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McCONNEL

AGRIBUGGY 2700

Demountable Sprayer Unit

16-24m Aluminium Booms

Operator Instruction Manual

DEMOUNTABLE SPRAYER FOR AGRIBUGGY A280 CHASSIS

OPERATORS INSTRUCTION MANUAL
16 - 24m ALUMINIUM BOOMS

This manual should be read in conjunction with the McConnel Agribuggy A280 Tractor Unit and Rate Controller manuals supplied with the machine

Introduction

THIS MANUAL SHOULD BE KEPT WITH THE MACHINE AT ALL TIMES AND SHOULD BE READ BY ALL OPERATORS BEFORE USING, MAINTAINING OR REPAIRING THE MACHINE.

The demountable sprayer has been designed specifically for the Agribuggy range of self-propelled low ground pressure vehicles. The sprayer is built to varying specifications depending on the customer requirements, although the operation is basically the same for all models.

IT IS SOLELY INTENDED for use in agriculture or similar operations, specifically for use as a crop sprayer. The use of this machine in any other way is considered to be contrary to the intended use. The manufacturer accepts no liability for damage or personal injury including to third parties, or any accident, injury, or any other occurrence resulting from the incorrect use or maintenance of the machine, these risks will be borne solely by the user. Operators are warned that improper use may lead to serious loss and/or injury.

Whilst every precaution is taken in selection of materials and components used in the manufacture of their machines to ensure maximum resistance to corrosive and clogging effects, the manufacturer cannot accept liability for any damage to machines of their manufacture, or any possible lack of efficiency, resulting from the improper use of the sprayer or chemicals, or the use of unsuitable spraying materials. In the case of improper use the warranty may be invalidated.

It is imperative that only correctly qualified people undertake operation, maintenance and repair of this machine.

This instruction manual concentrates on the standard sprayer designed for the Agribuggy chassis A280 unit (2014 specification). Information on non-standard booms, sprayer controls etc. are available on request.

The machine identification/serial no. should have been filled in at the front of this manual before you received your new sprayer, if not please fill it in now. It can be found on the from R/H side of the chassis. You will find it useful for future reference particularly when ordering spare parts.

McConnel Limited reserves the right to alter specifications as and when necessary without prior notice.

After reading this manual and becoming acquainted with the Agribuggy tractor unit (see appropriate manual) and the sprayer, it is recommended that the sprayer is filled with clean water only for a trial run in a grass or stubble field. It is important to get used to all aspects of operating, calibrating and cleaning out the sprayer before applying chemicals.

'Original instructions' applicable to machines manufactured from 2014 onwards.

Table of Contents

General Information

Read this manual before fitting or operating the machine or accessory. Whenever any doubt exists contact your local dealer or the McConnel Service Department for assistance.

Only use 'Genuine McConnel Parts' on McConnel machinery and equipment.

DEFINITIONS: *The following definitions apply throughout this manual;*

⚠ DANGER

DANGER: *Alerts to a hazardous situation which will result in death or serious injury if not observed carefully.*

⚠ WARNING

WARNING: *Alerts to a hazardous situation which could result in death or serious injury if not observed carefully.*

⚠ CAUTION

CAUTION: *Alerts to a hazardous situation which could result in damage to the machine and/or equipment if not observed carefully.*

NOTICE

NOTICE: *Specific or general information considered important or useful to emphasise.*

LEFT HAND (LH) & RIGHT HAND (RH): *These terms are applicable to the machine when fitted to the tractor/vehicle and viewed from the rear; these terms also apply to tractor/vehicle references.*

SERIAL PLATE

All machines are equipped with a serial number plate containing important information relating to the machine including a unique serial number used for identification purposes.

Note: Images in this manual are provided for instruction and informational purposes only and may not show components in their entirety. In certain instances images may appear different to the actual machine; where this occurs the general procedure will be basically the same. E&OE.

MACHINE & DEALER INFORMATION

Record the serial number of your machine on this page and always quote it when ordering parts. Whenever information concerning the machine is requested remember to also state the make and model of tractor to which the machine is fitted.	
Machine Serial Number:	Installation Date:
Machine Model Details:	
Dealer Name & Branch:	
Dealer Address:	
Dealer Telephone No:	
Dealer Email Address:	

Safety Precautions

ENSURE WHEN READING THROUGH THIS MANUAL YOU OBSERVE ALL SAFETY WARNINGS TO AVOID RISK OF PERSONAL INJURY AND/OR MACHINE DAMAGE.

1. Read this manual thoroughly before operating the machine.
2. Always operate the machine in a proper and safe manner observing all safety regulations.
3. For all driving and chassis related issues please refer to the A280 tractor manual.
4. Never allow children or unqualified persons to operate the machine.
5. The equipment should only be used by qualified people. Ensure operators are fully trained in the use and approved to operate the machine before commencing operation.
6. Wear all the appropriate PPE (personal protective equipment).
7. Keep your machine in sound mechanical working order. Unauthorised modifications to the machine may impair the safety and function of the machine and could invalidate warranty.
8. Ensure guards are fitted at all times and are properly maintained.
9. Always read instructions on chemical containers and follow instructions.
10. Do not, at any time, leave the sprayer unattended whilst it is being filled with water or chemical.
11. Ensure the sprayer is thoroughly decontaminated and/or use any necessary PPE / equipment necessary when making adjustments or carrying out any repairs to the sprayer.
12. Do not enter the tank for cleaning or repair purposes.
13. Do not carry contaminated clothing or spare parts in the cab.
14. Only use clean mains water to fill the hand wash tanks.
15. Keep clear of overhead power cables when folding and unfolding booms.
16. Ensure area is clear and level before folding/unfolding booms.
17. Ensure precautions are taken to avoid damage to the sprayer in frosty weather.
18. Never allow children to play near the sprayer.
19. Adhere to the code of practice for the use of pesticides at all times.
20. Keep both the inside and the outside of the sprayer clean.
21. Replace any damaged or obscured safety decals with identical items available from your dealer *– see safety decals page for further details.*

Please remember common sense is the greatest safety factor with any machine.

Overhead Power Lines (OHPLs)

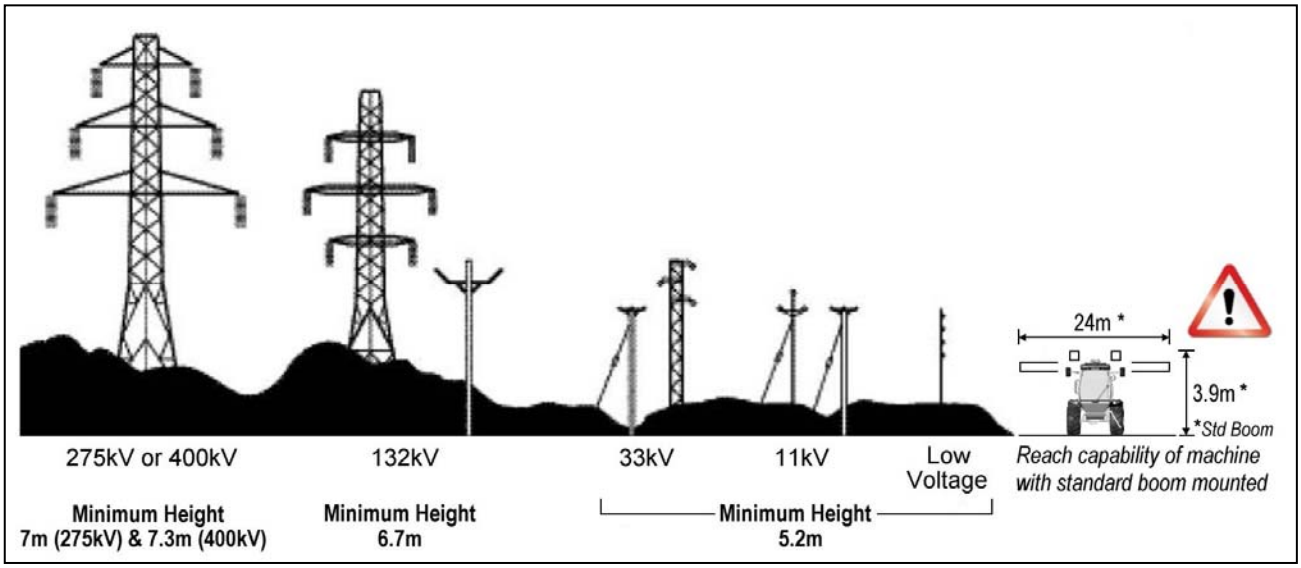
It cannot be stressed enough the dangers involved when working in the vicinity of Overhead Power Lines (OHPLs). The lowest legal minimum height for 11,000 and 33,000 volt power lines is 5.2 metres from the ground. Agribuggy machines with standard booms mounted are capable of 3.9m vertical reach and 24m horizontal reach.
Remember electrocution can occur without actually coming into contact with a power line as electricity can 'flashover' when machinery gets close to it.

⚠WARNING

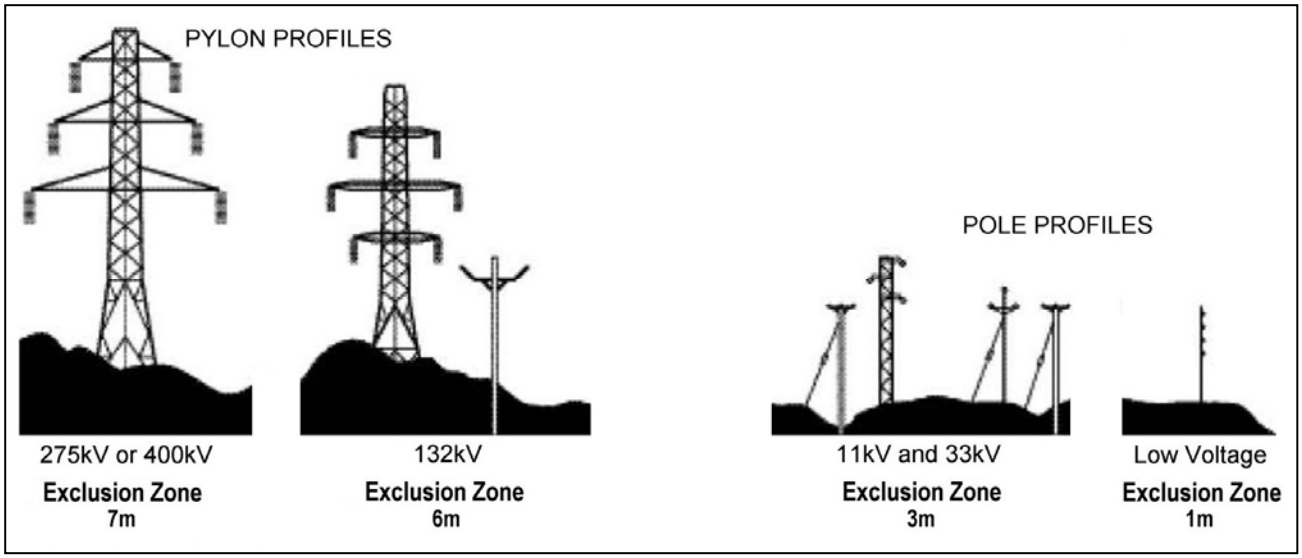
All operators must read the following information and be aware of the risks and dangers involved when working in the vicinity of Overhead Power Lines (OHPLs).

Wherever possible the safest option is always to avoid working in areas close to OHPLs.
Where unavoidable, all operators must perform a risk assessment and implement a safe procedure and system of work – *see following page for details.*
All operators should perform a risk assessment before operating the machine within 10m horizontal distance of any OHPLs.

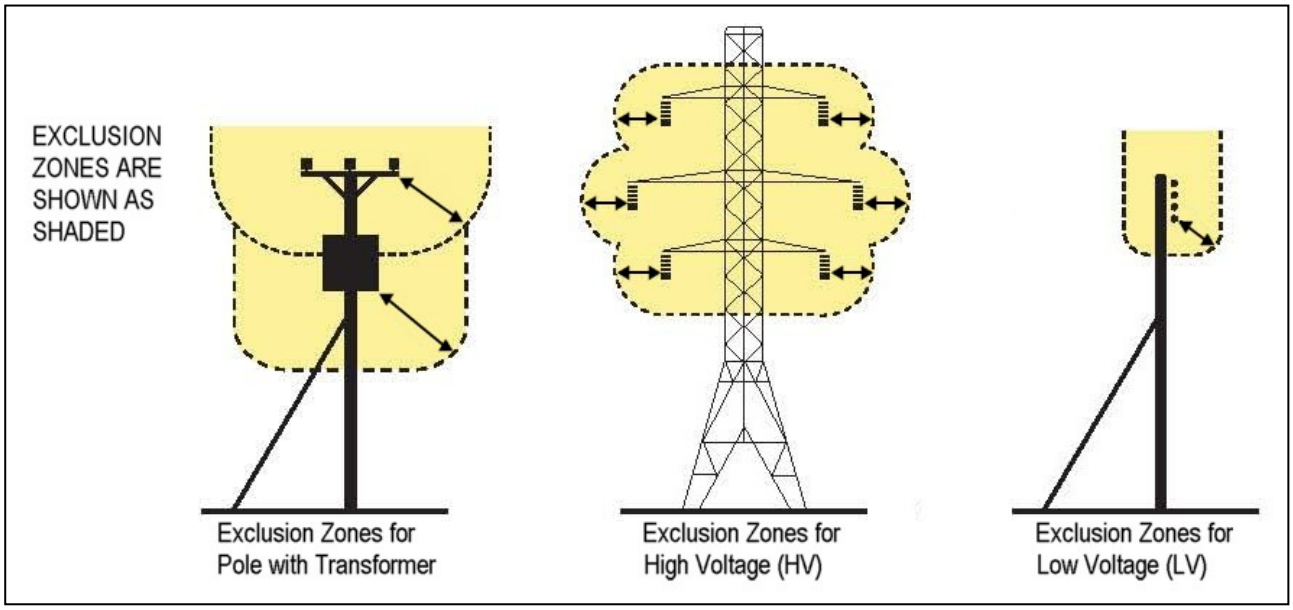
Minimum Heights for Overhead Power Lines



Absolute Minimum Exclusion Zones for Specific Overhead Power Lines



Definitions of Exclusion Zones



Risk Assessment

Before starting to work near OHPLs you should always assess the risks. The following points should be observed;

Know the risks of contacting OHPLs and the risk of flashover.

