012V	Cylinder 24m G-Var	2

Pos	Part No	Description	Qty
6	GB99600418	Seal Kit G-Var Cylinder	2
7	GB570500011Z	Orifice Nipple Outer Fold 1.5mm	4
8	GB750300009	¼" BSSP Lockout Valve (ST)	4
9	RCV-0808	½" BSPP Inline Check Valve	1
10	MP-630	Hyd Valve Manifold 4 Function	1
10	MP-630-1	Hyd Valve Dump	1
10	MP-630-2	Hyd Valve Double Acting	4
10	MP-630-3	Valve Coil 12v	9

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SECTION 10
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

INDEPENDENT OUTER WING FOLD, 24 MTR BOOM WITH HYDRAULIC WINGLIFT

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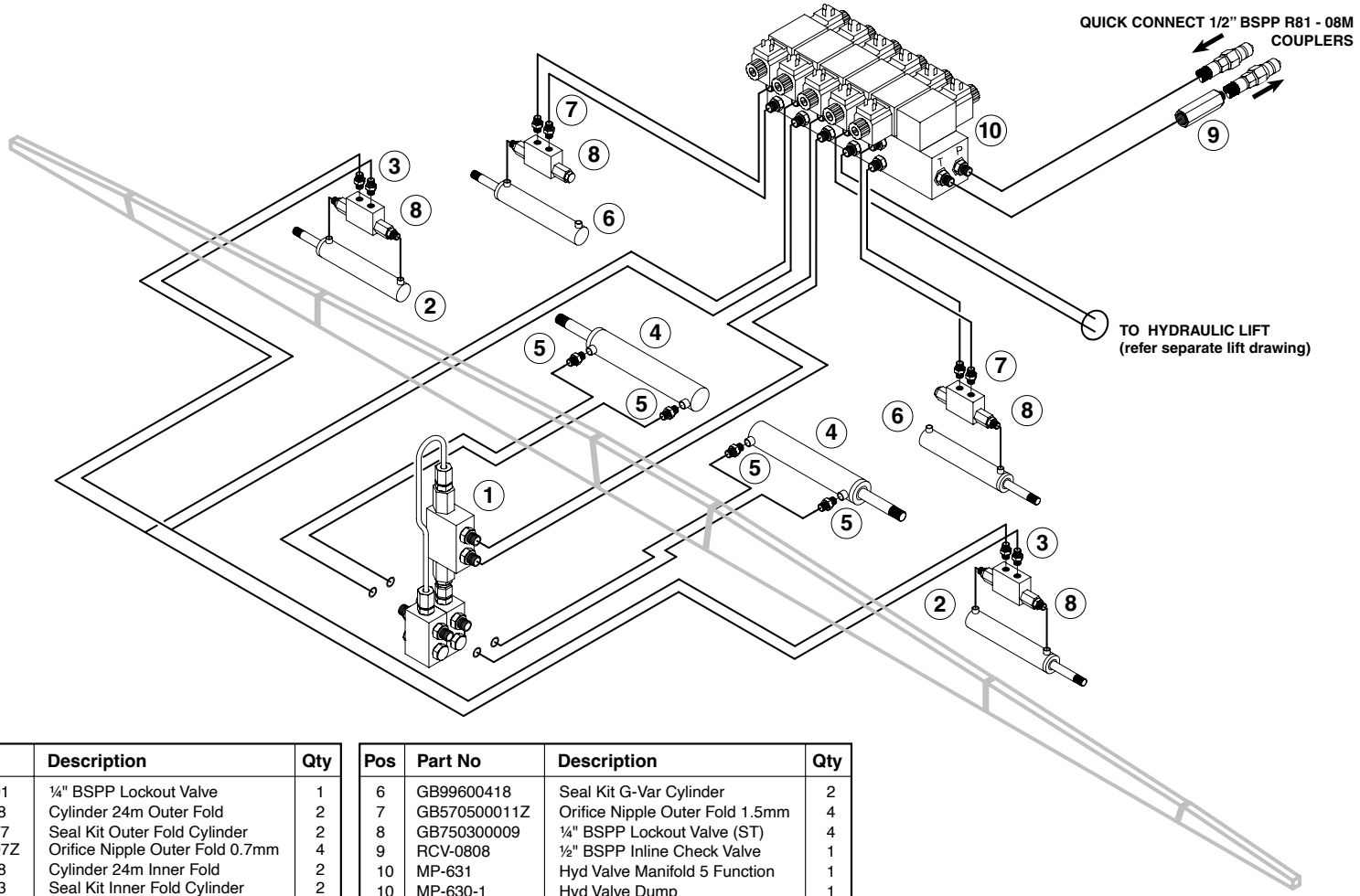

