

# Novation

## N1000 and N1250





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## **Congratulations on purchasing your new MS Gregson equipment.**

This equipment is manufactured with top quality components and is engineered using the latest technology to provide outstanding efficiency for years to come.

This manual is designed to help you in operating your new equipment. Please take the time to read this manual completely before using your new equipment. A thorough understanding of this manual will ensure that you receive the maximum benefit from your equipment.

### **Warranty**

- This equipment is guaranteed for a period of 12 months after the delivery date.
- This warranty covers the manufacturing and assembling defects, but does not cover breakage caused by bad maintenance or use, or damage caused by the chemicals products this equipment can apply.



#### **MS Gregson Inc.**

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**REGISTRATION OF GUARANTEES FORM**



4300 Vachon St., Drummondville, Qc J2B 6V4  
Tel. : (877) 470-3052 • Fax : (877) 474 5317  
E-mail : orders@msgregson.com • Web : www.msgregson.com

Return this form with the sales invoice. This registration of guarantees will be use for the implementation of the warranty.

EQUIPEMENT
Model : _____
Serial number : _____
Date purchased : _____

DEALER
Name : _____
City : _____
Province : _____

First name : _____
Last name : _____
Address : _____
City : _____ Province : _____ Postal code : _____
Phone number : _____ E-mail : _____

I have read and understand all safety and operational instructions of the owner's manual and received from my dealer the training needed to use and maintain this equipment.

End user signatures : \_\_\_\_\_ Date : \_\_\_\_\_

Dealer signatures (technician) : \_\_\_\_\_

Technician name in block letters : \_\_\_\_\_

**PLEASE return form at : [service@msgregson.com](mailto:service@msgregson.com) or fax 877-474-5317**

**Thank you for choosing MS Gregson products.**

<b>IMPORTANT</b> : If this form is not return to MS Gregson, waranty will start at the delivery date. <b>NON-NEGOTIABLE.</b>
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# 1- FORMS



4300 rue Vachon, Drummondville, Qc J2B 6V4  
Tél. : (877) 470-3052 • Téléc. : (877) 474 5317  
Courriel : orders@msgregson.com • Internet : www.msgregson.com

Veillez compléter ce formulaire et le retourner après la livraison de l'unité. Cet enregistrement sera utilisé pour la mise en vigueur de la garantie. S.V.P. joindre une copie de la facture de vente à votre client.

## ÉQUIPEMENT

Numéro de modèle : \_\_\_\_\_

Numéro de série : \_\_\_\_\_

Date d'achat : \_\_\_\_\_

## CONCESSIONNAIRE

Nom : \_\_\_\_\_

Ville : \_\_\_\_\_

Province : \_\_\_\_\_

## CLIENT

Prénom : \_\_\_\_\_

Nom de famille : \_\_\_\_\_

Adresse : \_\_\_\_\_

Ville : \_\_\_\_\_ Province : \_\_\_\_\_ Code postal : \_\_\_\_\_

Numéro de téléphone : \_\_\_\_\_ Adresse de courriel : \_\_\_\_\_

J'ai lu et compris toutes les mises en garde et les instructions d'utilisation du manuel de l'utilisateur et j'ai reçu de mon concessionnaire la formation nécessaire à l'utilisation et l'entretien de cet équipement.

Signature du client utilisateur : \_\_\_\_\_ Date : \_\_\_\_\_

Signature du technicien (concessionnaire) : \_\_\_\_\_

Nom du technicien en lettre moulée : \_\_\_\_\_

**S.V.P. Nous retourner par courriel à : [service@msgregson.com](mailto:service@msgregson.com) ou fax 877-474-5317**

**Merci de faire confiance aux produits MS Gregson.**

**IMPORTANT** : Si le formulaire n'est pas retourné chez MS Gregson, la date de facturation au concessionnaire déterminera le début de la garantie. **NON NÉGOCIABLE.**





**IMPORTANT ! It is the responsibility of the dealer to inspect the machine upon reception. This form should be retained in the dealer paper case file.**

Before performing any repairs on a product, the owner's manual must be carefully read. Tests must never be performed with chemical products in the tank. All applicable points in the list below must be verified. This inspection is to be completed before delivery to customer. The technician must verify each point and indicate it in the space provided; additional remarks may be noted in the comments section. Information is available in the owner's manual and MS Gregson's service department can supply more detailed information when necessary.

<b>Customer # :</b> _____	<b>Model #:</b> _____
<b>Customer name :</b> _____	<b>Serial # :</b> _____

**VERIFICATION AT DEALER**

**GENERAL**

- 1. Check the sprayer equipment compared to the customer's order.
- 2. Verify shipping/storage or any other damage.
- 3. Verify all accessories not installed on sprayer
- 4. Verify/adjust wheel track with customer specification.
- 5. Verify bolts and nuts are tightened appropriately.
- 6. Inspect tires and adjust tire pressure specified in manual.
- 7. Ensure that parts manual and owner's manual are included with sprayer.
- 8. Verify general appearance of paint and touch up if required.

**LUBRICATION**

- 1. Check oil levels.
- 2. Lubricate all grease fittings.

**HYDRAULIC SYSTEM AND BOOM OPERATION**

- 1. Remove any transport straps.
- 2. Set the boom in working position.
- 3. Check for any oil leaks.
- 4. Verify operation of all hydraulic cylinders.
- 5. Verify cylinder and boom adjustments.
- 6. Verify self-leveling adjustment and function.
- 7. Verify breakaway adjustment.

**WATER PIPING TEST**

- 1. Verify filters, drain plugs etc are tightened appropriately.
- 2. Check for kinked hoses.
- 3. Check for tank and plumbing leaks.
- 4. Verify the control function, maximum pressure\_\_\_\_ with nozzles\_\_\_\_\_.
- 5. Verify agitation function.
- 6. Verify chemical inductor.
- 7. Verify rinsing system function.

# 1- FORMS

## WATER PIPING TEST

- 8. Check rate control calibration numbers in owner's manual.
- 9. Verify rate control speed/ flow reading and speed reading.
- 10. Verify electrical connections.
- 11. Verify hose and wire routing.
- 12. Verify boom valve sections (open/close)
- 13. Verify all equipment and accessories (options) are working.
- 14. Perform winterization if necessary.

## FOAM MARKER OPERATION

- 1. Verify right and left operation.
- 2. Verify bubble time spacing
- 3. Winterization

## VERIFICATION AT CUSTOMER

### SAFETY

- 1. Ensure that SMV, safety labels, road lights and security chains are properly located and secured.
- 2. Verify that all safety shields are in place.
- 3. Be sure to have proper protection equipment such as gloves, aprons, goggles, etc.
- 4. Verify turn signals.
- 5. Verify filters, seals and pressurization gage in tractor cab.

## INSTRUCTIONS AND WARNINGS

- 1. Verify PTO length according to customer's tractor
- 2. Verify compatibility of hydraulic circuit of sprayer with customer's tractor.
- 3. Verify unit of measure (metric/US) for rate controller.
- 4. Explanation of warnings and operating instructions.
- 5. Give all manuals to the customer.

**COMMENTS :** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I have read and understand all safety and operational instructions of the owner's manual and received from my dealer the training needed to use and maintain this equipment.

**User signatures :** \_\_\_\_\_ **Date :** \_\_\_\_\_

**Dealers signatures :** \_\_\_\_\_

**SHOULD BE RETAINED IN THE DEALER PAPER CASE FILE**

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## 2.1 - Expressed warranties

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### LIMITED WARRANTY

The sprayers manufactured by **MS Gregson Inc.** are warranted, to the original purchaser, to be free from defects in materials and workmanship for the periods specified below. Normal use conditions, according to the instructions in the operator's manual, apply. This limited warranty is subject to the exclusions listed below, is calculated from the date of delivery to the original purchaser, and applies to the original components only. Parts replaced under this warranty will assume the remainder of the corresponding part's warranty period. The purchaser has sole right to the replacement of the parts, which the Manufacturer, or his authorized representative, deems faulty as regards their material or manufacture. This does not imply any right to compensation for any type of direct or indirect damage. Any faults or failures which occur during or after the period of the guarantee do not imply the right to suspend payment or to any further extension.

### 1 YEAR PARTS, 1 YEAR LABOUR WARRANTY

- The components, excluding accessories listed below and normal wear items listed below, are warranted for 1 year on parts and labour.

### WARRANTY PROVIDED BY OTHER MANUFACTURERS

Motors, engines, batteries, tires, rims, Raven and Micro-Trak product or other items, which are warranted by their respective manufacturers, are serviced through these manufacturer's local authorized service centres. **MS Gregson Inc.** cannot provide warranty on these items.

### EXCLUSIONS OF WARRANTY

- Routine adjustments and normal maintenance items such as lubricants, belts, hoses, O-rings, filter screens, fuses, and gun seal kits.
- Repairs required as a result of collision, accident, bumping, misuse, modifications made to the equipment without authorization, incorrect installation, lack of required maintenance, use contrary to the instructions included in the operator's manual or to the common sense.
- Repairs required as a result of freezing or exposition to corrosive products.
- Repairs required as a result of voltage fluctuations of the electric supply.
- Repairs required as a result of incompatibility between components and phytosanitary or chemical products
- Repairs required as a result of insufficient water supply or poor quality water.
- Damage to crop due to wrong calibration or incorrect use of the equipment.
- Damage to crop due by improper use, contamination or in-complete rinse of the sprayer.
- Damage to crop or spill due to components failure and/or accident.
- Additional charge resulting from stoppage for repair or other reason.
- Transportation and/or travelling.
- Any parts which are subject to wear during normal use.
- Any parts which are deemed faulty due to negligence or carelessness during use.

### For model with tank capacity of 100 gallons (380 litres) and more

THE **PRE-DELIVERY INSPECTION CHECKLIST** MUST BE COMPLETED BY DEALER AND SIGNED BY THE ORIGINAL RETAIL PURCHASER, AND RETURNED TO **MS GREGSON INC.** WITHIN 30 DAYS OF PURCHASE DATE SIGNED BY THE ORIGINAL RETAIL PURCHASER, INDICATING THAT HE HAS READ AND UNDERSTOOD ALL SAFETY AND OPERATIONAL INSTRUCTIONS IN THE MANUAL, AFTER THE RETAILING DEALER HAS EXPLAINED TO THE ORIGINAL PURCHASER ALL SAFETY INSTRUCTIONS. IN NO CASE THE WARRANTY WILL BE APPLIED IF THE **PRE-DELIVERY INSPECTION CHECKLIST HAS NOT BEEN COMPLETELY FILLED AND SIGNED BY THE DEALER AND THE RETAIL PURCHASER IN PROPER DELAY.** EXECUTION OF REPAIRS WITHIN THE WARRANTY PERIOD

In order to obtain warranty service on items warranted by **MS Gregson Inc.** within the warranty period, you must show to your dealer a proof of purchase. If the equipment is permanently installed, the dealer will carry out repairs on the spot. For warranty service on components warranted by other manufacturers, your authorized MS Gregson dealer can help you obtain warranty service through these manufacturers' local authorized service centres. The dealer has the responsibility to carry out repairs within the warranty period. Repairs will be done at the dealer's repair-shop for mobile equipments or at your site upon dealer's choice; the purchaser has the responsibility to bring his equipment to his dealer's repair-shop. The parts replaced under warranty become the property of **MS Gregson Inc.**

### LIMITATION OF LIABILITY

**MS Gregson Inc.** liability for special, incidental, or consequential damages is expressly disclaimed. In no event shall **MS Gregson Inc.** liability exceed the purchase price of the product in question. THE WARRANTY CONTAINED HEREIN IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. **MS Gregson Inc.** does not authorize any other party, including authorized **MS Gregson** dealers, to make any representation or promise on behalf of **MS Gregson Inc.** or to modify the terms, conditions, or limitations in any way. It is the buyer's responsibility to ensure that the installation and use of **MS Gregson** products conforms to local codes. While **MS Gregson Inc.** attempts to assure that its products meet national codes, it cannot be responsible for how the customer chooses to use or install the product.

## 2- INTRODUCTION

### 2.2 - Product identification Sheet

In order to help your dealer respond to all your needs, please note below the model number and serial number of your machine. Add complete information of your dealer for future reference.



	<b>MS Gregson</b> <i>div. de/of RAD Technologies Inc.</i> 4300, Vachon Drummondville, QC J2B 6V4 Canada <a href="http://www.msgregson.com">www.msgregson.com</a>		
	Modèle Model	<b>N1000</b>	N° Série Serial N°

Model :	_____
Serial number :	_____
Purchase date :	_____
Dealer name :	_____
Dealer phone # :	_____

## 2.3 - Understanding and Reading the Manual

Carefully read the operator's manual in order to properly use and maintain the sprayer. Any negligence in this regard may result in injury or property damage. This manual and the warning stickers are available from your dealer.

Each new operator must have received the training required to operate such equipment and have read the operator's manual. Some countries have regulations regarding the use of a sprayer for the application of phytosanitary products. Make sure the operator has the requisite license and knowledge for the operation of such equipment.

This manual should be considered an integral part of the sprayer and must accompany it upon resale and be stored in the record holder provided for this purpose.



Document holder

**Table : Reading of the manuel**

Date	Operator	Signature

## 3.1 - Security warning symbols



### DANGER

Indicates an immediate hazardous situation that, if not avoided, results in death or serious injury.



### WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.



### CAUTION

Indicates a potentially hazardous situation that, if not avoided, could result in a minor or intermediate injury.

Read carefully these instructions. It is necessary to read the instructions and security guidelines before trying to assemble or use this machine. It is strongly recommended to give a copy of these security measures to all persons using this machine.



### PROHIBITED

The following symbols are used to indicate important points in the operator's manual. The «prohibited» symbol indicates an action that must never be performed.



### MANDATORY

The following symbols are used to indicate important points in the operator's manual. The «mandatory» symbol indicates an action that must be performed.



### IMPORTANT

Indicates that damages to the machine or property could result if the instructions are not followed.



TOXIC



SAFETY MASK



SAFETY VISORS



SAFETY BOOTS



PROTECTIVE GLOVES



PROTECTIVE CLOTHING



INGESTION



TOXIC VAPOURS



HIGH PRESSURE



FLYING OBJECTS



ELECTROCUTION



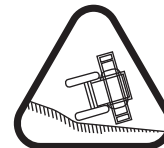
FALL



UNCOUPLING



CLEARANCE



OVERTURNING



RUNAWAY

### 3.2 - General Security warnings

- All people using this equipment must read the operator's manual.
- Keep all security guidelines in place.
- Respect all applicable laws concerning permits and qualifications of operators. Not respecting these guidelines is unlawful and unsafe.
- No person should be close to the sprayer when starting or during use.
- If the pump is equipped with a PTO, always assure that there is none close to the equipment before using.
- Never let anyone ride on the sprayer or its equipment.
- Respect all laws and guidelines concerning chemical products. Read the instructions and warnings of chemical product manufacturers. Contact the anti-poison center for questions about chemical products.
- Always be ready to act in case of emergency, have immediate access to a first-aid kit, protection equipment, and a fire extinguisher.
- Wear appropriate protective gear. This gear includes but is not limited to: safety glasses, mask, gloves, and water-proof clothing. Additional gear may be required depending on the type of chemical used.
- Keep the clean water tank full at all times.
- Always turn off the tractor motor and remove the key before performing any adjustments, maintenance or repairs.
- Never allow any person to pass under the boom when the lock is not securely fastened.
- Attach the security chain between the sprayer and the tractor before driving on the road and/or in the field.
- Do not open the sprayer boom when the sprayer is not attached to the tractor.
- Always think about how your actions affect the environment.
- Do not use the jack to support the sprayer when the reservoir is filled



### 3.3 - Chemical product cautions






General chemical use recommendations apply when using all products. The following suggestions on the use of chemical products should be reviewed:

- Be familiar with chemical poisoning symptoms. Dizziness, headache, stomach ache, blurred vision and excessive perspiration are poisoning symptoms from many pesticides. Consult a doctor if you don't feel well after manipulating chemical products. When consulting a doctor, bring the warning labels on the chemicals as these contain important information concerning the chemical in question.
- Read and understand all pesticide warning labels before using. These labels contain detailed instructions concerning safe use of the pesticides. Reread all instructions in bold print.
- When mixing or pouring a chemical product, assure that the flow of wind is away from your face.
- Do not hurry when using chemical products. Haste may cause many problems such as the wrong product being put in the sprayer or an incorrect spraying rate.
- Reduce the drift when spraying on less windy days. Spray with the least amount of pressure recommended to minimise drift.
- Wear appropriate protective gear. This gear includes but is not limited to: safety glasses, mask, gloves, and water-proof clothing. Additional gear may be required depending on the type of chemical used.
- Wear the correct gas mask when manipulating and working with chemical products and while spraying.
- Keep the clean water tank full at all times.
- Stay away from splashes and vapors.
- Do not breathe vapors.
- In the event of pesticide spilling on skin, wash the site thoroughly with soap and water. Change out of contaminated clothes before continuing.
- In the event of contact with eyes and mouth, read and follow the instructions from the chemical manufacturer. Seek out medical help immediately. Contact your local anti-poison centre.
- Wash hands, safety equipment and clothes after each spraying.


### 3.3 - ⚠ Chemical product cautions

	<ul style="list-style-type: none"><li>• This sprayer was developed and should only be used for the application of phyto-sanitary crop-protective products and agricultural fertiliser.</li><li>• Always choose the appropriate chemical product for each job. Handle and apply with care.</li><li>• Never use sprayer reservoirs for storing any materials not intended for spraying.</li><li>• Always close doors and windows of the tractor while spraying. It is important that the tractor cabin be sealed as much as possible to avoid contact with polluted air.</li></ul>
	<ul style="list-style-type: none"><li>• The tractor cabin should be equipped with one or more dust filters to avoid entry of dust and droplets as well as an active carbon filter to absorb dangerous gas present in the air.</li><li>• Wash the sprayer after use.</li><li>• Wash and rinse the sprayer after use.</li><li>• Rinse the tank of the sprayer and the attachment hoses before changing pesticides and before each repair.</li><li>• One should never get inside the sprayer tank for cleaning or repairs.</li><li>• Properly dispose of chemical products, spraying mixtures and rinsing residues complying with environmental regulations.</li><li>• Only perform maintenance and repairs when the machine is completely clean.</li><li>• All liquid leaks must be stopped and repaired immediately to avoid contamination to public places, roads, and cross contamination to farm equipment.</li></ul>

### 3.4 - ⚠ Hydraulic oil cautions


  	<p><b>WARNING</b></p> <ul style="list-style-type: none"><li>• Before applying pressure to the hydraulic system, check that all connections are closed tightly and that the hose adaptors are not damaged.</li><li>• If leaked under pressure from the hose and the accumulator, hydraulic liquid may penetrate the skin. If this happens, contact a doctor immediately.</li><li>• Remove the pressure from the system before repairing, adjusting, or hooking up the hydraulic system.</li><li>• Wear protective gear for eyes and hands to clean up hydraulic leaks. Always use a piece of cardboard or wood to look for a leak, never use your hands.</li><li>• Keep all equipment in good working condition. Replace any damaged hoses or connections.</li><li>• Repair all oil leaks. Leaks can cause fires, injuries and environmental damages.</li></ul> <p><b>IMPORTANT</b></p> <ul style="list-style-type: none"><li>• Before applying pressure to the hydraulic system, consult the Adjustment and Settings section.</li><li>• An incorrect adjustment to the hydraulic system can cause overheating and damages to the tractor. Different adjustments are required depending on the type of hydraulic circuit of the tractor.</li></ul>
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### 3.5 - ⚠ Electric Cautions


	<ul style="list-style-type: none"><li>• The electric system of this sprayer was developed to use 12 Vcc.</li><li>• Never use the sprayer with damaged electrical wires. Unplug the power source if any damages occur.</li><li>• Never attempt to bypass the fuses. Do not replace the original fuses with fuses of higher amperage.</li><li>• Unplug the power source before any maintenance.</li><li>• Only qualified personnel shall perform repairs to the electrical system.</li></ul>
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#### 3.6 - Platform access cautions

	<p><b>To prevent serious injury or death</b></p> <ul style="list-style-type: none"><li>• Use caution when climbing the ladder or when on the platform.</li><li>• Only use the ladder to get on or off of the sprayer.</li><li>• Do not allow non-authorized people to use the machine.</li><li>• Never get on or off of a moving sprayer.</li><li>• Do not allow any riders on the platform.</li><li>• Inspect the ladder, the platform and the safety guard before getting on or off.</li><li>• Keep the ladder and the platform clean.</li><li>• Do not store any equipment nor product on the platform.</li></ul>
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#### 3.7 - Cautions before using




	<p><b>To prevent serious injury or death</b></p> <ul style="list-style-type: none"><li>• Attach the security chain between the sprayer and the tractor before travelling on roads and in the field.</li><li>• If the pump is equipped with a PTO, be sure that no one is close to the equipment before using it.</li><li>• Secure the sprayer to the tractor when the ramp is unfolded. The drawbar will lift rapidly if the ramp is unfolded and the sprayer is not securely attached to the tractor.</li><li>• Always be sure that no person or object is close to the sprayer before using it.</li><li>• All safety decals must be installed and visible.</li><li>• All security equipment must be in place.</li><li>• The tank cover must be closed completely.</li><li>• Always be sure that the pump discharge hose is well attached. An unattached hose can cause serious injuries and or damage property.</li><li>• Check hoses for any signs of use or wear. Be sure that the connections are tightly secured.</li></ul>
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#### 3.8 - Cautions before and during transport

	<p><b>Cautions before transport</b></p> <ul style="list-style-type: none"><li>• Before driving on public roads, be sure that the boom clears any power lines.</li><li>• Attach the security chain between the sprayer and the tractor.</li><li>• The sprayer is not equipped with a brake. Be sure that the tractor has sufficient towing and braking capacity.</li><li>• The sprayer is considered a slow-moving vehicle. Be sure that the slow-moving triangle is visible when driving on roads.</li><li>• In accordance with local laws, be sure that any registration and/or permits are valid.</li></ul> <p><b>Cautions during transport</b></p> <ul style="list-style-type: none"><li>• Drive with caution and respect road safety laws.</li><li>• Slow down at curves to avoid tipping. Drive slowly on soil and side slopes.</li><li>• Use caution when using a sprayer with a high clearance that is equipped with a narrow wheel-base. There is greater possibility of tipping on a hilly terrain and/or during turns with such a model.</li></ul>
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## 3- SAFETY INSTRUCTIONS

### 3.9 - ⚠ Cautions during sprayer operation

	<p><b>DANGER</b></p> <ul style="list-style-type: none"><li>• Stay clear of power lines when opening or closing the sprayer booms. This equipment is not grounded. Electrocutation can happen without direct contact.</li><li>• Be sure there is no person or object in the path of the sprayer booms. Always be aware of the position of the boom.</li><li>• Never use the sprayer to pump flammable or explosive liquids such as gasoline, kerosene, oil, etc.</li><li>• Do not use in explosive environments. The pump should only be used for liquids that are compatible with its part's materials. Failure to comply with this warning may cause serious injury and/or property damage and will result in loss of the warranty of this product.</li></ul>
	<p><b>WARNING</b></p> <ul style="list-style-type: none"><li>• Maximum speed 40km/h (25 mi/h)</li><li>• Adjust the hydraulic flow rate by referring to section 6.1.1. If the rate of flow disturbed during operation or if a tractor change is made, the hydraulic flow rate should be newly calibrated.</li><li>• Before spraying, know the terrain and its possible dangers (trees, rocks, ravines, ditches, etc) Plan the route to avoid these dangers.</li><li>• Avoid steep inclines especially during boom opening.</li><li>• Slow down before going down-hill.</li><li>• Use caution when using a sprayer with a high clearance that is equipped with a narrow wheel-base. There is greater possibility of tipping on a hilly terrain and/or during turns with such a model.</li><li>• Use caution when turning.</li><li>• There is a risk of tipping when only one side of the boom is open.</li><li>• Never unplug the sprayer while using.</li><li>• Do not exceed highest recommended pumping pressure.</li><li>• Maximum temperature of 140 F (60 C) for centrifugal pumps on the 9300 series.</li><li>• Do not use this pump for water or any other liquid for human consumption.</li></ul>
	

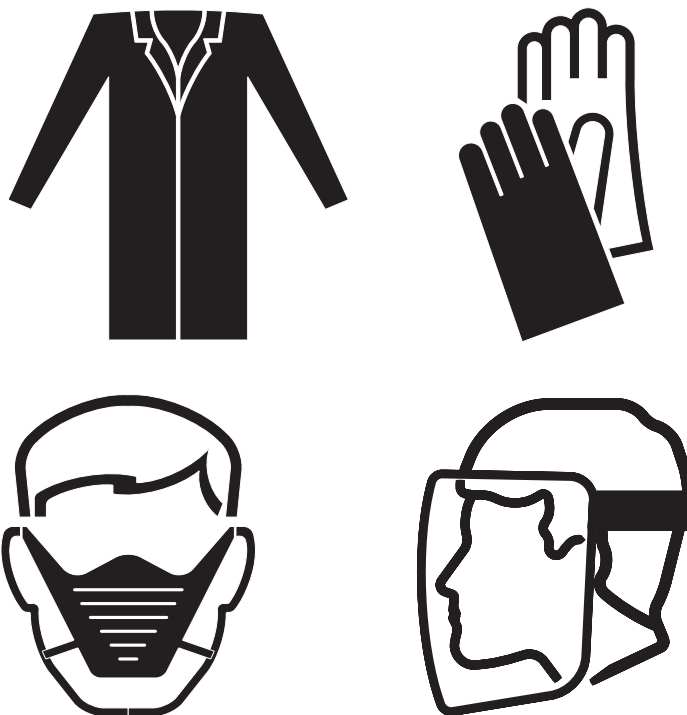
### 3.10 - ⚠ Cautions for maintenance

<ul style="list-style-type: none"><li>• Always turn off the tractor and remove the key before performing adjustments, maintenance or repairs.</li><li>• Never perform maintenance or repairs while the sprayer is running.</li><li>• Remove the hydraulic pressure in the system before repairing, adjusting or hooking-up the hydraulic system.</li><li>• Residual pressure may remain in the sprayer plumbing even if the unit is not being used. Remove the pressure before repairing the plumbing.</li><li>• Secure the cylinder lock while servicing the boom or the hydraulic system. Never allow any person to pass under the boom when the lock is not securely fastened.</li><li>• Place jack before you uncouple the sprayer from the tractor.</li><li>• Place center on easel before opening the boom.</li><li>• If the sprayer is detached from the tractor, place the boom on supports to avoid risk of tipping.</li><li>• Avoid working under the equipment. If this is necessary, secure the equipment before working.</li><li>• Drain all liquids from the system before performing any maintenance.</li><li>• Disconnect the controls and/or the battery before using an external battery (boosting), changing and/or charging the battery or arc welding.</li><li>• Replace all security equipment or protectors immediately after performing maintenance.</li><li>• Non-authorized modifications to the sprayer may alter the performance and/or the security and may reduce the working life of the sprayer.</li></ul>
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#### 3.11 - Use of the Sprayer

The Novation sprayer must be used for agricultural purposes only and was designed for the application of phytosanitary products for crop protection and for the application of agricultura fertilizer. For questions regarding chemicals, call the nearest poison control centre or the 911 emergency service.

- Be prepared to act in the event of an emergency: keep a first-aid kit, personal protective equipment and a fire extinguisher within reach.



CAPCC (Canadian Association of Poison Control Centres)  
Contact the nearest poison control centre.

Address:

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National Capital Poison Center  
3201 New Mexico Ave, Suite 310 Washington, DC 20016  
Emergency Line: 1-800-222-1222

### 3- SAFETY INSTRUCTIONS

#### 3.12 - Before Using the Sprayer

**Take note of all the following warnings.**

- Never remove, alter or hide warning stickers.
- Replace missing or damaged stickers. Replacement stickers are available from your dealer. All stickers can be ordered under part number A120-0005A.
- When installing the sprayer for the first time, remove the front boom supports, see the Sprayer Coupling section, and remove the protective membrane from the “SMV” triangle. The SMV triangle identifies vehicles traveling at speeds below 40 km/h. When traveling at higher speeds remove or hide the triangle to avoid any confusion. Make sure to have all the requisite equipment, signage and identifications for traveling at speeds above 40 km/h.
- To obtain the necessary clearance according to the various tractor cabs while maintaining a minimum height, you can adjust the height of the boom supports.



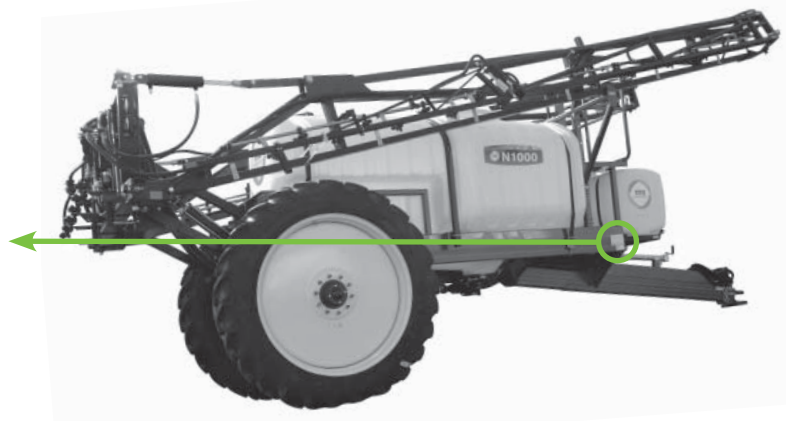
**In lower position:  
For transport in a delivery  
trailer only.**



**In upper position:  
For field work.**

- Make sure to have all licences and vehicle registration required under existing law before using public roads. You will find all the necessary information to proceed with the registration of your sprayer on the “Vehicle identification number” sticker located on the front right corner.

<b>MANUFACTURED BY / FABRIQUÉ PAR :</b> MS GREGSON, div. of/de RAD Technologies inc.				
<b>TYPE :</b> TRA / REM <b>DATE :</b> 2012-06-14				
<b>GVWR / PNBV :</b> 7 420 KG <b>V.I.N. / N.I.V. :</b> 2P9PAA1C7CD039174				
GAWR / ONBE KG	TIRE / PNEU DIMENSION	RIM / JANTE	COLD INFL. PRESS. PRESS. GONFL. À FROID PSI/LPC      KPA	
5639 KG	12.4 / 38	38"	28	193
<small>THIS VEHICLE CONFORMS TO ALL APPLICABLE STANDARD PRESCRIBED UNDER THE CANADIAN MOTOR VEHICLE SAFETY REGULATIONS IN EFFECT ON THE DATE OF MANUFACTURE. / CE VÉHICULE EST CONFORME À TOUTES LES NORMES QUI LUI SONT APPLICABLES EN VERTUS DU RÉGLEMENT SUR LA SÉCURITÉ DES VÉHICULES AUTOMOBILES DU CANADA EN VIGUEUR À LA DATE DE SA FABRICATION.</small>				



# 3- SAFETY INSTRUCTIONS

## 3.12 - Before Using the Sprayer



**DANGER!** Make sure the reservoirs are empty, do not go over the 500 gallons mark when the sprayer is supported by the jack.