Find out the maximum height and maximum vertical reach of your machine.

Find out the location and route of all Power Lines within the work area.

Find out the operating voltage of all Power Lines within the work area.

Contact the local Distribution Network Operator (DNO) who will be able to advise you on the operating voltage, safe minimum clearance distance for working, and additional precautions required.

Never attempt to operate the machine in exclusion zones.

Always work with extreme caution and plan your work ahead to avoid high risk areas.

If doubt exists do not work in the area – never risk the safety of yourself or others.

Emergency Action for Accidents Involving Electricity

- Never touch an overhead line - even if it has been brought down by machinery, or has fallen. Never assume lines are dead.
- When a machine is in contact with an overhead line, electrocution is possible if anyone touches both the machine and the ground. Stay in the machine and lower any raised parts in contact or drive the machine out of the lines if you can.
- If you need to get out to summon help or because of fire, jump out as far as you can without touching any wires or the machine - keep upright and away.
- Get the electricity company to disconnect the supply. Even if the line appears dead, do not touch it - automatic switching may reconnect the power.

Further information and leaflets on this and other agricultural safety subjects are available on the 'Health & Safety Executive' website at the following address: www.hse.gov.uk/pubns/agindex.htm

Maintenance

DANGER WARNING CAUTION

1. Maintenance work should only be undertaken by a skilled qualified mechanic fully conversant with the Agribuggy spray equipment and in compliance with the operating, maintenance and safety instructions in this manual.

2. Before carrying out any service, maintenance, repairs or welding on the Agribuggy sprayer, remove all chemical and fertiliser residues with a pressure washer or steam cleaner together with a suitable detergent and brushing if necessary - Burning chemical fumes are extremely toxic - Ammonium Nitrate (e.g. Nitram) can be explosive. Chemical residues are extremely hazardous to anyone working on the machine. Before welding disconnect both the positive (+) and negative (-) battery cables from the battery. Attach the welder ground cable no more than 0.61 meters [2 feet] from the part being welded. Do not connect the ground clamp of the welder to any of the sensors, wiring harness, electronic control units or the components. Direct welding of any electronic components must not be attempted. Sensors, wiring harness, and electronic control unit should be removed if nearby welding will expose these components to temperatures beyond normal operation. Additionally, all electronic control unit connectors must be disconnected.

3. Always use the correct PPE personal protective equipment when maintaining the machine.

4. Before carrying out service work stop the engine.

5. Avoid fluids under pressure coming into contact with the skin. Relieve system pressures first before working on high pressure pipes, fittings, etc. tighten all loosened connections before re applying pressure.

6. If fluid is accidentally 'injected' into the skin by contact accidentally being made with high-pressure fluid, consult a doctor immediately.

7. Hydraulic hoses can fail if physically damaged, kinked or through age and exposure. All hoses must be inspected regularly and replaced if damaged.

8. Hydraulic fluid connections can loosen due to damage and vibration. Connections should be regularly checked and any loose connections tightened.

9. When checking for the source of a leak use a sheet of card, keep skin protected at all times.

10. Prolonged and repeated contact with oil may cause serious skin disorders, including dermatitis and cancer. Wash thoroughly after contact. Keep out of reach of children.

11. If any safety critical faults are found during the daily / weekly checks and inspections they must be rectified before using the sprayer.

12. Care should be taken to prevent the contamination of drains and waterways; *chemical spillages should be dealt with in accordance with local regulations governing the disposal of waste.*

Spraying

1. The cab cannot fully protect against inhaling vapour, aerosol or dust, when operating in an environment where pesticides are present, wear appropriate clothing and if pesticides instructions call for it a respirator in and outside the cab.

2. To prevent ingress of hazardous substances into cab ensure: Doors and windows are closed, all seals (doors, windows) are in good condition, grommets for cables in the cab sealed properly, the air conditioning fan is ON and cab air filters are the correct type and in good condition

3. Wear personal protective equipment as called for in the pesticide instructions when leaving the cab to enter a treated area, when mixing and loading chemicals and when working on contaminated equipment such as nozzles.

4. Before entering the cab remove any clothing soiled with pesticide and ensure that footwear is free from contamination.

5. Clean Vehicle Of Hazardous Pesticides. During application of hazardous pesticides, pesticides residue can build up on the inside and outside of the vehicle. Clean the vehicle in accordance with current legislation to the instructions of hazardous pesticides. Wash down entire exterior of vehicle disposing of any wash water with hazardous concentrations according to published regulations.

Cleaning the Machine

1. Keep the machine clean and free of corrosive substances.

2. Before cleaning the machine ensure that the engine is stopped, handbrake is on and ignition key is removed.

3. Clean steps, pedals and floor. Remove grease, oil, dust and mud – slippery surfaces are hazardous.

NOTICE

It is the responsibility of the owner to clean the machine before an engineer arrives on site.
If any factory or field repairs have to be carried out on a contaminated machine we reserve the right to either refuse to carry out the work or to charge for any necessary cleaning.

Safety & Environment

Before servicing or maintaining the machine ensure it is free from chemical residues. If our service engineers are called out to work on the machine, or if the machine has to be returned to our works for repair, it must be thoroughly decontaminated and cleaned both internally and externally, removing all chemical residues to enable the work to be carried out safely and effectively. If the machine is not clean, we reserve the right to either refuse to carry out the work or to charge for any necessary cleaning.

Environmental Considerations

1. Do not fill the sprayer directly from open waters.
2. Ensure a non-return valve is always fitted on the end of any self-fill hose.
3. When filling from a mains supply, the filling hose should never touch the level of fluid in the tank, i.e. only use water in free fall. This ensures that pollution of the mains cannot occur due to a cut-off of mains flow or sudden pressure drop.
4. Always store empty pesticide containers in a secure empty container pound, do not leave them lying around where children and animals can access them.
5. Always read the "instructions for use" supplied with the chemicals and follow the recommendations given.
6. Check that you have the right chemical for the field you will be spraying.
7. Make sure that the crop or pest is at the right stage for best results.
8. Check that filters are suitable for use with the chemical to be sprayed.
9. Do not spray in windy weather.
10. Do not spray if any wind is blowing towards:-
    - *Grazing livestock*
    - *Regularly used pastures*
    - *Susceptible crops*
    - *Gardens or orchards and hedgerows*
    - *Lakes or ponds*
    - *Occupied premises*
11. Check that beekeepers have been warned.
12. Never blow or suck a blocked nozzle to clear it. Always carry spares and replace blocked jets immediately. Clear blocked jets later with an airline after thoroughly washing them.
13. Read all operator's and instruction manuals.
14. Before carrying out any spraying operations you should be sure that you are adequately trained and aware of the following relevant Acts of Parliament and legislation controlling the use of pesticides on farms:

The Control of Pollution Act, The Health and Safety at Work Act, the Poisonous Substances in Agriculture Regulations, The Food and Environment Protection Act, The code of Practice for using Plant Protection Products and The Control of Substances Hazardous to Health Regulations.

Pesticide Application Equipment - *Inspection of equipment in use*

The requirement to have pesticide application equipment that is in professional use inspected at regular intervals should be complied with.

Safety Decals

⚠WARNING

To alert the operator to potential hazards several safety decals are affixed to the vehicle. These warnings should be considered so that the risk of personal injury is minimised.

If the decals become worn or defaced they should be replaced with identical items available from your dealer.

Mounted on the right hand B post inside the cab.
Warnings regarding:

4 Wheel Steer.

Do not exceed 50 KPH (subject to local road legislation).

Read the Instruction manual before using the machine.

Chock wheels before performing maintenance.

Beware of overhead cables.

'Power Cut' contact telephone number **CALL 105**

Sprayer filter, located on both the primary and secondary filters;
Flush Filters Daily.

Air Decal located on out facing surface of air tanks; drain daily.

Hand wash tap: located on left hand engine cover

Crush Zone; located on both chassis rails forward of rear axle

Stop engine before accessing engine compartment; located on engine covers.

Caution Chemicals: Located on chemical induction hopper

Maintenance Caution; Located on side of chemical inductor

Caution Chemicals: Located both sides next to the tank lid

105 is the national emergency number for Distribution Network Operators (DNO's); ringing this number automatically connects you to the local DNO who can locate an incident and disconnect the power as soon as possible.

WARRANTY POLICY

WARRANTY REGISTRATION

All machines must be registered, by the selling dealer with McConnel Ltd, before delivery to the end user. On receipt of the goods it is the buyer's responsibility to check that the Verification of Warranty Registration in the Operator's Manual has been completed by the selling dealer.

1. LIMITED WARRANTIES

1.01. All mounted machines supplied by McConnel Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months, unless a different period is specified.

All Self Propelled Machines supplied by McConnel Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months or 1500 hours. Engine warranty will be specific to the Manufacturer of that unit.

1.02. All spare parts supplied by McConnel Ltd and purchased by the end user are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 6 months. All parts warranty claims must be supported by a copy of the failed part invoice to the end user. We cannot consider claims for which sales invoices are not available.

1.03. The warranty offered by McConnel Ltd is limited to the making good by repair or replacement for the purchaser any part or parts found, upon examination at its factory, to be defective under normal use and service due to defects in material or workmanship. Returned parts must be complete and unexamined. Pack the component(s) carefully so that any transit damage is avoided. All ports on hydraulic items should be drained of oil and securely plugged to prevent seepage and foreign body ingress. Certain other components, electrical items for example, may require particular care when packing to avoid damage in transit.

1.04. This warranty does not extend to any product from which McConnel Ltd's serial number plate has been removed or altered.

1.05. The warranty policy is valid for machines registered in line with the terms and conditions detailed and on the basis that the machines do not extend a period of 24 months or greater since their original purchase date, that is the original invoice date from McConnel Limited.

Machines that are held in stock for more than 24 months cannot be registered for warranty.

1.06. This warranty does not apply to any part of the goods, which has been subjected to improper or abnormal use, negligence, alteration, modification, fitment of non-genuine parts, accident damage, or damage resulting from contact with overhead power lines, damage caused by foreign objects (e.g. stones, iron, material other than vegetation), failure due to lack of maintenance, use of incorrect oil or lubricants, contamination of the oil, or which has served its normal life. This warranty does not apply to any expendable items such as blades, belts, clutch linings, filter elements, flails, flap kits, skids, soil engaging parts, shields, guards, wear pads, pneumatic tyres or tracks.

1.07. Temporary repairs and consequential loss - i.e. oil, downtime and associated parts are specifically excluded from the warranty.

1.08. Warranty on hoses is limited to 12 months and does not include hoses which have suffered external damage. Only complete hoses may be returned under warranty, any which have been cut or repaired will be rejected.

1.09. Machines must be repaired immediately a problem arises. Continued use of the machine after a problem has occurred can result in further component failures, for which McConnel Ltd cannot be held liable, and may have safety implications.

1.10. If in exceptional circumstances a non McConnel Ltd part is used to effect a repair, warranty reimbursement will be at no more than McConnel Ltd's standard dealer cost for the genuine part.

1.11. Except as provided herein, no employee, agent, dealer or other person is authorised to give any warranties of any nature on behalf of McConnel Ltd.

1.12. For machine warranty periods in excess of 12 months the following additional exclusions shall apply:

1.12.1. Hoses, exposed pipes and hydraulic tank breathers.

1.12.2. Filters.

1.12.3. Rubber mountings.

1.12.4. External electric wiring.

1.12.5. Bearings and seals

1.12.6. External Cables, Linkages

1.12.7. Loose/Corroded Connections, Light Units, LED's

1.12.8. Comfort items such as Operator Seat, Ventilation, Audio Equipment

1.13. All service work, particularly filter changes, must be carried out in accordance with the manufacturer's service schedule. Failure to comply will invalidate the warranty. In the event of a claim, proof of the service work being carried out may be required.

1.14. Repeat or additional repairs resulting from incorrect diagnosis or poor quality previous repair work are excluded from warranty.

NB Warranty cover will be invalid if any non-genuine parts have been fitted or used. Use of non-genuine parts may seriously affect the machine's performance and safety. McConnel Ltd cannot be held responsible for any failures or safety implications that arise due to the use of non-genuine parts.

2. REMEDIES AND PROCEDURES

2.01. The warranty is not effective unless the Selling Dealer registers the machine, via the McConnel web site and confirms the registration to the purchaser by completing the confirmation form in the operator's manual.

2.02. Any fault must be reported to an authorised McConnel Ltd dealer as soon as it occurs. Continued use of a machine, after a fault has occurred, can result in further component failure for which McConnel Ltd cannot be held liable.

