

ALR2103

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OPERATORS MANUAL

Safety, use and maintenance



ALR2103-V1-EN-2016-06

PF-LIVRETX-EN

WARRANTY

Terms and conditions

In this document, “the Company” refers to Industrie Aulari Inc.

- 1) New applicators manufactured by the Company, free of manufacturing defects (labor and parts) are warranted for a season of use from the date of delivery to the customer.
- 2) If the applicator or components thereof does not meet the terms of warranty presented in clause 1, the Company must solve the problem and put the applicator in operation conditions, at his option:
 - a) Repair defective parts or components;
 - b) Replace parts or defective components with new parts.
- 3) This warranty releases the Company from any liability for loss of profit or other consequences resulting from a defect of the applicator.
- 4) All warranty claims must be written to the Company within 14 days of the defect, only these written claims will be considered by the Company.
- 5) All warranty claims must be made by the original purchaser of the applicator.
- 6) The warranty will become void if:
 - a) Parts which are not manufactured by, provided by or approved by the Company are installed and used on the applicator;
 - b) Repairs, non-approved by the company, are made on the applicator;
 - c) Custom modification on the applicator are made without the written approval of the Company;
 - d) The applicator is damaged in an accident;
 - e) The applicator is misused, overloaded or used for any application other than seeding and fertilization. Specifications and capacities in this manual represent the acceptable limits for the use of the applicator (refer to the Specifications section of this manual);
 - f) The maintenance is not done according to the recommendations and intervals specified in this manual.

PRODUCT IDENTIFICATION

Please complete the information below upon receipt of your applicator. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. Also file those informations in a secure place off the machine.

Serial number	
Model	
Number of rows	
Year of manufacture	
Delivery date	
Date of first use	
Accessories included	

Dealer information (if applicable)

Name _____

Adress _____

City/ Province/ Country _____

Phone _____

Fax _____

Email _____

Manufacturer information

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CONTENTS

WARRANTY	3
PRODUCT IDENTIFICATION	5
INTRODUCTION	7
SAFETY	8
HIGHWAY AND TRANSPORT OPERATION	8
TRANSPORTING	11
ACCIDENT PREVENTION	12
TECHNICAL DATA – ALR2103	13
ATTACHING PROCEDURE	14
ELECTRIC SELECTOR (OPTION)	19
ADJUSTMENTS BEFORE OPERATION	20
<i>Adjustment before operation</i>	20
<i>Planting corn configuration</i>	20
<i>Soybean seeding configuration (option)</i>	21
SCALE MONITOR CALIBRATION (OPTION)	24
<i>Programming procedure</i>	24
START-UP PROCEDURE IN FIELD	25
START-UP OF THE APPLICATOR	27
A) <i>Direct tractor drive</i>	27
B) <i>PTO pump drive</i>	28
C) <i>Mechanical drive</i>	29
CALIBRATION PROCEDURE	29
<i>ALR3002 working width 4.5 m (6 rows) (kg/ha)</i>	29
<i>ALR3002 working width 15 ft (6 rows) (lbs/acre)</i>	30
<i>ALR3002 working width 6 m (8 rows) (kg/ha)</i>	31
<i>ALR3002 working width 20 ft (8 rows) (lbs/acre)</i>	32
<i>ALR3002 working width 9 m (12 rows) (kg/ha)</i>	33
<i>ALR3002 working width 30 ft (12 rows) (lbs/acre)</i>	34
<i>ALR3002 working width 12 m (16 rows) (kg/ha)</i>	35
<i>ALR3002 working width 40 ft (16 rows) (lbs/acre)</i>	36
SERVICE ON THE APPLICATOR	37
<i>Practice safe maintenance</i>	37
<i>Cleaning of the applicator</i>	37
<i>Service/Prior to operation every season</i>	38
<i>Storage and service at the end of season</i>	38
<i>Lubricants and capacities</i>	38
<i>Variable transmission oil</i>	38

<i>Oil reservoir (Distribution)</i>	39
<i>PTO pump gear-box(PTO pump option)</i>	39
<i>Oil reservoir (PTO pump option)</i>	39
<i>Lubrication of the fan gear box(mechanical drive option)</i>	40
<i>Belt tension (mechanical drive option)</i>	40
<i>Adjustment and removal of the metering shaft</i>	41
<i>Drive arm adjustment</i>	42
TABLE OF LUBRICATION (GREASE)	43
TABLE OF LUBRICATION (OIL)	46
TORQUE VALUES CHART	47
CONVERSION CHART	48

INTRODUCTION

This operator manual contains all the informations needed to make the adjustment and maintenance on your Aulari pneumatic precision applicator.