Pos	Part No	Description	Qty
1	GB750300001	¼" BSPP Lockout Valve	1
2	GBBG004138	Cylinder 24m Outer Fold	2
2	GB996000177	Seal Kit Outer Fold Cylinder	2
3	GB570500007Z	Orifice Nipple Outer Fold 0.7mm	4
4	GBBG016908	Cylinder 24m Inner Fold	2
4	GBBG010613	Seal Kit Inner Fold Cylinder	2
5	GB570500008Z	Orifice Nipple Outer Fold 0.8mm	4
6	GBBG703070012V	Cylinder 23m G-Var	2

Pos	Part No	Description	Qty
6	GB99600418	Seal Kit G-Var Cylinder	2
7	GB570500011Z	Orifice Nipple Outer Fold 1.5mm	4
8	GB750300009	¼" BSPP Lockout Valve (ST)	4
9	RCV-0808	½" BSPP Inline Check Valve	1
10	MP-631	Hyd Valve Manifold 5 Function	1
10	MP-630-1	Hyd Valve Dump	1
10	MP-630-2	Hyd Valve Double Acting	5
10	MP-630-3	Valve Coil 12v	11

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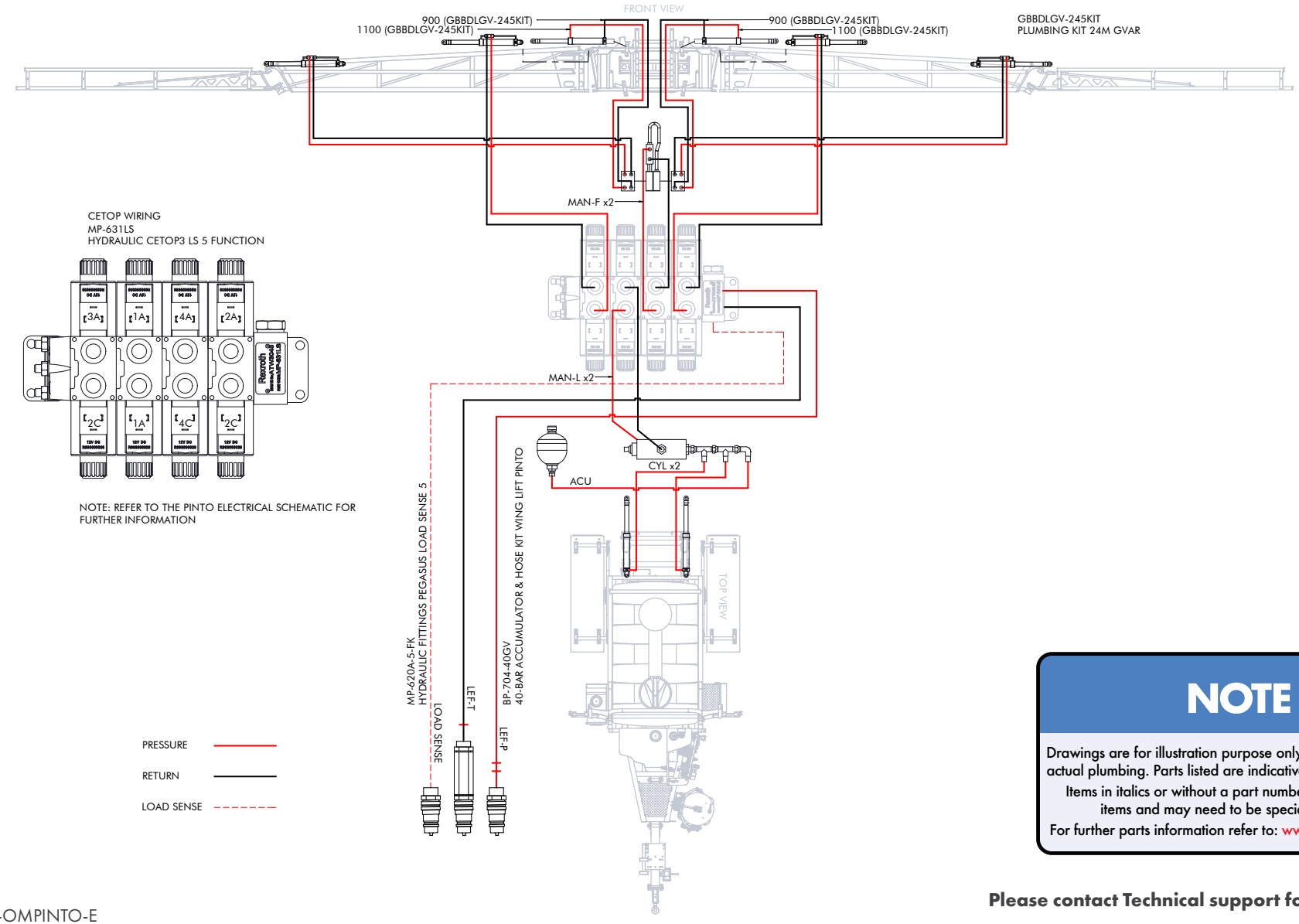
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