2.03. Repairs should be undertaken within two days of the failure. Claims submitted for repairs undertaken more than 2 weeks after a failure has occurred, or 2 days after the parts were supplied will be rejected, unless the delay has been authorised by McConnel Ltd. Please note that failure by the customer to release the machine for repair will not be accepted as a reason for delay in repair or submitting warranty claims.

2.04. All claims must be submitted, by an authorised McConnel Ltd Service Dealer, within 30 days of the date of repair.

2.05. Following examination of the claim and parts, McConnel Ltd will pay, at their discretion, for any valid claim the invoiced cost of any parts supplied by McConnel Ltd and appropriate labour and mileage allowances if applicable.

2.06. The submission of a claim is not a guarantee of payment.

2.07. Any decision reached by McConnel Ltd. is final.

3. LIMITATION OF LIABILITY

3.01. McConnel Ltd disclaims any express (except as set forth herein) and implied warranties with respect to the goods including, but not limited to, merchantability and fitness for a particular purpose.

3.02. McConnel Ltd makes no warranty as to the design, capability, capacity or suitability for use of the goods.

3.03. Except as provided herein, McConnel Ltd shall have no liability or responsibility to the purchaser or any other person or entity with respect to any liability, loss, or damage caused or alleged to be caused directly or indirectly by the goods including, but not limited to, any indirect, special, consequential, or

incidental damages resulting from the use or operation of the goods or any breach of this warranty. Notwithstanding the above limitations and warranties, the manufacturer's liability hereunder for damages incurred by the purchaser or others shall not exceed the price of the goods.

3.04. No action arising out of any claimed breach of this warranty or transactions under this warranty may be brought more than one (1) year after the cause of the action has occurred.

4. **MISCELLANEOUS**

4.01. McConnel Ltd may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.

4.02. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.

4.03. Applicable law may provide rights and benefits to the purchaser in addition to those provided herein.

McConnel Limited

EC DECLARATION OF CONFORMITY

CE

McConnel Limited
Station Road,
Salford Priors, Evesham,
Worcestershire, WR11 8SW.

Machine Type: AGRIBUGGY LOW GROUND PRESSURE VEHICLE

Model: AGRIBUGGY A280

Build no.: .....

Serial no.: .....

Month/year of manufacture:……

Complies with the required provisions of the Machinery Directive 2006/42/EC and 2009/127/EC.

The machinery directive is supported by the following harmonized standards;

- BS EN ISO 12100 (2010) Safety of machinery – General principles for design – Risk assessment and risk reduction.
- BS EN 349 (1993) + A1 (2008) Safety of machinery - Minimum distances to avoid the entrapment with human body parts.
- BS EN ISO 14120 (2015) Safety of machinery - Guards general requirements for the design and construction of fixed and movable guards.
- BS EN 4413 (2010) Hydraulic fluid power. Safety requirements for systems and their components.
- BS EN ISO 4254-1:2015. Agricultural machinery. Safety. General requirements.
- BS EN ISO 4254-6:2009. Agricultural machinery. Safety. Sprayers and liquid fertilizer distributors.
- BS EN 15695-1:2017 Agricultural tractors and self-propelled sprayers.

Signed ……. General Manager Date: February 2019

CHRISTIAN DAVIES on behalf of McCONNEL LIMITED.

Operating – Cab Controls

Boom control

Electro-hydraulic spool valves are fitted to operate the boom's, these are controlled using the 4-way "Joystick" for lift/lower and tilt, and the two toggle switches for inner and outer folding, all located on the main console. The decal behind each switch indicates its function for boom folding. There are normally 4 services fitted which can be any combination of single and double acting spools. A double acting spool can be safely used to operate a single acting service if required.

The hydraulic system/spool valve(s) fitted are only designed for intermittent operation of hydraulic cylinders and **should not be used to power motors or other hydraulic circuits**. Maximum pressure at the spools is approx. 2300 psi *(160bar).* Please consult the manufacturer if you require higher pressures or if wish to use them for any other purpose.

Please ensure that all couplings are clean before connecting hoses and that any couplings that are not in use are protected with plugs/caps. Ingress of dirt into the hydraulic system can lead to premature wear and possible failure of major components.

⚠WARNING **Door must be closed before operating boom controls**

A) 4-Way Joystick (Lift, Lower & Tilt)
1) Inner / 12m Control Switch
2) Outer / 24m Control Switch
3) Variable Geometry Switch LH Boom *
4) Variable Geometry Switch RH Boom *
* *Optional feature*

7-Section spray controls

Cab Controls

Master On/Off
The main sprayer on/off switch is situated in the lower right corner of the sprayer control panel (see above). Push the switch down to start spraying and up to stop spraying. This switch is normally connected to the spray control area meter to stop area being accumulated whilst turning on headland. It is also connected to the four wheel steering system and (if selected) automatically activates four wheel steer when spray lines are switched off, e.g. when turning.

Pressure Control
The spraying pressure is normally altered from the sprayer controller *(see separate manual).* The pressure can be monitored on the pressure gauge mounted immediately outside the front cab windscreen.

Boom Section Controls
The A280 sprayer is normally fitted with up to 7 boom sections. To stop an individual boom section spraying push the appropriate switch to off and to start it again push the switch to on. The master on/off switch will override all the boom section controls.
In addition to operating the individual section valves, the boom section switches are also linked to the spray control for more accurate area recording, i.e. when one or more section switches are turned off the accumulating area is reduced by the number of nozzles controlled by those switches.

Bout Marker Control
If an optional factory fitted bout marker is supplied, it is operated by a two way switch on the sprayer control panel. Depress the switch to the left to activate the left hand side, and to the right for the right hand side.

Operating – Important User Information

Storage Locker
The Agribuggy is fitted with a storage locker for protective clothing only; access is provided by opening the LH side engine panel.

Hand Wash Tank
The Agribuggy is fitted with an independent clean water tank with an outlet tap for emergency use and hand washing.
The fill point is located directly below the tap *(refer to photo).*
The hand wash tank capacity is approx. 25 litres of water.
The tank cap is fitted with a breather *(refer to photo on p15).*

⚠WARNING

ONLY USE CLEAN MAINS WATER TO FILL THE HAND WASH TANK

Clean Water Tank
The Agribuggy is fitted with an independent 'clean water rinse tank' used for cleaning the sprayer – *see photo opposite.*
The clean water tank capacity is approx. 300 litres of water.
The tank cap is fitted with a breather *(refer to photo on p15).*

⚠WARNING

ONLY USE CLEAN WATER TO FILL THE CLEAN WATER RINSE TANK

Operating - Spray Tank

PTO Controls

Please see tractor unit manual for details on the PTO system.

NOTICE

It is recommended that the PTO be run at as low a speed as possible with sprayers that are fitted with high capacity pumps. i.e. 350 rpm for 5/6cyl pumps & 400 rpm for 4cyl pumps *(see tractor manual for more detail).* However, please ensure that you have enough liquid flow for agitation with the pump running at your selected speed.

Spray Tank

Tank Lid

The tank lid is a screw on type and can be opened by turning anti-clockwise. The opening to the tank is protected by a filter basket, replace immediately if damaged *(Part No. AS68235S30P)*.

⚠WARNING Do not enter the tank for cleaning or repair purposes.

Tank Drain

The spray tank is fitted with a remote drain tap mounted underneath the spray tank. Turn the tap anti-clockwise to drain.

Please remember to take into consideration any environmental regulations before draining the tank.

Ensure the drain tap is closed before filling the tank.

Tank Sight Gauge

A sight level gauge is fitted to the front near side of the spray tank. It is important that the machine is on level ground for it to read accurately. Even a slight slope can cause significant inaccuracies.

Tank lids

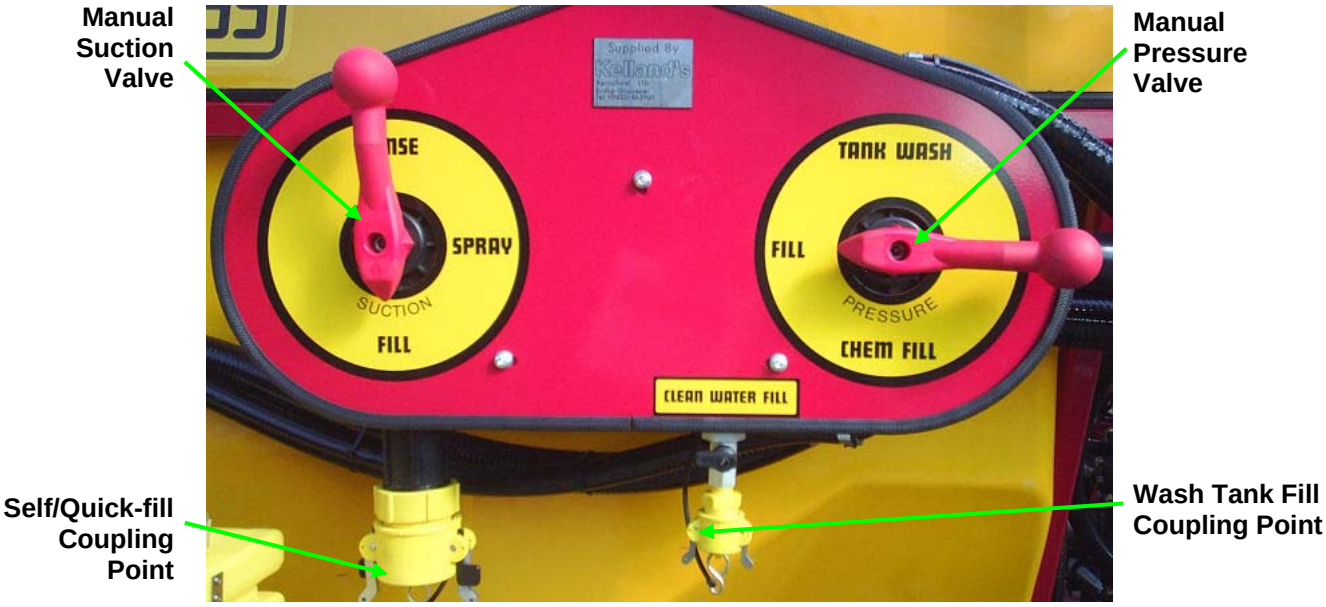
Tank Drain

Tank Sight Gauge

Operating - Main Control Valves

Main Control Valves

The main sprayer control valves are situated on the nearside of the machine above the chemical inductor.



Suction Control Valve

This manual valve controls the suction side of the pump and selects where the liquid is drawn from - i.e. the main spray tank, the clean water wash tank or the water self-fill connector.

Pressure Control Valve

This manual valve directs the pressure flow from the pump to either, the spray controls for normal spraying, the chemical induction hopper, the tank washing nozzles, or directly into the spray tank for direct filling.

Operating - Main Control Valves

Water Filling

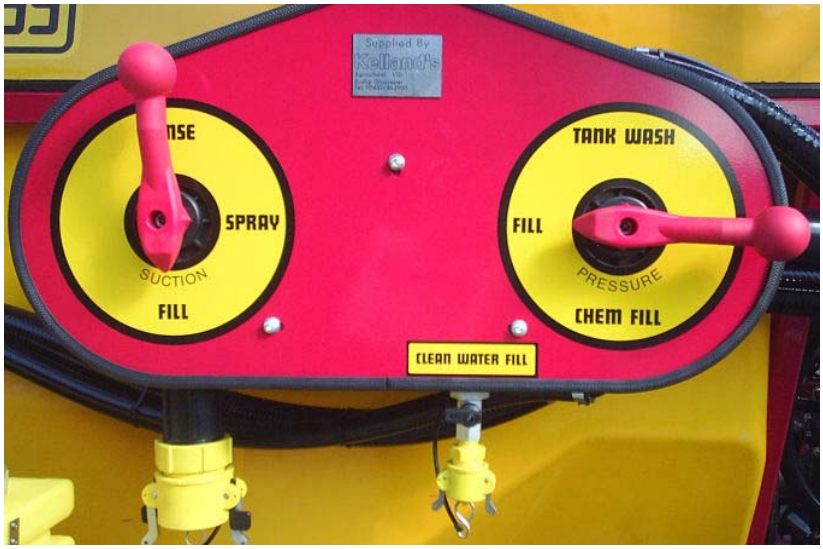
To fill the sprayer using the self-fill hose proceed as follows:

Connect the self-fill hose to the quick release coupler on the bottom of the suction control valve. Always use the hose supplied with the sprayer or one fitted with a non-return valve. **Do not fill the sprayer from open waters.**

Ensure the master sprayer control switch is in the **off** position, engage the PTO and turn the pressure and suction valves to the **fill** positions as shown below.

When the desired quantity of liquid has been drawn into the spray tank turn the valves back to the **spray/circulate** positions before stopping the PTO to avoid any liquid running back down the hose. The hose should then be withdrawn from the water source and disconnected.

Main valve positions for water self-filling



Spray/Recirculate

After filling, the valves should be returned to the positions as shown below. This is the normal position for spraying and circulating.