This manual should be considered as a permanent part of your machine and should remain with the machine when you sell it.

Please read this manual before using the applicator and be sure to follow the operating and maintenance instructions. Also, make sure that all operators of the applicator have read this operating manual. So, this way, you can prevent accidents, reduce repair costs and downtime. In addition, you will increase the productivity and longevity of your applicator. Always comply with all safety instructions present in this manual!

Industrie Aulari Inc. will not accept liability for any damage or consequence resulting from non-respect with the guidelines in this operator's manual.

The operating instructions will guide you for a better control of your machine and will guide you to make better use and optimal maintenance.

The operator manual must be read by anyone who works with this applicator, whether for:

- ☞ the operation of the applicator (adjustments in the field) ;
- ☞ daily or seasonal maintenance ;

The period of warranty coverage begins upon delivery of the distributor. A representative of the Company or the dealer will provide the adjustment instructions, maintenance and security for the first using of the applicator.

Industrie Aulari inc. reserves the right to modify technical data and illustrations in this document in order to improve the product.

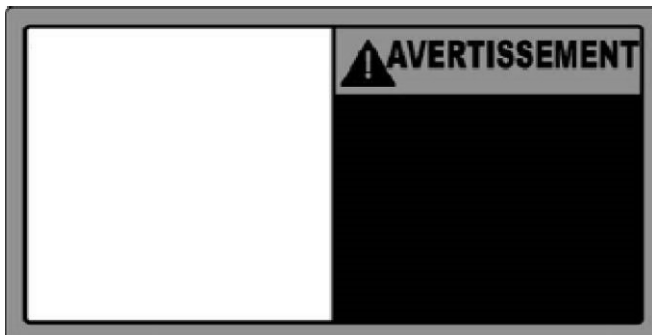
SAFETY

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good conditions. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your dealer or manufacturer.

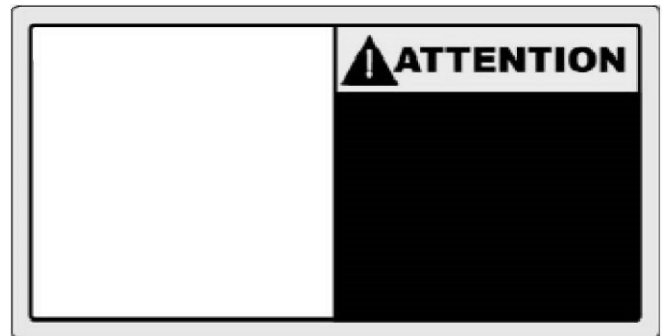
The following hazard and safety symbols are present in this manual and on your applicator.



A signal word - DANGER identifies the most serious hazards which can result in serious physical injury or death.



A signal word - WARNING indicates a potentially hazardous situation (e.g. security guard removed or unsafe practices) that can result in serious physical injury or death.



A signal word - CAUTION indicates a potentially hazardous situation, unsafe practice which could result in minor or moderate injury.

The safety decals on the applicator should never be hidden or damaged. For replacement stickers, contact Industry Aulari.

SAFETY SYMBOL ON THE APPLICATOR



- Read the operator and maintenance manual before using the applicator.



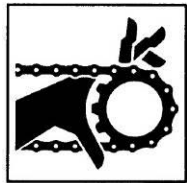
- Use anchor points identified on the applicator for the carriage.



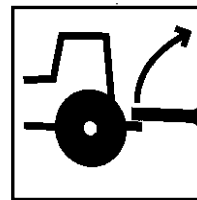
- Beware of under pressure escaping fluid. Relieve hydraulic system pressure before performing any works on the system.
- Relieve pressure before disconnecting hydraulic lines.
- Tighten all connections before applying pressure.
- Seek medical attention immediately if fluid is injected into skin.



- Never allow people on or near the equipment while it is moving.
- Do not climb on tank stairs or platform when equipment is in operation.



- Rotating fans and moving chains can sever digits. Keep hands, feet, hair and clothing away from moving parts.