The indicator gauge of the main reservoir only gives an approximation of its content. The gauge is factory calibrated at 500 US gallons when the frame is level. The position of the gauge must be readjusted according to the tractor's height of drawbar where the sprayer will be mounted. Refer to section 5.2 for sprayer mounting recommendations and follow the next steps to adjust the gauge before the first use:

1. Use to jack to put the frame level.
2. Fill the main reservoir up to the 500 gallons mark.
3. Mount the sprayer on the tractor or adjust its height to simulate the working height of the sprayer when it will be mounted.
4. Adjust the position of the gauge so the indicator shows 500 gallons.

## 3.13 - Security warning stickers

<p><b>⚠ DANGER</b></p> <p><b>RISQUE D'ÉLECTROCUTION</b> Pour prévenir les risques d'électrocution:</p> <ul style="list-style-type: none"> <li>• Rester éloigné des lignes électriques haute tension lors de la fermeture ou de l'ouverture des rampes de pulvérisation. Cet équipement n'est pas mis à la terre. Une électrocution peut avoir lieu sans contact direct.</li> <li>• Avant de s'engager sur les voies publiques, s'assurer que la rampe de pulvérisation dégage les lignes haute tension.</li> </ul> <p>AU-DECAVER9</p>	<p><b>⚠ DANGER</b></p> <p><b>ELECTROCUTION HAZARD</b> To prevent serious injury or death from electrocution:</p> <ul style="list-style-type: none"> <li>• Stay away from overhead power lines when folding or unfolding wings. This machine is not grounded. Electrocution can occur without direct contact.</li> <li>• Before engaging on road or highway, be sure the boom clears power lines.</li> </ul> <p>AU-DECAVER9</p>	<p><b>⚠ AVERTISSEMENT</b></p> <p><b>RISQUE D'EMBALLEMENT</b> Pour prévenir les risques de blessure ou de mort:</p> <ul style="list-style-type: none"> <li>• Embrayer à une vitesse inférieure avant de descendre une pente.</li> <li>• Laisser l'équipement sous charge en tout temps.</li> <li>• Ne jamais excéder une vitesse de transport sécuritaire.</li> </ul> <p>VITESSE MAXIMUM 40 KM/H (25 MI/H)</p> <p>AU-DECAVER10</p>	<p><b>⚠ WARNING</b></p> <p><b>RUN-AWAY HAZARD</b> To prevent serious injury or death:</p> <ul style="list-style-type: none"> <li>• Shift to lower gear before going down steep grades.</li> <li>• Keep towing vehicle in gear at all times.</li> <li>• Never exceed a safe travel speed.</li> </ul> <p>MAXIMUM SPEED 40 KM/H (25 MPH)</p> <p>AU-DECAVER10</p>
<p><b>⚠ AVERTISSEMENT</b></p> <p>POUR ÉVITER TOUT ACCIDENT</p> <ul style="list-style-type: none"> <li>• Lire et comprendre le manuel de l'utilisateur.</li> <li>• Garder les consignes de sécurité en place.</li> <li>• N'admettre aucun passager sur le tracteur ou l'équipement.</li> <li>• Regarder en arrière avant de reculer.</li> <li>• Garder les enfants et les animaux hors de portée lors de l'utilisation du pulvérisateur.</li> <li>• Porter les équipements de protection et un protecteur facial lors de la manipulation des produits chimiques.</li> <li>• Ne jamais ouvrir la rampe de pulvérisation lorsque le pulvérisateur n'est pas attaché au véhicule.</li> <li>• La vitesse maximale de remorquage est de 40 km/h (25 mi/h).</li> <li>• Attacher la chaîne de sécurité entre le pulvérisateur et le véhicule avant de le déplacer sur les routes et dans les champs.</li> <li>• Diminuer la vitesse lors de virages serrés.</li> <li>• Si la pompe est équipée d'une prise de force (PDF), soyez sûr que personne n'est près de l'équipement avant de l'actionner.</li> <li>• Garder le réservoir d'eau propre plein d'eau.</li> <li>• Soyez soucieux de l'environnement.</li> </ul> <p>AU-DECAVER14</p>	<p><b>⚠ WARNING</b></p> <p>TO PREVENT SERIOUS INJURY OR DEATH</p> <ul style="list-style-type: none"> <li>• Read and understand operator's manual.</li> <li>• Keep safety devices in place.</li> <li>• Never carry riders on the tractor or on the sprayer.</li> <li>• Look behind before backing.</li> <li>• Keep children and animals away when operating sprayer.</li> <li>• Wear chemical resistant protective clothing and facialwear when working with chemicals.</li> <li>• Never unfold boom when sprayer is not attached to a towing vehicle.</li> <li>• Maximum towing speed for this sprayer is 40 km/h (25 mph).</li> <li>• Attach safety chain between sprayer and towing vehicle before transporting on roads, highways and fields.</li> <li>• Slow down when making sharp turns.</li> <li>• On sprayers equipped with PTO driven pumps, make sure everyone is clear before engaging power.</li> <li>• Keep safety tank full of clean water.</li> <li>• Be mindful of the environment and ecology.</li> </ul> <p>AU-DECAVER14</p>	<p><b>⚠ AVERTISSEMENT</b></p> <p><b>RISQUE DE LIQUIDE HAUTE PRESSION</b> Pour prévenir des blessures graves ou la mort:</p> <ul style="list-style-type: none"> <li>• Un liquide hydraulique s'échappant sous pression des boyaux et de l'accumulateur peut avoir assez de force pour pénétrer la peau. Contacter immédiatement un médecin.</li> <li>• Enlever la pression dans le système avant de réparer, d'ajuster ou de brancher le système hydraulique.</li> <li>• Porter les équipements de protection pour les mains et les yeux pour chercher des fuites hydrauliques. Utiliser un morceau de bois ou un carton, ne jamais utiliser les mains pour détecter une fuite.</li> <li>• Garder tous les équipements en bon état.</li> </ul> <p>AU-DECAVER15</p>	<p><b>⚠ WARNING</b></p> <p><b>HIGH-PRESSURE FLUID HAZARD</b> To prevent serious injury or death:</p> <ul style="list-style-type: none"> <li>• Hydraulic fluid escaping under pressure from hose and accumulator can have enough force to penetrate the skin. If injured by escaping fluid, see a doctor at once.</li> <li>• Relieve pressure on system before repairing, adjusting or disconnecting.</li> <li>• Wear proper hand and eye protection when searching for leaks. Use wood or cardboard. Never use hands.</li> <li>• Keep all components in good condition.</li> </ul> <p>AU-DECAVER15</p>
<p><b>⚠ MISE EN GARDE</b></p> <p><b>CONSIGNES DE SÉCURITÉ</b> Les produits chimiques à usage agricole peuvent être dangereux. Un mauvais mélange ou mauvaise utilisation peut blesser ou endommager les gens, les animaux, les cultures, les terrains, les plans d'eau ou d'autres biens.</p> <p><b>SOYEZ PRUDENT</b></p> <ol style="list-style-type: none"> <li>1. Choisir le bon produit chimique pour le travail à effectuer.</li> <li>2. Manipuler et appliquer avec soin. Suivre les instructions inscrites sur les produits chimiques.</li> </ol> <p><b>SUIVRE LES LOIS ENVIRONNEMENTALES EN VIGUEUR</b></p> <ol style="list-style-type: none"> <li>1. Soyez soucieux de l'environnement et de l'écologie.</li> <li>2. Suivre les recommandations des autorités environnementales pour disposer des produits chimiques, bouillies de pulvérisation et bouillies de rinçage.</li> </ol> <p>AU-DECAVER12</p>	<p><b>⚠ CAUTION</b></p> <p><b>CHEMICAL SAFETY</b> Agricultural chemicals can be dangerous. Improper selection or use can injure people, animals, plants, soils, water source or other property.</p> <p><b>BE SAFE</b></p> <ol style="list-style-type: none"> <li>1. Select the right chemical for the job.</li> <li>2. Handle and apply it with care. Follow label information issued by the chemical manufacturer.</li> </ol> <p><b>OBSERVE ENVIRONMENTAL PROTECTION REGULATIONS</b></p> <ol style="list-style-type: none"> <li>1. Be mindful of the environment and ecology.</li> <li>2. Observe the relevant environmental protection regulations when disposing of raw chemical, tank mixed chemical, and chemical rinse water.</li> </ol> <p>AU-DECAVER12</p>	<p><b>⚠ AVERTISSEMENT</b></p> <p><b>POUR ÉVITER DES ACCIDENTS OU DES DOMMAGES MATÉRIELS:</b></p> <ul style="list-style-type: none"> <li>• Installer la barrière lors de l'entretien de la rampe ou de l'hydraulique. Ne pas passer sous la rampe tant que la barrière n'est pas installée.</li> </ul> <p>AU-DECAVER13</p>	<p><b>⚠ WARNING</b></p> <p><b>TO AVOID INJURY OR MACHINE DAMAGE:</b></p> <ul style="list-style-type: none"> <li>• Lock boom when servicing boom or hydraulics. Stay away from beneath the boom unless transport lock are installed.</li> </ul> <p>AU-DECAVER13</p>

# 3- SAFETY INSTRUCTIONS

**⚠ DANGER**



**RISQUE DE CONTAMINATION CHIMIQUE**  
PORTER LES ÉQUIPEMENTS DE PROTECTION REQUIS

- NE PAS RESPIRER DE VAPEUR
- NE PAS INGÉRER DE PRODUIT CHIMIQUE

- Ne jamais entrer en contact (peau, yeux, bouche, etc) avec les produits chimiques ou la bouteille.
- Porter des gants et un équipement de protection en tout temps.
- Laver les mains, l'équipement de protection et les vêtements après chaque pulvérisation.
- Rester éloigné des éclaboussures et des vapeurs.
- Ne pas respirer de vapeur.
- Porter le bon type de masque respiratoire lors de maintenance, travail et pulvérisation de produits chimiques.
- Chercher une assistance médicale immédiatement.
- Contacter un centre anti-poison.

UN MANQUEMENT À SUIVRE CES INSTRUCTIONS OCCASIONNERA UN RISQUE SÉRIEUR DE BLESSURE OU DE MORT.

**⚠ DANGER**



**TOXIC CHEMICAL HAZARD**

- WEAR PROTECTIVE EQUIPMENT
- DON'T BREATHE VAPOR
- DON'T INGEST CHEMICAL

- Do not allow chemical or solution to touch skin. Some can be absorbed through the skin.
- Wear rubber gloves and protective gear at all times.
- Wash your hands, protective gear and clothes after each spraying.
- Stay away from chemical splash and vapor.
- Do not breathe vapor.
- Chemicals are toxic.
- If in contact with eyes or mouth, read chemical manufacturers instructions and follow it.
- Seek medical attention immediately.
- Contact your poison control center.

FAILURE TO FOLLOW THESE INSTRUCTIONS WILL RESULT IN SERIOUS INJURY OR DEATH.

AU-DECAVER11



A120-0015

A120-0015

**Réglages des voies**

**IMPORTANT ! Ajustez votre vitesse de déplacement selon les conditions de terrain et diminuez votre vitesse lors de virages serrés pour garantir la stabilité et éviter le basculement du pulvérisateur.**

**NOTE ! Plus la voie est large, meilleure est la stabilité du pulvérisateur et meilleur est le comportement de la rampe**

A120-0013

A120-0013

**Supports de transport & réglage de la hauteur**

Pour obtenir le dégagement nécessaire en fonction des différentes cabines de tracteur tout en maintenant une hauteur minimale, vous pouvez régler la hauteur des supports de rampe.

En position haute: travail au champs  
En position basse: transport dans remorque

A120-0011

A120-0011

**PRESSION SYSTÈME**

**150 PSI MAX.**

**PRESSURE SYSTEM**

AU-DECPRSYST

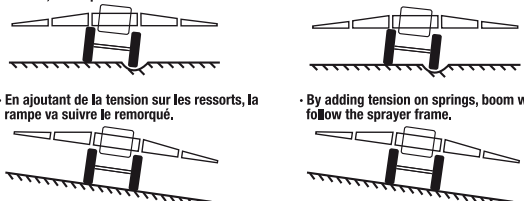
AU-DECPRSYST

**Ajustement du nivellement**

- En enlevant de la tension sur les ressorts, la rampe va suivre l'horizon.
- En ajoutant de la tension sur les ressorts, la rampe va suivre le remorqué.


**Levelling adjustment**

- By releasing tension on springs, boom will follow the horizon.
- By adding tension on springs, boom will follow the sprayer frame.




AU-DECAJUSTNVR

**⚠ AVERTISSEMENT**



**Risque de chute**  
Afin de prévenir des blessures sérieuses pouvant causer la mort:  
• Soyez prudent lorsque vous montez dans l'échelle ou sur la plate-forme.  
• Ne permettez pas aux personnes non-autorisées d'accéder à la machine.

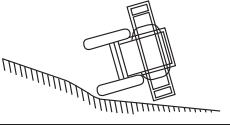
**⚠ WARNING**



**FALLING HAZARD**  
To prevent serious injury or death from falling:  
• Use care when climbing ladder or working on platform.  
• Keep unauthorized people off machine.

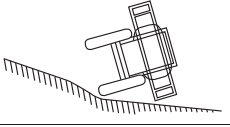
AU-DECAVER20

**⚠ AVERTISSEMENT**



• Pulvérisateur à haut dégagement muni d'un espace de roues étroit = Risques élevés de renversement sur un terrain vallonné et / ou dans les virages serrés  
• Risque de renversement avec la rampe ouverte d'un seul côté

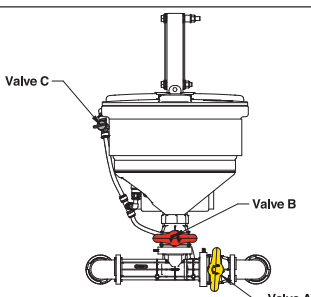
**⚠ WARNING**



• High clearance sprayer with narrow spacing = High risk of rollover on hill and / or in short turns  
• Risk of machine rollover with boom opened one side

AU-DECAVER21

**INSTRUCTIONS**



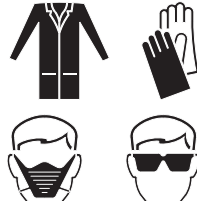
**VALVE A (Jaune/Yellow)**  
Mise en marche du prémélangeur  
Chemical inductor start-up

**VALVE B (Rouge/Red)**  
Transfert des produits  
For chemical transfer

**VALVE C (Gris/Grey)**  
Dilution des produits  
Chemical mix

**Note :** Le réservoir doit être vide lors du transport  
The tank must be empty during transport

**TOUJOURS PORTER LES ÉQUIPEMENTS DE SÉCURITÉ REQUIS**  
**ALWAYS WEAR PROTECTIVE EQUIPMENT AND CLOTHING**



AU-DECPREM7G

**AVERTISSEMENT**

**Vanne de contrôle du débit**

La vanne de contrôle a été ajustée en usine pour un rendement optimal. **NE PAS CHANGER** le réglage du contrôle de débit. Cela peut faire augmenter la révolution (RPM) du moteur et causer des bris.

**WARNING**

**Flow regulator**

The control valve is adjusted at the factory for optimal performance. **DO NOT CHANGE** the flow control setting. This can increase the engine revolution (RPM) and cause damage.

AU-DECVCD

### 4.1 - Recommended Tractors

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The operating power specifications suggested below are based on normal operating conditions and do not apply to all situations.

**Requirements:**

1. The tractor must be equipped with a 7-pin trailer light connector for the electrical connection of the warning lights.
2. The tractor must have an oil flow of at least 36 gpm: an oil flow of 13 gpm is required for the centrifugal pump and 5 gpm for the boom function distributor at a pressure of at least 16.5 Kpa (2400 lb/po2)
3. The tractor must have at least 2 auxiliary distributor connectors, additional outlets may be necessary for special options.
4. The tractor must be equipped with a hydraulic system with a low-pressure return line (less than 100 psi).
5. The tractor must be equipped with a 12-VDC / 20-A power supply.
6. The tractor must have the power required according to ground types.



**NOTE ! Tractor category recommended according to the ground types: CAT II (>100 HP) for flat ground & CAT III (>170 HP) for uneven ground.**

7. The tractor must be equipped with a middle tow bar chain bracket that can support the safety chain load.
8. For adequate and safe operation, the tractor flow rate must be adjustable. If this is not the case, check with the tractor manufacturer that the flow feeding the centrifugal pump is not greater than 13 gpm.
9. Check that the oil flow for the ramp is at least 6 gpm without however exceeding 24 gpm.

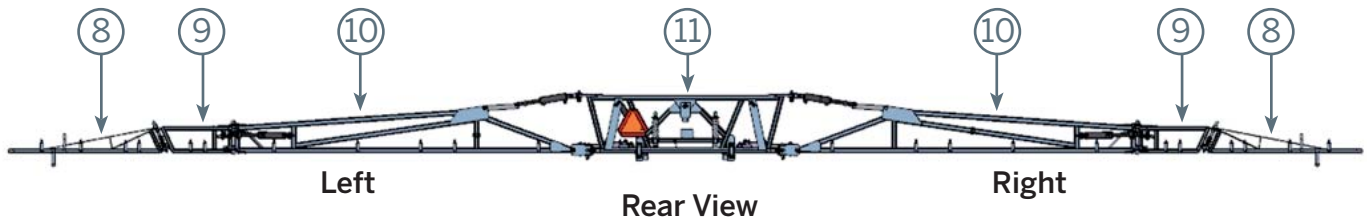


# 4- SPRAYER DESCRIPTION

## 4.2 - Description and Components



1. Hitch
2. Auxiliary rinse tank
3. Clean water tank—cleaning water
4. Main tank
5. Front boom support
6. Suction valves and filter assembly
7. Lifting



8. Break-a-way
9. Secondary
10. Main
11. Center
12. Boom section (segment) valve (#1 left)
13. Valves for hydraulic systems
14. Line filter





### 5.1 - Lights for road circulation

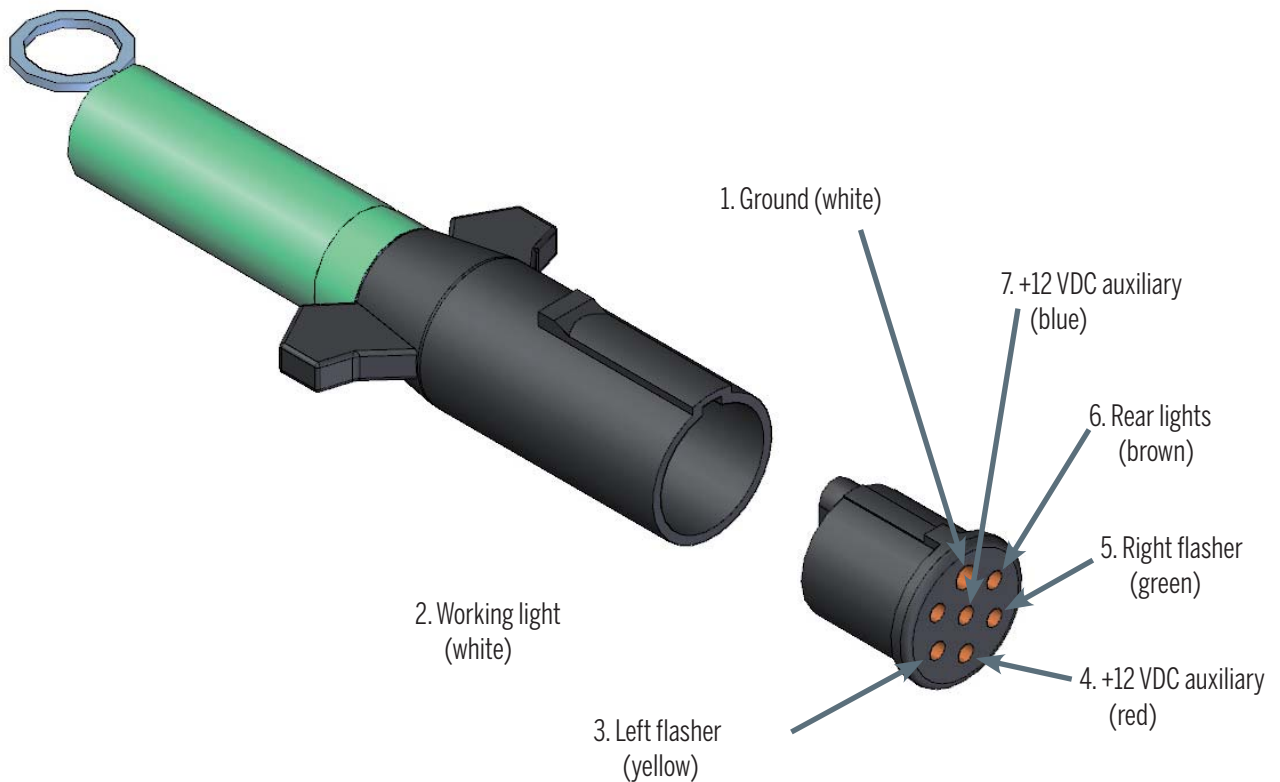
When driving on public roads, the cable with a connector for lights (A) must be connected to the tractor. Hazard lights and road signs required are provided. Brake lights are not included.



#### Connection for air suspension (optional)

The power of the air suspension compressor is connected to the tractor by 7-pin connection plug. The terminals reserved for the air suspension are:

- #1: ground (white)
- #2: +12 Vcc (red)
- #7: +12 Vcc (blue)

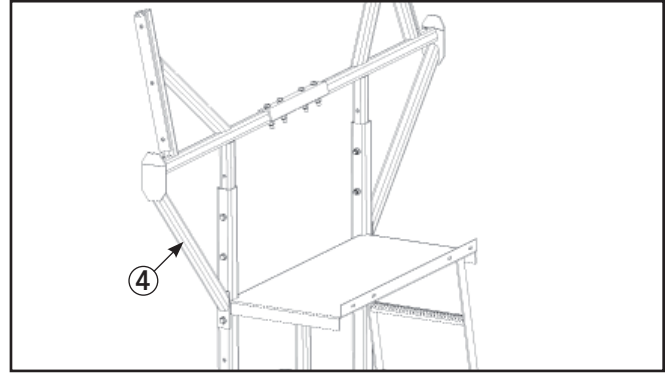


## 5- SPRAYER INSTALLATION

### 5.2 - Sprayer Coupling

#### Things to do upon initial installation :

- Remove the boom fasteners used during transport (1).
- Remove the fastener maintaining hoses and cables on the tow bar during transport (2).
- Remove the lifting stopper (3).
- Move the front boom support in the upper position (4).



Ensure that the connections are functional before moving the sprayer from one place to another in order to be able to move the boom if necessary.

#### Height adjustments

- Adjust the height of the hitch so that the sprayer slopes toward the front about 1" to 2" along the length of the frame to allow for proper drainage of the tank.
- Add shims between the tractor tow bar and the sprayer clevis in order to remove the vertical clearance of the sprayer and improve spraying quality. Install a 1-1/4" coupler knuckle pin.
- Secure the safety chain to the tractor in the brackets provided.



## 4- SPRAYER INSTALLATION

### 5.3 - Connection of hydraulic hoses to the hydraulic system of the tractor



**WARNING !** Before applying pressure to the hydraulic system, consult the Adjustment and Settings section. An incorrect adjustment to the hydraulic system can cause overheating and damages to the tractor. Different adjustments are required depending on the type of hydraulic circuit of the tractor.



**DANGER! The pump must not be run dry.**

Before starting the pump, the inlet line and pump must be filled with liquid and all discharge lines must be open. The pump must not be run unless it is completely filled with liquid because there is a danger of damaging the mechanical seal, which depends on the liquid for its lubrication.



**DANGER! Secondary Circuits**

Secondary circuits can be used for the spray pump hydraulic pressure supply, but free dump returns should always be used with them. Standard tractor secondary return ports are even more restrictive than primary return ports. When shutting off the pump, move the selector to the FLOAT position to allow the centrifugal pump to come to a stop gradually.

#### Hydraulic outputs of tractors

The hydraulic outputs of the tractor are usually situated in the back of the tractor. The number of outputs depends on the individual tractor model. They are usually numerically identified 1, 2, 3. (figure 9)

The outputs are organized in groups of two. One is for the oil pressure and another for the oil return. These outputs are identified with a retracted or extended cylinder.

(figure 10 & 11)

The symbols represented in these images are for reference only. The symbols on the tractor may vary depending on the model.

#### Hydraulic hose hook up

The hydraulic hoses on the sprayer are color-coded based on their hydraulic functions:

- **Blue:** Hydraulic motor of the sprayer pump
- **White:** Electro-hydraulic distributor of boom functions
- **Green:** Hydraulic wheel spacing (option)

For each function the number of tie wrap on hose indicates:

**1 tie wrap:** Oil outlet

**2 tie wrap:** Oil return

**If the lever or command switch in the tractor is actioned to the front:**

Hoses with one attachment must be installed on the retracted side

(Image 10 - A)

Hoses with two attachments must be installed on the extended side

(Image 11 - B)

**If the lever or command switch in the tractor is actioned to the bottom:**

You must inverse the hook up of the hoses, which means:

Hoses with one attachment must be installed on the extended side (Image 11 - B)

Hoses with two attachments must be installed on the retracted side (Image 10 - A)

#### Pump hydraulic motor (blue attachments)

We suggest you hook up the hydraulic hoses of the pump (blue tie-wrap) to the primary electrohydraulic outlet #1 of the tractor.



**IMPORTANT !** The oil return of the pump (2 blue attachments) must be hooked up directly to the oil tank of the tractor.

#### Boom function hydraulic distributor (white attachments)

It is recommended to connect the hydraulic hose of the boom's hydraulic distributor to the tractor's #2 distributor.

Additional functions may be connected to the tractor's other available distributors.

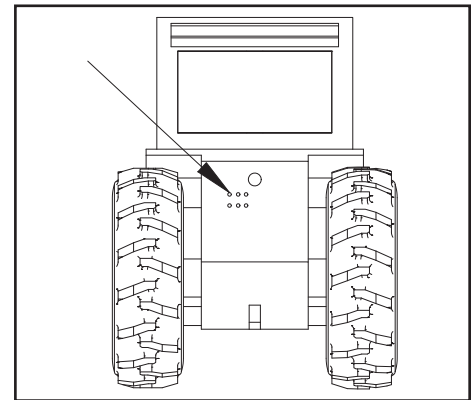
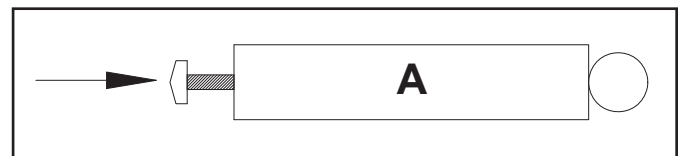
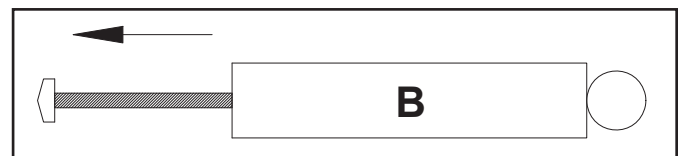


Figure 9



Retracted, oil pressure - figure 10



Extended, oil return - figure 11

## 5- SPRAYER INSTALLATION

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### Steering axles (optional)

The sprayer comes standard with a fixed axle. You can replace the fixed axle to a steering axle. The steering axle is available for a wheel track spacing 72".



### Connection of hydraulic hoses (steering axles)

Connect the couplings of the hydraulic hoses to those of the tractor. Pull the lever to see the direction of the wheels. If the actions are reversed, i.e., when the lever is pressed forward, the wheels go to the left instead of right, simply reverse the hydraulic hoses.



### Installation (steering axles)

1. Unscrews the wheel nuts
2. Remove the wheels
3. Remove the hubs
4. Remove the bolts on the axle
5. Remove the axle
6. Place the steering axle
7. Tighten the bolt of the axle
8. Make sure that the axle is perpendicular to the frame
9. Replace hubs
10. Replace the wheels
11. Tighten wheel nuts

### Electrical harness

The harnesses must be routed inside the cab to be connected to various controls. Consult the operator's manual of the tractor for the appropriate location.





### 5.4 - Coupling and uncoupling to the Tractor

#### Coupling to the Tractor

- Install the coupler knuckle pin.
- Secure the safety chain to the tractor.
- Remove the jack and place it in the storage rim.
- Connect all hydraulic couplings.
- Connect the tractor connectors.

#### Uncoupling the Sprayer

Before you proceed with uncoupling the sprayer, clean the hoses, the inside of the tank, and the whole sprayer in order to avoid contamination hazard by contact with the sprayer. For the sprayer equipped with air suspension, empty the air tank and leave the drain open.

- Install the jack in uncoupling position and slightly lift the sprayer.
- Disconnect all hydraulic couplings.
- Disconnect the tractor connectors.
- Remove the coupler knuckle pin.
- Detach the safety chain from the tractor.
- Slowly drive the tractor away from the sprayer.



**IMPORTANT !** Should the equipment be unstable, use wheel blocks to prevent the sprayer from moving.



**IMPORTANT !** To prevent the sprayer from tipping over, do not uncouple when the boom is extended.



## 5- SPRAYER INSTALLATION

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### 5.5 - Adjustment of the wheel track spacing (optional)

---

The sprayer comes standard with a 90" to 120" manual adjustable wheel spacing. Tires are mounted with V bars pointing backwards to reduce wear and vibration. In addition, at the back of the tire, the V-shaped bars funnel dirt and debris to the middle of the tire to prevent them from falling on crop plants.

#### Tire load:

320 / 90 R46	52 psi
380 / 90 R46	58 psi

#### Manual adjustment of the wheel track spacing.

1. The sprayer tank must be empty to perform this procedure.
2. Measure the wheel track spacing.
3. Make a mark with a pencil on the moving part near the fixed part.
4. Calculate the difference between the current spacing and the spacing desired, and divide by two to obtain the distance by which the axle must be moved.
5. Unscrew the lock nuts of the 4 set screws located under the axle with a 1-1/8" wrench. Then, unscrew the set screws with a 3/4" wrench. Make sure the set screws will not prevent the inner tube from sliding inside the 7" x 7" outer tube.
6. Move the axle to the desired position.
7. Once completed, tighten the 4 set screws firmly and lock them in place with the lock nuts.