Valve positions for spraying/circulating

Operating - Chemical Inductor

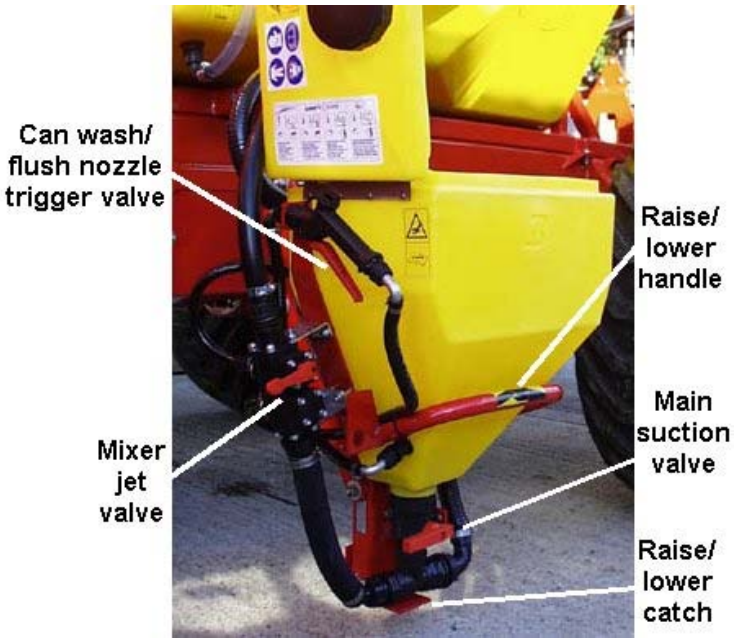
Chemical Inductor

The chemical inductor hopper is fitted to the nearside of the spray tank. It works on the venturi principle, i.e. a high pressure flow from the pump passes through a venturi tube underneath the hopper. This creates a drop in pressure as the flow passes into the larger bore outlet hose. This in turn "sucks" the contents out of the hopper and "blows" it straight through the return hose into the main tank.

The advantage of this system is that no neat chemical has to pass through the pump and the "sucking" and "blowing" effect mixes and disperses liquid and powdered chemicals in the spray tank without pre-mixing.

The hopper is fitted to a bracket that can be raised and lowered by pressing the catch shown below. This is particularly useful when the machine is fitted with high clearance wheels.

A container flushing nozzle is also built into the hopper which can be used to flush out empty chemical containers with the washings going straight into the hopper.



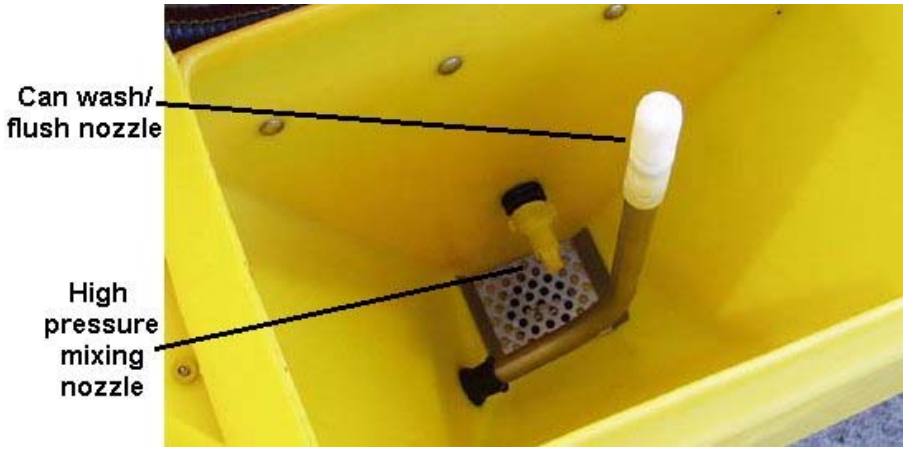
The chemical inductor can be used with the suction valve in any position but the pressure valve must be in the **Chemical fill** position. The most common position for the suction valve is for it to be used in the water self-fill position (see diagram below) - This is the best time to add chemicals to the tank - i.e. when clean water is being drawn in whilst filling.

Normal valve positions whilst using inductor

Operating - Chemical Inductor

Operating the Chemical Inductor
Raise/Lower

To lower the hopper to the working position support the weight using the handle and then press the release catch with your foot. The hopper can then be lowered to the working position. To raise the hopper lift it using the main handle until the catch clicks into position.



Operation

NOTE: Before operating the hopper please read paragraph 2 on page 25 – Pressure Control.

1. Run the spray pump to at least 320 revs on the PTO and put at least 200 litres of water into the spray tank.

2. Ensure all the taps on the inductor are turned off.

3. Turn the pressure control valve to the **Chemical fill** position and the suction control to the desired position (preferably water self-fill).

4**.** A high pressure mixing nozzle is fitted into the bottom of the hopper and can be used to mix and flush powders down into the venturi. To turn it on, switch the flip valve on the left hand side of the hopper to the on/up position.

5. Pour chemicals or powders into hopper.

6. Turn main suction valve (page 15) on the inductor to the **on** position when the hopper is half-3/4 full. Chemical/powders will then be drawn out of the hopper.

7. To operate the can-wash, lower the empty container over the rotary nozzle inside the hopper and squeeze the trigger valve on the LH side; a spray of water will then be directed into the can. For the best cleaning effect, move the can around so the spray reaches all parts of the can.

8. As soon as the hopper is empty, turn the tap under the hopper to the **Off** position. Failure to do so will cause foaming in the spray tank due to the venturi sucking air. This tap may have to be turned on and off several times during the filling and flushing operation or alternatively may be only partially opened to slow down the flow from the hopper.

9. To wash the hopper out close the lid and ensure it is fastened securely, then squeeze the trigger valve to spray water around the inside of the hopper. The action of the rotary nozzle and its cleaning effect can be seen through the transparent window in the top of the hopper.

10. When you have finished, turn all taps on the chemical inductor to the **OFF** position. Turn the main sprayer pressure valve back to either the **spray/fill** or **spray/circulate** position.

Operating - Tank Wash System

Tank Washing System

The tank wash system allows the tank and spray lines to be rinsed out and the washings disposed of in the field.

If you are changing chemicals and crops and there is a potential danger of crop damage being caused by the tank not being thoroughly cleaned, it is recommended that a further full wash is carried out with a cleaning agent by conventional methods afterwards.

Wash tank connector

To fill the clean water tank, connect a hose using the coupling provided, to the small valve situated between the main control valves. **Only clean water should be used.**

Recommended Washing Procedure

The following procedure is recommended to ensure that your crops are not overdosed and you end up with a relatively clean sprayer using the minimum amount of water and, of course, minimising the possibilities of any pollution.

When you spray a field in which you know you are going to use the tankwash afterwards, the area of the field where you intend to spray the washings should be under-dosed by approximately 15%. The area required can be calculated as follows:

½ wash tank volume ÷ Application rate (l/ha) e.g. 75 ÷ 200 l/ha = 0.375 hectares.

The easiest way to achieve this to increase your speed by 15% e.g. from 10 to 11.5 kph. Choose a smooth area of the field and before setting off reset the trip area meter on the rate controller. You can then simply watch the area meter until you have covered the required area and then slow down again. If you have a variable speed PTO you will need to set it in constant mode. If you have an automatic rate controller you will need to alter either the application rate programmed into the unit or switch it into manual mode.

Washing the Tank

Valve Positions for Tank Washing

Operating - Tank Wash / Agitator

1) As you finish spraying, empty the tank of as much chemical as possible and switch off.

2) Turn the main sprayer pressure control valve to the **Tank wash** position and the main suction valve to the **Rinse** position, (see below).

3) Clean water will then be drawn out of the tank and will be pumped through the rotary flushing nozzles in the tank.

Engine tick-over speed is all that is required to operate the rotary nozzles for a good cleaning action. High engine/PTO speeds may damage the rotary heads.

For the best cleaning effect it is recommended that the tank and lines be flushed through twice; so only draw half of the clean water out of the tank for now.

4) Whilst the water is being drawn out of the clean water tank, turn the main pressure valve to the **chemical fill** position for a few moments to flush clean water through the chemical inductor. Also operate the other valves on the inductor to flush through all the other pipes and then turn the main pressure valve back to the **tank wash** position.

5) When you have drawn the required amount of water out of the clean water tank, turn the suction valve back to the **spray/circulation** position, and the pressure valve back to the spray/circulation position.

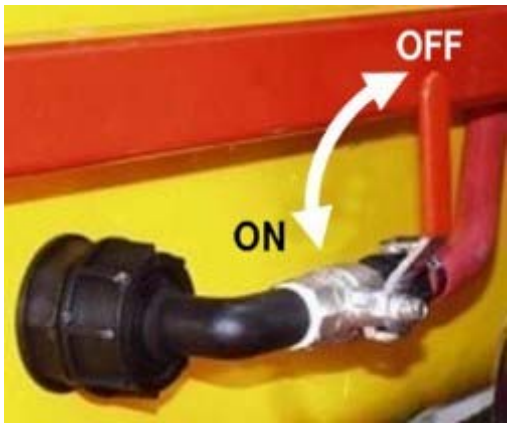
6) Turn all the boom switches off and the master sprayer switch on for a few moments - this will flush out the return pipes back to the tank. Turn the master switch off and the boom switches back on again.

7) You can then proceed to spray the washings out on to the under-dosed area of the field.

8) When you have finished, the whole procedure should be repeated with the second half of the clean water.

Agitator

A booster agitator is fitted inside the spray tank for extra agitation if required. It is recommended that it be used when spraying chemicals that are held in suspension or are prone to settling out. It is operated by moving the valve behind the spray tank as shown in the picture below.



The Agitator Control Valve

Operating - Quick Fill / Wash Lance & Reel

Quick Fill (optional)

A quick-fill system is fitted to allow filling from an external, high capacity pumped bowser system.

The camlock connector directly below the main suction valve is used for both suction and pressure filling. In “Quick-fill” mode a by-pass valve is pushed open allowing liquid to pass straight into the tank, a drop pipe is fitted into the tank so liquid is pumped in below the liquid level to avoid foaming.

Clean water pumped in can also be circulated through the chemical inductor giving clean water for can washing.

The suction valve **must** be turned to the fill position **before** pumping starts.

Wash Lance / Hose Reel (optional)

The sprayer may be fitted with a hand washing lance for cleaning booms off in the field or designated washing area.

Please consult the appropriate regulations before using the washing system.

The hose reel and control valve are situated on the off side of the sprayer. The lance is fitted with a trigger mechanism.

To wash the outside of the machine off with clean water proceed as follows:

a) Set engine on a fast tick-over with the spray pump running at 200-250rpm.

b) Set main pressure valve to Spray/circulate.

c) Set main suction valve to Rinse.

d) Switch all boom sections OFF.

e) Switch master spray control to ON.

f) Increase spraying pressure to 5bar.

g) Allow a few seconds for the clean water to circulate through the pump and then turn the lance control valve to the ON position.

h) Wash the boom/machine as required and then return the valves and switches to their normal spray positions.

The Hose Reel and Lance

Operating

Air Operated Spray System

A standard feature of the A280 sprayer is the air operated spray control system which is operated in the normal way using the control switches in the cab *(see page 13).*

Air is provided by a compressor is mounted on the chassis (see A280 tractor manual for details). Air is drawn in to the system through a filter which is used to remove dust and dirt particles, this must be checked every 50 hours and replaced every 300 hours/6 months or sooner depending on operating conditions.

⚠CAUTION A blocked or restricted filter will cause oil to be drawn from the compressor and fed into the system which can cause failure of the spray controls.

Pressurised air is fed from the compressor to the dryer unit which consists of a filter unit, (which must be checked and replaced as above), an unloader valve, an unloader tank and a pressure limit valve.

To keep the system working well a dryer filter is fitted to remove any moisture from the air in order to prevent residue build up and possible blockage problems. It works in conjunction with the unloader tank which automatically builds up to a pre-set air pressure and them “blows back” clean dry air through the dryer filter and out of the unloader valve, this process helps to keep the system as clean and dry as possible.

The pressure limit valve is fitted to govern the safe pressure limit within the system. It is pre-set and will “blow off” automatically when the maximum pressure is reached.

To cope with the varying amounts of air required a main storage tank is fitted. This has a drain valve which should be released daily to drain any moisture build up through condensation, if excessive water and/or oil is found check filters immediately). A connection point for a standard air-line fitting is also provided for adjustment of tyre pressures in the field. (Air-line not provided)

⚠WARNING **IMPORTANT NOTE: If any work is to be carried out on the system IT MUST BE COMPLETELY DEPRESSURISED FIRST**

Air Controls

To use the air for spray control the tank is connected to a solenoid manifold block located in a housing on the back of the sprayer.
This manifold consists of two pressure regulation solenoids (+ & -), seven section solenoids, all operated from the control panel in the cab, and a manual relief valve with a pressure gauge - ***this manual valve is factory pre-set and should NOT be adjusted.***

No maintenance is required on this unit other than keeping the housing and valves clean.

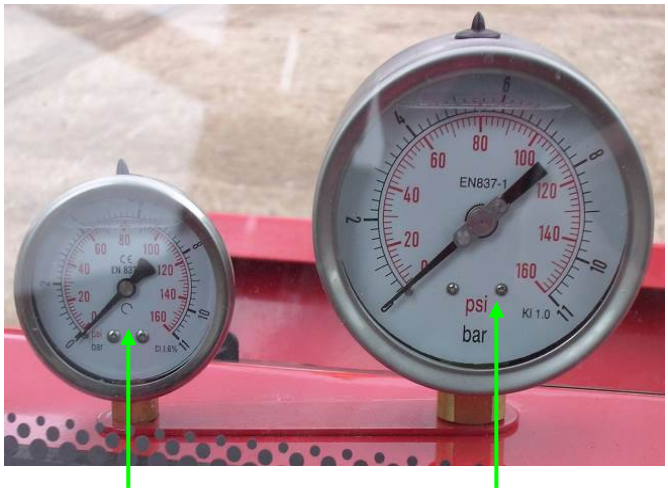
Operating – Pressure Control

Pressure Control

The spray pressure is controlled either manually or automatically from the cab on the rate controller (See separate manual). In either case the regulator solenoids increase or decrease the air pressure on the diaphragm within the Ramsey unit, this in turn restricts the flow in the spray system and so controls the spray pressure. The pressure in the Ramsey unit should never exceed 5 bar maximum and periodic replacement of the diaphragm will be required.