- Always keep all guards and shield in place

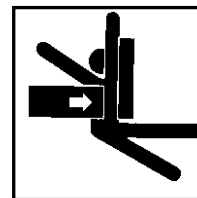
- Severing hazard.



- Remove guards only for adjustment or maintenance.
- Disconnect and lockout power source before adjusting or servicing.



- Close and secure guards and shields before starting.



- Never use the PTO without the security guard in place. Before maintenance or repair, disengage



the PTO and stop the tractor.

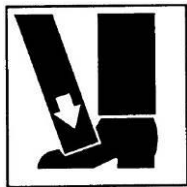
- Avoid tipping cart, always fold the toolbar wings and lower down to the ground the equipment before unhitching the applicator.

- Never climb onto applicator when it is not attached to an implement. Cart could tip, which may result in death or serious injury.

- Always keep a distance off the wings of the applicator when unfolding and folding.

- Keep all persons and objects clear while any part of this equipment is in motion.

- Always install the cylinder locking devices before maintenance, repair or transport of the applicator.



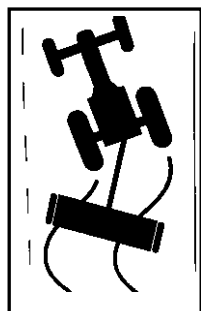
- The jack may collapse under the weight of the applicator if hopper is full. Use the jack only to support the applicator when hopper is empty.



- Do not stand under the step when lower down.

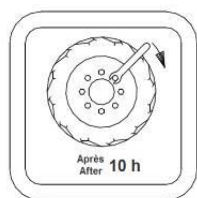


- Never step in the hopper when the applicator is in operation



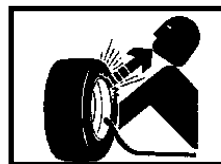
- Always follow the safety instructions when transporting the applicator. Pull the applicator with a tractor only. The maximum permitted speed on the road is 25 km/ h (16 mi / h).

- Use proper warning lights
- Install safety chains.
- Tighten the wheel bolts after the first 10 hours of operation.



Thereafter perform a torque check of wheel nuts after 40

hours of use. See Section OTHER MAINTENANCE (page 59) in this manual.



- Check the tires daily. Make repairs when needed. Carefully check the tire pressure. See Section OTHER MAINTENANCE (page 59) for the correct pressure.
- Inflating or servicing tires can be dangerous.



To protect against death or serious injury, all labels must be on the machine and must be legible.

If labels are missing or cannot be read, call Industry Aulari at 1-450-792-2126 or 1-877-892-2126, or email info@aulari.com for replacement labels.

HIGHWAY AND TRANSPORT OPERATION

When it is necessary to travel on public roads, it is important to always follow the road safety rules in place.

It is the responsibility of the customer to know the lighting and marking requirements of the local highway authorities and to install and maintain the equipment to provide compliance with the regulations. Add extra lights when transporting at night or during periods of limited visibility.

Adopt safe driving practices:

- ☞ The maximum speed limit on road is 25 km / h (16 mph).
- ☞ Always use headlights, flashing warning lights, day and night, when transporting on a public roadway. Keep lighting and marking clean and visible to operators and other vehicles.
- ☞ Replace or repair any defective lighting or marking that has been damaged or lost.
- ☞ Safety chains should be used at all times. These chains must have a greater capacity than the combined weight of a loaded applicator and other equipment attached to it (minimum chain capacity recommended: 18300 kg - 40500 lb).
- ☞ Always use a proper tractor to operate the applicator. On the road, the tractor weight should always be 67% of the weight of the machine being towed.
- ☞ Never pull the planter on the road with a hopper filled more than 50% of its capacity.
- ☞ Do not allow any passengers in the hopper.

- ☞ In regards to warning lamps, maximum permissible transport widths and weights, check local governmental regulations.
- ☞ Serious injury or death can result from contact with electric lines. Use care when moving or operating this applicator near electric lines to avoid contact.
- ☞ Plan your route to avoid heavy traffic.
- ☞ Be a safe and courteous driver. Always yield to oncoming traffic in all situations.
- ☞ Watch for obstructions overhead and to the side while transporting.
- ☞ Never stand alongside of unit with engine running or attempt to start engine and/or operate machine while standing alongside of unit.
- ☞ Never leave running equipment attachments unattended.
- ☞ Always operate equipment in a position to provide maximum visibility at all times. Make allowances for increased length and weight of the equipment when making turns, stopping the units, etc.