**WARNING !** Adjustment of the wheel spacing must be done with empty tanks.



### 5.6 - Hydraulic adjustment of the wheel track spacing (optional)



**WARNING !** Adjustment of the wheel spacing must be done with empty tanks.

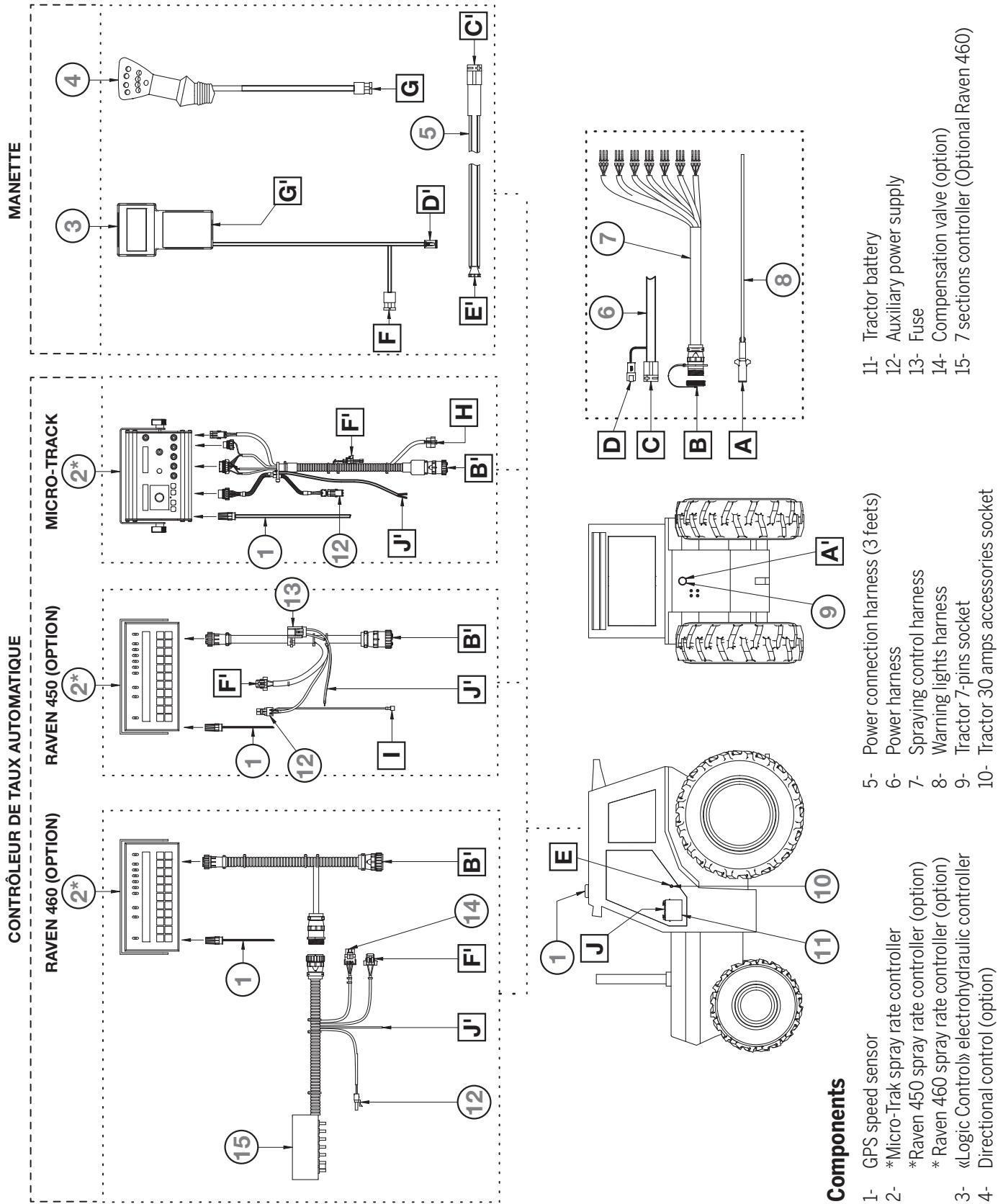
1. Unscrew the lock nuts of the 4 set screws located under the axle with a 1-1/8" wrench. Then, unscrew the set screws with a 3/4" wrench. Make sure the set screws will not prevent the inner tube from sliding inside the 7" x 7" outer tube.
2. Locate the 8 grease fittings. Grease the axle before opening. It is also possible to apply grease when the inner tubes are fully extended using a brush and bulk grease.
3. Tubes must only be extended while moving forward. Plan a distance of about 18 meters minimum on a flat surface to perform the extension under ideal conditions. Extension can be performed while turning, but a greater distance might be required to reach full wheel track spacing.
4. Drive at approximately 2 km/h and apply hydraulic pressure to the cylinders to increase or decrease wheel spacing. The hydraulic system is designed in parallel, so the side with less resistance will open or close first.
5. If you increase wheel spacing from the minimum (60") to the maximum (120"), or decrease it from 120" to 60", allow time for cylinders to open or close to the maximum. If you need wheel track spacings other than 60" or 120", follow these steps:
6. Space the wheels out enough to insert the spacer tubes on fix part of the axle (female) to block them at required spacing (spacer tubes provided will yield a minimum spacing of 90"). Spacer tubes can be shortened to get a minimum spacing other than 90".
7. Secure the spacer tubes inside the female tubes.
8. Decrease wheel spacing up to the spacer tubes.
9. Spacer tubes can remain in place or be removed. Before removing spacers, you may need to slightly release the cylinder pressure to free them.
10. Once completed, tighten the 4 set screws firmly and lock them in place with the lock nuts.



**IMPORTANT !** Wheel track spacings of a minimum of 90 inches is recommended for booms of 80 feet or longer. The wider the wheel base, the better stability and boom function.

# 5- SPRAYER INSTALLATION

## 5.7 - Installation with a spraying console





## 5- SPRAYER INSTALLATION

The power harness (6) and the sprayig harness (7) must be brought inside the cabin of the tractor. Consult the tractor manual for the correct place.

Install the spray rate controller (2) inside the cabin. Refer to the console manual for installation instructions. Secure the connections between the console and the harness supplied with the sprayer console.

Install the electrohydraulic console (3) to the inside of the cabin. Refer to the Logic Boom manual (#A120-0023) for installation instructions.

Install the GPS speed sensor (1). Follow the recommendations from the speed sensor manual for installation and appropriate placement. Bring the harness inside the cabin and hook up the connector to the back of the sprayer console (2).

After installation of parts in the cabin, complete the following hook-ups.

**(Refer to the previous page for placement of each part)**

**A A'** Plug in the (8) in the 7 terminals plug in the tractor (9). This connection is for the distress lights and the street signals. It does not include function of the brake lights.

**B B'** Plug the (7) to the harness connector of the sprayer console.

**C C'** Plug the large gray power harness (6) to the gray (5).

**D D'** Plug the (3) to the small receptor of (6).

**E E'** Plug the 3 terminals connector of (5) to the (10). If your tractor is not equipped with a (10), an attachment kit is available to plug in to the accessory switch. This kit includes all the wires and connectors necessary, a 40 amperes disjoints and a solenoid relay. Option number PA01102.

**F F'** To use the spraying console button for the start/stop of the spraying (hold) , plug the connector of (3) to the connector of the (2).

**G G'** Plug the (4) in the DB25 port of the (3) (option)

**H H'** Plug in the foam marker (option)

**I I'** Plug in the small speed detector connector to the spraying console harness (console Raven 450)

**J J'** Plug in the (2) to (11).

Console	Positive (+)	Negative (-)
Micro Trak MT3405 / MT3407	white	black
Raven SCS 450/ 460	red	white

## 5- SPRAYER INSTALLATION

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### 5.8 - Installation without spraying console

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Without a spraying console, install the LogicControl hydroelectric console as described in the previous section and connect the spraying control harness to the rate controller. The spraying control harness responds to one of the two following standards:

A cable adaptor (A390-0016) allows a 22 branch sprayer to plug in 37 branch rate controller.

A cable adaptor (A390-0029) allows a 37 branch sprayer to plug in a 22 branch rate controller.

## 6.1 Hydraulic adjustment



**WARNING !** Never run the pump without water. The pump may get damaged if the pump and the ligne d'aspiration are empty. Be sure that the pump has water running through it before starting the hydraulic flow. **When stopping the directional valve, move the selector lever to the floating position to allow the flow of oil to stop gradually.** Before using the boom, it is important to hitch the sprayer to a tractor to prevent tipping. The hydraulic system of the tractor and of sprayer must be adjusted each time the sprayer is hitched.

### 6.1.1 Oil flow adjustment for the centrifugal pump (model HM1C – 13 gpm)

For adequate operation, it is necessary to adjust the hydraulic flow of the tractor. The centrifugal pump oil flow must be adjusted to 13 gpm or less. To do this, complete the following steps:



**IMPORTANT !** The oil distributor feeding the centrifugal pump must be adjustable. If this is not the case, check with the tractor manufacturer that the flow does not exceed 13 gpm and do not complete the following steps.

#### INSTRUCTIONS :

##### AJUSTEMENT DE SORTIE D'HUILE DU TRACTEUR POUR POMPE HYPRO 9306C-HM1C DE 13 GPM

- FERMER LA VANNE DE L'AGITATION
- FERMER TOUTES LES ÉLECTROVANNES DE LA RAMPE
- AVEC DE L'EAU DANS LE RÉSERVOIR, OUVRIR GRADUELLEMENT LA SORTIE D'HUILE DU TRACTEUR AFIN D'ATTEINDRE **105 LB/PO<sup>2</sup>** SUR LE MANOMÈTRE DE LA LIGNE DE SORTIE DE LA POMPE
- UNE FOIS ATTEINT, BLOQUER L'AJUSTEMENT DE LA SORTIE D'HUILE À CETTE POSITION «**13 GPM**»
- **NE JAMAIS SURALIMENTER LA POMPE AU-DELÀ DE CET AJUSTEMENT**

#### INSTRUCTIONS :

##### TRACTOR HYDRAULIC OUTLET ADJUSTMENT FOR A 13 GPM 9306C-HM1C HYPRO PUMP

- CLOSE THE AGITATION VALVE
- CLOSE ALL THE BOOM VALVES
- WITH WATER IN THE TANK, GRADUALLY OPEN YOUR TRACTOR HYDRAULIC VALVE UNTIL **105 PSI** IS INDICATED ON THE PUMP OUTLET LINE GAUGE
- BLOCK THE HYDRAULIC OUTLET LEVER ADJUSTMENT IN THIS POSITION AT “**13 GPM**”
- **NEVER OVERFEED THE PUMP ABOVE THIS ADJUSTMENT**

A120-0062

#### INSTRUCTIONS:

##### AJUSTEMENT DE SORTIE D'HUILE DU TRACTEUR POUR POMPE HYPRO 9306C-HM5C DE 17 GPM

- FERMER LA VANNE DE L'AGITATION
- FERMER TOUTES LES ÉLECTROVANNES DE LA RAMPE
- AVEC DE L'EAU DANS LE RÉSERVOIR, OUVRIR GRADUELLEMENT LA SORTIE D'HUILE DU TRACTEUR AFIN D'ATTEINDRE **140 LB/PO<sup>2</sup>** SUR LE MANOMÈTRE DE LA LIGNE DE SORTIE DE LA POMPE
- UNE FOIS ATTEINT, BLOQUER L'AJUSTEMENT DE LA SORTIE D'HUILE À CETTE POSITION «**17 GPM**»
- **NE JAMAIS SURALIMENTER LA POMPE AU-DELÀ DE CET AJUSTEMENT**

#### INSTRUCTIONS:

##### TRACTOR HYDRAULIC OUTLET ADJUSTMENT FOR A 17 GPM 9306C-HM5C HYPRO PUMP

- CLOSE THE AGITATION VALVE
- CLOSE ALL THE BOOM VALVES
- WITH WATER IN THE TANK, GRADUALLY OPEN YOUR TRACTOR HYDRAULIC VALVE UNTIL **140 PSI** IS INDICATED ON THE PUMP OUTLET LINE GAUGE
- BLOCK THE HYDRAULIC OUTLET LEVER ADJUSTMENT IN THIS POSITION AT “**17 GPM**”
- **NEVER OVERFEED THE PUMP ABOVE THIS ADJUSTMENT**

A120-0064

## 6- STARTING

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1. Do not use a restriction orifice at the motor entry (P) **(1 on figure 27)**.
2. Make sure to close and lock down the bypass adjusting screw in the hydraulic motor **(4 on figure 27)**.
3. Turn the suction valve to the right for suction from the main tank **(figure 28)**.
4. Check if the water is getting to the pump and the filter.
5. Check if there are any leaks.
6. Start the tractor. Leave the lever in the neutral position to allow the hydraulic oil to warm-up (10-15 min). Reach the operation RPMs.
7. Be sure that the oil flow control of the #1 (primary) distributor on the tractor is to minimum (turtle position).
8. Start the hydraulic pump of the tractor.
9. Increase very slowly the flow of the #1 distributor of the tractor while observing the spraying pressure changes on the main pressure gauge. **(figure 29)** The sprayer pressure must never exceed 150 psi.
10. **Do not increase the hydraulic flow from now on.** If the flow is increased, it may damage the centrifugal pump system.
11. Restart the tractor's hydraulic pump.
12. Open the agitation circuit to the desired level.
13. If the spraying pressure is too high, reduce the tractor's hydraulic flow to the desired pressure.



**IMPORTANT !** If the flow disturbed during operation or if a tractor change is made, the hydraulic flow rate should be newly calibrated.

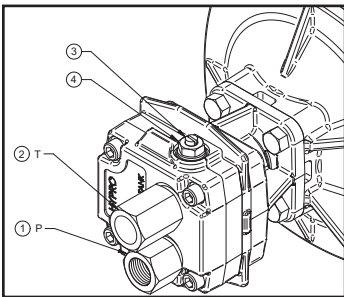


Figure 27

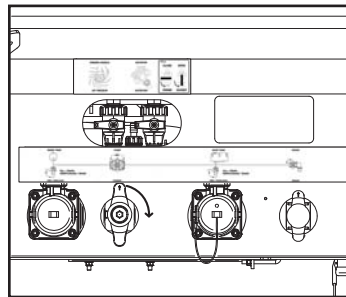


Figure 28

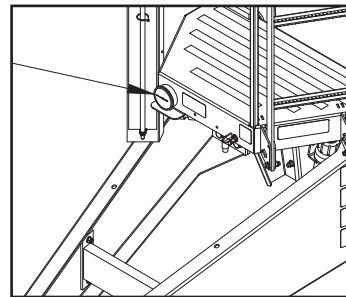


Figure 29

## 6- STARTING

### 6.1.2 Hydraulic adjustment for the hydraulic outlet (hydraulic block)



**IMPORTANT !** Refer to section 6.1.3 for oil flow adjustment of the booms

#### Open Circuit (up to 5 gpm - factory setting)

1. The DMP valve must be in the DMP A position.
2. Start the tractor. Leave the lever in neutral and wait for normal working conditions (temperature).
3. Put the lever in the lowest position to allow oil to reach the hydraulic valve.
4. Test the booms for necessary functions.

#### Closed Circuit with pressure compensator

1. The DMP valve must be in the DMP B position.
2. Start the tractor. Leave the lever in neutral and wait for normal working conditions (temperature).
3. Put the lever in the lowest position to allow oil to reach the hydraulic valve.
4. Test the booms for necessary functions.

#### Closed circuit with load sensor

1. The DMP valve must be in the DMP A position.
2. Refer to section 6.1.3 for flow adjustment.
3. Test the booms for necessary functions.



**IMPORTANT !** For a closed circuit with a pressure compensator, the pressure of the safety valve on the hydraulic bloc of the sprayer must be higher than that of the tractor. It is necessary, therefore, to screw the nut to its tightest adjustment on the safety valve.

#### Position DMP A:

Factory-preset position. The red button is pushed in.

#### Position DMP B:

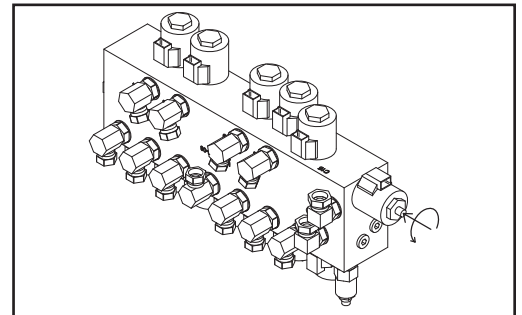
The red button is completely release.

#### To shift from position DMP A to position DMP B

Turn the red button counter-clockwise to release it.  
The red button is completely release. **(figure 30)**

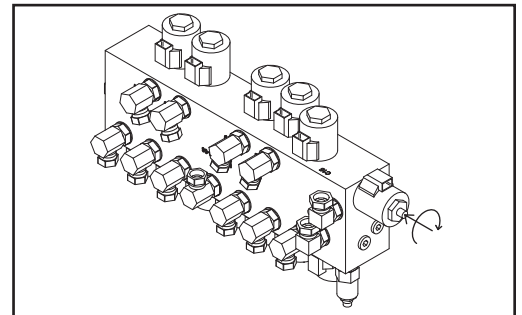
#### To shift from position DMP B to position DMP A

Turn and push the red button clockwise.  
The red button is now completely pushed in. **(figure 31)**



DMP A à DMP B

Figure 30



DMP B à DMP A

Figure 31

## 6- STARTING

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### 6.1.3 Oil flow adjustment for the booms

The oil flow for the booms is factory adjusted to 5 gpm. The control valve has been adjusted for optimal performance.



**WARNING !** DO NOT CHANGE the flow control setting. This can increase the engine revolution (RPM) and cause damage.



**IMPORTANT !** The oil flow from distributor feeding the hydraulic block of booms functions must be at least 6 gmp.



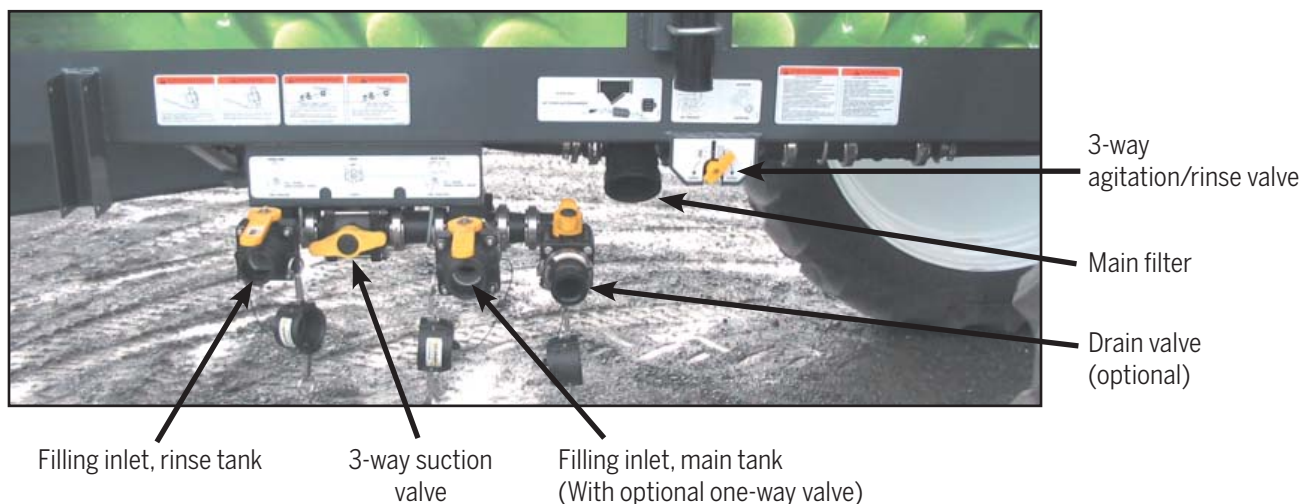
Before using the system for the first time, you must make sure that there is no air in the hydraulic circuit. The following procedure explains how to purge the system. Purge the system before using your sprayer for the first time, at the beginning of each spraying season and also after maintenance or repair works have been performed on the sprayer hydraulic system.

- Choose a place where there is enough space to completely unfold the boom.
- After activating the outlet on which the boom control system is connected, use manual controls and lift the center section of the boom to its highest point.
- Look on both sides to make sure that the boom sections are not lying on their supports anymore. If the boom sections are not high enough to clear the supports, use the left or right tilt buttons to lift the boom sections in order to clear the supports.
- When the supports are cleared, unfold both primary sections at the same time.
- When primary sections are unfolded, fold them and then unfold them a second time.
- When primary sections are unfolded again, do the same with the secondary sections: unfold, fold and unfold a second time, both sides at the same time.
- After that, lift the left tilt to its highest point, lower it completely, lift it again, and then adjust it so that this boom section will be horizontal.
- Do the same with the right tilt.
- Finally, lower completely the center part of the boom, lift it completely and lower it once again.
- Purge is finished. You will now do a hydraulic pressure test. Lift the center section of the boom and while it is going up, check the pressure reading on the console. While cylinder is activated, pressure should be between 2600 and 2800 psi. If pressure is lower than 2600 psi, the hydraulic flow of that tractor's outlet could be too low. Increase a little the hydraulic flow and repeat the test.
- When pressure (and flow) has been corrected, lift completely the center part of the boom if it is not already done, fold both secondary sections at the same time, fold both primary sections at the same time and lower center part for approximately 4 seconds. Look at the boom sections in their supports. If they do not perfectly lie in the supports, use the tilt buttons to lower them.

Your sprayer is now ready to work.

## 6.2 - Spray Circuit

Control valves are all located on the left side of the sprayer between the ladder and the tire.



#### Filling of the main and rinse tanks using the external inlet

Filling process: The filling inlet is designed to safely transfer the liquid from a water source to the sprayer using a 2-way cut-off valve.



**WARNING !** Never leave the filling valve unattended while open to prevent any spillage from the main tank. Filling must be done in an appropriate location or with a supply tank that allows for the safe handling of products. Never connect a filling hose to a fire hydrant or any other drinking water source without authorization from local authorities.

#### Filling procedure:

1. Remove the cap and connect the filling hose with the quick-connect fittings.
2. Start the transfer pump at idle speed (refer to the transfer pump operator's manual for instructions).
3. Select the tank to fill with the sprayer filling valve (main tank or rinse tank).
4. Open the valve of the filling hose.
5. Engage the motor at full speed.
6. After filling the tank, close the sprayer valve and the filling hose valve.
7. Stop the transfer pump immediately.
8. Disconnect the filling hose and put the cap back onto the sprayer valve.



**IMPORTANT !** If the chemicals are diluted directly into the tank, it is suggested to put half the required amount of water, add chemicals, and then proceed to complete the filling with the amount of water required for treatment. Always complete the liquid transfer with clean water to avoid contamination.



## 6- STARTING

### 6.2 - Spray Circuit


#### Filling of clean water tank

Do not leave the rinse water in the sprayer for a long period of time as high temperatures can cause potentially harmful microorganisms to develop.



### 6.3 - Chemical inductor


#### 6.3.1 Adding chemical products with the chemical inductor (option)

 **WARNING !** The pre-mixer must always be empty during transport. If the valve on the pre-mixer is not closed or completely sealed, the solution from the reservoir will be transferred to the pre-mixer tank and can cause spilling. With wettable powders, certain types should be diluted in a pre-mix before transferring. Others can be added, in small quantities, directly to the pre-mixer without previous dilution. Follow the chemical manufacturer's instructions. Avoid spilling and splashing when pouring products. Never activate the rinsing nozzle without a container covering it. Rotation of the rinsing nozzle can wet and contaminate people close to the equipment. While operating, check the volume of liquid transferred to the main tank taking into consideration that liquid had been added to the tank to avoid spilling of the sprayer tank.

The pre-mixer is a piece of equipment developed to facilitate and speed up transferring phyto-sanitary products into the main tank. The 26 liter tank is placed to the left of the sprayer close to the command valves.

It is equipped with a rinsing nozzle to clean empty containers. Each container must be rinsed at least three times to be sure that there is no residue remaining. The first rinsing can be completed with the sprayer solution from the main tank. The second and third rinsing must be performed with clean water from the optional rinsing tank or an external clean water source.

Clean all containers immediately after emptying to avoid residue drying in the container.

 **WARNING !** Beware of splashing when rinsing containers. Wear required protective equipment. Never operate the red lever without a container being installed on the rinsing nozzle. The rotation of the rinsing nozzle can wet and contaminate people standing near the equipment.

#### To lower the pre-mixer:

- Hold the handle and press the lever in the back to unlock it. **(figure 35)**
- Lower the pre-mixer toward you to its lowest position. **(figure 36)**

#### To raise the pre-mixer:

- Hold the handle and lift the pre-mixer until it clicks in place.

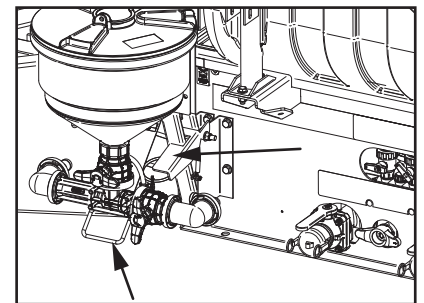


Figure 35

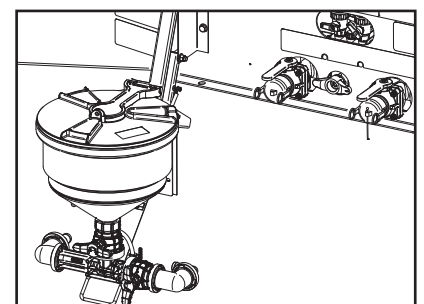


Figure 36



## 6- STARTING

### Procedure:

The sprayer pump must be working to at least 100 lb/in<sup>2</sup> for sufficient operational speed.

1. Fill the main tank with half of the required quantity of water.
2. Turn on agitation valve to desired level.
3. Lower the pre-mixer.
4. Open the **A valve (YELLOW)**. Minimum of 40 psi required.
5. Open the **B valve (RED)**.
6. Open the **C valve (GREY)** as needed to dilute the products.
7. Pour the liquids or powders in the pre-mixer tank.
8. Place the product container upside down over the rinsing nozzle at the bottom of the pre-mixer tank.
9. Hold the container with two hands and push to activate the rinsing valve for 30 seconds or more until the container is visibly clean.
10. Leave the C valve open for 30 more seconds to rinse the container of all residues.
11. Close the **C valve (GREY)**.
12. Let the pre-mixer tank empty completely.
13. Close the **B valve (RED)**.
14. Close the **A valve (YELLOW)**.
15. Raise the pre-mixer to its highest position.
16. Complete the filling of the tank with the rest of the required quantity of water.

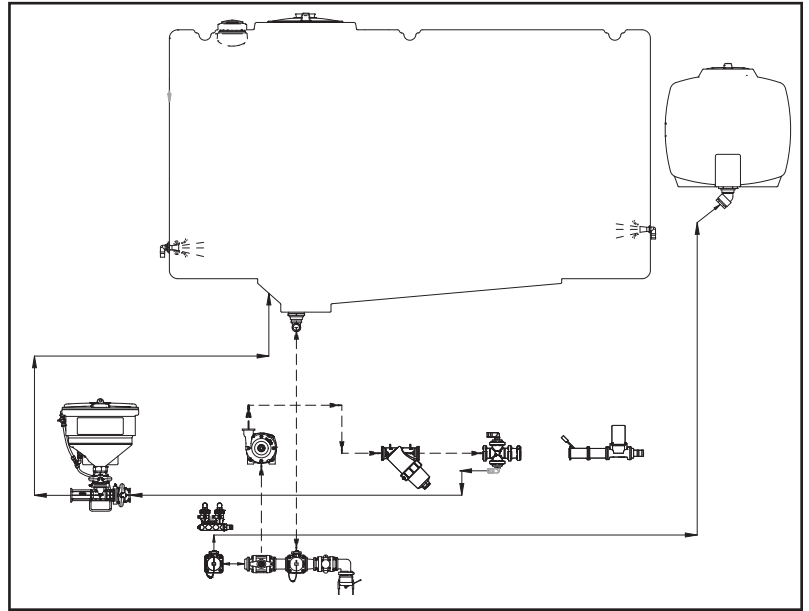
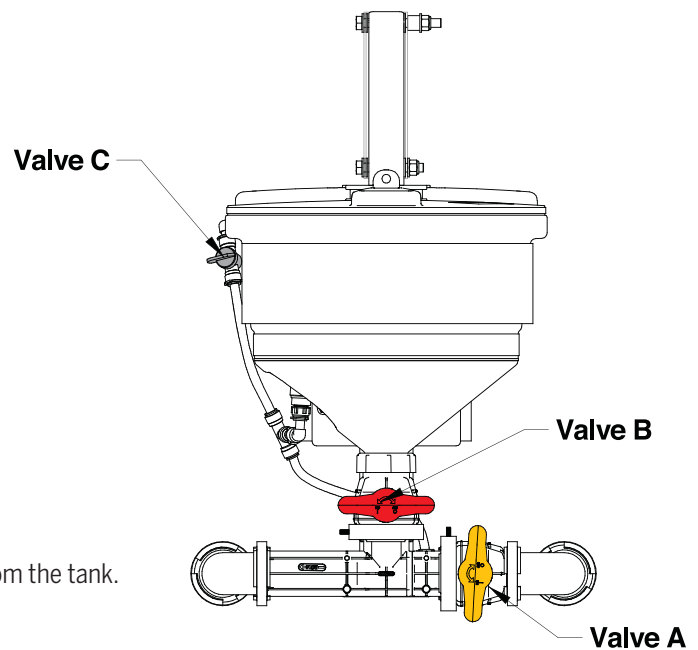


Figure 37

### 8.7.3 Rinsing of the pre-mixer

1. Close all the valves of the pre-mixer before starting the pump.
2. Turn the suction valve towards the rinsing tank.
3. Start the pump.
4. Open the **A valve (YELLOW)**.
5. Open the **B valve (RED)**.
6. Open the **C valve (GREY)**.
7. Leave the C valve open for a few minutes to rinse the residues from the tank.
8. Close the **C valve (GREY)**.
9. Let the tank of the pre-mixer empty completely.
10. Close the **B valve (RED)**.
11. Close the **A valve (YELLOW)**.



**WARNING !** Wear appropriate protective gear. This protective gear includes safety visors, masks, gloves and water-repellant clothing.

## 6.4 - Use of the rinsing tank and nozzles (optional)

Rinsing tank: it is important to rinse the sprayer after each use or every change of product in the tank. In most cases it is suggested to rinse and clean the sprayer in the field to minimize the handling of excess water from the rinsing process. In some cases it is possible to add a neutralizing or cleaning product to the tank to dissolve and neutralize chemicals. Contact your chemicals supplier to get the right type of neutralizing product according to the type of chemicals used. Read and follow the manufacturer's recommendations when using a tank cleaner. Take special precautions to avoid high concentrations of chemicals in one location.



**WARNING !** Always wear protective equipment. Fill the rinse tank with clean water only. Never leave the 3-way valve half closed; always turn until you reach the mechanical stop. Consult an agronomist to determine the proper way to dispose of the rinse slurry. Tank cleaning products can put herbicides back into circulation and can damage crops.



**IMPORTANT !** For first use following the rinsing of the tank, note that there is water, not slurry, in the boom hoses. To prevent algae growth inside the rinse tank, always empty the rinse tank when the sprayer is not used. Use the pump to draw air between each rinsing step. The rinse tank can also be used as an additional reserve of water to complete a treatment. Transfer water into the main tank (same procedure as when rinsing the tank) and add the correct amount of chemicals for the amount of water transferred.



**WARNING !** Never add a rinse product to the tank before the end of spraying. Some cleaning product could return to the main tank and contaminate the spray slurry through the agitation circuit and the purge line.