NOTE: If the sprayer has been unused for a while, air pressure will naturally drain from the system. Before filling the sprayer and using the induction hopper with rate controller in "Manual", press the increase pressure button until approximately 3 bar pressure is shown on the air gauge. Without air pressure the induction hopper will not empty…! The rate controller unit will automatically control both air and spray pressure when returned to "Auto".

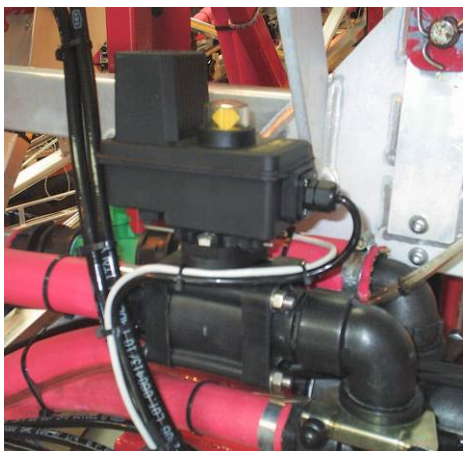
Ramsey Pressure Regulator



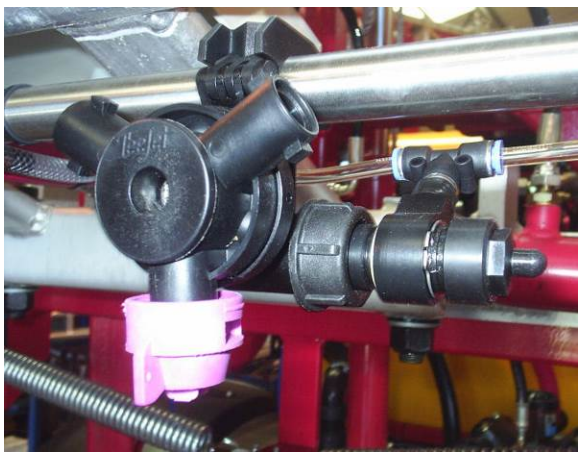
Air Pressure Gauge **Spray Pressure Gauge**

Master ON/OFF – Section Controls

Because the spray system is fully recirculating, a master valve is fitted to the return (to tank) line and works in conjunction with the section controls, i.e. when the master switch is OFF the master valve opens allowing full flow back to tank, and all the section solenoids shut down closing off each of the nozzle check valves. When the master switch is ON the master valve closes the return to tank and all the section solenoids open, pressurising and opening the nozzle check valves allowing the system to start spraying.



Master On/Off Valve



Nozzle body with air activated check valve

Operating – Recirculation

Recirculation / Purge System

The benefit of the recirculating system as fitted to the Agribuggy sprayer is that after filling and with the manual suction and pressure valves returned to the “spray” position, chemical from the tank will be circulated through the spray lines. This means that when the sprayer is switched ON at the start of the field every nozzle will flow with mixed chemical, waiting for the chemical to feed along the spray-line is not necessary.

The second benefit is that by turning the manual suction valve to “Rinse”, clean water can be circulated through the spray-lines and returned to tank, therefore flushing the lines clean without the need to spray excess chemical in the field. This is often referred to as “Purge”.

Operating – Calibration

Calibration

It is outside the scope of this manual to go through the complete nozzle selection procedure. You should have been taught the ‘ins and outs’ of spray quality, nozzle selection procedures, volumes etc. during your ‘Sprayer Operator Training’, however the following notes should serve as a useful reminder.

The recommended procedure for calibrating this, or any other sprayer, is as follows;

1. Read Label

Check the label on the chemical pack (or accompanying leaflet) for recommended volume of application and spray quality (nozzle type and operating pressure). Decide on application rate.

2. Calibrate Speed

See rate controller manual.

3. Calculate Nozzle Output

a) Measure and record the nozzle spacing. McConnel sprayers normally have a spacing of 0.5 metres.
b) Calculate and record the output per nozzle required to achieve the intended volume of application using the following formula;

Application volume (l/ha) x Speed (km/hr) x Nozzle spacing (m) ÷ 600 = Nozzle output (l/min)

4. Select and fit Nozzles

Refer to nozzle manufacturer's data charts or cards, or to MAFF lists, and select type and size of nozzle that will provide the calculated nozzle output and the spray quality required. Record the recommended spraying pressure for the required output.

5. Check Nozzles

a) Fill sprayer with CLEAN water, start spraying and set pressure to the pressure decided above.
b) Check spray patterns and alignment visually. Replace any faulty nozzles and re-check.
c) Compare the output of individual nozzles by use of either a nozzle flow meter or a calibrated recording jug. Replace nozzles with more than a ± 5% variation from the average.

6. Calibrate Sprayer

a) Using a calibrated jug, measure the output from at least four nozzles or at least one nozzle from each boom section, and compare with the calculated nozzle output.
b) If the output differs by a small amount from the calculated output, alter the pressure accordingly and repeat the calibration until you have established the correct pressure for the required application rate.
c) If the output differs by a large amount, re-check calibration and calculations and change the nozzle size and/or forward speed if necessary.

Field Operation

The Agribuggy chassis unit is capable of working at speeds in excess of 16 km/h, however, these sorts of speeds are very rarely suitable for crop spraying operations. Due to the excellent boom stability of the McConnel sprayer speeds considerably higher than those used for conventional tractor spraying, can normally be used. However, for most spraying operations you should be able to spray at between 10 and 12 km/hr but when deciding working speeds, the following factors must be taken into consideration;

a) Size, shape, contours of field and obstacles - can you maintain your target speed?

b) Ground conditions - if the whole field is wet or there are wet patches - again, can you maintain your target speed? - You may have to consider taking smaller tank loads if conditions are bad.

c) Ground level analysis – operators should complete a pre-work analysis of the entire work area to determine the best working method. This is particularly important on sites where overhead power lines are present; uneven ground or use of boom levelling devises can increase the risk of unintentional contact with overhead power lines especially when performing folding/unfolding operations during the work process.

d) Application volume / spray quality - make sure you can get the required spray quality if you are using large jets and a high speed to get your required application rate.

e) Spray drift - Ensure that you don't use too high a pressure with an undersized nozzle to get your required application rate at a high speed.

f) Target - don't forget the whole object of the crop spraying operation is to hit the target weed or crop with the chemical. If the crop is dense and the target is weeds in the bottom of the crop, then don't go too fast or the spray will not penetrate.

g) Boom stability - It is most important that the boom is stable whilst spraying. A boom that is bouncing or yawing will cause uneven application, particularly at the boom tips. This will be more noticeable with booms over 12 metres wide.

When you have decided your working speed, have calibrated the sprayer and have become fully acquainted with the operation of the chassis unit and the sprayer, it is recommended that you practice in a suitable field with clean water only. This is particularly important if you have not driven a self-propelled sprayer before - there are an awful lot of new things to get used to!

When spraying at relatively high speeds, it is very important that your working speed is maintained to avoid under or over dosing. It is important that two bouts are sprayed around the headland when using a 12 metre boom to give yourself plenty of time to turn the sprayer on and off. Maintain your working speed as you travel on to the headland and turn the sprayer off before you start turning. After turning, straighten up and accelerate to your target speed before switching on again. **If you turn whilst spraying you will get considerable overdosing at the outside of the inner boom.**

For the same reasons always reverse into corners and accelerate as quickly as possible as you switch the sprayer on.

If the sprayer is fitted with an automatic spray rate controller it is still important to keep as near to your target speed as possible or the spray quality will vary considerably.

When spraying potatoes and other dense crops with row crops fitted, always try to travel in the same direction each time you spray the field. The tops will then tend to grow in that direction with very little damage caused. If you change direction each time, you will find the tops are dragged back the other way, causing considerably more damage.

Operating – Opening / Closing Booms

Folding/Unfolding Booms

⚠WARNING The machine must be stationary when folding and unfolding booms and should be parked on as level ground as possible.

⚠DANGER Ensure you are well clear of any obstacles especially overhead power cables. Always keep booms as low as possible when folding and unfolding – *see OHPL information on pages 3 & 4.*

Hydraulic Boom Controls

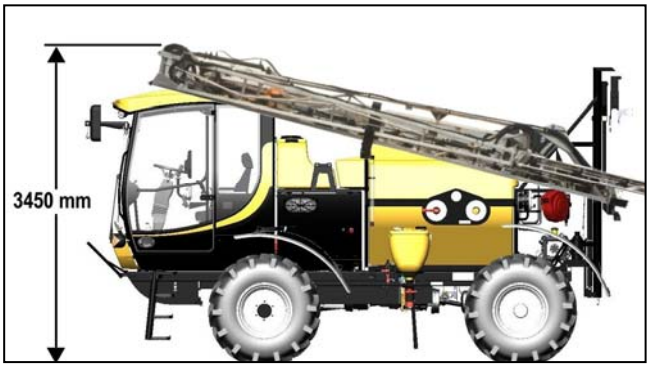
The electro-hydraulic spool valve control switches are positioned on the main control panel.
The "joystick" lever has four-way functions and operates both lift/lower and tilt.
The **two switches** to the right of the joystick operate the main (12m) section, and the outer (24m) section.

⚠WARNING **Door must be closed before operating boom controls**

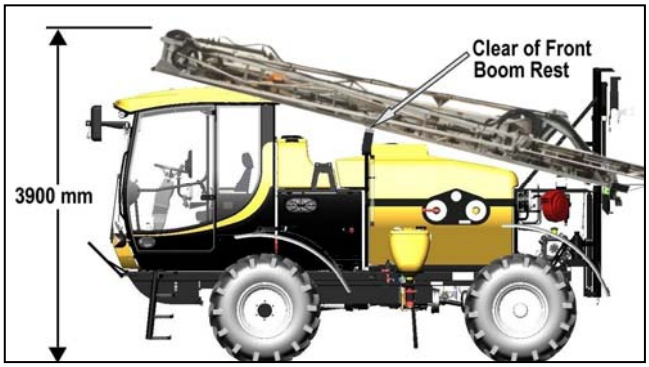
A) 4-Way Joystick (Lift, Lower & Tilt)
1) Inner / 12m Control Switch
2) Outer / 24m Control Switch
3) Variable Geometry Switch LH Boom
4) Variable Geometry Switch RH Boom

It should only normally be necessary to run the engine at tick-over to open and close the booms.
The decals to show the operation of the boom controls is positioned around the switches.

Folded Height

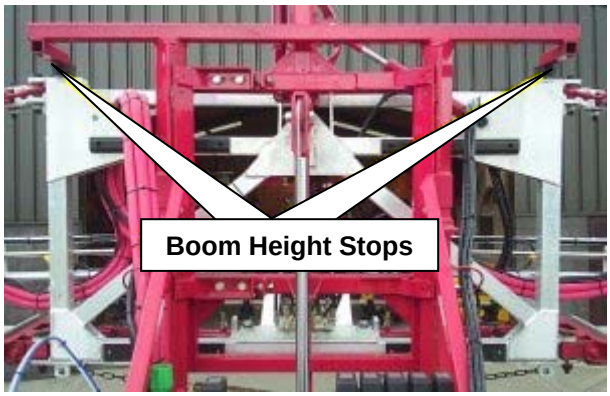


Unfolding Height



Unfolding *(Refer to controls on previous page)*

1. Make sure you are parked on level ground and are well clear of obstacles and overhead power cables.
2. Using Joystick 'Lift', raise the boom to the top of the height mast ensuring that the centre section hits both the rubber stops; *check the boom is clear of front boom rests.*
3. Using 'Inner/12m control switch', open inner booms to clear front boom rests - *where 'active VG rams' are fitted, extend until the booms are parallel to the ground.* Continue operation to fully open inner booms.
4. Using 'Outer/24m control switch', open outer booms out to their full width position.
5. Lower booms to working height.



Folding *(Refer to controls on previous page)*

1. Make sure you are parked on level ground and are well clear of obstacles and overhead power cables.
2. Using the hydraulic tilt ram ensure that the boom is parallel to the ground.
3. Raise the boom to the top of the height mast ensuring that the centre section hits both rubber stops *(refer to the photo top right),* this stabilises the boom.
4. Using 'Outer/24m control switch', fold outer sections in to 12 metres - *where 'active VG rams' are fitted, extend until the booms are parallel to the ground.*
5. Using 'Inner/12m control switch', fold inner sections in until boom touches the vertical plates on the front boom rests; *chains will automatically lift boom to clear front boom rest.*
6. Using Joystick 'Lower', lower boom down into boom rests (front and rear), ensuring the pressure is off the hydraulics.

Front Boom Rest

Rear Boom Rest

Hydraulic Break-Back (optional)

On some variants the outer fold rams may have a hydraulic break-back incorporated as a safety precaution. This is used when the boom tips (and also the normal break-back) have been removed from the 24m boom for spraying at 20m.