When transporting, make sure that the stair of the platform is in raised position in order to not interfere with the components of the planter or tractor when it is in movement.

ACCIDENT PREVENTION

In addition to all the instructions, it is necessary to take special precautions to prevent accidents.

During service

- ☞ Understand service procedure before doing work. Keep area clean and dry.
- ☞ Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop engine. Remove the key. Allow machine to cool.
- ☞ Securely support any machine elements that must be raised for service work.
- ☞ The fertilizer application parts (discs openers) present risks of injury.
- ☞ To avoid the risk of falling, never climb on rotatable parts (discs, gauge wheels, etc.).
- ☞ Observe the maintenance intervals specified in this operator's manual.

Hydraulic system

- ☞ Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.
- ☞ The hydraulic system of the applicator operates at high pressure. To prevent incidents search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.
- ☞ Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.



To protect the operator and the other person which have to move around the applicator, always lower equipment to the ground and put the safety lock provided.

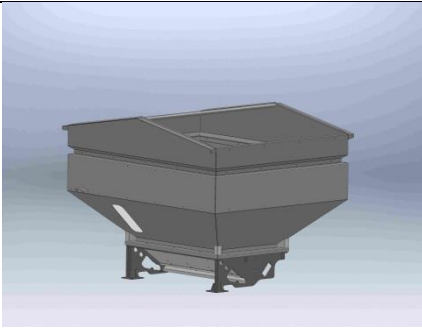
During operation

- ☞ Before starting, make sure that nobody is near the planter.
- ☞ All protective devices (guards and shields) must be in place at all times during the use of the applicator.
- ☞ The step and platform of the hopper should be used only when the applicator is not in operation. It is forbidden to carry a passenger on the platform of the hopper.
- ☞ Nobody should get into the hopper during operation of the applicator. It could cause suffocation.

TECHNICAL DATA – ALR2103

Working width*	6 rows at 30 in / 4.6 m / 15 ft 8 rows at 30 in / 6 m / 20 ft
Length (applicator only)	5.18 m / 17 ft
Operating height (top of the hopper)	3.09 m / 10 ft 2 in
Transport width (applicator only)	
- Single tire (spacing 152 cm / 60 in with spreading boom)	3.54 m / 12 ft
- Dual tire (spacing 152 cm / 60 in and 304 cm / 120 in)	4.82 m / 15 ft 10 po
Transportation height (front toolbar extremity)	
Rigid front toolbar	3.70 m / 12ft 2 in
Side-dressing configuration	4.11 m / 13ft 6 in

Hopper capacity

	
Dimensions	213 cm x 173 cm
	84 in x 68 in
Capacity	3830 Liters
	105 bushels

Rear lift capacity**	7200 kg / 16000 lbs
Total weight (empty hopper) (including 8 fertilizer coulters)	4100 kg / 9000 lbs
Maximum authorized weight (full hopper and equip with rear equipment)	16325 kg / 36000 lbs
Maximum permissible on rear axle	18100 kg / 40000 lbs
Tires (standard configuration)***	460/70R24
Minimum horse power required****	75 – 120 KW / 100 – 160 cv

*Configurations with ALR2103. Only the initial configuration on the sale of the applicator is covered by warranty (6 rows or 8 rows).

**Make sure not to exceed the carrying capacity of the tires. For non-standard tires, lift capacity may be less. Contact the manufacturer for applicable values

*** Other possible tire configurations, depending on the configuration at the sale of the applicator.

**** Depending on the configuration of the applicator and equipment used.

ATTACHING PROCEDURE

For attaching procedure to the tractor, follow the planter manufacturer's recommendations. The Aulari applicator has three possible types of drive of the fan A) Hydraulic direct tractor drive B) Pump PTO drive or C) Mechanical drive. When purchasing the applicator, one of these options was chosen and is installed on your equipment.

A) HYDRAULIC DIRECT TRACTOR DRIVE

This type of drive means that your fan is driven by the conventional hydraulic outlets of your tractor. The fan motor requires a minimum of 100 liters (22 gallons) of oil per minute for its operation. This minimum must be available at the tractor hydraulic outlets.

The Aulari applicator is mounted with ½” male tip quick couplings.