### Procedure for cleaning the tank:

1. Ensure the rinse tank is filled with clean water. The spray tank must be completely empty.
2. Stop the pump, turn the 3-way suction valve in the "Rinse tank" position and activate the lever of the rinse valve to "ON" (red handle) on the control.
3. Start the pump at full speed until reaching 2/3 of tank capacity.
4. Return to spray position and empty the tank again. Apply the rinse slurry to the fields that have just been sprayed. For the first few minutes, keep in mind that the product in the hoses and coming out of the nozzles is still concentrated. Consult an agronomist to determine the proper way to dispose of the rinse slurry. Operate all sprayer equipment such as the pre-mixer, nozzle kits, etc.
5. Clean all filter cartridges and repeat steps 2 through 4 again twice, then stop the pump.
6. Clean all filter cartridges and drain the suction line.



**WARNING !** If a cleaning product is used, add it at step # 3 and continue with the procedure. Never dissolve a cleaning product in the rinse tank without using it within minutes to prevent contamination of the main tank during spraying. Remove all stagnant slurry, e.g. at the filling inlet and level indicator (figure 1). Purge all the pipe sections of the boom to prevent accumulation and contamination hazards (figure 2).



Figure 1



Figure 2

## 6- STARTING

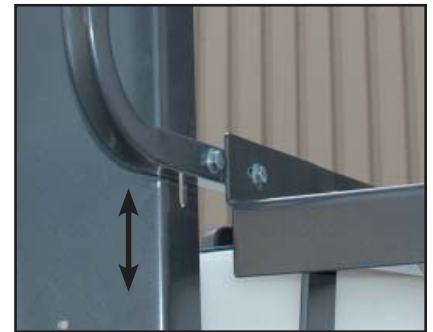
### 6.5 - Procedure for cleaning the spray boom and spray control

1. Ensure the rinse tank is filled with clean water.
2. Stop the pump and turn the 3-way suction valve in the "Rinse tank" position.
3. Start the pump and continue to spray until water comes out of the nozzles.
4. Stop the pump and return to spray position.

#### Liquid level indicator

The liquid level indicator is provided only as a guide; it gives a general idea of the actual volume in the tank. For a more precise measure of liquid, use the controller's tank volume function. The filling inlet can also be equipped with a flow indicator to obtain precise information about the volume of liquid added to the tank.

The level indicator support can be moved vertically to compensate for discrepancies between tanks.

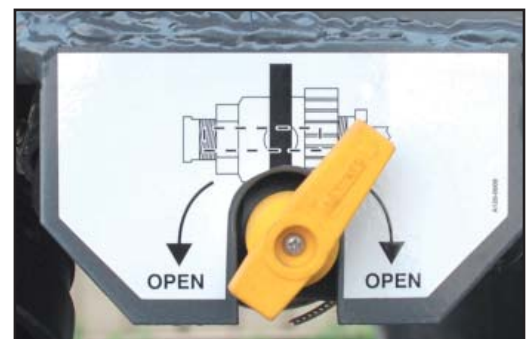


### 6.6 - Use of a rate controller

The following guidelines apply to all rate controllers. The terms used may vary from brand to brand but the procedure is the same.

#### Initial adjustment of the system

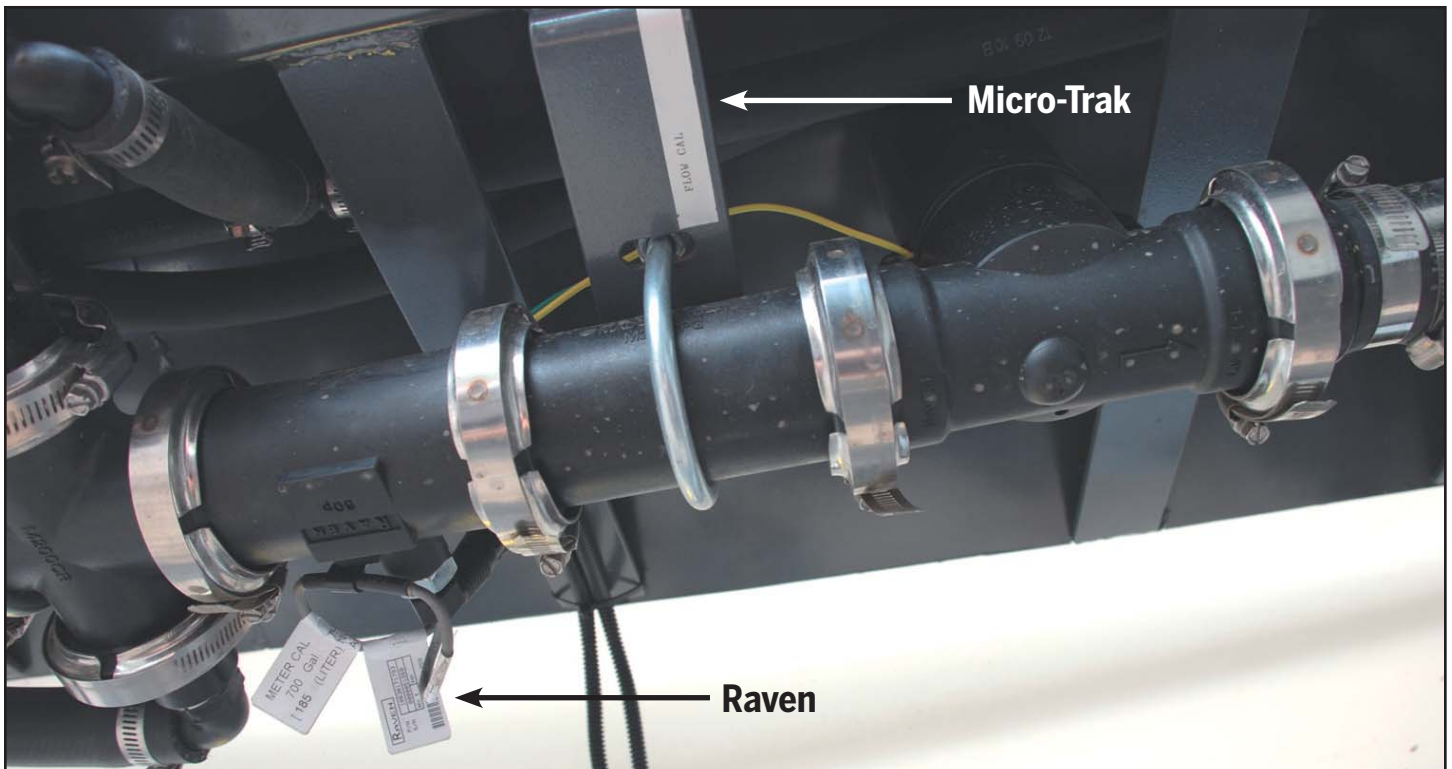
1. Fill the tank with water only.
2. Turn the boom master switch and each of the boom contact switches to OFF.
3. Place the controller in manual mode.
4. Turn the ON/OFF switch to ON.
5. Check whether the boom width, speed calibration, flow calibration, control valve, and programmed rates in the console are correct.
6. Operate the pump at normal operating speed (see the Hydraulic Adjustment for Spraying Operation section).
7. Check that each ON/OFF boom valve functions and that no nozzle is clogged by using each of the boom's ON/OFF contact switches.
8. Turn all boom ON/OFF contact switches to ON.
9. Hold the control valve contact switch in the increase position (INC/+) until the pressure reaches maximum. This ensures that the mechanical control valve is fully open. Verify that the maximum pressure does not exceed the maximum system pressure. See the main pressure gauge attached to the front platform.
10. Adjust the manual valve of the agitator to obtain the desired agitation.  
Note: When the tank is near empty, it may be preferable to reduce or completely close the agitation valve to prevent foam from forming inside the tank, which could adversely affect pump suction.
11. Hold the control valve contact switch in the decrease position (DEC/-) until the pressure reaches minimum. This ensures that the mechanical control valve is fully closed. Check that the minimum pressure and FLOW rate can be reached.



## 6- STARTING

To calibrate the console, refer to the manual corresponding to each of the controllers that can be used with this type of equipment. It is best to unplug the Automatic Start/Stop connector before beginning controller calibration. In order to facilitate maintenance, prevent data loss and the replacement of the controller, calibration data should be transcribed in the manual under the relevant section according to the type of controller used.

The flow indicator is located near the main filter. The calibration value is located on the cable (Raven controller) or a metal sticker (Micro-Trak) to find the calibration number (calibration value for the rate controller).



# 7- CALIBRATION

## 7.1 - Calibration value for Raven controller SCS series (SCS440-SCS450-SCS460)



TEST : \_\_\_\_\_



TIME : \_\_\_\_\_



TANK VOLUME : \_\_\_\_\_



FLOW 2 : \_\_\_\_\_



FLOW 1 : \_\_\_\_\_



VALVE CAL. : \_\_\_\_\_



FLOW CAL. : \_\_\_\_\_



SPEED CAL. : \_\_\_\_\_



BOOM CAL. : \_\_\_\_\_



BOOM SELECTION : \_\_\_\_\_



BOOM SELECTION : \_\_\_\_\_

### SELECTION WIDTHS

Section 1 : \_\_\_\_\_

Section 2 : \_\_\_\_\_

Section 3 : \_\_\_\_\_

Section 4 : \_\_\_\_\_

Section 5 : \_\_\_\_\_

Section 6 : \_\_\_\_\_

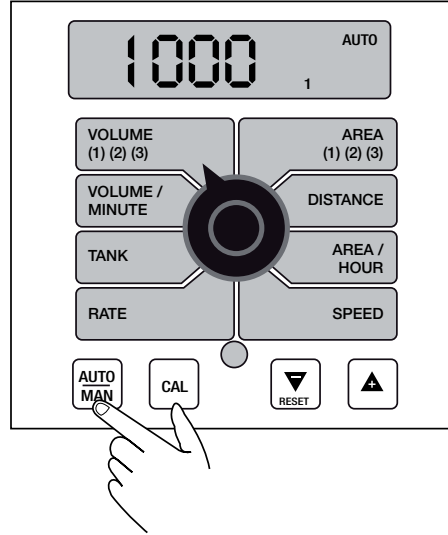
Section 7 : \_\_\_\_\_

## 7.2 - Calibration value for Micro-Trak controller F series (SprayMate-MT3405F-MT3407F)

### Special calibration:

0
OFF
OFF
2

Fill Tank Size  
 Tank Set Point  
 Auto Shut-off On/Off  
 Auto Delay Time

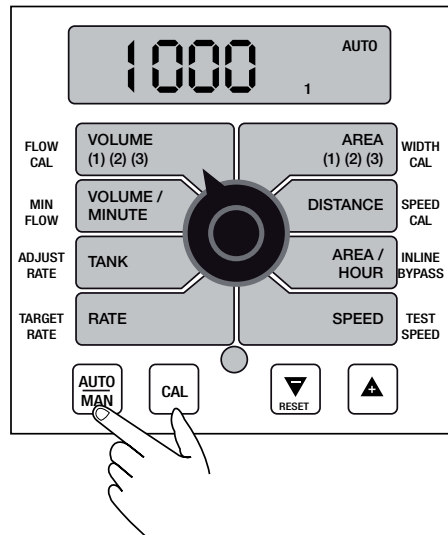


Units	0
Valve Voltage	OFF
Material	H2O
Valve Response Speed	2

Section 1 :	_____
Section 2 :	_____
Section 3 :	_____
Section 4 :	_____
Section 5 :	_____
Section 6 :	_____
Section 7 :	_____

### Calibration:


Flow Calibration  
 Minimum Flow  
 Adjustment Rate  
 Target Rate



Width Calibration	
Speed Calibration	
Inline / Bypass	
Test Speed	

## 7- CALIBRATION

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### 7.3 Sprayer Calibration

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The calibration of the sprayer is an important step in preparing phyto-sanitary treatment and is necessary in order to have efficient results. A good calibration is one of the steps that will guarantee a uniform application.

It is important to completely calibrate the sprayer at the beginning of the season, and also when the applying conditions change significantly (ex: before the plant sprouts vs after it sprouts, type of chemical used, type of nozzle, change tractor tires or change of tractor, etc) The calibration operation consists of measuring the application rate of the solution based on the base measures such as volume, length and time.

#### **«Action-Reglage» program in your area**

This program has two objectives :

- Increase the precision of phyto-sanitary product sprayers and increase the quality of their applications.
- Promote the correct use of pesticides in an agro-environmental approach in managing crop nuisances.

A well-calibrated sprayer is most economical, most efficient and safest. A decal is affixed on all new sprayers sold in Quebec, reminding all of the importance of calibration and regular maintenance of these machines.

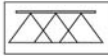
The «Action-Reglage» program is for Quebec residents and is based on mobile calibration workshops headed by accredited professionals.

Please visit your government website in your area in order to obtain instructions about setting accreditation.



$$A = \frac{B+C}{D}$$

# Sprayer Calibration



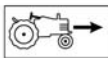
## Broadcast Application

Sprayer calibration (1) **readies your sprayer for operation** and (2) **diagnoses tip wear**. This will give you optimum performance of your TeeJet® tips.

### Equipment Needed:

- TeeJet Calibration Container
- Calculator
- TeeJet Cleaning Brush
- One new TeeJet Spray Tip matched to the nozzles on your sprayer
- Stopwatch or wristwatch with second hand

## STEP NUMBER 1



### Check Your Tractor/Sprayer Speed!

Knowing your real sprayer speed is an essential part of accurate spraying. Speedometer readings and some electronic measurement devices can be inaccurate because of wheel slippage. Check the time required to move over a 100- or 200-foot strip on your field. Fence posts can serve as permanent markers. The starting post should be far enough away to permit your tractor/sprayer to reach desired spraying speed. Hold that speed as you travel between the "start" and "end" markers. Most accurate measurement will be obtained with the spray tank half full. Refer to the table on page 124 to calculate your real speed. When the correct throttle and gear settings are identified, mark your tachometer or speedometer to help you control this **vital** part of accurate chemical application.

## STEP NUMBER 2

$$A = \frac{B+C}{D}$$

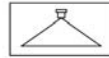
### The Inputs

Before spraying, record the following:

	EXAMPLE
Nozzle type on your sprayer. . . . .	TT11004 Flat Spray Tip
(All nozzles must be identical)	
Recommended application volume . . . . .	.20 GPA
(From manufacturer's label)	
Measured sprayer speed . . . . .	.6 MPH
Nozzle spacing . . . . .	.20 Inches



## STEP NUMBER 3



### Calculating Required Nozzle Output

Determine GPM nozzle output from formula.

**FORMULA:**  $GPM = \frac{GPA \times MPH \times W}{5,940 \text{ (constant)}}$

**EXAMPLE:**  $GPM = \frac{20 \times 6 \times 20}{5,940} = \frac{2,400}{5,940}$

**ANSWER:** 0.404 GPM

## STEP NUMBER 4



### Setting the Correct Pressure

Turn on your sprayer and check for leaks or blockage. Inspect and clean, if necessary, all tips and strainers with TeeJet brush. Replace one tip and strainer **with an identical new tip and strainer** on sprayer boom.

Check appropriate tip selection table and determine the pressure required to deliver the nozzle output calculated from the formula in Step 3 for your new tip. Since all of the tabulations are based on spraying water, conversion factors must be used when spraying solutions that are heavier or lighter than water (see page 125).

**Example:** (Using above inputs) refer to TeeJet table on page 5 for TT11004 flat spray tip. The table shows that this nozzle delivers 0.40 GPM at 40 PSI.

Turn on your sprayer and adjust pressure. **Collect and measure the volume of the spray from the new tip for one minute in the collection jar.** Fine tune the pressure until you collect .40 GPM.

You have now adjusted your sprayer to the proper pressure. It will properly deliver the application rates specified by the chemical manufacturer at your measured sprayer speed.

## STEP NUMBER 5



### Checking Your System

**Problem Diagnosis:** Now, check the flow rate of a few tips on each boom section. If the flow rate of any tip is 10 percent greater or less than that of the newly installed spray tip, recheck the output of that tip. If only one tip is faulty, replace with new tip and strainer and your system is ready for spraying. However, if a second tip is defective, **replace all tips on the entire boom**. This may sound unrealistic, but two worn tips on a boom are ample indication of tip wear problems. Replacing only a couple of worn tips invites potentially serious application problems.



### Banding and Directed Applications

The only difference between the above procedure and calibrating for banding or directed applications is the input value used for "W" in the formula in Step 3.

For single nozzle banding or boomless applications:

$W =$  Sprayed band width or swath width (in inches).

For multiple nozzle directed applications:

$W =$  Row spacing (in inches) divided by the number of nozzles per row.

$$A = \frac{B+C}{D}$$

# Drop Size Classification

Nozzle selection is often based upon droplet size. The droplet size from a nozzle becomes very important when the efficacy of a particular plant protection chemical is dependent on coverage, or the prevention of spray leaving the target area is a priority.

The majority of the nozzles used in agriculture can be classified as producing droplets in the range of fine to ultra coarse droplets. Nozzles that produce droplets in the finer to middle portion of the range are usually recommended for post-emergence contact applications, which require excellent coverage on the intended target area. This may include herbicides, insecticides and fungicides. Nozzles producing droplets

from the middle to coarser end of the range, while offering less thorough surface coverage, provide significantly improved drift control. These nozzles are commonly used for systemic and pre-emergence surface applied herbicides.

An important point to remember when choosing a spray nozzle that produces a droplet size in one of the eight categories is that one nozzle can produce different droplet size classifications at different pressures. A nozzle might produce medium droplets at low pressures, while producing fine droplets as pressure is increased.

Droplet size classes are shown in the following tables to assist in choosing an appropriate spray tip.

Category	Symbol	Color Code	Approximate Dv0.5 (VMD) (microns)
Extremely Fine	XF	Purple	≈50
Very Fine	VF	Red	<136
Fine	F	Orange	136-177
Medium	M	Yellow	177-218
Coarse	C	Blue	218-349
Very Coarse	VC	Green	349-428
Extremely Coarse	XC	White	428-622
Ultra Coarse	UC	Black	>622

Droplet size classifications are based on BCPC specifications and in accordance with ASABE Standard S572.1 at the date of printing. Classifications are subject to change.

## Turbo TwinJet® (TTJ60)

Nozzle	PSI									
	20	25	30	35	40	50	60	70	80	90
TTJ60-11002	C	C	C	C	C	M	M	M	M	M
TTJ60-110025	VC	C	C	C	C	C	C	M	M	M
TTJ60-11003	VC	C	C	C	C	C	C	C	M	M
TTJ60-11004	VC	C	C	C	C	C	C	C	C	M
TTJ60-11005	VC	C	C	C	C	C	C	C	C	C
TTJ60-11006	XC	VC	VC	C	C	C	C	C	C	C

## AIXR TeeJet® (AIXR)

Nozzle	PSI										
	15	20	25	30	35	40	50	60	70	80	90
AIXR110015	XC	XC	VC	C	C	C	C	M	M	M	M
AIXR11002	XC	XC	XC	VC	VC	C	C	C	C	M	M
AIXR110025	XC	XC	XC	XC	VC	VC	C	C	C	C	C
AIXR11003	XC	XC	XC	XC	VC	VC	C	C	C	C	C
AIXR11004	UC	XC	XC	XC	XC	XC	VC	VC	C	C	C
AIXR11005	UC	XC	XC	XC	XC	XC	VC	VC	C	C	C
AIXR11006	UC	XC	XC	XC	XC	XC	VC	VC	VC	C	C

## Turbo TeeJet® (TT)

Nozzle	PSI										
	15	20	25	30	35	40	50	60	70	80	90
TT11001	C	M	M	M	M	M	F	F	F	F	F
TT110015	C	C	M	M	M	M	M	M	F	F	F
TT11002	C	C	C	M	M	M	M	M	M	M	F
TT110025	VC	C	C	C	M	M	M	M	M	M	F
TT11003	VC	VC	C	C	C	C	M	M	M	M	M
TT11004	XC	VC	VC	C	C	C	C	C	M	M	M
TT11005	XC	VC	VC	VC	VC	C	C	C	C	M	M
TT11006	XC	XC	VC	VC	VC	C	C	C	C	C	M
TT11008	XC	XC	VC	VC	VC	VC	C	C	C	C	M

## AI TeeJet (AI) and AIC TeeJet (AIC)

Nozzle	PSI										
	30	35	40	45	50	55	60	70	80	90	100
AI110015	UC	XC	XC	XC	XC	XC	VC	VC	VC	C	C
AI11002	UC	UC	XC	XC	XC	XC	VC	VC	VC	VC	C
AI110025	UC	UC	XC	XC	XC	XC	VC	VC	VC	VC	C
AI11003	UC	UC	XC	XC	XC	XC	VC	VC	VC	VC	C
AI11004	UC	UC	XC	XC	XC	XC	VC	VC	VC	VC	C
AI11005	UC	UC	XC	XC	XC	XC	VC	VC	VC	VC	VC
AI11006	UC	UC	UC	XC	XC	XC	XC	VC	VC	VC	VC
AI11008	UC	UC	UC	UC	XC	XC	XC	VC	VC	VC	VC
AI11010	UC	UC	UC	UC	XC	XC	XC	XC	VC	VC	VC
AI11015	UC	UC	UC	UC	XC	XC	XC	XC	VC	VC	VC

## Air Induction Turbo TwinJet (AITTJ60)

Nozzle	PSI										
	20	25	30	35	40	50	60	70	80	90	100
AITTJ60-11002	XC	XC	VC	VC	VC	C	C	C	C	C	M
AITTJ60-110025	XC	XC	VC	VC	VC	C	C	C	C	C	M
AITTJ60-11003	UC	XC	XC	XC	VC	VC	C	C	C	C	C
AITTJ60-11004	UC	XC	XC	XC	VC	VC	C	C	C	C	C
AITTJ60-11005	UC	XC	XC	XC	XC	VC	VC	C	C	C	C
AITTJ60-11006	UC	XC	XC	XC	XC	VC	VC	C	C	C	C


## Turbo TeeJet Induction (TTI)

Nozzle	PSI											
	15	20	25	30	35	40	50	60	70	80	90	100
TTI110015	UC	UC	UC	UC	UC	UC	UC	XC	XC	XC	XC	XC
TTI11002	UC	UC	UC	UC	UC	UC	UC	UC	XC	XC	XC	XC
TTI110025	UC	UC	UC	UC	UC	UC	UC	UC	XC	XC	XC	XC
TTI11003	UC	UC	UC	UC	UC	UC	UC	UC	XC	XC	XC	XC
TTI11004	UC	UC	UC	UC	UC	UC	UC	UC	XC	XC	XC	XC
TTI11005	UC	UC	UC	UC	UC	UC	UC	UC	XC	XC	XC	XC
TTI11006	UC	UC	UC	UC	UC	UC	UC	UC	XC	XC	XC	XC




$$A = \frac{B+C}{D}$$


### XR TeeJet® (XR) and XRC TeeJet (XRC)

	PSI						
	15	20	25	30	40	50	60
XR8001	M	F	F	F	F	F	F
XR80015	M	M	M	F	F	F	F
XR8002	M	M	M	M	F	F	F
XR8003	M	M	M	M	M	M	F
XR8004	C	C	M	M	M	M	M
XR8005	C	C	C	C	M	M	M
XR8006	C	C	C	C	C	C	C
XR8008	VC	VC	VC	C	C	C	C
XR11001	F	F	F	F	F	VF	VF
XR110015	F	F	F	F	F	F	F
XR11002	M	F	F	F	F	F	F
XR110025	M	M	F	F	F	F	F
XR11003	M	M	M	F	F	F	F
XR11004	M	M	M	M	M	F	F
XR11005	M	M	M	M	M	M	F
XR11006	C	C	M	M	M	M	M
XR11008	C	C	C	C	C	M	M
XRC11010	VC	VC	C	C	C	C	M
XRC11015	XC	XC	VC	VC	C	C	C
XRC11020	XC	XC	XC	VC	VC	VC	VC


### TeeJet® (TP)

	PSI				
	30	35	40	50	60
TP8001	F	F	F	F	F
TP80015	F	F	F	F	F
TP8002	M	M	F	F	F
TP8003	M	M	M	M	F
TP8004	M	M	M	M	M
TP8005	C	M	M	M	M
TP8006	C	C	C	C	C
TP8008	C	C	C	C	C
TP11001	F	F	F	VF	VF
TP110015	F	F	F	F	F
TP11002	F	F	F	F	F
TP11003	F	F	F	F	F
TP11004	M	M	M	F	F
TP11005	M	M	M	M	F
TP11006	M	M	M	M	M
TP11008	C	C	C	M	M


### TurfJet (TTJ)

	PSI						
	25	30	40	50	60	70	75
1/4TTJ02	UC	UC	UC	XC	XC	XC	XC
1/4TTJ04	UC	UC	UC	UC	UC	UC	UC
1/4TTJ05	UC	UC	UC	UC	UC	UC	UC
1/4TTJ06	UC	UC	UC	UC	UC	UC	UC
1/4TTJ08	UC	UC	UC	UC	UC	UC	UC
1/4TTJ10	UC	UC	UC	UC	UC	UC	UC
1/4TTJ15	UC	UC	UC	UC	UC	UC	UC


### Turbo FloodJet® (TF)

	PSI				
	10	20	30	40	50
TF-2	UC	XC	XC	VC	VC
TF-2.5	UC	UC	XC	XC	VC
TF-3	UC	UC	XC	XC	VC
TF-4	UC	UC	XC	XC	XC
TF-5	UC	UC	UC	XC	XC
TF-7.5	UC	UC	UC	XC	XC
TF-10	UC	UC	UC	XC	XC


### DG TwinJet (DGTJ60)

	PSI				
	30	35	40	50	60
DGTJ60-110015	F	F	F	F	F
DGTJ60-11002	M	M	M	F	F
DGTJ60-11003	C	M	M	M	M
DGTJ60-11004	C	C	C	C	M
DGTJ60-11006	C	C	C	C	C
DGTJ60-11008	C	C	C	C	C


### TwinJet® (TJ)

	PSI				
	30	35	40	50	60
TJ60-6501	F	VF	VF	VF	VF
TJ60-650134	F	F	F	VF	VF
TJ60-6502	F	F	F	F	F
TJ60-6503	M	F	F	F	F
TJ60-6504	M	M	M	M	F
TJ60-6506	M	M	M	M	M
TJ60-6508	C	C	C	M	M
TJ60-8001	VF	VF	VF	VF	VF
TJ60-8002	F	F	F	F	F
TJ60-8003	F	F	F	F	F
TJ60-8004	M	M	F	F	F
TJ60-8005	M	M	M	F	F
TJ60-8006	M	M	M	M	M
TJ60-8008	C	M	M	M	M
TJ60-8010	C	C	C	M	M
TJ60-11002	F	VF	VF	VF	VF
TJ60-11003	F	F	F	F	F
TJ60-11004	F	F	F	F	F
TJ60-11005	M	M	M	F	F
TJ60-11006	M	M	M	F	F
TJ60-11008	M	M	M	M	M
TJ60-11010	M	M	M	M	M

### DG TeeJet® (DG E)

	PSI				
	30	35	40	50	60
DG95015E	M	M	M	F	F
DG9502E	M	M	M	M	M
DG9503E	C	M	M	M	M
DG9504E	C	C	C	M	M
DG9505E	C	C	C	M	M

### DG TeeJet (DG)

	PSI				
	30	35	40	50	60
DG80015	M	M	M	M	F
DG8002	M	M	M	M	M
DG8003	C	M	M	M	M
DG8004	C	C	C	M	M
DG8005	C	C	C	M	M
DG110015	M	M	F	F	F
DG11002	M	M	M	M	M
DG11003	C	M	M	M	M
DG11004	C	C	M	M	M
DG11005	C	C	C	M	M

$$A = \frac{B+C}{D}$$

# Drift Causes and Control



Figure 1. This is not what crop protection should look like!

When applying crop protection chemicals, spray drift is a term used for those droplets containing the active ingredients that are not deposited on the target area. The droplets most prone to spray drift are usually small in size, less than 200 µm micron in diameter and easily moved off the target area by wind or other climatic conditions. Drift can cause crop protection chemicals to be deposited in undesirable areas with serious consequences, such as:

- Damage to sensitive adjoining crops.
- Surface water contamination.
- Health risks for animals and people.
- Possible contamination to the target area and adjacent areas or possible over-application within the target area.

## Causes of Spray Drift

A number of variables contribute to spray drift; these are predominantly due to the spray equipment system and meteorological factors.

### ■ Droplet Size

Within the spray equipment system, drop size is the most influential factor related to drift.

When a liquid solution is sprayed under pressure it is atomized into droplets of varying sizes: **The smaller the nozzle size and the greater the spray pressure, the smaller the droplets and therefore the greater the proportion of driftable droplets.**

### ■ Spray Height

As the distance between the nozzle and the target area increases, the greater impact wind velocity can have on drift. The influence of wind can increase the proportion of smaller drops being carried off target and considered drift.

**Do not spray at greater heights than those recommended by the spray tip manufacturer, while taking care not to spray below the minimum recommended heights.**

### ■ Operating Speed

Increased operating speeds can cause the spray to be diverted back into upward wind currents and vortices behind the sprayer, which trap small droplets and can contribute to drift.

**Apply crop protection chemicals according to good, professional practices at maximum operating speeds of 4 to 6 mph (with air induction type nozzles—up to 6 mph). As wind velocities increase, reduce operating speed.\***

\* Liquid fertilizer applications using the TeeJet® tips with very coarse droplets can be performed at higher operating speeds.

### ■ Wind Velocity

Among the meteorological factors affecting drift, wind velocity has the greatest impact. Increased wind speeds cause increased spray drift. It is common knowledge that in most parts of the world the wind velocity is variable throughout the day (see Figure 2). Therefore, it is important for spraying to take place during the relatively calm hours of the day. The early morning and early evening are usually the most calm. **Refer to chemical label for velocity recommendations.** When spraying with traditional techniques the following rules-of-thumb apply:

In low wind velocity situations, spraying can be performed at recommended nozzle pressures.

As wind velocities increase up to 17 mph, spray pressure should be reduced and nozzle size increased to obtain larger droplets that are less prone to drift. Wind measurements should be taken throughout the spraying operation with a wind meter or anemometer. As the risk of spray drift increases, selecting designed to more coarse droplets that are less prone to drift is extremely important. Some such TeeJet nozzles that fit into this category are: DG TeeJet®, Turbo TeeJet®, AI TeeJet, Turbo TeeJet Induction, and AIXR TeeJet.

When wind velocities exceed 11 MPH (5 m/s), spraying operation should not be performed.

### ■ Air Temperature and Humidity

In ambient temperatures over 77°F/25°C with low relative humidity, small droplets are especially prone to drift due to the effects of evaporation.

**High temperature during the spraying application may necessitate system changes, such as nozzles that produce a coarser droplet or suspending spraying.**

### ■ Crop Protection Chemicals and Carrier Volumes

Before applying crop protection chemicals, the applicator should read and follow all instructions provided by the manufacturer. Since extremely low carrier volume usually necessitates the use of small nozzle sizes, the drift potential is increased. As high a carrier volume as practical is recommended.

## Application Regulations for Spray Drift Control

In several European countries, regulatory authorities have issued application regulations in the use of crop protection chemicals to protect the environment. In order to protect the surface waters and the field buffer areas (examples are: hedges and grassy areas of a certain width) distance requirements must be kept because of spray drift. Inside the European Union (EU) there is a directive for the harmonization of crop protection chemicals in regards to environmental protection. In this respect the procedures that have been implemented in Germany, England and the Netherlands will be established in other EU countries in the coming years.