If the end of the boom hits an obstacle, oil will be forced out of the ram and back to the hydraulic tank through a safety relief valve. The hydraulic pressure will be lost out of the second fold rams and it will be necessary to re-pressurise them by operating the outer section switch before continuing.

Whilst the boom is being used at 24m the break-back system should be switched off or un-coupled.

Maintenance
Maintenance - Lubrication

Aluminium Boom Suspension System
It is essential that the aluminium boom be checked for wear, adjustments made and lubrication carried out on a regular basis. Failure to do so will lead to the suspension system becoming ineffective which will in turn lead to boom fatigue, cracking, eventual failure and very expensive repairs or replacements. A correctly maintained boom will last the life of the machine.

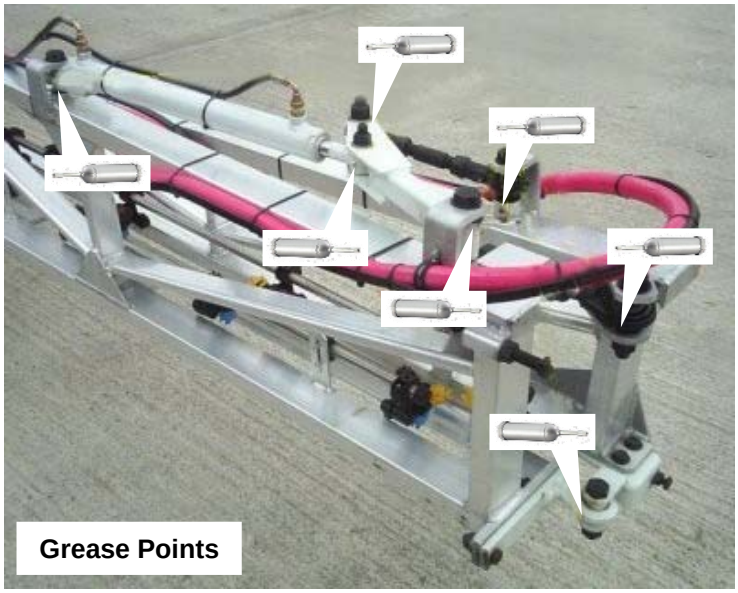
Lubrication

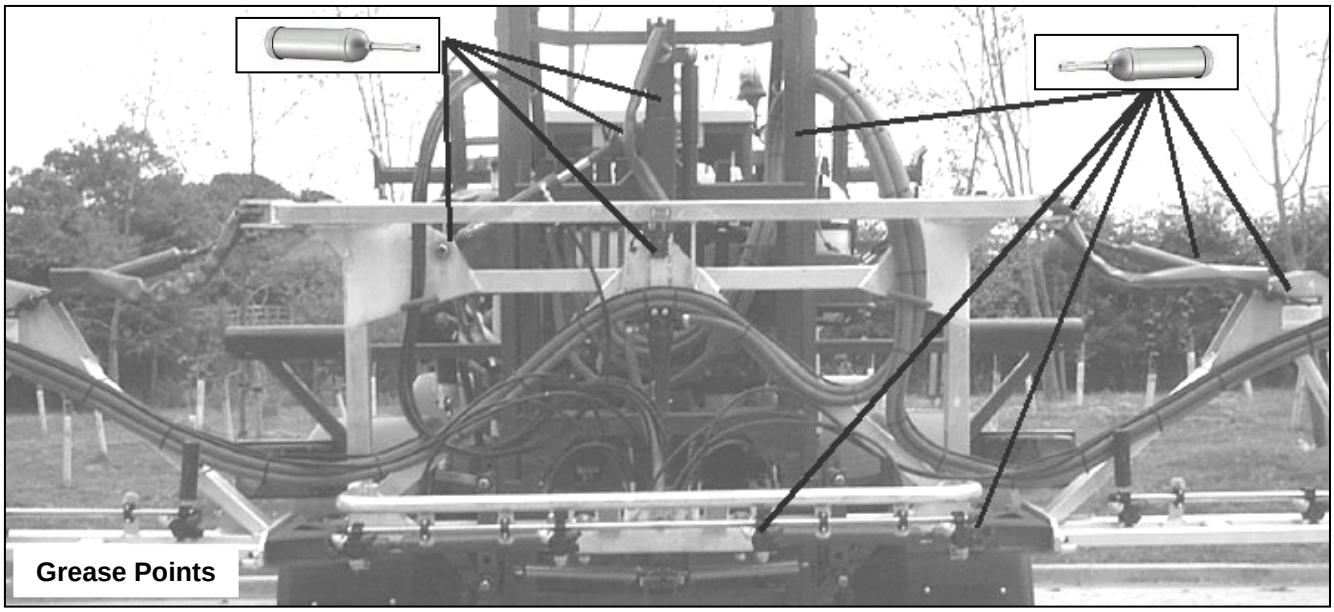
Height Mast
The height mast / sliding frame should be kept well coated in oil or grease. If the mast dries up you may experience difficulty in raising and lowering the booms when they are in the folded position. The mast may need lubricating daily if you are opening and closing the booms a lot, especially if the weather is hot and you are working in dusty conditions. The mast should be degreased periodically, particularly after working in dusty conditions, and re-lubricated.

Grease Nipples
The boom is fitted with grease nipples on the majority of the pivot points. These should be greased at least once a week. Any pivot points that are not fitted with grease nipples should be oiled generously.

It is particularly important to keep the main boom suspension unit well lubricated to ensure that the suspension system works freely.

There is also a grease nipple on each yoke of the PTO shaft (if fitted) and a grease point on each end of the PTO shaft guard - again grease weekly.





Boom Lubrication Points

Maintenance - Boom Adjustments

Boom Adjustments

Various areas of the boom may need adjusting from time to time as wear naturally takes place. It is important to keep the boom adjusted correctly to get the best life and performance from it.

You should also thoroughly inspect the boom from time to time for any signs of fatigue or cracking. It is much easier to repair a cracked boom than a broken one.

Height Mast / Slide Frame

It is important that movement between the sliding frame and the height mast should be kept to a minimum. If the movement becomes too great the booms will not clear the front supports by an adequate margin when you are folding them in.

There are nylon wear pads in between the height mast and slide frame, 4 at each side.

Check that these are O.K. then adjust the slide frame with the two adjustable slides fitted to the offside of the frame, one at the top and one at the bottom (see right).

Top Slide Frame Adjusting Bracket

Adjust as follows:

1) Slacken off the two set studs securing the top bracket to the frame.

2) Slacken off the locknut on the adjusting bolt.

3) Turn the adjusting bolt to push the slide bracket up to the height mast - do not over tighten.

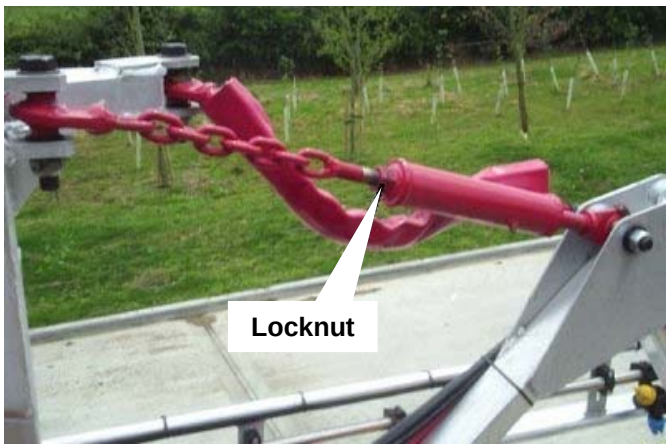
4) Tighten the two securing studs and the adjuster bolt locknut.

5) Repeat with the lower bracket.

6) With the booms open lift the boom up and down to check that the carriage does not bind. If it does slacken the slides off slightly and try again.

Boom Dampers (Standard)

The main boom sections are suspended on damper units to absorb shock loads. After initial use and from time to time afterwards the booms may start to sag.
If so slacken off the locknut (see right) and turn the damper to shorten the overall assembly length. When set at the required level remember to tighten the locknut.
These dampers should be checked regularly to ensure that they are working correctly by "bouncing" the boom up and down by hand and checking that the suspension action is still working. If it is not then the shock loads will be carried down the boom resulting in the booms cracking. Replacement units are available from your dealer or McConnel Limited.



Boom Damper

Passive Boom Suspension (Optional)

Where fitted, the passive boom system gives superior boom suspension compared to the standard damper system, allowing the boom to better follow the contours of the ground. The system features accumulators that eliminate 'shock loading' when operating on rough terrain, thus increasing the longevity of the boom structure.

If a reduction in damping performance is experienced and/or if the tips of the boom have 'dropped' the damper rams will need to be hydraulically re-charged; a charging hose is supplied with the machine specifically for this purpose, the charging procedure is as follows:

- On a firm level site, set parking brakes and chock the wheels securely.
- Place boom into its fully extended working position.
- Attach charging hose between PTO pressure connection and damper ram.
- With engine running at idle, start PTO in manual mode at lowest flow rate.
- Open tap on charging hose to allow a slow flow of oil into the damper ram - *the amount of oil added is enough only to raise the tips until boom is parallel to the ground; care must be taken when adding oil to avoid the risk of overfilling the ram.*
- Close tap, switch PTO and engine off and remove charging hose.
- Repeat procedure for the opposing side.

Charging Hose (AS68241S70K)

Variable Geometry (Optional)

Where fitted, the Variable Geometry system offers all the features of the Passive system, but also allows the operator to manually control the individual incline of the left and right boom, providing greater contour on undulating ground.

⚠WARNING The machine must be stationary when folding and unfolding booms and should be parked on as level ground as possible.

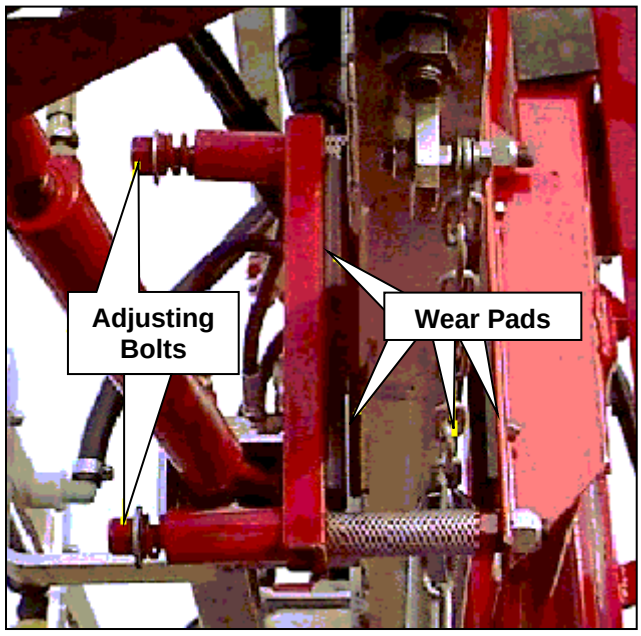
⚠DANGER Ensure you are well clear of any obstacles especially overhead power cables. Always keep booms as low as possible when folding and unfolding – *see OHPL information on pages 3 & 4.*

Maintenance - Boom Adjustments

Anti-Yaw Adjustment

The boom is fitted with an anti-yaw device to damp out any yawing movements of the boom. As the nylon wear plates begin to wear the play will increase.

You will find that the booms will not clear the front supports by an adequate margin when you are folding the booms if the play becomes too great.
The gap between the spring cover tube and the rear wear plate should not exceed 30mm. It should be checked with the boom open and it can be adjusted by tightening the two nuts indicated. **Ensure that the top and bottom bolts are adjusted evenly.**



Anti-Yaw Adjustment

Wear Pads

There are two sets of wear pads fitted to the boom and anti-yaw plates. These should be kept lightly lubricated and should be regularly inspected for wear and replaced when necessary. If they get badly worn they will stop the boom suspension system working and will cause boom problems as previously discussed.

Folding Chains

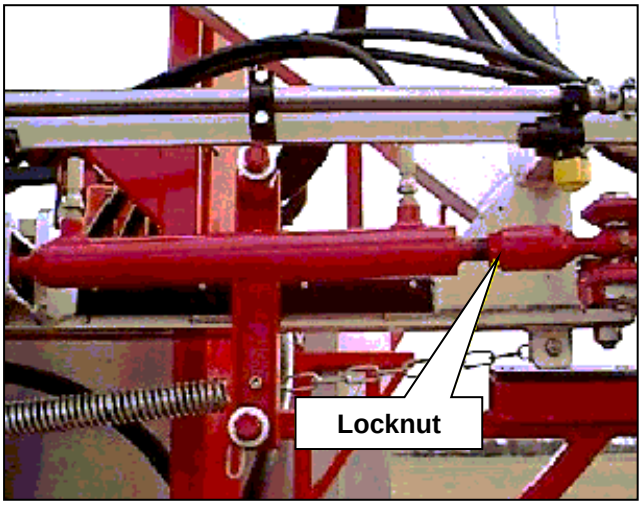
As the booms fold inwards the weight is taken on the folding chains instead of the dampers. The length of these chains should not be adjusted unless absolutely necessary. They should always be slack when the boom is fully down in its rests in the transport position.

If you do not have adequate clearance between the booms and the front supports when folding the booms, ensure that the sliding frame and the anti-yaw device are both adjusted correctly first before touching the folding chains. If you do find it necessary to shorten these chains it is imperative that they are not over-shortened. Doing so will reduce the amount of weight carried on the front supports in the transport position and increase the pressure on the aluminium centre section. This, over the long term, will lead to fatigue and possible boom failure.