- ☞ Select the motor function on tractor remote. Consult your tractor manufacturer's manual for details.
- ☞ An adjustment of the oil flow of the tractor will be required for operation of the fan. Excessive flow will cause overheating of the tractor hydraulics.

The applicator is equipped with a valve [Figure 1, A] which controls the speed of the fan. This component protects the system from any sudden flow or pressure increase. No adjustment is required on this valve. The valve has been pre-set at the factory and a seal of approval was stamped on the valve.

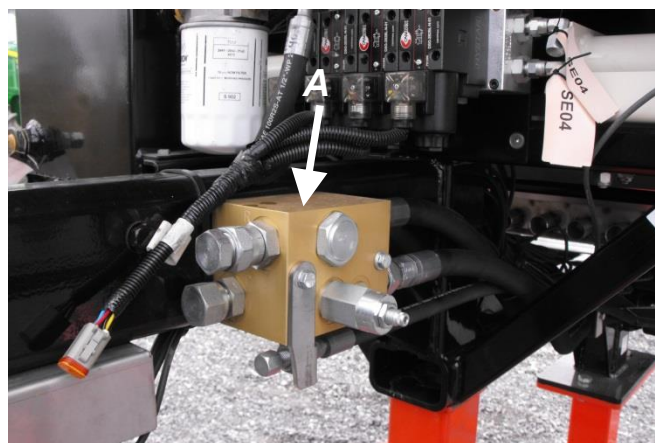


Figure 1



Breaking the seal will void the warranty if damage is caused to the components of the drive system.

Hydraulic direct tractor drive connecting procedure:

1. Stop tractor engine.
 2. Connect all hydraulic hose to the tractor.
- ☞ Clean the tip of hose coupler and the tractor port before connecting to avoid contamination of the hydraulic circuit.
3. Test the functioning of the connection. Start the tractor.
 4. Engage the corresponding remote. The fan will start.
- ☞ The fan is equipped with a one-way hydraulic circuit protective device. If the fan doesn't start, reverse the hoses to the tractor and do another test run. If after reversing the hoses, the fan still doesn't start, check the functioning of the tractor hydraulic outlets.
 - ☞ Repair immediately any oil leaks: Escaping fluid under pressure can cause serious injury! Repair all defect hose or fittings with manufacturer original parts.



Before starting, make sure that nobody is near the distributor.

- Depending of the options on your applicator, complete the connection of electronic cables in the cabin. [Figure 3 and 4]

☞ To operate your electric options, please refer to the "ELECTRIC SELECTOR" in this section.

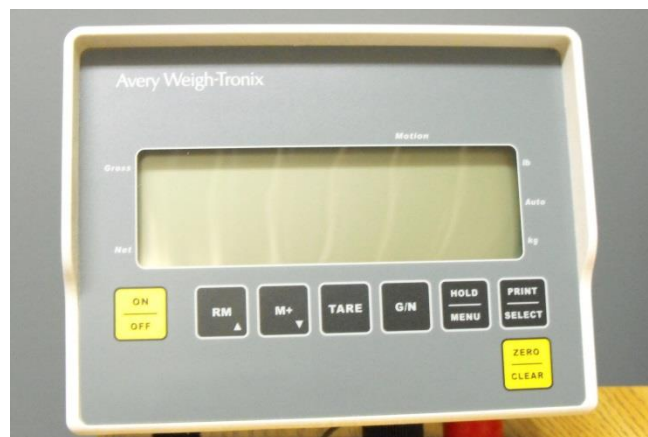


Figure 4

- After all the connections, verify their functioning. If there is malfunction, repair defective parts immediately.



Figure 3

B) PTO PUMP DRIVE

This type of drive is a closed hydraulic circuit powered by the tractor PTO at 1000 rpm [Figure 5]. The size of the fast connection of the PTO gearbox can varied according to your tractor; 1 3/8-21 or 1 3/4 -20