To reach the objectives for environmental protection, spray drift reducing measures have been integrated as a central instrument in the practice of risk evaluation. For example, buffer zones may be reduced in width if certain spraying techniques or equipment is used that have been approved and certified by certain regulatory agencies. Many of the TeeJet nozzles designed for reducing spray drift have been approved and certified in several EU countries. The certification of those registrars fits into a drift reduction category, such as 90%, 75%, or 50% (90/75/50) control of drift (see page 186). This rating is related to the comparison of the BCPC reference nozzle capacity of 03 at 3 bar.

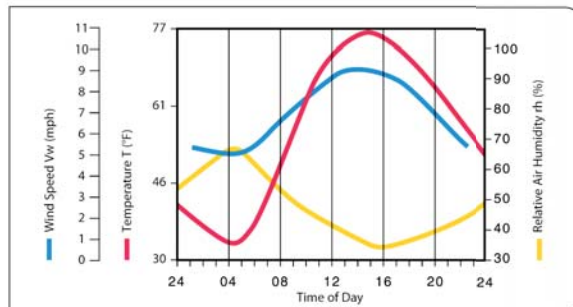


Figure 2. Development of wind velocity, air temperature and relative air humidity (example). From: Malberg



$$A = \frac{B+C}{D}$$

## Nozzles for Spray Drift Control

Drift potential can be minimized even when it is necessary to use small nozzle capacities by selecting nozzle types that produce larger Volume Median Diameter (VMD) droplets and a lower percentage of small droplets. Figure 4 is an example showing VMD's produced by nozzles of identical flow rates (size 11003) which produce coarser droplets than an XR TeeJet and then larger droplets in sequence; TT/TTJ60, AIXR, AI, AITTJ60 and TTI. TTI nozzles produce the coarsest droplet size spectrum of this group. When operating at a pressure of 50 PSI (3 bar) and 5 MPH (7 km/h) ground speed, the application rate is 20 GPA (200 l/ha). At the same time, the observation is that the VMD increases significantly from the XR to the TTI. This shows that it is possible to cover the entire droplet size spectrum from very fine to extremely coarse droplets by using different types of nozzles. While susceptibility to drift decreases when droplets become larger, the number of droplets available may lead to less uniform coverage. To compensate for this drawback and for the chemical to be effective, it is necessary to apply the optimum pressure range specified for a particular type of nozzle. If applicators comply with the parameters set by the manufacturers, they will always cover 10–15% of the target surface on average, which is not least attributed to the fact that less drift translates

into more effective coverage. Figure 4 shows the VMD curves by nozzle type indicating the optimum pressure ranges for the individual nozzles which should be selected with respect to both effective drift control and effect of the chemical. When the focus is on drift control, TT, TTJ60 and AIXR are operated at pressures of less than 29.5 PSI (2 bar). Yet, where maximum effect is critical, the nozzles are operated at pressures between 29.5 PSI (2 bar) and 52 PSI (3.5 bar) or even higher in specific conditions. These pressure ranges do not apply to AI and TTI, which operate at less than 43.5 PSI (3 bar) when drift control is critical and always at 58 PSI (4 bar) and 101.5 PSI (7 bar) and even 116 PSI (8 bar) when the emphasis is on chemical affect. Therefore, for applicators to select the correct nozzle size it is necessary to consider the spray pressure at which a chemical is most effective. With this, they simply have to reduce pressure and ground speed to comply with statutory buffer strip requirements. It is down to the conditions prevailing at the individual farm (location of the field, number of water bodies, type of chemical applied, etc.) whether they should choose a TeeJet nozzle that reduces drift by 50%, 75% or 90%. On principle, applicators should use 75% or 90% drift control nozzles (extremely coarse droplets) only when spraying near field boundaries and 50% or less TeeJet nozzles in all other areas of the field.

While the classic XR TeeJet orifice provides two functions; metering the volume flow rate and distributing and creating the droplets, all other nozzle types discussed above use a pre-orifice for metering while distribution and droplet creation takes place at the exit orifice (Fig. 3). Both functions and devices relate to each other with respect to geometry and spacing and interact with respect to the droplet size produced. The TT, TTJ60, AITTJ60 and TTI nozzles force the liquid to

change direction after it has passed the pre-orifice, forcing it into a horizontal chamber and to change direction again into the nearly vertical passage in the orifice itself. The AI, AITTJ60, AIXR and TTI air induction nozzles operate on the Venturi principle, where the pre-orifice generates a higher-velocity stream, aspirating air through the side holes. This specific air / liquid mix creates more coarse droplets that are filled with air, depending on the chemical used.

## Summary

Successful drift management centers on sound knowledge about drift contributing factors and the use of drift control, TeeJet nozzles. To strike a sound balance between successful chemical application and environmental protection, applicators should use approved broadcast TeeJet nozzles that are classified as drift control and operate these within the pressure ranges that ensure chemical effectiveness; i.e. set nozzles to 50% drift control or less. The following list shows all the relevant factors that need to be considered, optimized or applied to achieve effective drift control:

- Low-Drift TeeJet nozzles
- Spraying pressure and droplet size
- Application rate and nozzle size
- Spraying height
- Forward speed
- Wind velocity
- Ambient temperature and relative humidity
- Buffer strips (or apply options that allow reducing the width of buffer strips)
- Compliance with manufacturer instructions

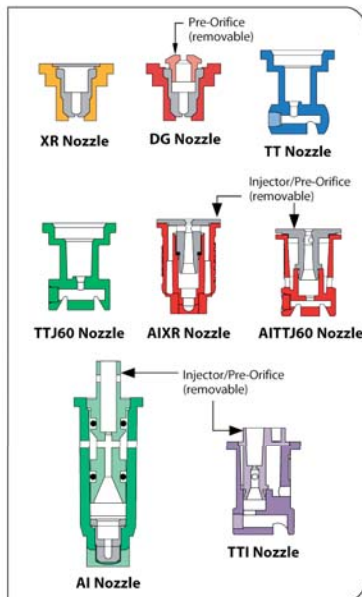


Figure 3: XR, DG, TT, AIXR, AI, AITTJ60, TTJ60 and TTI nozzles (sectional drawings).

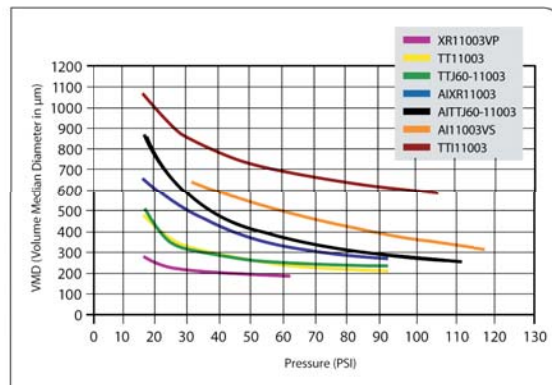








Figure 4. Volumetric droplet diameters of XR, TT, TTJ60, AIXR, AI, AITTJ60 and TTI nozzles relative to pressure

Measurement conditions:  
 - Continuous Oxford Laser measurement across the full width of the flat spray  
 - Water temperature 70 °F

# 8- REFERENCE GUIDE



## TeeJet® Broadcast Nozzle Selection Guide

	HERBICIDES			FUNGICIDES		INSECTICIDES		DRIFT MANAGEMENT
	SOIL APPLIED	POST-EMERGENCE		CONTACT	SYSTEMIC	CONTACT	SYSTEMIC	
		CONTACT	SYSTEMIC					
 <b>Turbo TeeJet®</b> Reference page 5		VERY GOOD	VERY GOOD	VERY GOOD	VERY GOOD	VERY GOOD	VERY GOOD	VERY GOOD
 <b>Turbo TeeJet®</b> at pressures below 30 PSI (2.0 bar) Reference page 5	GOOD	GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT	VERY GOOD
 <b>Turbo TwinJet®</b> Reference page 14	GOOD	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	VERY GOOD
 <b>Turbo TwinJet®</b> at pressures below 30 PSI (2.0 bar) Reference page 14	VERY GOOD	VERY GOOD	EXCELLENT	VERY GOOD	EXCELLENT	VERY GOOD	EXCELLENT	EXCELLENT
 <b>Turbo TeeJet Induction®</b> Reference page 9	EXCELLENT		EXCELLENT		EXCELLENT		EXCELLENT	EXCELLENT
 <b>Air Induction Turbo TwinJet®</b> Reference page 15	VERY GOOD	GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT	EXCELLENT
 <b>XR, XRC TeeJet®</b> Reference pages 10–11		EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD	GOOD
 <b>XR, XRC TeeJet®</b> at pressures below 30 PSI (2.0 bar) Reference pages 10–11	GOOD	GOOD	VERY GOOD	GOOD	VERY GOOD	GOOD	VERY GOOD	VERY GOOD
 <b>AIXR TeeJet®</b> Reference page 6	VERY GOOD	GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT	EXCELLENT
 <b>AI, AIC TeeJet®</b> Reference pages 7–8	VERY GOOD	GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT	EXCELLENT
 <b>TwinJet®</b> Reference page 16		EXCELLENT		EXCELLENT		EXCELLENT		
 <b>DG TwinJet®</b> Reference page 18	VERY GOOD	VERY GOOD	EXCELLENT	VERY GOOD	EXCELLENT	VERY GOOD	EXCELLENT	VERY GOOD
 <b>Turbo FloodJet®</b> Reference page 19	EXCELLENT		VERY GOOD		VERY GOOD		VERY GOOD	EXCELLENT
 <b>TurfJet®</b> Reference page 22	EXCELLENT		EXCELLENT		EXCELLENT		EXCELLENT	EXCELLENT
 <b>QCTF Turbo FloodJet®</b> Reference page 21	EXCELLENT							EXCELLENT
 <b>AirMatic AirJet®</b> Contact your regional sales office for additional information	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT

**Note:** Consult the chemical manufacturer's product label for specific rate and application recommendations.



**TeeJet** Specialty Application Nozzle Selection Guide



		HERBICIDES			FUNGICIDES		INSECTICIDES	
		PRE-EMERGENCE	POST-EMERGENCE		CONTACT	SYSTEMIC	CONTACT	SYSTEMIC
			CONTACT	SYSTEMIC				
BANDING	 <b>AI TeeJet<sup>®</sup> EVEN</b> Reference page 29	EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT
	 <b>TeeJet<sup>®</sup> EVEN</b> Reference page 31	GOOD	VERY GOOD	GOOD	VERY GOOD	GOOD	VERY GOOD	GOOD
	 <b>TwinJet<sup>®</sup> EVEN</b> Reference page 32		EXCELLENT		EXCELLENT		EXCELLENT	
DIRECTED SPRAYING	 <b>AI TeeJet<sup>®</sup> EVEN</b> Reference page 29	VERY GOOD	GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT
	 <b>TeeJet<sup>®</sup> EVEN</b> Reference page 31	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD
	 <b>TwinJet<sup>®</sup> EVEN</b> Reference page 32		VERY GOOD		VERY GOOD		VERY GOOD	
	 <b>AIUB TeeJet<sup>®</sup></b> Reference page 33		GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT
	 <b>AITX ConeJet<sup>®</sup></b> Reference page 38		GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT
	 <b>ConeJet<sup>®</sup></b> Reference pages 28 & 35		EXCELLENT		EXCELLENT		EXCELLENT	
	 <b>ConeJet<sup>®</sup></b> Reference pages 36–37		EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD
AIR BLAST	 <b>Disc-Core<sup>®</sup></b> Reference pages 40–41		EXCELLENT	GOOD	EXCELLENT	GOOD	EXCELLENT	GOOD

**Note:** Consult the chemical manufacturer's product label for specific rate and application recommendations.



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## TeeJet® Liquid Fertilizer Nozzle Selection Guide

	BROADCAST	DIRECTED
 <b>StreamJet</b> (7-ORIFICE) <i>Reference page 43</i>	EXCELLENT	VERY GOOD
 <b>StreamJet</b> (3-ORIFICE) <i>Reference page 42</i>	VERY GOOD	EXCELLENT
 <b>StreamJet</b> (SINGLE-ORIFICE) <i>Reference page 45</i>		EXCELLENT
 <b>CP4916</b> (ORIFICE PLATE) <i>Reference page 44</i>		EXCELLENT
 <b>TP TeeJet</b> (LARGE CAPACITY) <i>Reference page 12</i>	VERY GOOD	
 <b>AI TeeJet</b> <b>AIC TeeJet</b> (LOW VOLUME) <i>Reference pages 7-8</i>	VERY GOOD	
 <b>AIUB TeeJet</b> (LOW VOLUME) <i>Reference page 33</i>		VERY GOOD
 <b>Turbo TeeJet® Induction</b> <i>Reference page 9</i>	EXCELLENT	
 <b>Turbo FloodJet®</b> <i>Reference page 19</i>	EXCELLENT	
 <b>QCTF Turbo FloodJet®</b> <i>Reference page 21</i>	EXCELLENT	

### LIQUID FERTILIZER APPLICATION

Just as in applying crop protection products, the proper application of liquid fertilizer is important. Delivering nutrients to the crop in a timely and effective manner while minimizing crop damage is essential. TeeJet Technologies offers an extensive selection of nozzles specifically designed to maximize the performance of your liquid fertilizer application.

Solid stream nozzles, offered in both single- and multiple-stream versions, are designed to deliver fertilizer to the soil surface where it can be effectively utilized by the crop. By creating solid liquid streams, these nozzles greatly reduce foliar coverage in standing crop in order to minimize leaf burn. TeeJet Technologies StreamJet nozzles provide the ideal blend of compact, reliable design, ease of installation and affordable pricing.

In some cases, the use of a broadcast nozzle for fertilizer application may be desirable. This could include combined fertilizer/pesticide applications, foliar feeding or broadcast liquid fertilization of bare ground. For these applications TeeJet Technologies offers a wide variety of low drift, flat spray nozzles.

### Liquid Density Conversion

When selecting a specific capacity tip for liquid fertilizer application, always correct for liquid density. Application charts shown in this catalog are based on spraying water. Many fertilizer solutions are denser than water, which will affect the application rate. Please see page 125 for a list of density conversion factors.

### Example:

Desired application rate is 20 GPA of 28% Nitrogen. Determine the correct nozzle size as follow:

$$\text{GPA (liquid other than water)} \times \text{Conversion Factor} = \text{GPA (from table in catalog)}$$

$$20 \text{ GPA (28\%)} \times 1.13 = 22.6 \text{ GPA (water)}$$

The applicator should choose a nozzle size that will supply 22.6 GPA of water at the desired pressure.

**Note:** Consult the chemical manufacturer's product label for specific rate and application recommendations.

## 8- REFERENCE GUIDE

GPA			spacing of 20 " (50.8 cm)							
orifice	pressur (psi)	flow GPM	4 MPH	5 MPH	6 MPH	7 MPH	8 MPH	9 MPH	10 MPH	12 MPH
01	15	0.061	4.5	3.6	3.0	2.6	2.3	1.8	1.5	1.3
	20	0.071	5.3	4.2	3.5	3.0	2.6	2.1	1.8	1.5
	30	0.087	6.5	5.2	4.3	3.7	3.2	2.6	2.2	1.8
	40	0.10	7.4	5.9	5.0	4.2	3.7	3.0	2.5	2.1
	50	0.11	8.2	6.5	5.4	4.7	4.1	3.3	2.7	2.3
	60	0.12	8.9	7.1	5.9	5.1	4.5	3.6	3.0	2.5
	75	0.14	10.4	8.3	6.9	5.9	5.2	4.2	3.5	3.0
015	90	0.15	11.1	8.9	7.4	6.4	5.6	4.5	3.7	3.2
	15	0.092	6.8	5.5	4.6	3.9	3.4	2.7	2.3	2.0
	20	0.11	8.2	6.5	5.4	4.7	4.1	3.3	2.7	2.3
	30	0.13	9.7	7.7	6.4	5.5	4.8	3.9	3.2	2.8
	40	0.15	11.1	8.9	7.4	6.4	5.6	4.5	3.7	3.2
	50	0.17	12.6	10.1	8.4	7.2	6.3	5.0	4.2	3.6
	60	0.18	13.4	10.7	8.9	7.6	6.7	5.3	4.5	3.8
02	75	0.21	15.6	12.5	10.4	8.9	7.8	6.2	5.2	4.5
	90	0.23	17.1	13.7	11.4	9.8	8.5	6.8	5.7	4.9
	15	0.12	8.9	7.1	5.9	5.1	4.5	3.6	3.0	2.5
	20	0.14	10.4	8.3	6.9	5.9	5.2	4.2	3.5	3.0
	30	0.17	12.6	10.1	8.4	7.2	6.3	5.0	4.2	3.6
	40	0.20	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2
	50	0.22	16.3	13.1	10.9	9.3	8.2	6.5	5.4	4.7
03	60	0.24	17.8	14.3	11.9	10.2	8.9	7.1	5.9	5.1
	75	0.27	20.0	16.0	13.4	11.5	10.0	8.0	6.7	5.7
	90	0.30	22.3	17.8	14.9	12.7	11.1	8.9	7.4	6.4
	15	0.18	13.4	10.7	8.9	7.6	6.7	5.3	4.5	3.8
	20	0.21	15.6	12.5	10.4	8.9	7.8	6.2	5.2	4.5
	30	0.26	19.3	15.4	12.9	11.0	9.7	7.7	6.4	5.5
	40	0.30	22.3	17.8	14.9	12.7	11.1	8.9	7.4	6.4
04	50	0.34	25.2	20.2	16.8	14.4	12.6	10.1	8.4	7.2
	60	0.37	27.5	22.0	18.3	15.7	13.7	11.0	9.2	7.8
	75	0.41	30.4	24.4	20.3	17.4	15.2	12.2	10.1	8.7
	90	0.45	33.4	26.7	22.3	19.1	16.7	13.4	11.1	9.5
	15	0.24	17.8	14.3	11.9	10.2	8.9	7.1	5.9	5.1
	20	0.28	20.8	16.6	13.9	11.9	10.4	8.3	6.9	5.9
	30	0.35	26.0	20.8	17.3	14.9	13.0	10.4	8.7	7.4
05	40	0.40	29.7	23.8	19.8	17.0	14.9	11.9	9.9	8.5
	50	0.45	33.4	26.7	22.3	19.1	16.7	13.4	11.1	9.5
	60	0.49	36.4	29.1	24.3	20.8	18.2	14.6	12.1	10.4
	75	0.55	40.8	32.7	27.2	23.3	20.4	16.3	13.6	11.7
	90	0.60	44.6	35.6	29.7	25.5	22.3	17.8	14.9	12.7
	15	0.31	23.0	18.4	15.3	13.2	11.5	9.2	7.7	6.6
	20	0.35	26.0	20.8	17.3	14.9	13.0	10.4	8.7	7.4
06	30	0.43	31.9	25.5	21.3	18.2	16.0	12.8	10.6	9.1
	40	0.50	37.1	29.7	24.8	21.2	18.6	14.9	12.4	10.6
	50	0.56	41.6	33.3	27.7	23.8	20.8	16.6	13.9	11.9
	60	0.61	45.3	36.2	30.2	25.9	22.6	18.1	15.1	12.9
	75	0.68	50.5	40.4	33.7	28.9	25.2	20.2	16.8	14.4
	90	0.75	55.7	44.6	37.1	31.8	27.8	22.3	18.6	15.9
	15	0.37	27.5	22.0	18.3	15.7	13.7	11.0	9.2	7.8
08	20	0.42	31.2	24.9	20.8	17.8	15.6	12.5	10.4	8.9
	30	0.52	38.6	30.9	25.7	22.1	19.3	15.4	12.9	11.0
	40	0.60	44.6	35.6	29.7	25.5	22.3	17.8	14.9	12.7
	50	0.67	49.7	39.8	33.2	28.4	24.9	19.9	16.6	14.2
	60	0.73	54.2	43.4	36.1	31.0	27.1	21.7	18.1	15.5
	75	0.82	60.9	48.7	40.6	34.8	30.4	24.4	20.3	17.4
	90	0.90	66.8	53.5	44.6	38.2	33.4	26.7	22.3	19.1
10	15	0.49	36.4	29.1	24.3	20.8	18.2	14.6	12.1	10.4
	20	0.57	42.3	33.9	28.2	24.2	21.2	16.9	14.1	12.1
	30	0.69	51.2	41.0	34.2	29.3	25.6	20.5	17.1	14.6
	40	0.80	59.4	47.5	39.6	33.9	29.7	23.8	19.8	17.0
	50	0.89	66.1	52.9	44.1	37.8	33.0	26.4	22.0	18.9
	60	0.98	72.8	58.2	48.5	41.6	36.4	29.1	24.3	20.8
	75	1.10	81.7	65.3	54.5	46.7	40.8	32.7	27.2	23.3
10	90	1.20	89.1	71.3	59.4	50.9	44.6	35.6	29.7	25.5
	15	0.61	45.3	36.2	30.2	25.9	22.6	18.1	15.1	12.9
	20	0.71	52.7	42.2	35.1	30.1	26.4	21.1	17.6	15.1
	30	0.87	64.6	51.7	43.1	36.9	32.3	25.8	21.5	18.5
	40	1.00	74.3	59.4	49.5	42.4	37.1	29.7	24.8	21.2
	50	1.12	83.2	66.5	55.4	47.5	41.6	33.3	27.7	23.8
	60	1.22	90.6	72.5	60.4	51.8	45.3	36.2	30.2	25.9
75	1.37	101.7	81.4	67.8	58.1	50.9	40.7	33.9	29.1	

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GPA			spacing of 15 " (38.1 cm)							
orifice	pressur (psi)	flow GPM	4 MPH	5 MPH	6 MPH	7 MPH	8 MPH	9 MPH	10 MPH	12 MPH
01	15	0.061	6.0	4.8	4.0	3.5	3.0	2.4	2.0	1.7
	20	0.071	7.0	5.6	4.7	4.0	3.5	2.8	2.3	2.0
	30	0.087	8.6	6.9	5.7	4.9	4.3	3.4	2.9	2.5
	40	0.10	9.9	7.9	6.6	5.7	5.0	4.0	3.3	2.8
	50	0.11	10.9	8.7	7.3	6.2	5.4	4.4	3.6	3.1
	60	0.12	11.9	9.5	7.9	6.8	5.9	4.8	4.0	3.4
	75	0.14	13.9	11.1	9.2	7.9	6.9	5.5	4.6	4.0
015	90	0.15	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2
	15	0.092	9.1	7.3	6.1	5.2	4.6	3.6	3.0	2.6
	20	0.11	10.9	8.7	7.3	6.2	5.4	4.4	3.6	3.1
	30	0.13	12.9	10.3	8.6	7.4	6.4	5.1	4.3	3.7
	40	0.15	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2
	50	0.17	16.8	13.5	11.2	9.6	8.4	6.7	5.6	4.8
	60	0.18	17.8	14.3	11.9	10.2	8.9	7.1	5.9	5.1
02	75	0.21	20.8	16.6	13.9	11.9	10.4	8.3	6.9	5.9
	90	0.23	22.8	18.2	15.2	13.0	11.4	9.1	7.6	6.5
	15	0.12	11.9	9.5	7.9	6.8	5.9	4.8	4.0	3.4
	20	0.14	13.9	11.1	9.2	7.9	6.9	5.5	4.6	4.0
	30	0.17	16.8	13.5	11.2	9.6	8.4	6.7	5.6	4.8
	40	0.20	19.8	15.8	13.2	11.3	9.9	7.9	6.6	5.7
	50	0.22	21.8	17.4	14.5	12.4	10.9	8.7	7.3	6.2
03	60	0.24	23.8	19.0	15.8	13.6	11.9	9.5	7.9	6.8
	75	0.27	26.7	21.4	17.8	15.3	13.4	10.7	8.9	7.6
	90	0.30	29.7	23.8	19.8	17.0	14.9	11.9	9.9	8.5
	15	0.18	17.8	14.3	11.9	10.2	8.9	7.1	5.9	5.1
	20	0.21	20.8	16.6	13.9	11.9	10.4	8.3	6.9	5.9
	30	0.26	25.7	20.6	17.2	14.7	12.9	10.3	8.6	7.4
	40	0.30	29.7	23.8	19.8	17.0	14.9	11.9	9.9	8.5
04	50	0.34	33.7	26.9	22.4	19.2	16.8	13.5	11.2	9.6
	60	0.37	36.6	29.3	24.4	20.9	18.3	14.7	12.2	10.5
	75	0.41	40.6	32.5	27.1	23.2	20.3	16.2	13.5	11.6
	90	0.45	44.6	35.6	29.7	25.5	22.3	17.8	14.9	12.7
	15	0.24	23.8	19.0	15.8	13.6	11.9	9.5	7.9	6.8
	20	0.28	27.7	22.2	18.5	15.8	13.9	11.1	9.2	7.9
	30	0.35	34.7	27.7	23.1	19.8	17.3	13.9	11.6	9.9
05	40	0.40	39.6	31.7	26.4	22.6	19.8	15.8	13.2	11.3
	50	0.45	44.6	35.6	29.7	25.5	22.3	17.8	14.9	12.7
	60	0.49	48.5	38.8	32.3	27.7	24.3	19.4	16.2	13.9
	75	0.55	54.5	43.6	36.3	31.1	27.2	21.8	18.2	15.6
	90	0.60	59.4	47.5	39.6	33.9	29.7	23.8	19.8	17.0
	15	0.31	30.7	24.6	20.5	17.5	15.3	12.3	10.2	8.8
	20	0.35	34.7	27.7	23.1	19.8	17.3	13.9	11.6	9.9
06	30	0.43	42.6	34.1	28.4	24.3	21.3	17.0	14.2	12.2
	40	0.50	49.5	39.6	33.0	28.3	24.8	19.8	16.5	14.1
	50	0.56	55.4	44.4	37.0	31.7	27.7	22.2	18.5	15.8
	60	0.61	60.4	48.3	40.3	34.5	30.2	24.2	20.1	17.3
	75	0.68	67.3	53.9	44.9	38.5	33.7	26.9	22.4	19.2
	90	0.75	74.3	59.4	49.5	42.4	37.1	29.7	24.8	21.2
	15	0.37	36.6	29.3	24.4	20.9	18.3	14.7	12.2	10.5
08	20	0.42	41.6	33.3	27.7	23.8	20.8	16.6	13.9	11.9
	30	0.52	51.5	41.2	34.3	29.4	25.7	20.6	17.2	14.7
	40	0.60	59.4	47.5	39.6	33.9	29.7	23.8	19.8	17.0
	50	0.67	66.3	53.1	44.2	37.9	33.2	26.5	22.1	19.0
	60	0.73	72.3	57.8	48.2	41.3	36.1	28.9	24.1	20.6
	75	0.82	81.2	64.9	54.1	46.4	40.6	32.5	27.1	23.2
	90	0.90	89.1	71.3	59.4	50.9	44.6	35.6	29.7	25.5
10	15	0.49	48.5	38.8	32.3	27.7	24.3	19.4	16.2	13.9
	20	0.57	56.4	45.1	37.6	32.2	28.2	22.6	18.8	16.1
	30	0.69	68.3	54.6	45.5	39.0	34.2	27.3	22.8	19.5
	40	0.80	79.2	63.4	52.8	45.3	39.6	31.7	26.4	22.6
	50	0.89	88.1	70.5	58.7	50.3	44.1	35.2	29.4	25.2
	60	0.98	97.0	77.6	64.7	55.4	48.5	38.8	32.3	27.7
	75	1.10	108.9	87.1	72.6	62.2	54.5	43.6	36.3	31.1
10	90	1.20	118.8	95.0	79.2	67.9	59.4	47.5	39.6	33.9
	15	0.61	60.4	48.3	40.3	34.5	30.2	24.2	20.1	17.3
	20	0.71	70.3	56.2	46.9	40.2	35.1	28.1	23.4	20.1
	30	0.87	86.1	68.9	57.4	49.2	43.1	34.5	28.7	24.6
	40	1.00	99.0	79.2	66.0	56.6	49.5	39.6	33.0	28.3
	50	1.12	110.9	88.7	73.9	63.4	55.4	44.4	37.0	31.7
	60	1.22	120.8	96.6	80.5	69.0	60.4	48.3	40.3	34.5
75	1.37	135.6	108.5	90.4	77.5	67.8	54.3	45.2	38.8	

## 8- REFERENCE GUIDE

L / ha			spacing of 20 " (50.8 cm)							
orifice	pressur (psi)	flow L / min	6 km/hr	7 km/hr	8 km/hr	10 km/hr	12 km/hr	14 km/hr	16 km/hr	18 km/hr
01	15	0.23	45	39	34	27	23	19	17	15
	20	0.27	53	45	40	32	26	23	20	18
	30	0.33	65	56	49	39	32	28	24	22
	40	0.38	75	64	56	45	37	32	28	25
	50	0.42	82	70	61	49	41	35	31	27
	60	0.45	89	77	67	54	45	38	34	30
	75	0.53	104	89	78	63	52	45	39	35
90	0.57	112	96	84	67	56	48	42	37	
015	15	0.35	69	59	51	41	34	29	26	23
	20	0.42	82	70	61	49	41	35	31	27
	30	0.49	97	83	73	58	48	42	36	32
	40	0.57	112	96	84	67	56	48	42	37
	50	0.64	127	109	95	76	63	54	48	42
	60	0.68	134	115	101	80	67	57	50	45
	75	0.79	156	134	117	94	78	67	59	52
90	0.87	171	147	129	103	86	73	64	57	
02	15	0.45	89	77	67	54	45	38	34	30
	20	0.53	104	89	78	63	52	45	39	35
	30	0.64	127	109	95	76	63	54	48	42
	40	0.76	149	128	112	89	75	64	56	50
	50	0.83	164	141	123	98	82	70	61	55
	60	0.91	179	153	134	107	89	77	67	60
	75	1.02	201	172	151	121	101	86	75	67
90	1.14	224	192	168	134	112	96	84	75	
03	15	0.68	134	115	101	80	67	57	50	45
	20	0.79	156	134	117	94	78	67	59	52
	30	0.98	194	166	145	116	97	83	73	65
	40	1.14	224	192	168	134	112	96	84	75
	50	1.29	253	217	190	152	127	109	95	84
	60	1.40	276	236	207	165	138	118	103	92
	75	1.55	306	262	229	183	153	131	115	102
90	1.70	335	287	251	201	168	144	126	112	
04	15	0.91	179	153	134	107	89	77	67	60
	20	1.06	209	179	156	125	104	89	78	70
	30	1.32	261	224	196	156	130	112	98	87
	40	1.51	298	255	224	179	149	128	112	99
	50	1.70	335	287	251	201	168	144	126	112
	60	1.85	365	313	274	219	183	156	137	122
	75	2.08	410	351	307	246	205	176	154	137
90	2.27	447	383	335	268	224	192	168	149	
05	15	1.17	231	198	173	139	115	99	87	77
	20	1.32	261	224	196	156	130	112	98	87
	30	1.63	320	275	240	192	160	137	120	107
	40	1.89	373	319	279	224	186	160	140	124
	50	2.12	417	358	313	250	209	179	156	139
	60	2.31	455	390	341	273	227	195	170	152
	75	2.57	507	434	380	304	253	217	190	169
90	2.84	559	479	419	335	279	240	210	186	
06	15	1.40	276	236	207	165	138	118	103	92
	20	1.59	313	268	235	188	156	134	117	104
	30	1.97	387	332	291	232	194	166	145	129
	40	2.27	447	383	335	268	224	192	168	149
	50	2.54	499	428	374	300	250	214	187	166
	60	2.76	544	466	408	326	272	233	204	181
	75	3.10	611	524	458	367	306	262	229	204
90	3.41	671	575	503	402	335	287	251	224	
08	15	1.85	365	313	274	219	183	156	137	122
	20	2.16	425	364	319	255	212	182	159	142
	30	2.61	514	441	386	308	257	220	193	171
	40	3.03	596	511	447	358	298	255	224	199
	50	3.37	663	568	497	398	332	284	249	221
	60	3.71	730	626	548	438	365	313	274	243
	75	4.16	820	703	615	492	410	351	307	273
90	4.54	894	766	671	537	447	383	335	298	
10	15	2.31	455	390	341	273	227	195	170	152
	20	2.69	529	453	397	317	265	227	198	176
	30	3.29	648	556	486	389	324	278	243	216
	40	3.79	745	639	559	447	373	319	279	248
	50	4.24	835	715	626	501	417	358	313	278
	60	4.62	909	779	682	545	455	390	341	303
	75	5.19	1021	875	766	613	510	438	383	340