Main Fold Rams

The main boom fold rams should be adjusted so that the booms just touch the front inner boom support plates when the booms are in the fully closed position. If the booms are forced too hard against these plates when you fold the booms, damage will eventually be caused.

If adjustment is necessary slacken off the locknut shown on the right and turn the ram rod with a suitable spanner. Remember to re-tighten the locknut when correctly set.



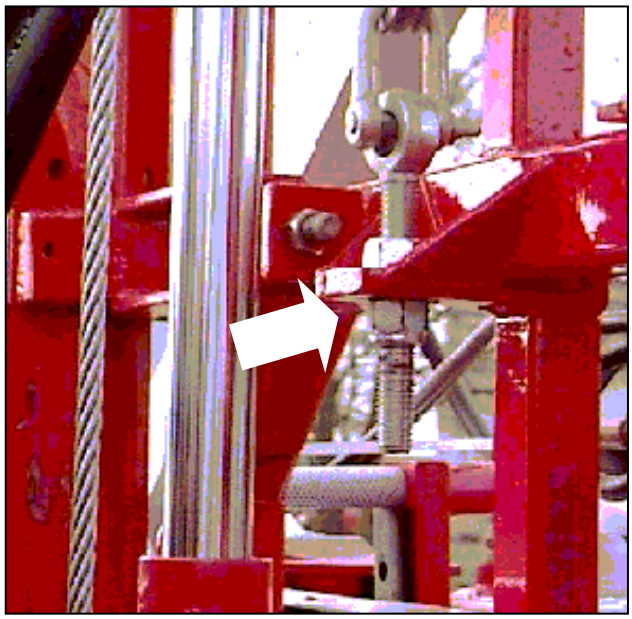
Maintenance - Boom Adjustments

Outer Fold Rams

The outer fold rams are part of a complex folding mechanism, and should only be adjusted by a suitably qualified person.

Main Lift Ram

The main lift ram relies on a wire rope to lift the boom. After a while this may stretch and the back frame will not travel all the way to the top of the height mast; it is easily adjusted by shortening the threaded eye bolt shown on the right.



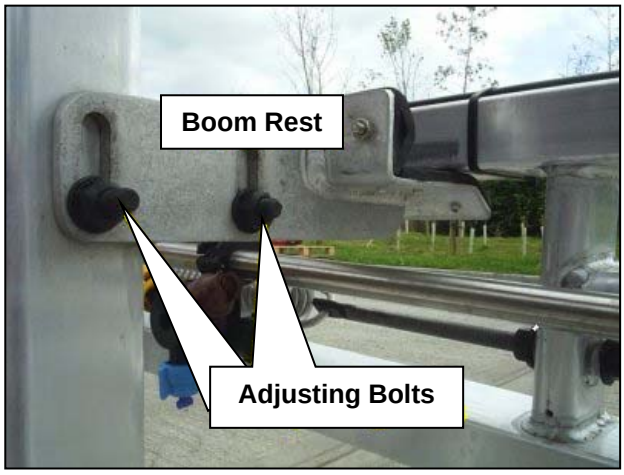
Main Lift Ram Cable Adjuster

Outer Boom Rests

The outer boom rests support the outer boom sections whilst transporting and whilst spraying at 12 metres.

It is most important that the rest takes the weight of the outer section when it is folded in.

When starting off or climbing hills ensure the outer sections do not move back off the rests or serious damage to the outer hinge points may result.



Maintenance & Technical

Maintenance and Technical Information

The life of your sprayer will depend on the care it receives throughout its life. It is the operator's responsibility to ensure that the machine is not only correctly operated, but also to ensure that any maintenance operations outlined in this manual are carried out. Please remember that you are obliged to keep your sprayer in top working condition under the various acts and codes of practice mentioned previously. If you are unsure of how to carry out any of the maintenance or repair operations, please do not hesitate to enlist the help of McConnel.

Cleaning

The sprayer should always be kept clean and **MUST be washed out daily** even if you are using the same chemical the next day.

DO NOT leave chemicals in the tank overnight if you can possibly avoid it.

To get rid of any remaining traces of chemical in the sprayer it is generally better to wash it through several times with relatively small amounts of water i.e. 100-200 litres than it is just to spray one large amount through.

For a thorough wash out, firstly add about 200 litres of clean water to the sprayer and circulate it whilst washing the inside of the tank with a hose. Then spray the water out through the spray lines and finally drain out the tank.

During the washing process direct the water through the chemical inductor for a while and operate the flush ring, can-wash and flushing hose. Also turn the booster agitator on for a while, if you have not been using it, checking that the nozzles in the tank are not blocked. Whilst spraying the water out of the tank turn the boom section switches off for a few moments to flush out the balanced return pipes back to the tank. **It is important that all the hoses on the sprayer are flushed through during the cleaning process.**

After the initial flush out repeat the process adding some cleaning agent to the water and, when you have finished, give it a final rinse through with clean water again. Leave the pump running for a while with the tank drain open each time to empty as much water as possible out of the system. You cannot hurt the spray pump by running it dry.

If you have been spraying with a particularly "potent" or concentrated chemical circulate a detergent mix through the sprayer and spray lines and leave to stand overnight. Before commencing spraying circulate the mix again, spray it out and then flush through twice more with clean water remembering to ensure that all the hoses are flushed through as above.

The outside of the sprayer should also be cleaned down immediately after use.

Please remember to follow the Code of Practice etc. when washing the sprayer out and disposing of tank washings.

When you have finished, remove all the filters and nozzles from the sprayer and check them for cleanliness. Clean them off with brush in a bucket of water if necessary and then replace.

Maintenance - Frost protection

Frost Protection

It is most important that all the components on the sprayer are protected from damage caused by frost.

It is extremely difficult with today's modern sprayers and complicated plumbing systems to drain every last drop of water from the sprayer without disconnecting a number of hoses. For this reason the most practical method of frost protection, assuming you cannot store the sprayer in a frost protected building, is to use motor vehicle anti-freeze.

1) Wash out the sprayer thoroughly as on previous page and drain as much water out as possible.
2) Pour 10 litres of antifreeze and 20 litres of water into the tank.
3) Run the pump and circulate the mixture around the system, observing the notes on the previous page about flushing all the hoses through (Inductor, can-wash, agitator etc.).
4) Switch the sprayer on and spray the mix out through the spray lines to protect the filters, spray lines and nozzle bodies.
5) Before using the sprayer again flush the antifreeze out of the system with clean water.

Maintenance - Filtration

Filtration

Efficient filtration is essential for successful crop spraying, especially with increasing use of low-volume application techniques requiring the use of small nozzles. The McConnel sprayer is normally fitted with a two stage filtration system. Firstly there is a high capacity suction filter, followed by a pressure side filter after the pump.

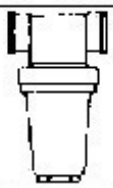
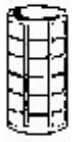
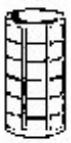
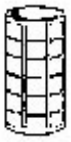
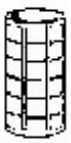
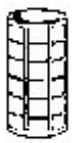
They should all be cleaned out at least once daily and each time you wash out to change chemicals. If you are spraying a particularly "sticky" chemical or 'wettable' powders held in suspension you may have to clean some of the filters out more often. Experience will soon tell you how often to clean them.

Not only is it most important that the filtration system is kept clean and well maintained, but also that the correct size mesh is used in each filter for the different rates of flow and chemical used. Always read the chemical container label for advice on filtration.

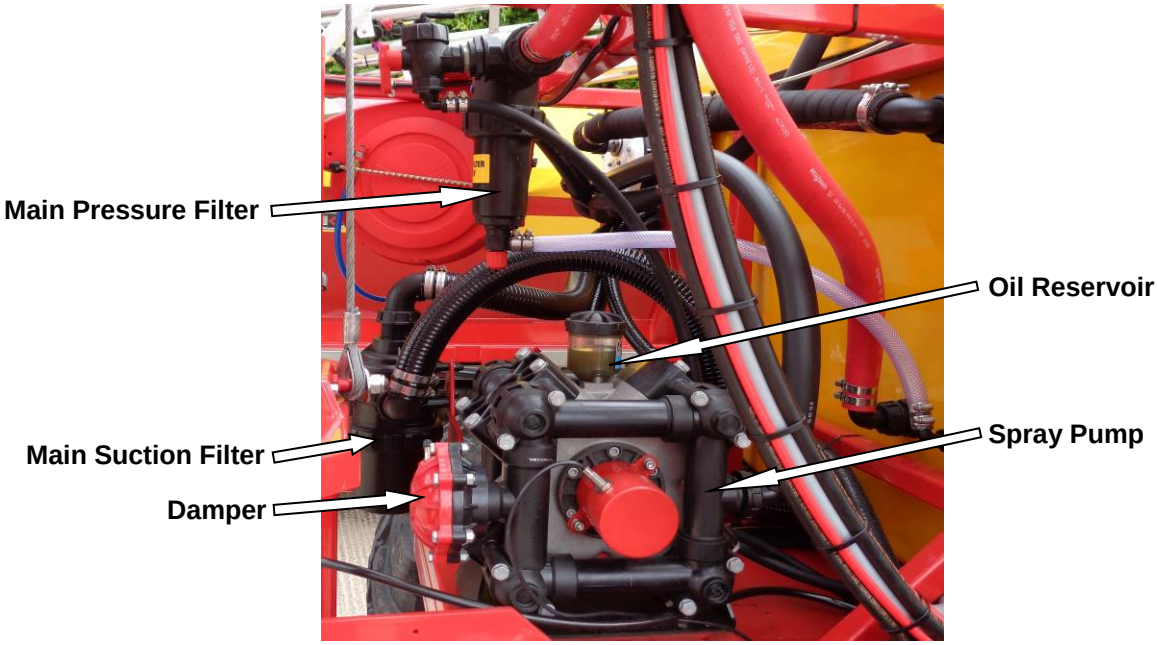
Filtration should be applied in two stages starting with a coarse mesh and progressing to finer sizes. In order to maintain efficient filtration without restricting liquid flow the screen area used should be as large as possible.

Recommended Mesh Sizes

Use the chart below to establish which size element should be fitted in each filter for each different nozzle used. Your nozzle selection chart will show the nozzle output in litres/min for each particular tip. The elements are all colour coded for easy reference. (Line filters are not used on recirculating systems).

Nozzle output in litres/min at 3 Bar (flat fan, standard pressure tips)	 SUCTION FILTER ELEMENT	 FLUSHING FILTER ELEMENT	 SMALL PRESSURE LINE FILTER ELEMENT
0.4 - 0.7	50# BLUE 	80# RED 	100# GREEN 
0.8 - 1.3	50# BLUE 	80# RED 	80# RED 
1.4 - 2.2 (Standard for McConnel Sprayer)	30# WHITE 	50# BLUE 	50# BLUE 
2.3 - 3.3	30# WHITE 	30# WHITE 	30# WHITE 
Over 3.4 litres / min	30# WHITE 	30# WHITE 	30# WHITE 

Maintenance – Pump & Filters



Main Suction Filter

The main suction filter is situated alongside the pump on the back of the sprayer.

To remove the filter element, firstly turn the yellow cap anti-clockwise on the underside of the filter bowl, unscrew the threaded ring and remove together with the lower bowl; the element can then be removed for cleaning.
After cleaning reassemble ensuring the sealing ring is correctly seated. The bowl should not be removed whilst there is chemical in the spray tank.

Main Suction Filter Assembly

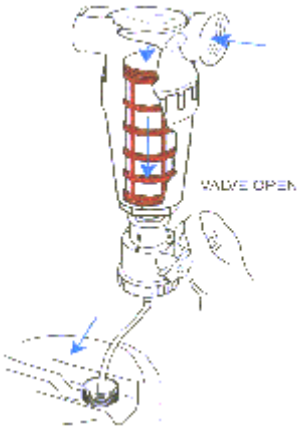
Main Pressure Filter

The main pressure filter is situated on the back of the sprayer. It is a flushable type of filter which means that by opening the red tap at the bottom, it can be flushed out at any time without having to remove the bowl.

This operation should be carried out at least once a day. However, when spraying some chemicals it may be advisable to flush the filter out every few tank loads.

Dispose of 'flushings' carefully! - Do not flush straight out of the tank and onto the ground other than in designated areas.

The bowl should, however, be removed periodically to inspect the element and to give it a thorough clean. This time period will depend on what type of chemicals you are using - please use your own judgement. It should always be removed when giving the sprayer a thorough wash out.



Main Pressure Filter Assembly

The Spray Pump

The spray pump fitted to your sprayer is a diaphragm type pump and may be one of several different types and/or sizes, however, the operation and maintenance is the same for all of them.

Pulsation Damper

The damper is fitted to smooth out any pulsations in the flow of water away from the pump.

For it to work correctly the air diaphragm should be inflated with a hand or foot pump to approx. one third of your normal spraying pressure.

Spray Pump Lubrication

The oil level should be kept up to the mark on the transparent bowl on the top of the pump. It should be topped up with a good quality 20W/30 motor oil.

Change the oil every 200 hrs or at the end of the season. There is an oil drain plug located at the base of the pump body. Rotate the pump shaft slowly by hand until the oil stops flowing.

Slowly refill, rotating the shaft by hand again, until the level reaches the mark on the reservoir.