PINTO LOAD SENSE - POWER BEYOND HYDRAULICS; 4 FUNCTION



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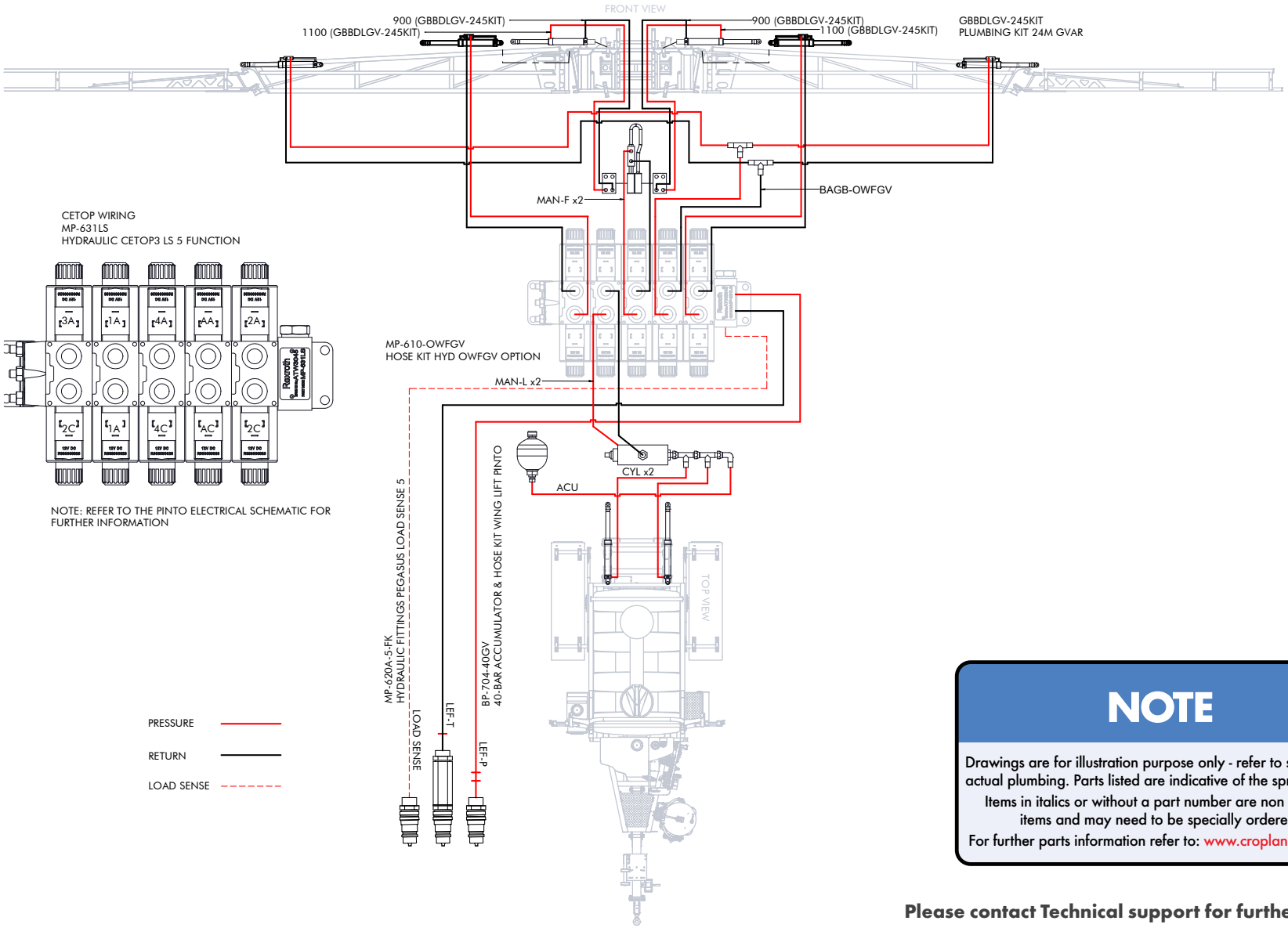
ASSEMBLY DRAWINGS, PARTS & SCHEMATICS

PINTO LOAD SENSE - POWER BEYOND HYDRAULICS; 5 FUNCTION



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CROPLANDS

CROPLANDS

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