L / ha			spacing of 15 " (38.1 cm)							
orifice	pressur (psi)	flow L / min	6 km/hr	7 km/hr	8 km/hr	10 km/hr	12 km/hr	14 km/hr	16 km/hr	18 km/hr
01	15	0.23	61	52	45	36	30	26	23	20
	20	0.27	71	60	53	42	35	30	26	24
	30	0.33	86	74	65	52	43	37	32	29
	40	0.38	99	85	75	60	50	43	37	33
	50	0.42	109	94	82	66	55	47	41	36
	60	0.45	119	102	89	72	60	51	45	40
	75	0.53	139	119	104	83	70	60	52	46
90	0.57	149	128	112	89	75	64	56	50	
015	15	0.35	91	78	69	55	46	39	34	30
	20	0.42	109	94	82	66	55	47	41	36
	30	0.49	129	111	97	77	65	55	48	43
	40	0.57	149	128	112	89	75	64	56	50
	50	0.64	169	145	127	101	84	72	63	56
	60	0.68	179	153	134	107	89	77	67	60
	75	0.79	209	179	156	125	104	89	78	70
90	0.87	229	196	171	137	114	98	86	76	
02	15	0.45	119	102	89	72	60	51	45	40
	20	0.53	139	119	104	83	70	60	52	46
	30	0.64	169	145	127	101	84	72	63	56
	40	0.76	199	170	149	119	99	85	75	66
	50	0.83	219	187	164	131	109	94	82	73
	60	0.91	238	204	179	143	119	102	89	79
	75	1.02	268	230	201	161	134	115	101	89
90	1.14	298	255	224	179	149	128	112	99	
03	15	0.68	179	153	134	107	89	77	67	60
	20	0.79	209	179	156	125	104	89	78	70
	30	0.98	258	221	194	155	129	111	97	86
	40	1.14	298	255	224	179	149	128	112	99
	50	1.29	338	290	253	203	169	145	127	113
	60	1.40	368	315	276	221	184	158	138	123
	75	1.55	407	349	306	244	204	175	153	136
90	1.70	447	383	335	268	224	192	168	149	
04	15	0.91	238	204	179	143	119	102	89	79
	20	1.06	278	238	209	167	139	119	104	93
	30	1.32	348	298	261	209	174	149	130	116
	40	1.51	397	341	298	238	199	170	149	132
	50	1.70	447	383	335	268	224	192	168	149
	60	1.85	487	417	365	292	243	209	183	162
	75	2.08	546	468	410	328	273	234	205	182
90	2.27	596	511	447	358	298	255	224	199	
05	15	1.17	308	264	231	185	154	132	115	103
	20	1.32	348	298	261	209	174	149	130	116
	30	1.63	427	366	320	256	214	183	160	142
	40	1.89	497	426	373	298	248	213	186	166
	50	2.12	556	477	417	334	278	238	209	185
	60	2.31	606	519	455	364	303	260	227	202
	75	2.57	676	579	507	405	338	290	253	225
90	2.84	745	639	559	447	373	319	279	248	
06	15	1.40	368	315	276	221	184	158	138	123
	20	1.59	417	358	313	250	209	179	156	139
	30	1.97	517	443	387	310	258	221	194	172
	40	2.27	596	511	447	358	298	255	224	199
	50	2.54	666	571	499	399	333	285	250	222
	60	2.76	725	622	544	435	363	311	272	242
	75	3.10	815	698	611	489	407	349	306	272
90	3.41	894	766	671	537	447	383	335	298	
08	15	1.85	487	417	365	292	243	209	183	162
	20	2.16	566	485	425	340	283	243	212	189
	30	2.61	686	588	514	411	343	294	257	229
	40	3.03	795	681	596	477	397	341	298	265
	50	3.37	884	758	663	531	442	379	332	295
	60	3.71	974	835	730	584	487	417	365	325
	75	4.16	1093	937	820	656	546	468	410	364
90	4.54	1192	1022	894	715	596	511	447	397	
10	15	2.31	606	519	455	364	303	260	227	202
	20	2.69	705	605	529	423	353	302	265	235
	30	3.29	864	741	648	519	432	370	324	288
	40	3.79	994	852	745	596	497	426	373	331
	50	4.24	1113	954	835	668	556	477	417	371
	60	4.62	1212	1039	909	727	606	519	455	404
	75	5.19	1361	1167	1021	817	681	583	510	454

### 9.1 - Main and line pressure gauges (optional)

#### Main pressure reading

The main pressure reading indicates the working pressure and must be used only as a reference. For nozzle calibration, and according to flow charts, pressure must be taken at the nozzle. A higher than normal pressure may indicate that the main filter is clogged. See the Main Filter section.



#### Line pressure reading (optional)

Indicates the actual pressure for each boom section. A discrepancy between the main pressure reading and the line filter readings indicates that the boom section cartridges are clogged and need cleaning.



#### Main and line filters

All the water that passes through the pump is filtered by the main filter. It must therefore be cleaned periodically depending on the cleanliness of the water used and the type of phytosanitary products sprayed (liquid, soluble or suspension).



#### Line filter

The water distributed by the boom section valves is filtered by the line filters. Different cartridges can be used depending on the type of nozzle used. 50- and 100-mesh cartridges are supplied with the sprayer.





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## 9.2 - Off-Season Storage

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For off-season storage, follow the same steps described in the Uncoupling the Sprayer section, and then complete with the following steps:

- Lubricate the cylinder rods (lifting and variable geometry) with a solution of 40% diesel and 60% oil.
- A protective coating such as Shell SAS 4000 or Castrol Molymax can be applied to protect the metal frame from rust.
- Lubricate all friction parts.

### **For the sprayer equipped with air suspension do the following steps:**

- Empty the air tank and leave the drain open.
- Clean the air filter of compressor.

### **Winter storage**

1. Thoroughly rinse the interior of the sprayer.
2. Completely wash the outside of the sprayer.
3. Lubricate all the grease fittings of the sprayer.
4. Inspect all components of the sprayer to detect the presence of damaged or worn parts or hoses.
5. Apply a fresh coat of paint when necessary.
6. Before storage, rinse the tank with clean water and turn the pump on. Circulate clean water in all the sprayer hoses. For winter storage or under conditions where there is possibility of freezing, drain the entire system with standard antifreeze solution (car antifreeze) mixed with water in a ratio of 50-50. Let the pump run to completely fill the pump and all the hoses. Quickly activate each boom section so that the antifreeze goes down to the nozzles. Close the sprayer leaving the antifreeze in the hoses. This prevents breakage caused by freezing and keeps rubber diaphragms, gaskets and washers lubricated.
7. Remove all electrical control boxes, monitors, nozzles and filters, or any other part sensitive to cold temperatures. These components will have to be stored in a cool, dry, and weather-protected location.
8. Remove pressure gauges containing glycerin and store them in a cool, dry place.
9. Remove the line anti-drips and plugs.
10. Make a list of all deficiencies or worn parts that require replacement. Place an order immediately with your dealer.
11. Leave all the ball valves open.
12. Store the sprayer in a dry place, away from children and animals.

### **Preparation after winter storage**

Recover the antifreeze, lubricate joints and follow the instructions found in the Sprayer Coupling section.



### 9.3 - Instructions for the safe maintenance of the sprayer

- Stop the engine and remove the ignition key.
- Maintain the sprayer and accessories in good working condition.
- Maintain all safety devices in place and in good working condition.
- Unauthorized modifications to the sprayer may alter its performance and/or safety and shorten its service life.
- Disconnect the controls and/or battery before using an external battery (booster), replacing and/or charging the battery, or arc welding.

#### High-pressure washer



**IMPORTANT !** Electrical/electronic parts, connectors, bearings, hydraulic system seals, and any other sensitive components or parts can break if subjected to high pressure water. Reduce the water pressure and direct the water jet at a 45-90 degree angle.



**IMPORTANT !** Before any maintenance, place benches under the boom before uncoupling it from the tractor to prevent the sprayer from tipping over.



Check the wheel nuts after the first 8 hours of service; see also “Adjustment of the Wheel Track Spacing” in the Uncoupling the Sprayer section. Tighten the wheel nuts to 480 N·m. Regularly check the wheel nuts.

After each maintenance, fill out a log to keep track of all maintenance performed on the equipment (copies can be made). If necessary, maintenance intervals can be shortened depending on sprayer use and the type of slurry being sprayed.

## 9- MAINTENANCE

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### 9.4 - Cleaning of the filter cartridges (daily)

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### 9.5 - Lubrication (every 25 hours)

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Lubricate the sliding axle and the break-a-way with a lithium-type grease containing molybdenumdisulphite and graphite (Shell SAS 4000, Castrol Molymax), which is resistant to sliding.



### 9.6 - Monthly maintenance

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Disassemble the nozzle stand assembly and clean with mild soap and a brush. Remove the caps from the boom hoses to fully drain and clean any accumulation of product inside the water lines.



9.7 - Maintenance Log

<b>User</b>	<b>Date</b>	<b>Comments</b>

## 9- MAINTENANCE

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### 9.8 - Proper disposal of waste

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#### **Proper disposal of waste**

Excess spray liquid must be removed and/or disposed according to existing regulations. Never rinse the main tank by disposing the rinse residues into storm water sewers.

Oil and antifreeze must be removed and disposed in established collection centres.

Wash water must also be recovered to prevent contamination of surface water and groundwater.

#### **Disposal**

At the end of service life, dispose of the sprayer according to existing laws. Consult local authorities to make required arrangements.

#### **Troubleshooting**

Operating problems often originate from similar causes, some of which are listed below:

- Air intake through suction pipes. Check tightness of couplings.
- Clogged filter. Clean and rinse.
- Lack of controller accuracy. Calibrate speed and flow indicators.
- Spray application rate indicates 0. Missing speed or flow reading.
- Erratic operation of hydraulic systems. Surplus or lack of hydraulic flow.
- Spraying pressure too high or too low. Review the selection of spray nozzles.
- Fuse blown or missing.

## 10- TECHNICAL SPECIFICATIONS

### 10.1 - Novation frame specifications

#### Technical Specifications

Weights are provided only as a reference and are given for units equipped with a rinse tank, a pre-mixer and 320/90 R46 tires, along with their own respective boom. Weight may vary depending on the options installed on the sprayer.

Novation Frame	N1000	N1250
Main tank capacity	3850 l / 1000 gal. us	4730 l / 1250 gal. US
Rinse tank capacity	378 l / 100 gal. US (option)	
Material of the tank	White polyethylene	
Tire 320/90 R46 148 A8	N1000 / N1250	
Tire 380/90 R46 159 A8	Option	
Axle	Manual adjustable 90" - 120"	
Steering axle	Option 72" fix	
Air suspension	Option	
Hubs	10 bolts / 10 000 lbs	10 bolts / 12 000 lbs
Tongue	«T»	
Pump type	Centrifugal Hypro 9306C-HM1C-U	
Hydraulic outlets required	2	
Minimum flow	13 gpm pump / 5 gpm boom	
Tongue weight (loaded tank)	4 220 lbs	
Axle weight (loaded tank)	7 260 lbs / axle	
Total weight (loaded tank)	18 740 lbs	
Tongue weight (empty tank)(Boom open)	800 lbs	
Axle weight (empty tank)(Boom open)	2 920 lbs / axle	
Total weight (empty tank)	6 940 lbs	
Total length	274"	
Length pin to axle	202" ( adjustable 193"/196"/199" )	
Under axle clearance	34" (+2" with tire 380/90 R46) fix axle	
Hitch	21 1/4" (+/- 2 1/4") for CAT III	
Transport width	135"	
Automatic rate controller	Micro Trak (opt. Raven SCS)	
Type of fitting	Banjo flange & NPT	
Main harness	22 pins (equivalent to Raven #115-0159-708) Opt. 37 pins (equivalent to Raven #115-0171-314)	
Flow meter	Raven RFM 60P 60 gpm	
Flow control valve	Raven 1 1/2"	

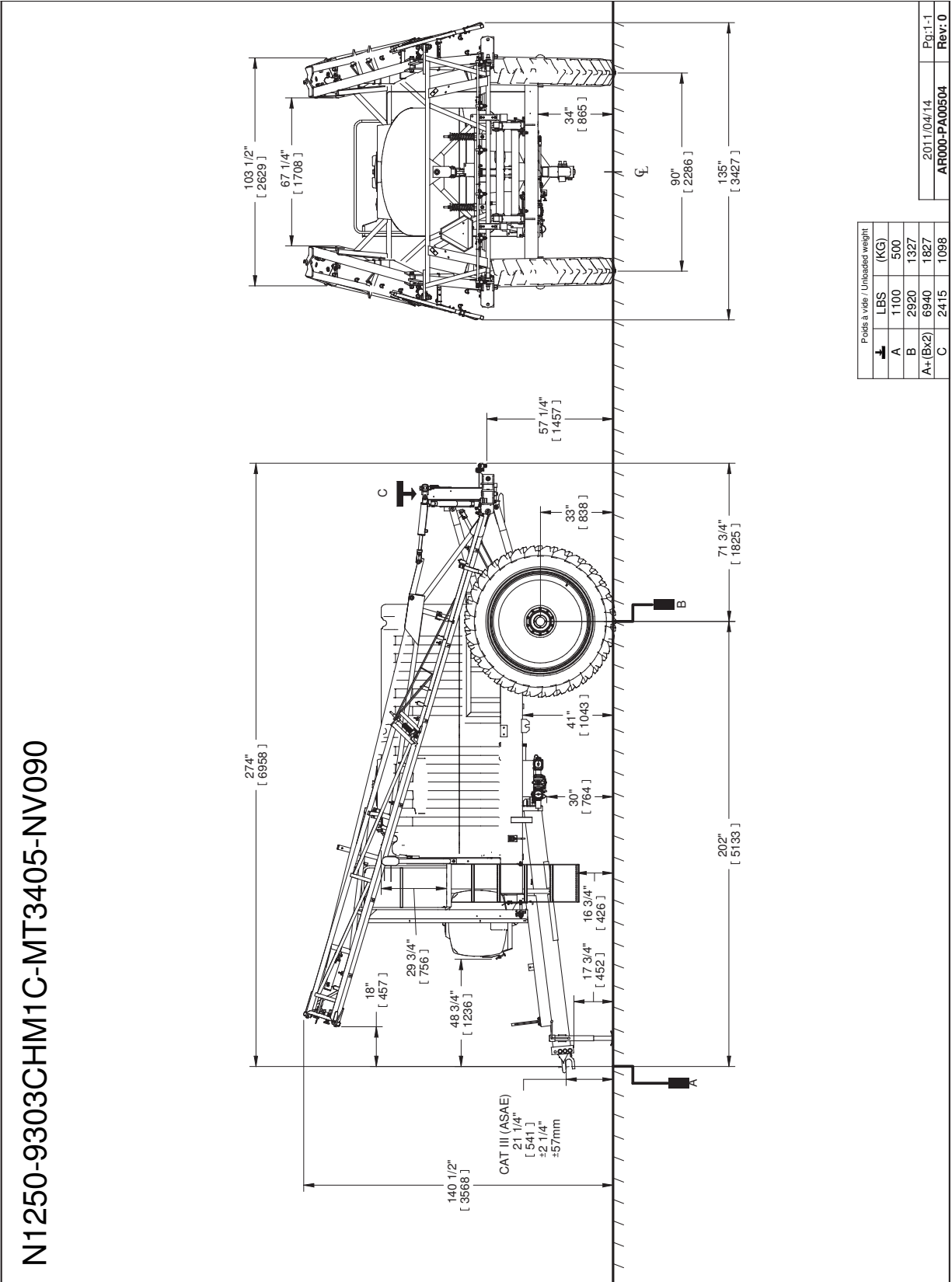
# 10- TECHNICAL SPECIFICATIONS

## 10.2 - Novation frame specifications

Novation Boom	NV060	NV075	NV080	NV090	NV100
Working width	60' (720")	75' (900")	80' (960")	90' (1080")	100' (1200")
Number of row covered at 30"	24 rows	30 rows	32 rows	36 rows	40 rows
Structure	Steel tube, single structure				
Boom section valve	Teejet serie 430				
Nozzle spacing	20" (option 15")				
Nozzle bodies number at 20" spacing	36	45	48	54	60
Nozzle bodies number (20") / section (5)	6-9-6-9-6	9-10-7-10-9	9-12-6-12-9 (std)	12-12-6-12-12 (std)	15-12-6-12-15
Nozzle bodies number (20") / section (7)	4-2-9-6-9-2-4	5-4-10-7-10-4-5	5-4-12-6-12-5-4	5-7-12-6-12-7-5	6-9-12-6-12-9-6
Nozzle bodies number (20") / section (9)	N/D	N/D	5-4-6-6-6-6-5-4	5-7-6-6-6-6-7-5	6-9-6-6-6-6-9-6
Nozzle bodies number at 15" spacing	49	61	65	73	81
Nozzle bodies number (15") / section (5)	8-12-9-12-8	12-14-9-14-12	12-16-9-16-12	16-16-9-16-16	20-16-9-16-20
Nozzle bodies number (15") / section (7)	8-6-6-9-6-6-8	7-5-14-9-14-5-7	7-5-16-9-16-5-7	7-9-16-9-16-9-7	9-11-16-916-11-9
Nozzle bodies number (15") / section (9)	N/A	N/A	7-5-8-8-9-8-8-5-7	7-9-8-8-9-8-8-5-7	9-11-8-8-9-8-8-11-9
Nozzle bodies type	TeeJet serie 463 triple				
Boom plumbing	Stainless steel. Ø 0.995" ID				
Type of hydraulic control	Joystick		Control box (opt joystick)		
Number of hydraulic functions	5 function selector (opt. 7 direct acting)		5 direct acting (opt. 7 direct acting)		
Boom clearance	20"-77"				
Main suspension	Using accumulator on parallel arms lift system				
Suspension on wing tilt	Using accumulator (optional)				
Boom self-stabilizing system	Central pivot with shock absorber & spring				

# 10- TECHNICAL SPECIFICATIONS

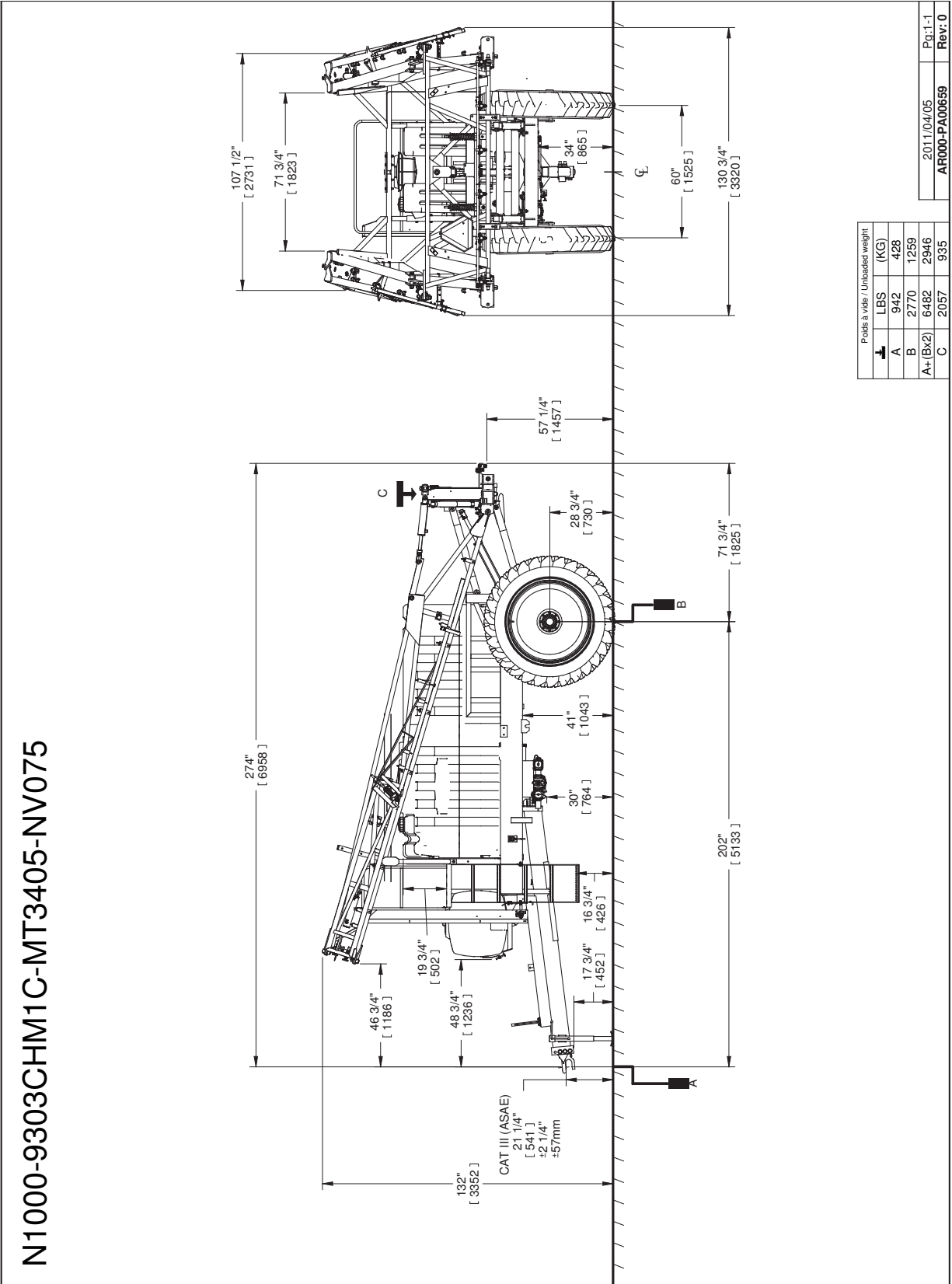
## 10.3 - N1250-9303CHM1C-MT3405-NV090





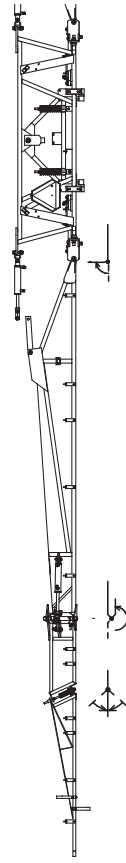
# 10- TECHNICAL SPECIFICATIONS

## 10.4 - N1000-9303CHM1C-MT3405-NV075



10.5 - Novation Boom NV060, 60' (nozzle bodies at 15")

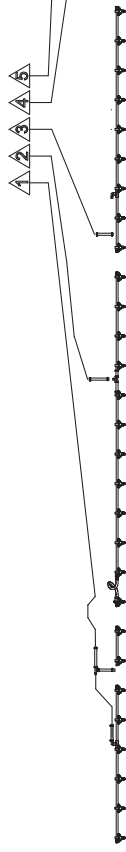
Novation Boom NV060, 60'



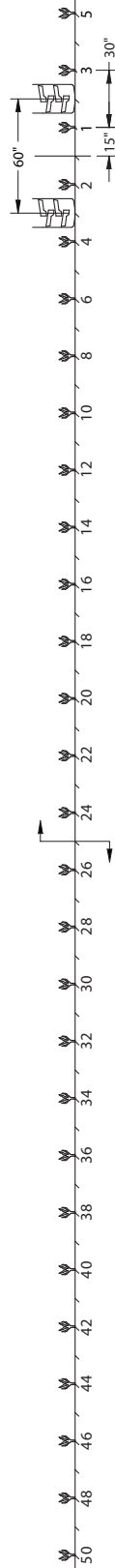
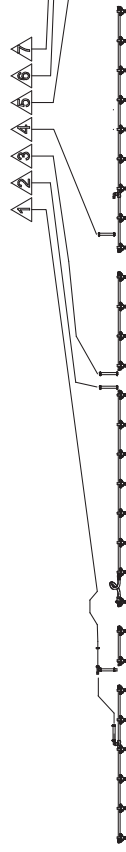
AR800-NV06015300 3 sect ions (16-17-16), 49 x 15 " (735"), 24 R @ 30"



AR800-NV06015500 5 sect ions (8-12-9-12-8), 49 x 15 " (735"), 24 R @ 30"



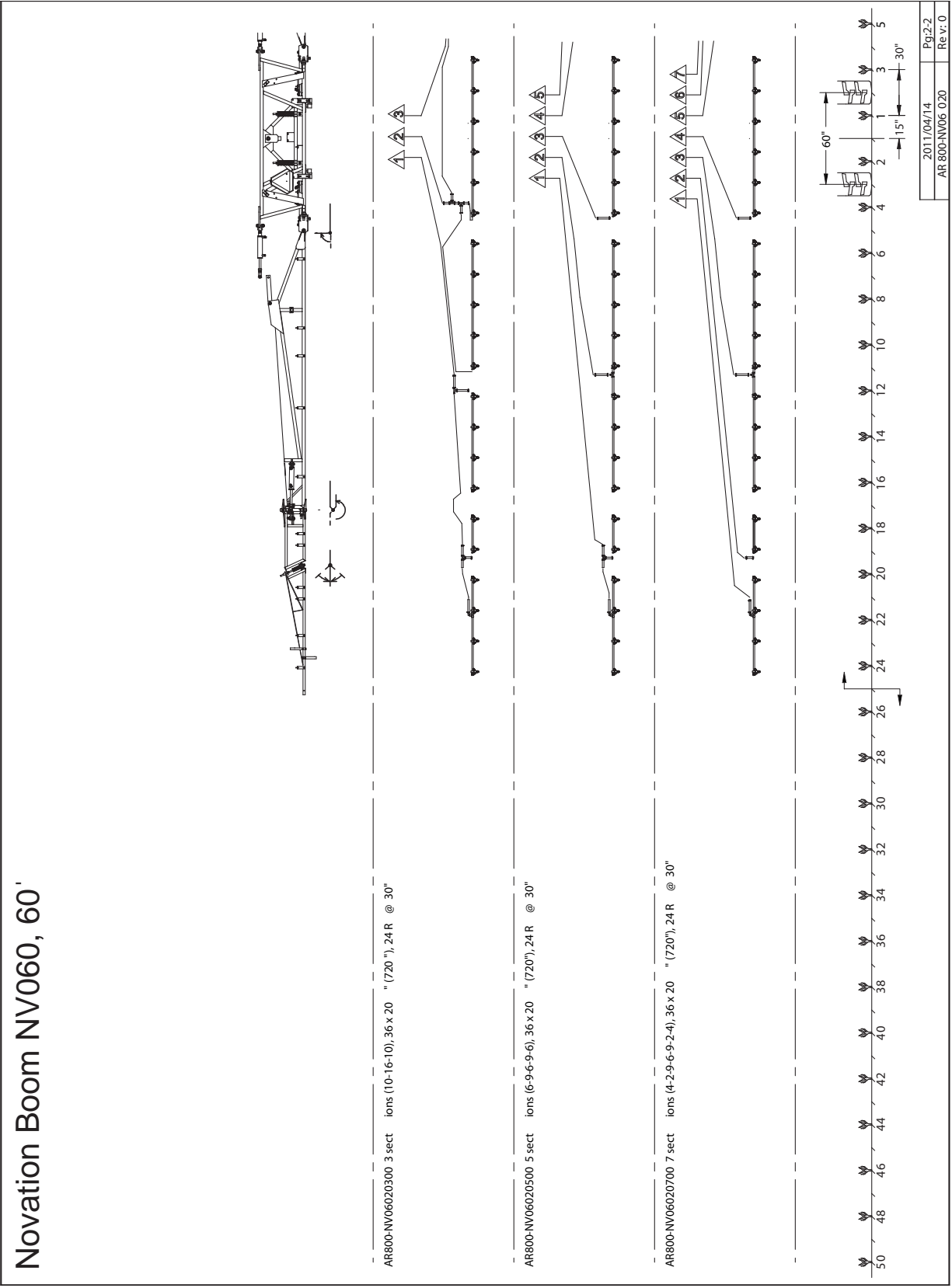
AR800-NV06015700 7 sect ions (8-6-6-9-6-6-8), 49 x 15 " (735"), 24 R @ 30"



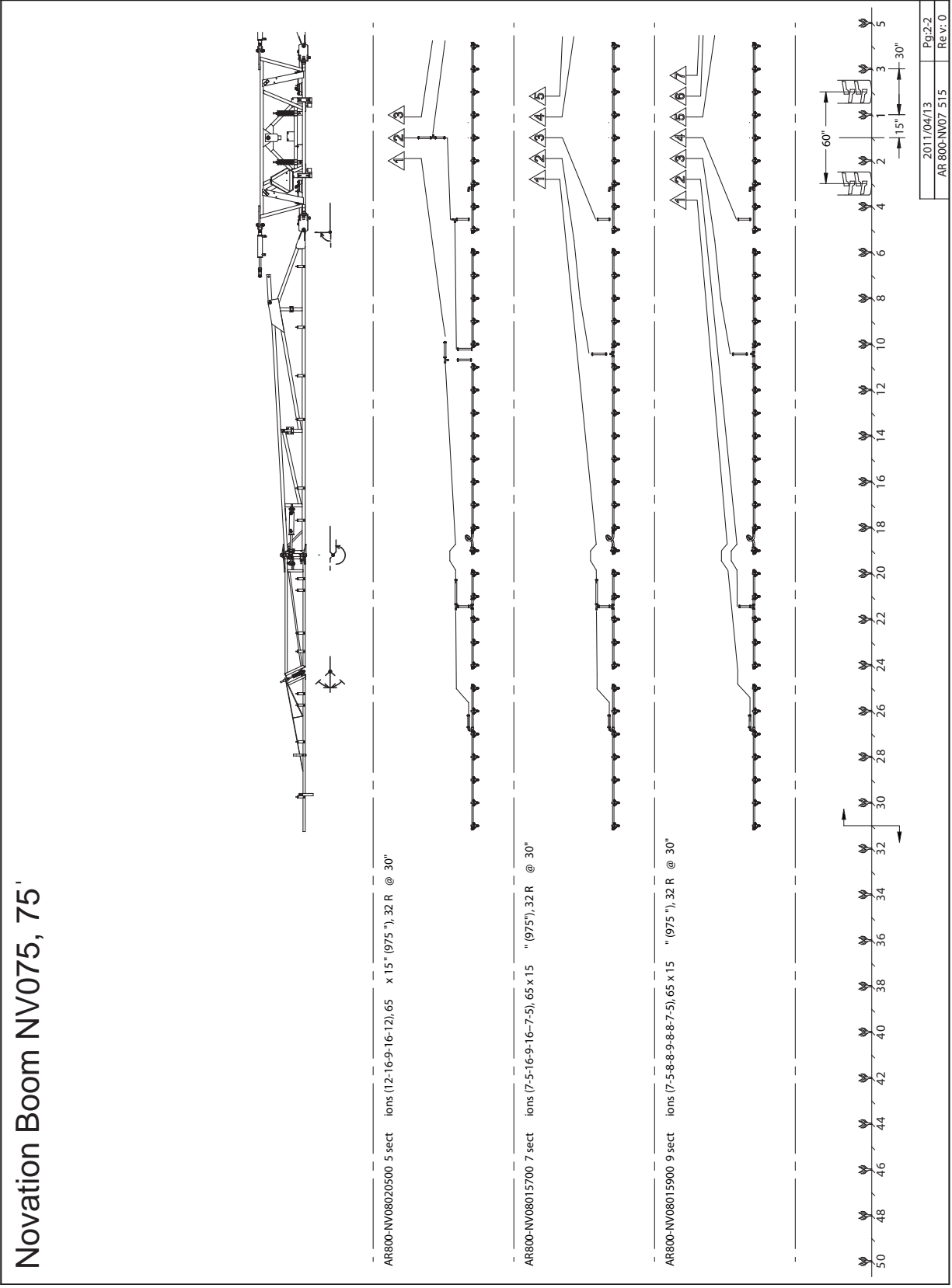
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# 10- TECHNICAL SPECIFICATIONS