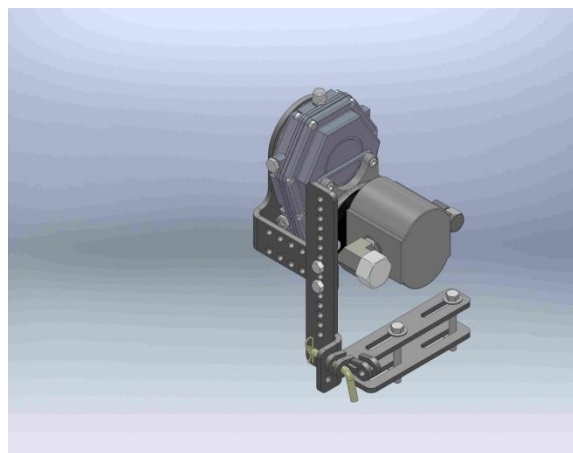


Figure 5



The tractor PTO must rotate at 1000 rpm. If the PTO doesn't turn to the right rpm, the fan will not reach its operating speed and can cause a blockage in the fertilizer hose line.

Connection procedure:

1. Park the tractor in a safe location and stop the tractor.
2. Clean the PTO shaft of the tractor.
3. Connect the PTO gearbox and the pump to the tractor PTO.
4. Install the retaining bracket on the drawbar of the tractor to prevent the PTO pump from turning
5. Check the oil level in the oil tank [Figure 6, **A**].
6. Verify the supply valve (suction hose) on the reservoir to the PTO pump, it should be open [Figure 6, **B**].
7. Check the suction hose so it doesn't have bend, this could stop the oil flow to the PTO pump.
8. Make an operation test. Start the tractor and operate the PTO at low speed.

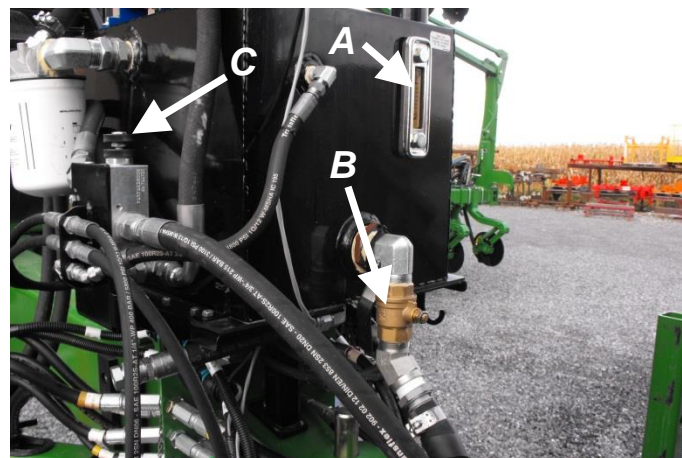



Figure 6

11. Proceed with the connection of electric cables in the cabin depending on the options on the applicator [Figure 3 and 4].
12. After all connections, check their functioning. Make the correction if necessary.



Always start the PTO at low rpm to avoid significant damage to the PTO gearbox and pump.

9. Increase the engine speed of the tractor to reach 1000 rpm at the PTO.

 Immediately repair any oil leaks; the high-pressure could cause injury! Replace all damaged hoses with original parts.



Before starting, make sure that nobody is near the distributor.

10. Adjust the flow control valve [Figure 6, **C**] to reach the desired pressure in the air distribution system. Consult “START-UP

To operate your electric options, please refer to the "ELECTRIC SELECTOR" in this section.

C) MECHANICAL DRIVE

This type of drive has mechanical components to drive the fan of the applicator. Some adjustments are required for proper operation.

The PTO shaft is equipped with a double joint to allow better turning radius. [Figure 4A, A].



Figure 4A

Connection procedure :

1. Clean well the splines of the PTO shaft of the tractor.
2. Connect the PTO with the shaft of the tractor. According to the tractor used, if the PTO shaft is too long to retract completely when tight turns with the tractor, it is possible to cut the PTO shaft.

If you need to cut the PTO shaft. See Figure 4B to meet industry standards. For more details consult the user manual attached to the PTO shaft.

NOTE : Only triangular shape shaft can be cut. NO spline shaft.