If the oil changes to a milky colour this is a sign of water leaking into the oil through the diaphragms - they should then be checked immediately.

It is good practice to overhaul the pump replacing diaphragms, valves and seals at the end of each season if you spray large acreages.

Maintenance – Hoses

Hoses

All the hoses on the sprayer should be inspected periodically for any signs of deterioration. Also check for any signs of chafing, particularly around the areas of the height mast where the boom goes up and down.

Damaged or perished pipes should be replaced immediately.
The consequences of a high pressure hose bursting can be very serious.

Parts

All replacement parts are available from McConnel. Some parts are fairly common and may also be available from other local sources. If you require any parts information please do not hesitate to contact either your dealer or ourselves. Only genuine spare parts should be fitted where their use will effect health and safety.

When ordering parts please give us as much information as possible including the following:

The model/build number - *this is on a plate on the front offside of the chassis.*

The sprayer model and serial number - *this on a plate next to the sprayer controls.*

Agribuggy Automatic Sprayer Controller (In Cab Monitor)

See separate rate controller instruction manual.

De-Mounting

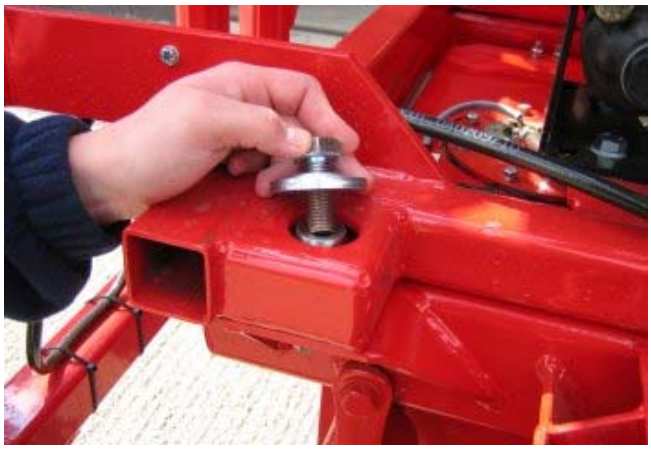
It is recommended that the optional de-mount legs are used when removing the sprayer from the chassis unit. If you make your own legs ensure that they support the sprayer in such a way that it can't be pushed or blown over when it is removed. Ensure the sprayer is demounted on firm, level ground.

If you remove the sprayer from the chassis unit when row crop wheels are fitted it is advisable to lower it down on the jacks, after de-mounting, to the lowest position to make it more stable.

When fitting the de-mount legs ensure that the safety pins are fitted through the holes in the inside end of the legs so that they can't slip out of their locating sockets.

Remove the 4 main mounting bolts and jack up evenly so that each leg is taking an equal amount of weight.

Slacken the chemical inductor mounting bolt, slide the inductor from its mounting socket and slot it in to the socket on the nearside, front demount leg.



The Main Mounting Bolts

Disconnect all the main hoses and services on the right-hand side of the machine, not forgetting to shut off the feed from the clean water tank using the tap fitted to the tank outlet. Also disconnect the tank drain tap on the right-hand side.

⚠CAUTION

The A280 sprayer is fitted with an electro-hydraulic valve block mounted on the boom. Normally hydraulic oil flows continuously through this valve block, to and from the tractor unit's hydraulic system. However, when the hoses are disconnected for demounting it is possible to "deadhead" the system if the engine is started, causing major hydraulic failure. To prevent this happening and to enable the machine to be driven forward ready for the fertilizer unit to be fitted, a bypass valve is fitted.

Closed/Normal position ← → **Open/Demount position**

This bypass valve must be turned to the open position to allow oil to flow back to tank when the engine is running and so preventing damage occurring.

The cone guidance system automatically aligns the demount frame when re-fitting.

⚠CAUTION Be sure all services have been disconnected and the lowest point on the sprayer is well clear of the chassis before driving away.

A factory supplied spreader demount frame is equipped with a PTO motor, speed sensor, and an electro-hydraulic valve block, all of which should be reattached to the appropriate connection points on the tractor unit.

To remount the sprayer demount onto the tractor unit, simply reverse the process above.

Nozzle Application Rate Chart - Standard ISO Tips

BPC Spray quality	Fine	Medium	Coarse

ISO Colour /Ref BPC Quality Filter mesh	Pressure bar	Flow L/min	Application Rate Litres/Hectare						
			6 km/h	8 km/h	10 km/h	12 km/h	14 km/h	16 km/h	18 km/h
	2.0	0.33	66	50	40	33	28	25	22
Orange 01 Fine 100 mesh	2.5	0.37	74	56	44	37	32	28	25
	3.0	0.40	80	60	48	40	34	30	27
	3.5	0.43	86	65	52	43	37	32	29
	4.0	0.46	92	69	55	46	39	35	31
	2.0	0.49	98	74	59	49	42	37	33
Green 015 Fine 100 mesh	2.5	0.55	110	83	66	55	47	41	37
	3.0	0.60	120	90	72	60	51	45	40
	3.5	0.65	130	98	78	65	56	49	43
	4.0	0.69	138	104	83	69	59	52	46
	2.0	0.65	130	98	78	65	56	49	43
Yellow 02 Fine 80 Mesh	2.5	0.73	146	110	88	73	63	55	49
	3.0	0.80	160	120	96	80	69	60	53
	3.5	0.86	172	129	103	86	74	65	57
	4.0	0.92	184	138	110	92	79	69	61
	2.0	0.82	163	122	98	82	70	61	55
Lilac 025 Fine/med 80 Mesh	2.5	0.91	183	137	110	91	78	68	62
	3.0	1.00	200	150	120	100	86	75	67
	3.5	1.08	216	162	130	108	93	81	72
	4.0	1.15	231	173	139	115	99	87	77
	2.0	0.98	196	147	118	98	84	74	65
Blue 03 Fine/med 80 Mesh	2.5	1.10	220	165	132	110	94	83	73
	3.0	1.20	240	180	144	120	103	90	80
	3.5	1.30	260	195	156	130	111	98	87
	4.0	1.39	278	209	167	139	119	104	93
	2.0	1.31	262	197	157	131	112	98	87
Red 04 Medium 50 Mesh	2.5	1.46	292	219	175	146	125	110	97
	3.0	1.60	320	240	192	160	137	120	107
	3.5	1.73	346	260	208	173	148	130	115
	4.0	1.85	370	278	222	185	159	139	123
	2.0	1.63	326	245	196	163	140	122	109
Brown 05 Medium 50 Mesh	2.5	1.83	366	275	220	183	157	137	122
	3.0	2.0	400	300	240	200	171	150	133
	3.5	2.16	432	324	259	216	185	162	144
	4.0	2.31	462	347	277	231	198	173	154
	2.0	1.96	392	294	235	196	168	147	131
Grey 06 Medium 50 Mesh	2.5	2.20	440	330	264	220	189	165	147
	3.0	2.40	480	360	288	240	206	180	160
	3.5	2.60	520	390	312	260	223	195	173
	4.0	2.80	560	420	336	280	240	210	187
	2.0	2.61	522	392	313	261	224	196	174
White 08 Coarse 50 Mesh	2.5	2.92	584	438	350	292	250	219	195
	3.0	3.20	640	480	384	320	274	240	213
	3.5	3.46	692	519	415	346	297	259	231
	4.0	3.70	740	555	444	370	317	277	247
	2.0	3.27	654	491	392	327	280	245	218
Cream 10 Coarse 30 Mesh	2.5	3.65	730	548	438	365	313	274	243
	3.0	4.00	800	600	480	400	343	300	267
	3.5	4.32	864	648	518	432	370	324	288
	4.0	4.62	924	693	554	462	396	347	308

Sprayer Jet Chart

Rate L/min — Spray width 50 cm

	ISO code	Pressure Bar	Flow rate L/min	Application rate in L/Ha at Km/h 6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Orange	01	2	0.327	65	56	49	44	39	36	33	30	28	26	25	23	22	21	20	19	18	17	16	16
		3	0.400	80	69	60	53	48	44	40	37	34	32	30	28	27	25	24	23	22	21	20	19
		4	0.462	92	79	69	62	55	50	46	43	40	37	35	33	31	29	28	26	25	24	23	22
Green	015	2	0.490	98	84	74	65	59	53	49	45	42	39	37	35	33	31	29	28	27	26	25	24
		3	0.600	120	103	90	80	72	65	60	55	51	48	45	42	40	38	36	34	33	31	30	29
		4	0.693	139	119	104	92	83	76	69	64	59	55	52	49	46	44	42	40	38	36	35	33
Yellow	02	2	0.653	131	112	98	87	78	71	65	60	56	52	49	46	44	41	39	37	36	34	33	31
		3	0.800	160	137	120	107	96	87	80	74	69	64	60	56	53	51	48	46	44	42	40	38
		4	0.924	185	158	139	123	111	101	92	85	79	74	69	65	62	58	55	53	50	48	46	44
Lilac	025	2	0.816	163	140	122	109	98	89	82	75	70	65	61	58	54	52	49	47	45	43	41	39
		3	1.000	200	171	150	133	120	109	100	92	86	80	75	71	67	63	60	57	55	52	50	48
		4	1.140	228	195	171	152	137	124	114	105	98	91	86	80	76	72	68	65	62	59	57	55
Blue	03	2	0.980	196	168	147	131	118	107	98	90	84	78	74	69	65	62	59	56	53	51	49	47
		3	1.200	240	206	180	160	144	131	120	111	103	96	90	85	80	76	72	69	65	63	60	58
		4	1.386	277	238	208	185	166	151	139	128	119	111	104	98	92	88	83	79	76	72	69	67
Brown Red	035	2	1.140	228	195	171	152	137	124	114	105	98	91	86	80	76	72	68	65	62	59	57	55
		3	1.400	280	240	210	187	168	153	140	129	120	112	105	99	93	88	84	80	76	73	70	67
		4	1.620	324	278	243	216	194	177	162	150	139	130	122	114	108	102	97	93	88	85	81	78
Red	04	2	1.306	261	224	196	174	157	142	131	121	112	104	98	92	87	82	78	75	71	68	65	63
		3	1.600	320	274	240	213	192	175	160	148	137	128	120	113	107	101	96	91	87	83	80	77
		4	1.848	370	317	277	246	222	202	185	171	158	148	139	130	123	117	111	106	101	96	92	89
Brown	05	2	1.622	324	278	243	216	195	177	162	150	139	130	122	114	108	102	97	93	88	85	81	78
		3	2.000	400	343	300	267	240	218	200	185	171	160	150	141	133	126	120	114	109	104	100	96
		4	2.309	462	396	346	308	277	252	231	213	198	185	173	163	154	146	139	132	126	120	115	111
Grey	06	2	1.960	392	336	294	261	235	214	196	181	168	157	147	138	131	124	118	112	107	102	98	94
		3	2.400	480	411	360	320	288	262	240	222	206	192	180	169	160	152	144	137	131	125	120	115
		4	2.771	554	475	416	369	333	302	277	256	238	222	208	196	185	175	166	158	151	145	139	133
White	08	2	2.613	523	448	392	348	314	285	261	241	224	209	196	184	174	165	157	149	143	136	131	125
		3	3.200	640	549	480	427	384	349	320	295	274	256	240	226	213	202	192	183	175	167	160	154
		4	3.695	739	633	554	493	443	403	370	341	317	296	277	261	246	233	222	211	202	193	185	177
Light Blue	10	2	3.266	653	560	490	435	392	356	327	301	280	261	245	231	218	206	196	187	178	170	163	157
		3	4.000	800	686	600	533	480	436	400	369	343	320	300	282	267	253	240	229	218	209	200	192
		4	4.619	924	792	693	616	554	504	462	426	396	370	346	326	308	292	277	264	252	241	231	222
Light Green	15	2	4.899	980	840	735	653	588	534	490	452	420	392	367	346	327	309	294	280	267	256	245	235
		3	6.000	1200	1029	900	800	720	655	600	554	514	480	450	424	400	379	360	343	327	313	300	288
		4	6.928	1386	1188	1039	924	831	756	693	640	594	554	520	489	462	438	416	396	378	361	346	333
Black	20	2	6.532	1306	1120	980	871	784	713	653	603	560	523	490	461	435	413	392	373	356	341	327	314
		3	8.000	1600	1371	1200	1067	960	873	800	738	686	640	600	565	533	505	480	457	436	417	400	384
		4	9.238	1848	1584	1386	1232	1109	1008	924	853	792	739	693	652	616	583	554	528	504	482	462	443

Calibration formulas

Speed Check

Distance (mtr) x 3.6 / Time (sec) = Km/ph

Example

400 x 3.6 / 120 = 12 Km/ph

Application

600 x L/min (per nozzle) / Nozzle spacing (mtr) x Km/ph = L/Ha

Example

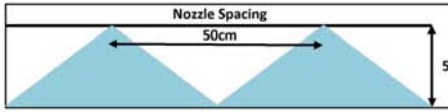
600 x 1.2 / 0.5 x 12 = 120 L/Ha

Nozzle output

Nozzle spacing (cm) x L/Ha x Km/ph / 600 = L/Min (per nozzle)

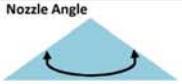
Example

50 x 120 x 12 / 600 = 1.2 L/min (per nozzle)

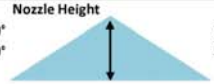


Tip Spacing
35cm
75cm

L/Min Conversion factor
1.43
0.67



80°
110°



75cm
50cm

NOTES

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