## 10.6 - Novation Boom NV060, 60' (nozzle bodies at 20")

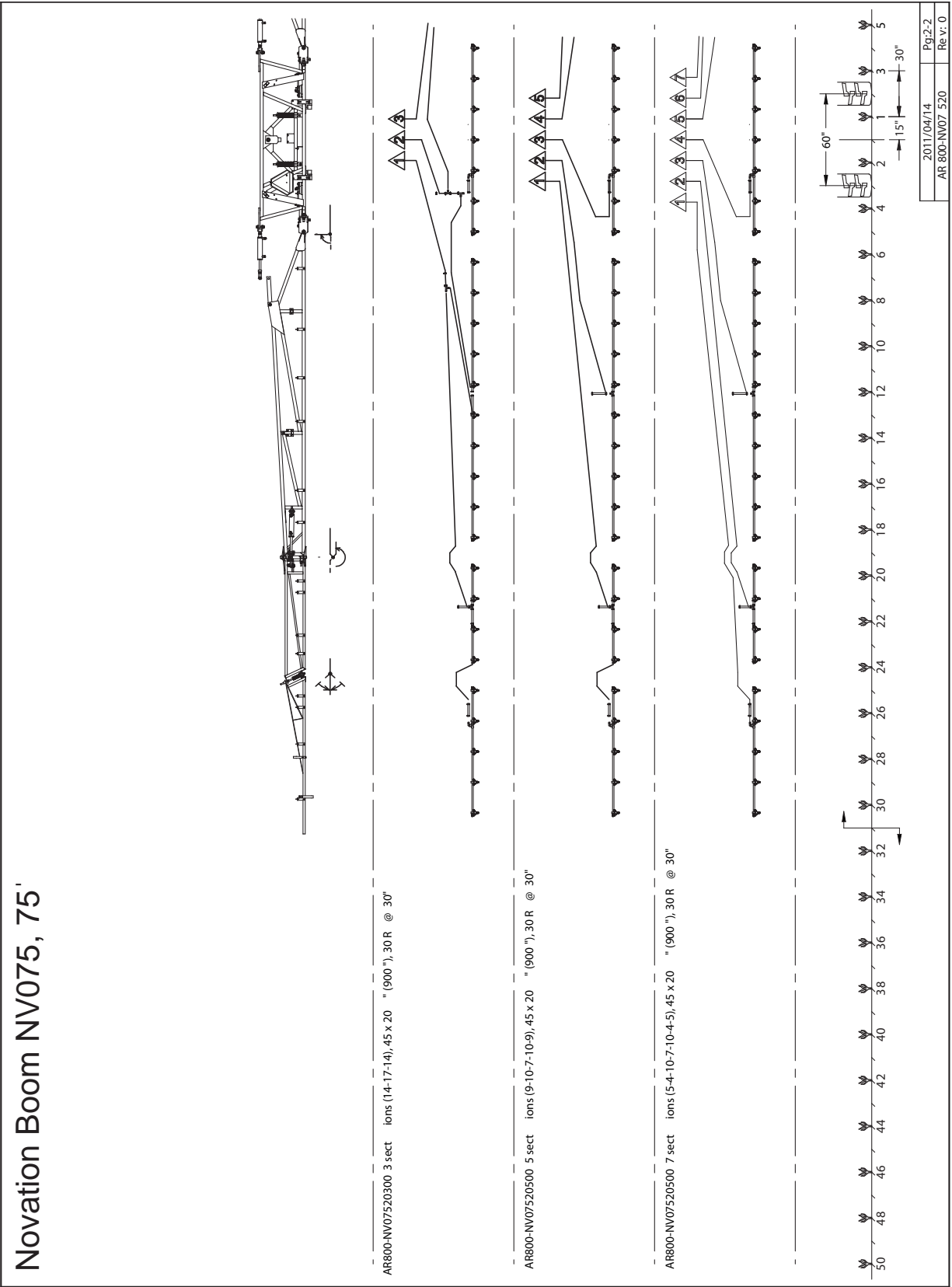


10.7 - Novation Boom NV075, 75' (nozzle bodies at 15")



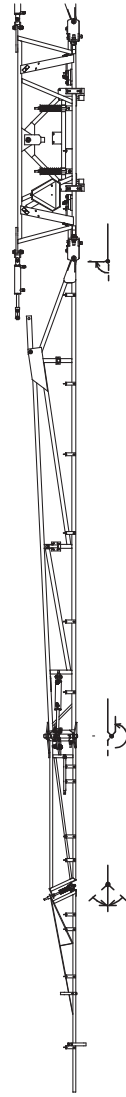
# 10- TECHNICAL SPECIFICATIONS

## 10.8 - Novation Boom NV075, 75' (nozzle bodies at 20")

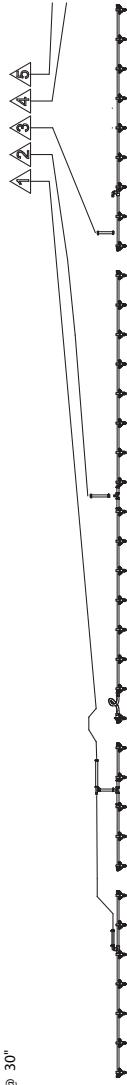


10.9 - Novation Boom NV080, 80' (nozzle bodies at 15")

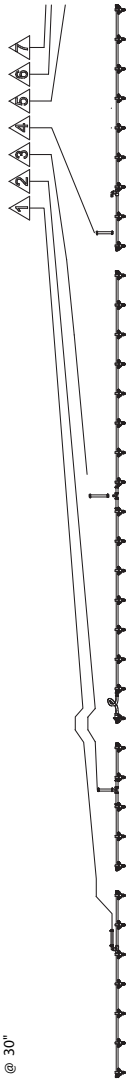
Novation Boom NV080, 80'



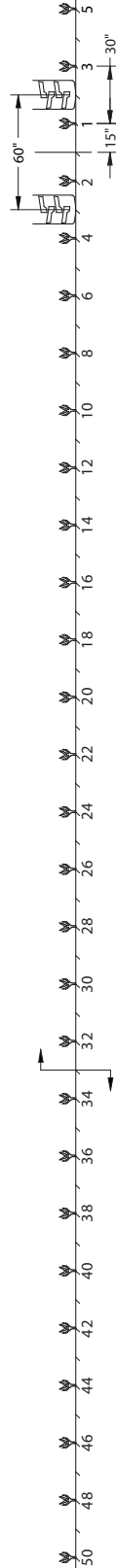
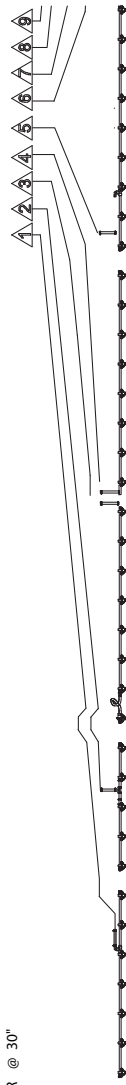
AR800-NV08015500 5 sect ions (12-16-9-16-12), 65 x 15" (975"), 32 R @ 30"



AR800-NV08015700 7 sect ions (7-5-16-9-16--7-5), 65 x 15" (975"), 32 R @ 30"



AR800-NV08015900 9 sect ions (7-5-8-8-9-8-8-7-5), 65 x 15" (975"), 32 R @ 30"

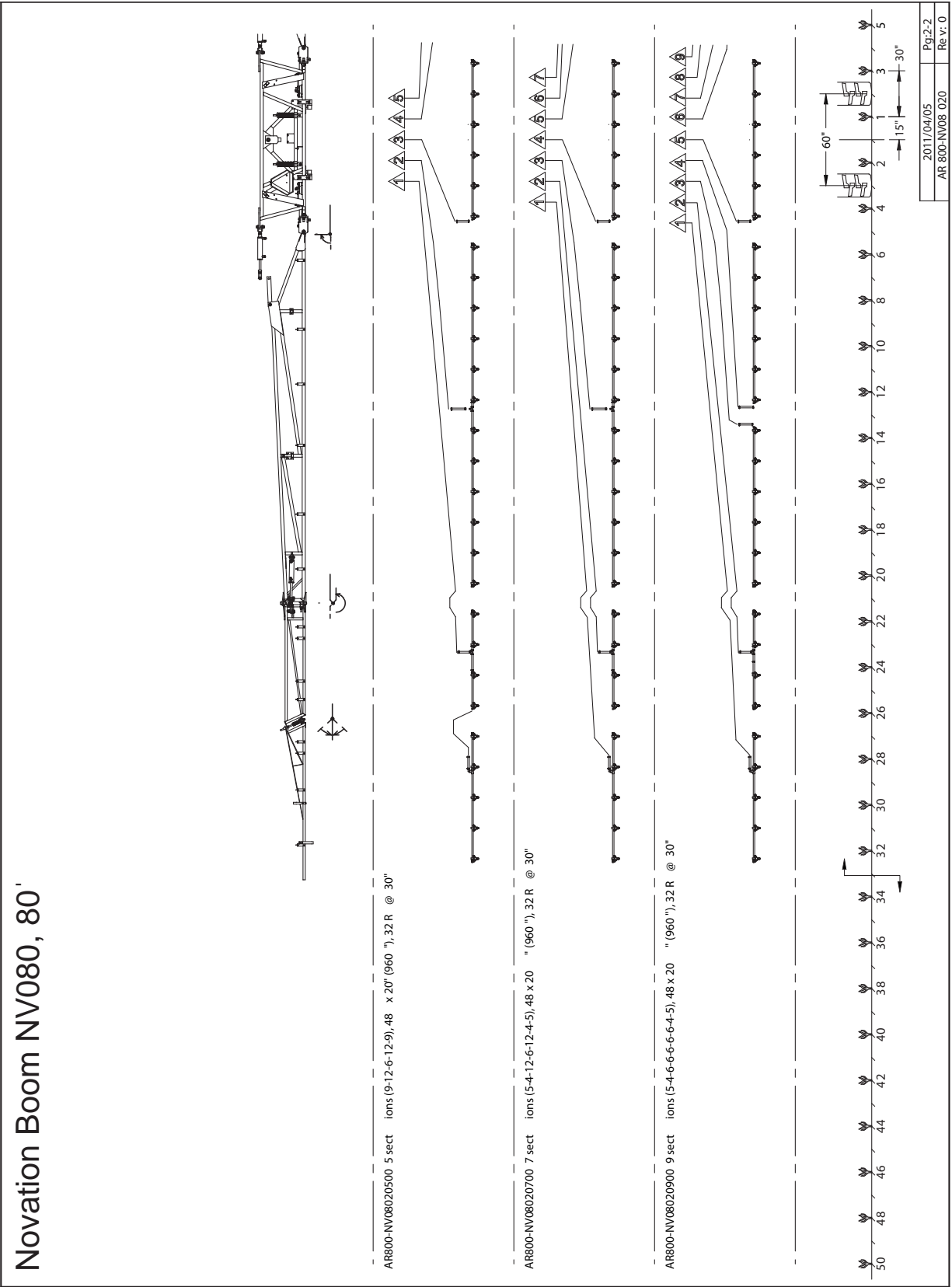


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# 10- TECHNICAL SPECIFICATIONS

## 10.10 - Novation Boom NV080, 80' (nozzle bodies at 20")

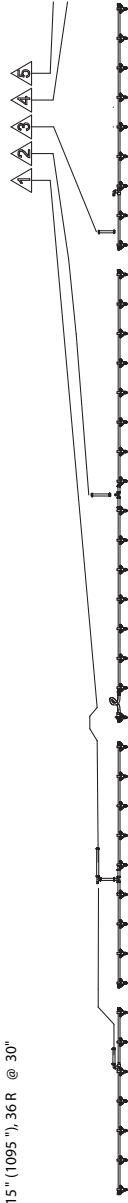


10.11 - Novation Boom NV090, 90' (nozzle bodies at 15")

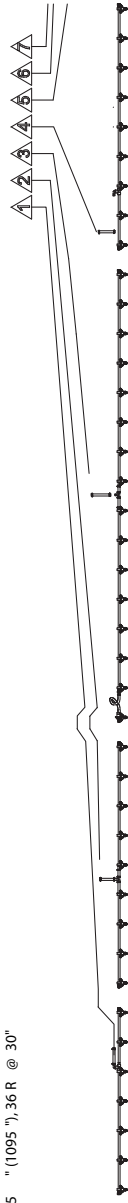
Novation Boom NV090, 90'



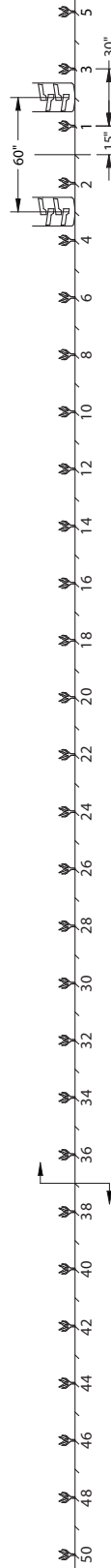
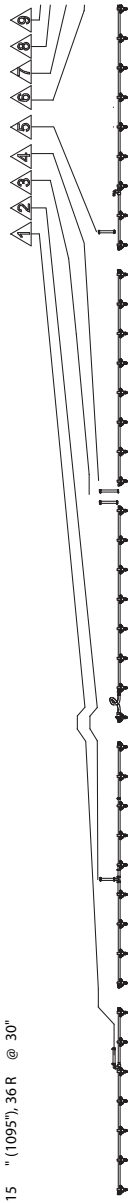
AR800-NV09015000 5 sect ions (16-16-9-16-16), 73 x 15" (1095"), 36 R @ 30"



AR800-NV09015700 7 sect ions (7-9-16-9-16-9-7), 73 x 15" (1095"), 36 R @ 30"



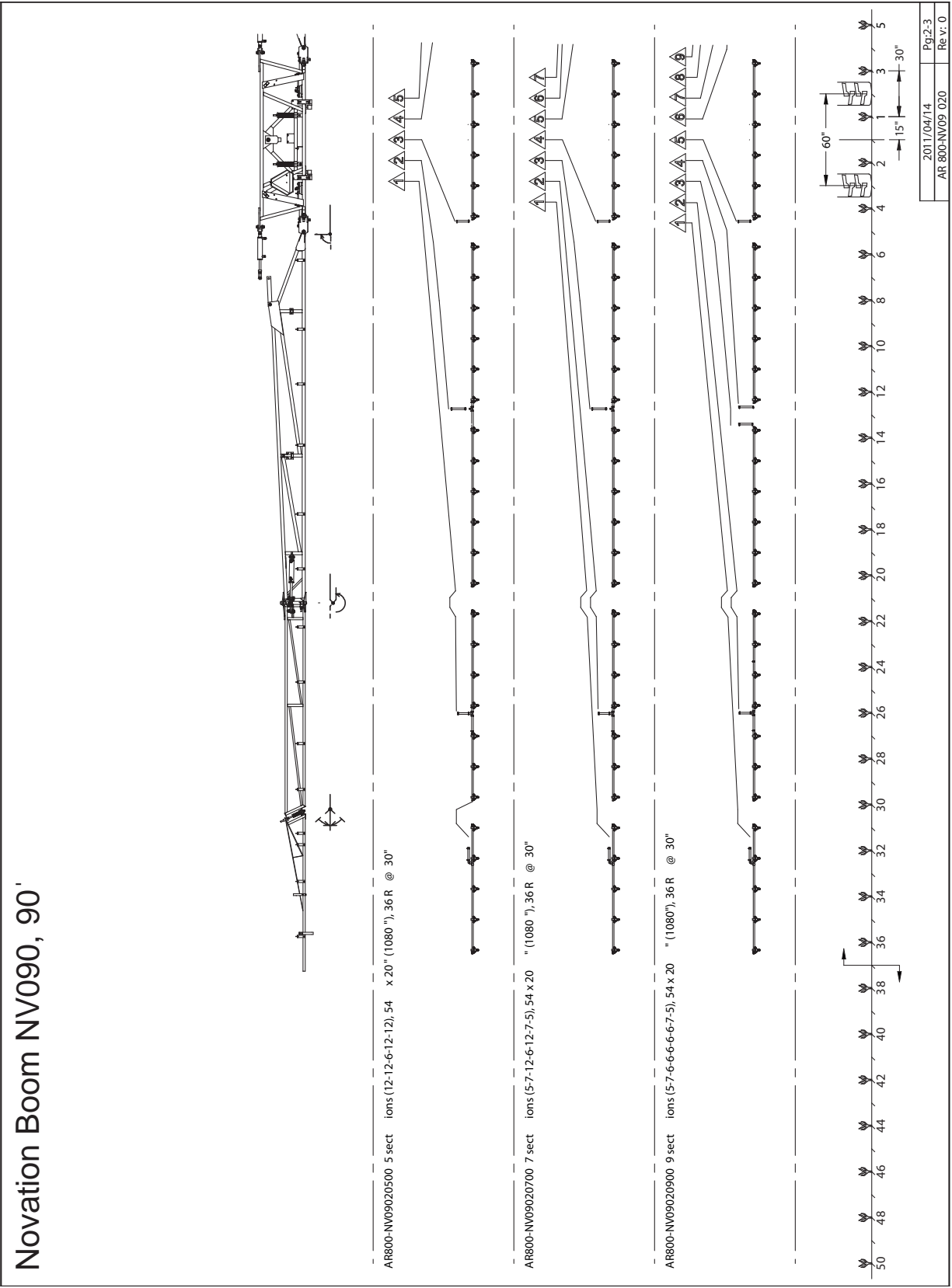
AR800-NV09015900 9 sect ions (7-9-8-8-9-8-8-9-7), 73 x 15" (1095"), 36 R @ 30"



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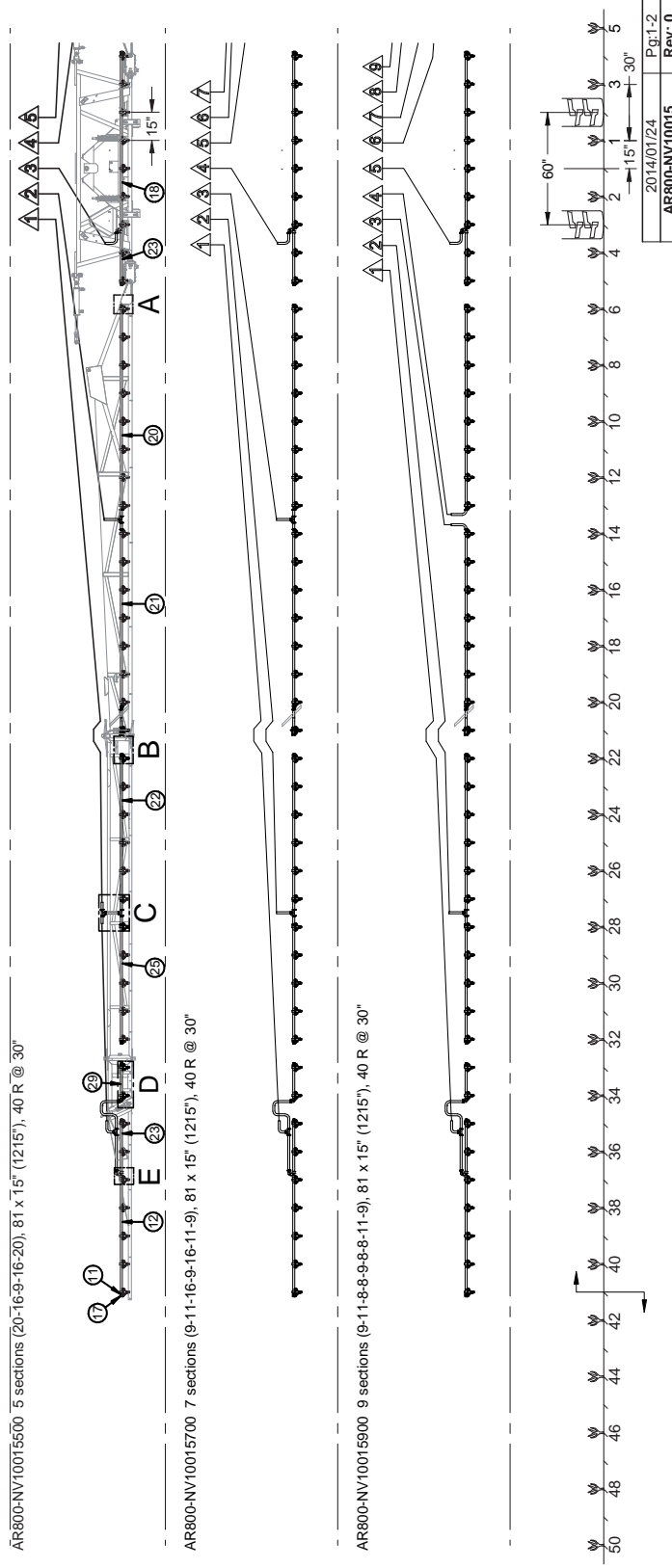
# 10- TECHNICAL SPECIFICATIONS

## 10.12 - Novation Boom NV090, 90' (nozzle bodies at 20")



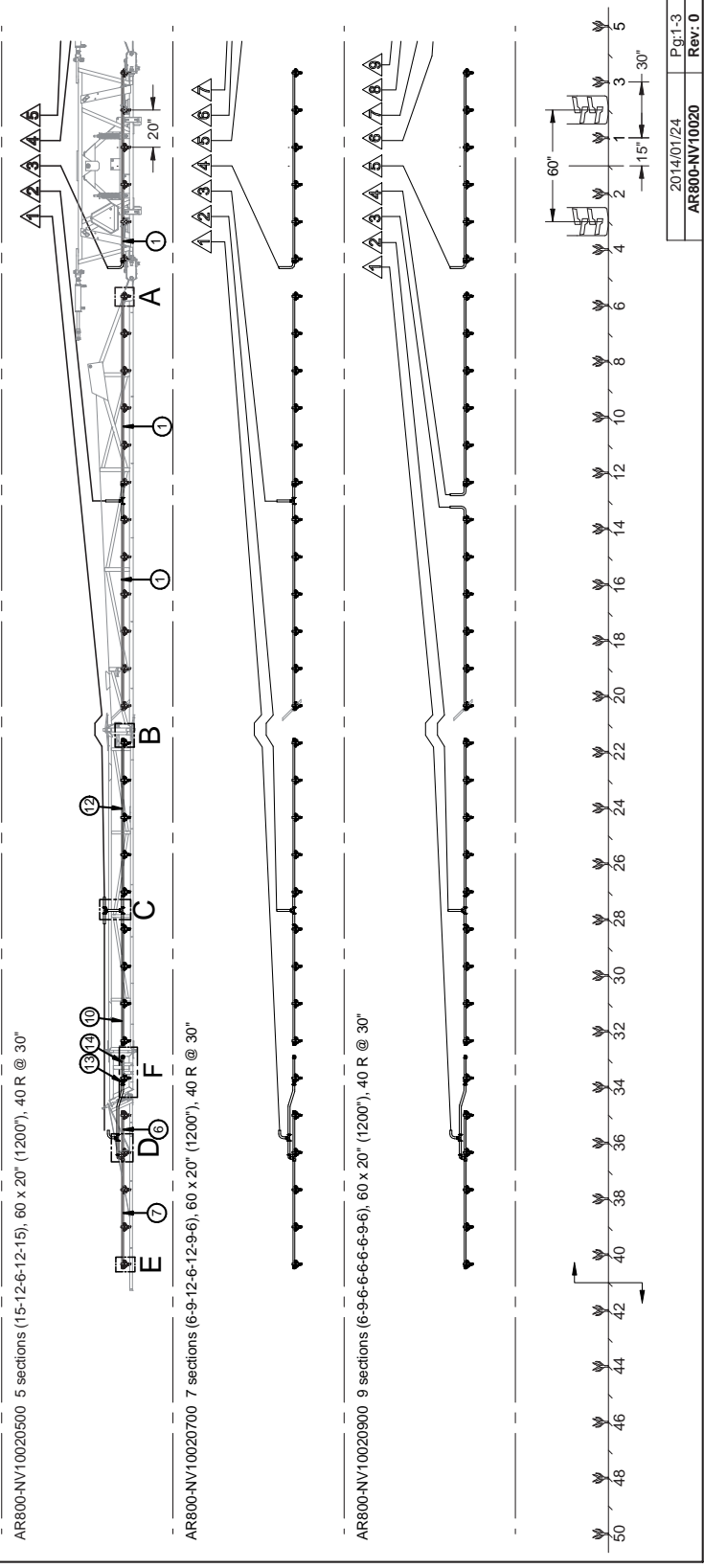
10.13 - Novation Boom NV100, 100' (nozzle bodies at 15")

Novation Boom NV100, 100'



10.14 - Novation Boom NV100, 100' (nozzle bodies at 20")

Novation Boom NV100, 100'

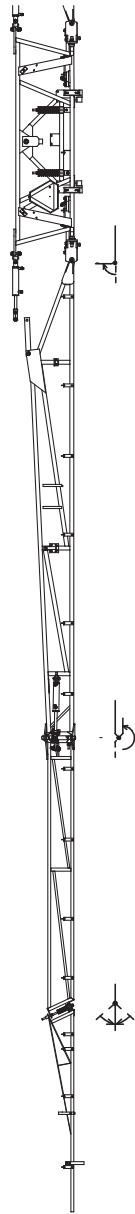


10.15 - Tracking comparaison of 60"/120" and 90"

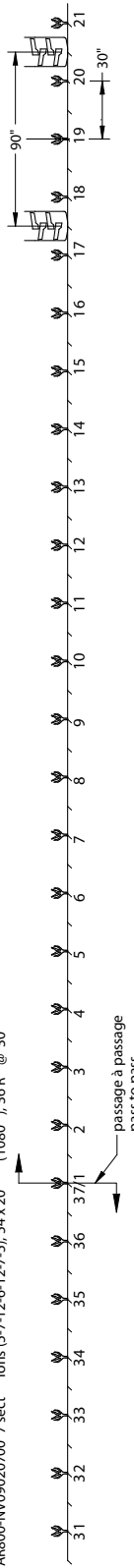
Novation Boom NV090, 90'

Comparaison voie de 60"/120" et 90"  
Tracking comparaison of 60"/120" and 90"

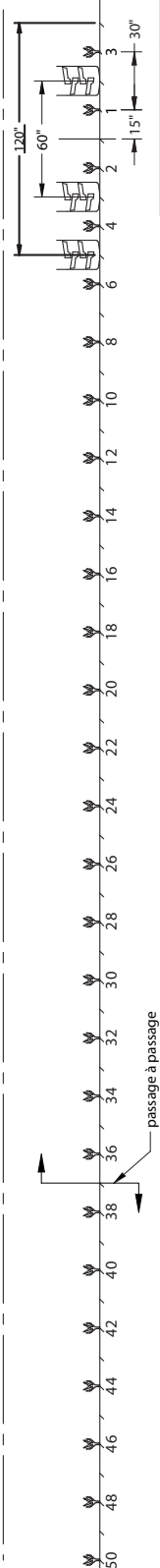
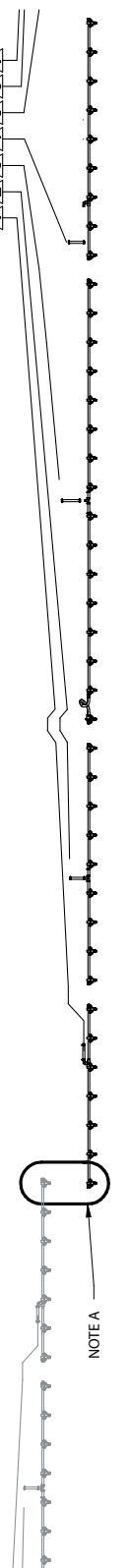
**NOTE A:**  
L'utilisation d'un espacement de 15" avec des rangs au 30" demande l'utilisation de buses avec des orifices ayant la moitié du débit des buses régulières. La même buse passant deux fois au même endroit pour éviter une double dose de pulvérisation.  
When working with 15" spacing at 30" row spacing you need to use nozzles with the half flow of regular nozzles. The same nozzle will spray twice on the same row to avoid double spray dose.



AR800-NV09020700 7 sect ions (5-7-12-6-12-7-5), 54 x 20 " (1080 "), 36 R @ 30"



AR800-NV09020700 7 sect ions (7-9-16-9-16-9-7), 73 x 15 " (1095 "), 36 R @ 30"

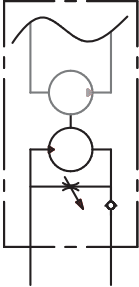




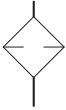
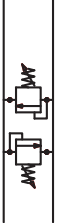


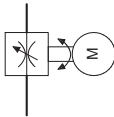

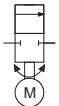







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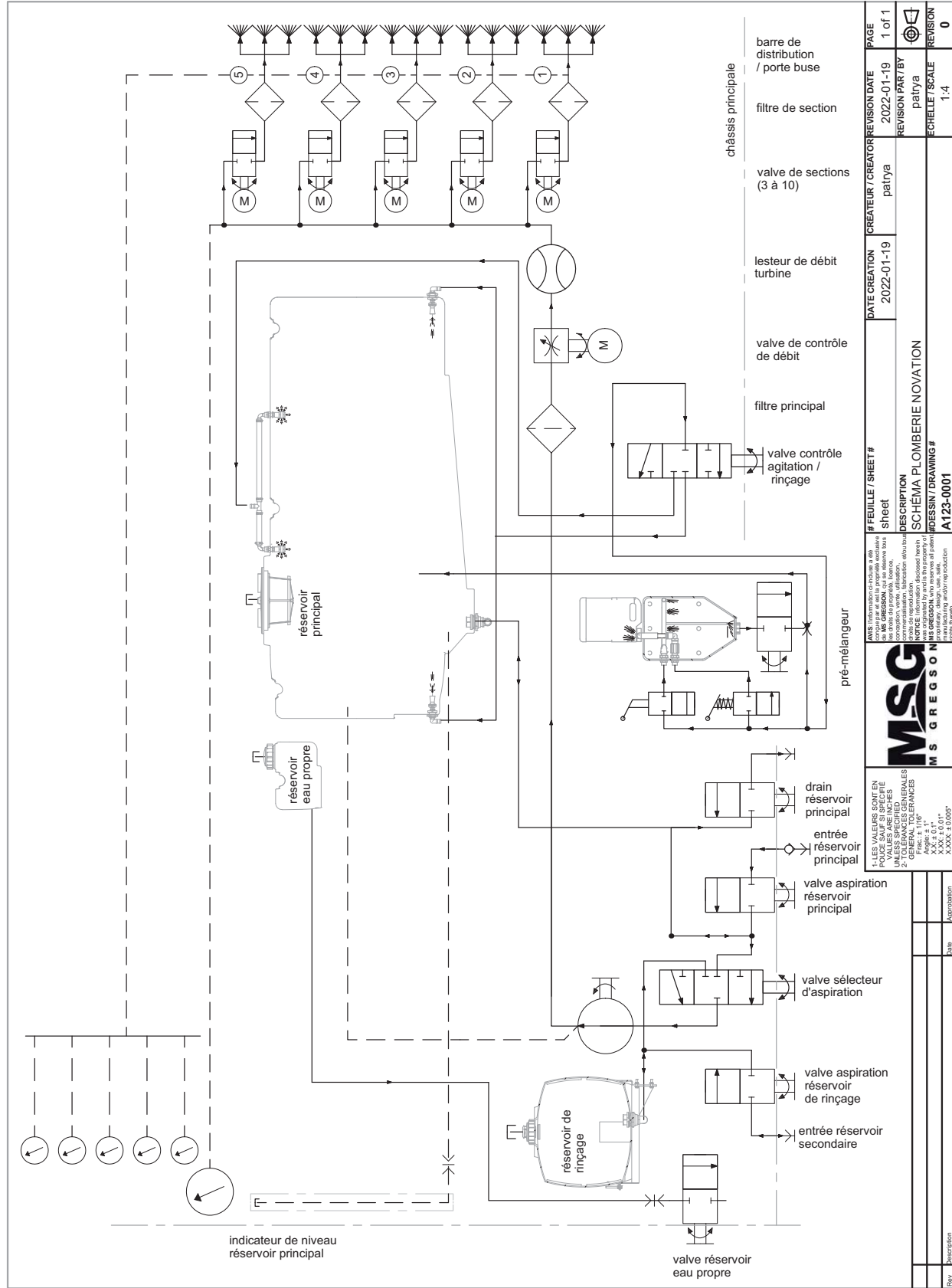
# 10- TECHNICAL SPECIFICATIONS

## 10.16 -Hydraulic symbols

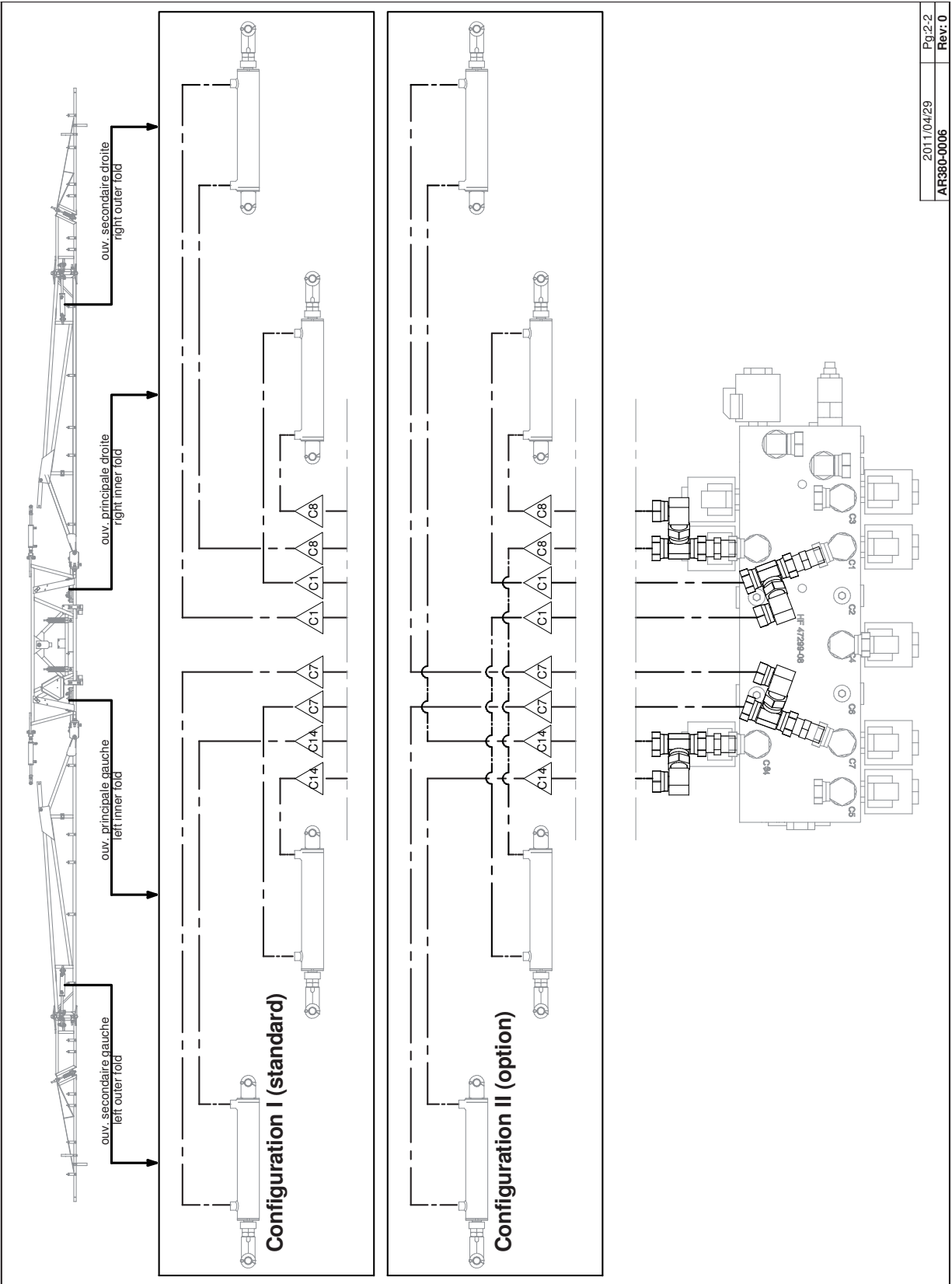
Hydraulic Symbol Legend		2011/05/31	Pgr:1-1
		Legend	
	hydraulic motor		breather
	check valve with restrictor		accumulator
	cylinder		filter
	pressure relief valve		flow meter
	male connection with check valve		variable orifice flow valve
	female connection		on/off 2 way electrical valve
	adjustable orifice		pressure gauge
	check valve		
	2 way directional valve (electrical)		
	2 way bypass valve (electrical)		

# 10- TECHNICAL SPECIFICATIONS

## 10.17 - Novation drawing

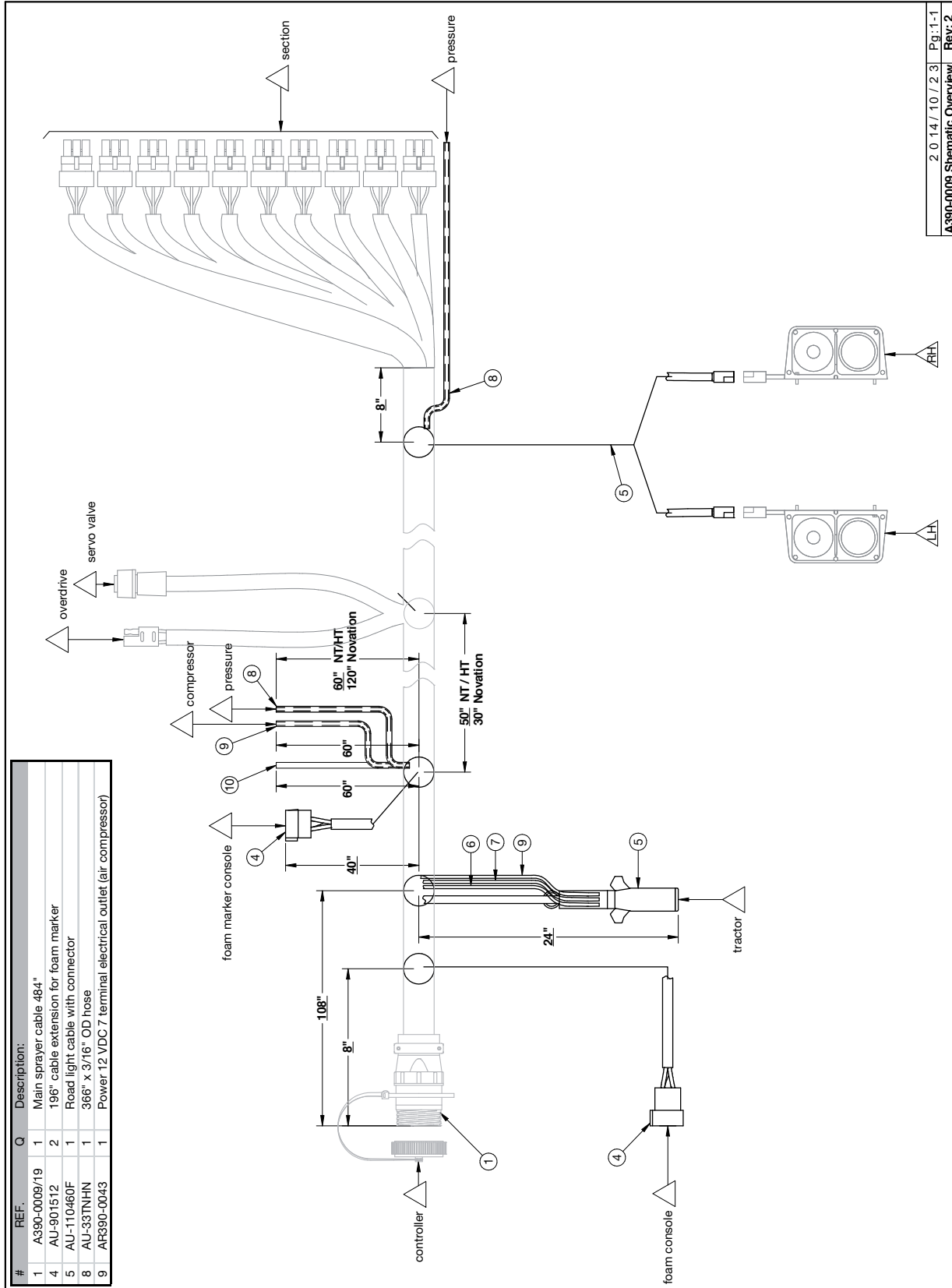


# FEUILLE / SHEET #	sheet	DATE CREATION	2022-01-19	CREATEUR / CREATOR	pat/y/a	REVISION	1.4
DESCRIPTION	SCHEMA PLOMBERIE NOVATION						
# DRESSIN / DRAWING #	A123-0001						
AVIS	Information contained herein is the property of M.S. GREGSON, Inc. and is to be used only for the project and location specified. No part of this drawing may be reproduced without the written permission of M.S. GREGSON, Inc.						
NOTICE	Information disclosed herein is the property of M.S. GREGSON, Inc. and is to be used only for the project and location specified. No part of this drawing may be reproduced without the written permission of M.S. GREGSON, Inc.						
1- LES VALEURS SONT EN POINCE SAUF SI SPECIFIÉ	UNLESS SPECIFIED, DIMENSIONS ARE IN INCHES						
2- TOLERANCES GÉNÉRALES	FRACTIONAL PARTS						
	XXX ± 0.01"						
	XXX ± 0.1"						
	XXX ± 0.005"						
Rev	description	Date					



# 10- TECHNICAL SPECIFICATIONS

10.20 - A390-0009

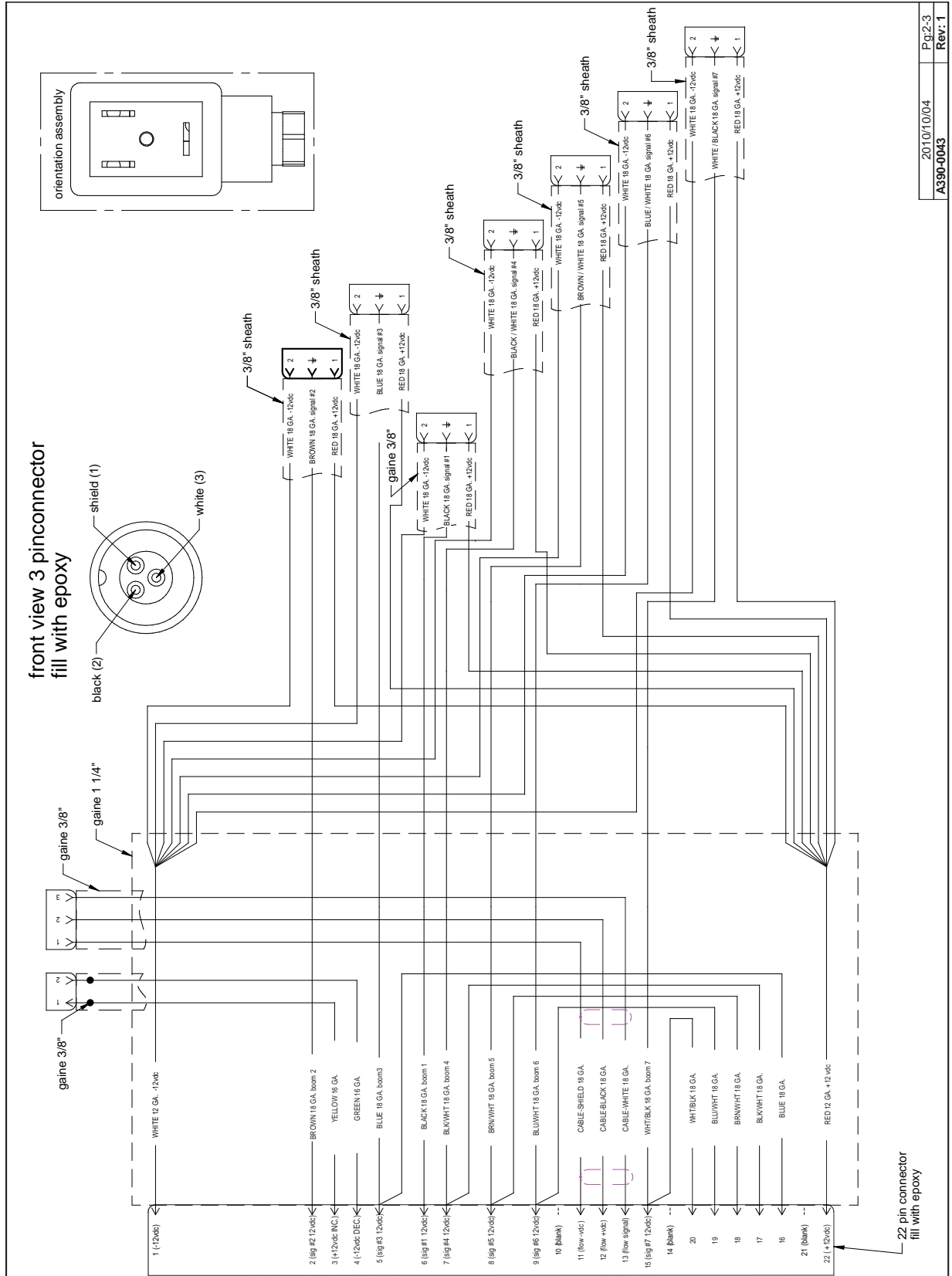


#	REF.	Q	Description:
1	A390-0009/19	1	Main sprayer cable 484"
4	AU-901512	2	196" cable extension for foam marker
5	AU-110460F	1	Road light cable with connector
8	AU-33TNNH	1	366" x 3/16" OD hose
9	AF390-0043	1	Power 12 VDC 7 terminal electrical outlet (air compressor)

2 0 1 4 / 1 0 / 2 3 Pg.1-1  
A390-0009 Schematic Overview Rev. 2

# 10- TECHNICAL SPECIFICATIONS

10.21 - A390-0043



2010/10/04	Pg:2-3
A390-0043	Rev: 1





## 10- TECHNICAL SPECIFICATIONS

### 10.23 Tightening torque values

The following table shows the tightening torque values for the different nuts and bolts. Screw the bolts to the specified value shown in the table unless otherwise specified.

Use this table as a guide. Replace the bolts with the same size bolt.

The tightening torque value is identified on the head of the bolt.



#### Imperial units

«A»	Grade 2		Grade 5		Grade 7	
	N.m	lb-ft	N.m	lb-ft	N.m	lb-ft
1/4"	8	6	12	9	16	12
5/16"	13	10	25	18	35	25
3/8"	27	20	40	30	60	45
7/16"	40	30	70	50	110	80
1/2"	60	45	100	75	155	115
9/16"	95	70	155	115	220	165
5/8"	130	95	200	150	300	225
3/4"	225	165	390	290	540	400
7/8"	230	170	570	420	880	650
1"	300	225	850	630	1310	970

#### Metric units

«A»	Classe 8.8		Classe 9.8		Classe 10.9	
	N.m	lb-ft	N.m	lb-ft	N.m	lb-ft
6	13	9	14	10	17	13
7	21	15	24	18	29	21
8	31	23	34	25	42	31
10	61	45	68	50	83	61
12	106	78	118	88	144	106
14	169	125	189	140	230	170
16	263	194	293	216	357	263
18	363	268			493	364
20	513	378			689	515
22	699	516			952	702

The values in the table are for bolts with non-greased and non-lubricated threads. Do not grease or lubricate the nuts or the bolts unless specified to do so in this manual. When a (nylon or metal auto locking nut is used, increase the value by 5%).

Technical documents are also available for the maintenance and repair of this sprayer. See your dealer for more information on these documents.

## 10- TECHNICAL SPECIFICATIONS

### 10.24 Conversion table

Application rate	
1 US gallon per acre (GPA)	9,35 litres per hectare
2.9 US oz. per 1,000 sq. feet	1 US gallon per acre (GPA)
Capacity	
1 quart	0,473 litre
1 quarter gallon	0,946 litre
1 US gallon	3,785 litres
1 bushel	35,239 litres
1 litre	33,8 ounces
1 litre	1,0567 quarter gallon
1 litre	0,264 US gallon
Area & surface (square measures)	
1 cubic centimetre	0,061 cubic inch
1 square centimetre	0,155 square inch
1 square metre	10,760 square feet
1 square metre	1,196 square yards
1 square kilometre	0,386 square mile
1 square inch	6,452 square centimetres
1 square foot	929,030 square centimetres
1 square foot	0,0929 square metre
1 square yard	0,836 square metre
1 square mile	2,5899 square kilometres
1 square mile	258,999 hectares
1 acre	0,405 hectare
1 acre	43 560 square feet
1 hectare	2,58471 acres
100 hectares	1,0 square kilometre

Cubic Measures	
1 cubic inch	16,3862 cubic centimetres
1 cubic foot	0,0283 cubic metre
1 cubic yard	0,7646 cubic metre
1 cubic centimetre	0,0610 cubic inch
1 cubic metre	35,3145 cubic feet
1 cubic metre	1,308 cubic yards
Length and Distance	
1 centimetre	0,3937 inch
1 decimetre	0,3281 feet
1 metre	3,2810 feet
1 kilometre	0,6241 mile
1 kilometre	0,5390 nautical mile
1 inch	2,5400 centimetre
1 foot	0,3048 metre
1 yard	0,9144 metre
1 mile	1,6093 kilometre
1 mile	5 280 feet
1 nautical mile	1,8520 kilometre
Pressure	
1 psi	0,69 bar
1 psi	6,896 kilopascals

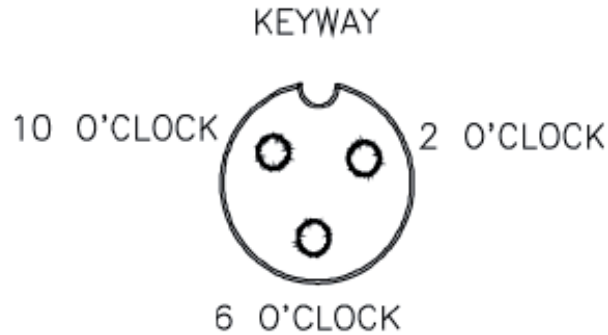
## 10- TECHNICAL SPECIFICATIONS

Volume	
1 Imp. oz.	0,961 US oz.
1 Imp. gal.	1,201 US gal.
1 US oz.	1,041 Imp. oz.
1 US gal	0,833 Imp. gal.
1 US gal	128,0 oz.
1 quart	0,568 litre
1 quarter gallon	1,137 litre
1 Imp. gal.	4,546 litres
1 bushel	36,369 litres
1 litre	35,2 ounces
1 litre	0,88 quarter gallon
1 inch	3 16,3871 cubic centimetre
1 gallon	231 cubic inches
1 cubic centimetre	1 ml
1 cubic centimetre	1 gram water

Density kg / L	Conversion factor
0,84	0,92
0,96	0,98
1,00	1,00
1,08	1,04
1,20	1,10
1,32	1,13
1,44	1,15
1,68	1,20

### 11.1 - Procedure to test flow meter cables

Disconnect cable from flow sensor. Hold flow sensor cable so that the keyway is pointing in the 12 o'clock position.



#### Pin designation

2 o'clock socket location is power.  
10 o'clock socket location is ground.  
6 o'clock socket location is signal.

#### Voltage reading

10 o'clock socket to 6 o'clock socket = +5 VDC.  
10 o'clock socket to 2 o'clock socket = +5 VDC.

If a +5 VDC voltage reading is not present, disconnect the speed sensor cable. If the flow reading is restored, test the speed sensor cable per appendix procedure to test speed sensor cables.

#### Procedure to check cable

1. Enter a METER CAL number of one (1) in key labelled «METER CAL 5».
2. Depressed key labelled «TOTAL VOLUME».
3. Place BOOM switches to ON.
3. With small jumper wire (or paper clip), short between the 2 o'clock and 6 o'clock sockets with a «short-no short» motion. Each time a contact is made, the TOTAL VOLUME should increase by increments of 1 or more counts.
4. If TOTAL VOLUME does not increase, remove the section of cable and repeats test at connector next closest to console.  
Replace defective cable as required.
5. Perform above voltage checks.
6. If all cables test good, replace flow sensor.



**WARNING !** After testing is complete, re-enter correct METER CAL number before application.

# 11- TROUBLE SHOOTING

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## 11.2 - Quick check of the rate controller

---

Ensure that all calibration data transcribed in your operator's manual correspond to those of the equipment and those programmed into the controller.



**NOTE ! Perform the following tests with water.**

### **It all comes down to the three following questions:**

- 1- Is there speed?
- 2- Is there flow?
- 3- Are the adequate nozzles installed?

#### **1- Is there speed?**

Ensure that the GPS speed sensor is working properly. Refer to GPS speed sensor manual for calibration.

#### **2- Is there flow**

Ensure that the controller calculates the right amount of liquid. Place the controller in the "Volume" (gallon/litre) position and compare the displayed volume with the quantity applied or collected. If there is a discrepancy, adjust the calibration number.

#### **3- Are the adequate nozzles installed?**

Determine your spray data: rate, speed, nozzle, etc., and compare them to a reference chart. To make tests easier, simulate a normal driving speed with your controller and check the operation in manual mode first and then in automatic mode. Simulate lower and higher speeds as well to verify equipment behavior.

In manual mode, you will be able to raise and lower the pressure and compare data, as well as to compare the relationship between driving speed, spray pressure and rate. Once the system is operating in manual mode, repeat the same steps in automatic mode to perform an overall verification.

Liquid loss or lack of pressure at nozzles.	Main filter clogged.	Clean the cartridge.
	Line filter clogged.	Clean the cartridge.
	Insufficient oil flow.	Adjust according to tractor.
	Nozzle selection.	Select nozzles according to data.
Excessive pressure.	Excessive oil flow.	Adjust according to section 6.1
	Nozzle selection.	Select nozzles according to data.
	Control valve is malfunctioning.	Check valve operation with (inc./dec-).
	Line filter is getting clogged.	Clean the line filter.
Vibration of the pressure gauge needle.	Air infiltration into the system.	Check tightness of components.
	Turbulence inside the tank.	Check return hoses and fluid return that can adversely affect operation.
	Bad pump start-up.	Purge the pump.
Fluctuation of the pressure gauge needle.	Air infiltration into the system.	Check tightness of components.
	Irregular speed.	Regulate driving speed.
	Irregular speed reading.	Check GPS speed sensor.
	Irregular flow reading.	Check the impeller and functioning of the flow indicator.
Loss of liquid at the pump.	Loss of water, pump running dry.	Replace the mechanical seal.
	Loss of oil at the hydraulic motor.	Inappropriate shutdown hydraulic motor.
No pressure, the pump does not function.	The hydraulic selector of the tractor is not engaged.	Push the lever forward.
	The hydraulic safety cut off the system.	Put in neutral position, reduce flow and engage the selector again.
	Bad pump start-up.	Bleed air from the system.
	Lack of water.	Check the position of valves.



## 11- TROUBLE SHOOTING

PROBLEM	CAUSE	SOLUTION
Foam is forming in the main tank.	Air infiltration into the system.	Check tightness / Close valve "B" at pre-mixer. Tightness of suction couplings.
	Excessive agitation.	Reduce agitation. When the tank is near empty, turn off agitation. Add antifoam to the spray slurry.
	The 3-way suction valve is in rinsing position and the rinse tank is empty.	Fill the tank or turn the suction valve in spraying position.
The boom does not work.	The hydraulic selector of the tractor is not engaged.	Push the lever forward.
	The hydraulic safety cut off the system.	Put in neutral position, reduce flow and engage the selector again.
	The electro-hydraulic valves are not powered (12 VDC).	Check electrical supply, cable, connectors, logic diodes (cable and control).
Erratic operation of the boom.	Insufficient hydraulic flow	Increase hydraulic flow.
	Electrical connector oxidized and/or insufficient power supply.	Check and clean all connections.
Overheating of the hydraulic system.	Excessive flow.	Reduce flow and make required adjustments.
	Bad hydraulic system type selection.	Make required adjustments according to tractor system type.
Unequal speed between the cylinders.	Port blocked/partially clogged.	Clean port inside the hydraulic unit.
Forward/backward movement of the boom sections.	Wear and/or misalignment of joints.	Review the procedure for adjusting the cylinders
Leveling valve of the air suspension remains at the same level: full or empty	Faulty valve	Replace the valve

## 12.1 - Astro Series GPS Speed Sensor - Instruction

**INSTALLATION:**

**RECEIVER:** The GPS receiver may be mounted either externally (roof of the cab or other place with a clear view of the sky) or inside the vehicle cab. However, if mounted inside the cab there may be some loss of accuracy due to blockage of satellite signals. For most reliable operation, mount the GPS receiver in a location where it has an unobstructed view of the sky. The bottom plate on the receiver provides a magnetic mount, or you can use the provided dual-lock Velcro to attach the receiver. If using the dual-lock, thoroughly clean the surface, remove the backing from the dual lock, and press firmly to the surface.

**WIRING:** Route the 10 foot cable from the receiver into the cab (if receiver is externally mounted). Avoid sharp edges or heat sources. The rectangular module is roughly the same size as the connector and will fit through the same opening.

**MODULE:** The small potted module includes a power indication light and a GPS status light. The module can be attached in a visible spot using the dual-lock, or if desired may be tucked out of sight.

**CONSOLE CONNECTION:** Connect the short cable from the Astro to the speed sensor connector on your console. The standard Astro is available with either a 3-pin Packard Metri-Pak shroud connector or a 3-pin Weather-Pak shroud connector to mate to Micro-Trak products. Other connectors and/or adapters are available to connect to other console makes/models.

**CALIBRATION:**

**OUTPUT SIGNAL:** The Astro will output a 50% duty cycle square wave proportional to vehicle speed. The standard output is 46.56 Hz/MPH, but the user can select the low frequency option (10.115 Hz/MPH) by cutting the wire loop on the module. The low frequency option should be used with older Micro-Trak Generation I base products or some consoles from other vendors to allow a reasonable maximum speed. See table below.

**SPEED CALIBRATION:** The table below provides speed calibration numbers and indicates whether or not the wire loop should be cut. Perform your "fine-tuning speed/distance value" procedure per your installation manual. If you have questions, please refer to the operator's manual for your console, or call Micro-Trak's Service Department at 1-800-328-9613.

Console Type	Speed Cal		Wire Loop	Connector Type	Part Number		
	English	Metric			Astro II	Astro 5	
SodPro II, ProPlant II, ProSeed, GSC-1000, MT-3405D, MT-NH3 II, SprayMate II, Calc-An-Acre II, FlowTrak II, MT-2405F II, MT-3405F II, RoadMaster, Whirlwind, PLC-10X	0.189	0.48	DO NOT CUT	3-Pin Metri-Pak Shroud	01410	01425 / 01437	
MT-NH3, SprayMate, MT-403/MT-400, Calc-An-Acre LR, FlowTrak LR, MT-2405F, MT-3405F, SodPro, AutoTrol, MT-9000	0.90	.022	CUT	3-Pin Metri-Pak Shroud	01410	01425	
Speed-O-Meter	6910	4800	CUT	3-Pin Metri-Pak Shroud	01410	01425	
MT-3000/MT-5000	1.80	.044	CUT	3-Pin Weather-Pak Shroud	01411	01426	
Raven 440, 460 etc.*	783	200	DO NOT CUT	3-Pin Conxall	01415	01430	
Calc-An-Acre 84C, FlowTrak 84C/FT96C	1.70	.044	CUT	2-Pin w/Adapter	01412	01427	
Mid-Tech ARC6000	994	1000	DO NOT CUT	4-Pin AMP CPC	01413	01428	
dickey-John Amp	6146	N/A	DO NOT CUT	4-Pin AMP CPC	01413	01428	
Tee-Jet 844	923	923	DO NOT CUT	3-Pin Wedge-Lock Reception	01417	01432	
Tee-Jet 855	923	923	DO NOT CUT	3-Pin Deutsch Plug	01419	01433	
Hiniker	Computer Facts	13584	N/A	DO NOT CUT	3-Pin Cannon	01420	01435
	Acre Commander	27.70	N/A				
	Spray Commander	389.4	N/A				
Hardi (sprayer input connection)	N/A	N/A	N/A	3-Pin AMP Superseal	01847	01848	





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