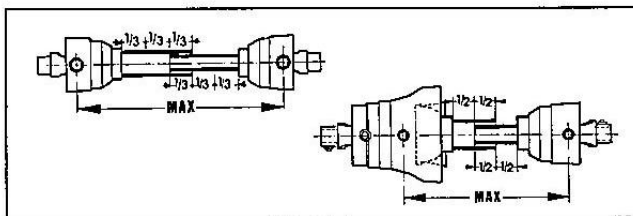


Figure 4B

3. Attach the safety chains of the PTO shaft to prevent it from turning when the PTO is running.
 4. Perform a slow tight turn to the left and to the right to ensure that the 3 point hitch lift arms of the tractor doesn't come in contact with the drive shaft and verify the length of the PTO if adequate.
 5. Connect all hydraulic hoses to the tractor.
 6. According to your options, proceed with the connection of electronic cables in the cabin [Figure 3 et 4].
- To operate your electric options, please refer to the "ELECTRIC SELECTOR" in this section.
7. Perform a test run. Start the tractor and operate the PTO at low speed.



Always start the PTO at low speed. Neglect can cause significant damage to the gear box and PTO shaft

8. Increase engine speed to 1000 rpm to the PTO. Consult START-UP OF THE APPLICATOR section for working air pressure.



Before starting, make sure that nobody is near the distributor.

9. After all the connections, check their functioning. If there is malfunction, make repairs immediately.

ELECTRIC SELECTOR (Option)

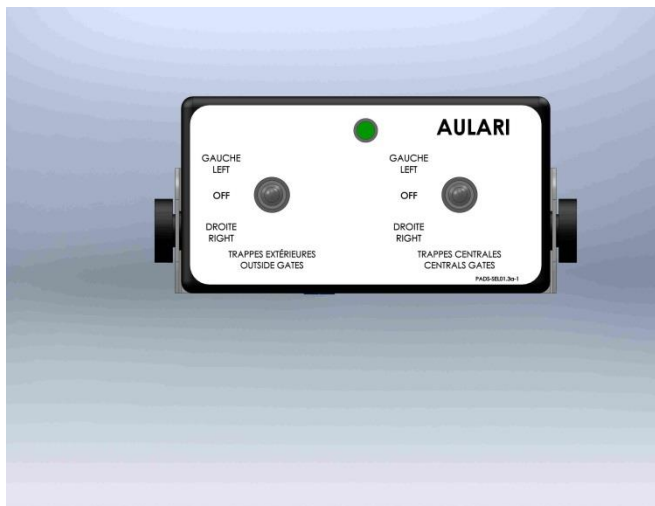


Figure 5

If your applicator is equipped with an electric selector (Figure 5), please follow the connection procedure below.

1. Connect the switch box to the 12 VDC source of your tractor.



Make sure your tractor source connection works well with the ignition of the tractor. Otherwise, the green light on the switch box will illuminate when connected and stay on continuously, which will empty the batterie.

2. Connect the cables from your applicator to your switch box.
3. The different switches allow you to close the fertilizer gates depending to your needs. Select the gates on the switch box and activate the corresponding hydraulic outlets on the tractor remote.



Always place the switch in the OFF position when working in the field or during storage. This can put your batteries flat or impair the proper functioning of your fertilizer gates during operation.

ADJUSTMENTS BEFORE OPERATION

To optimize the performance of your applicator, it is best to make all adjustments before to start the applicator in the field.

ADJUSTMENTS BEFORE OPERATION

1. If your applicator is equipped with hydraulic gates, ensure that all gates are open and work well.
2. If your applicator is equipped with electronic scale, the monitor as been preset by the manufacturer in kilograms or pounds according to the customer specification. To change the monitor unit, refer to the CALIBRATION PROCEDURE section of this manual.

PLANTING CORN CONFIGURATION

1. Make sure that all the gates of the distribution system are open.
2. If your planter is equipped with Aulari fertilizer coulters, the basic adjustment at the factory is 6 cm / 2 1/2 inches to the side of seed. If necessary adjust the distance of each fertilizer disc relative to the corn row Consult your agricultural advisor for your specific needs.

☞ Please note that mechanical constraints could affect the lateral movement of the discs.



Figure 12B

3. If applicable, also adjust the height of each fertilizer disc to the ground. The preset adjustment by the manufacturer is 10 cm / 4 inch depth [Figure 12B].
- ☞ For the adjustment procedure of the Aulari coulters, consult your Aulari fertilizer coulters user manual. Consult your agricultural advisor for your specific needs.

SOYBEEN SEEDING CONFIGURATION (OPTION)

1. Make sure that all the gates of the distribution system are open.
2. Soybean seed must pass over the metering roll, to do this you need to install the reverser kit [Figure 12D] on the preinstalled support on the side of the distribution base [Figure 12E, **A**].



Figure 12D

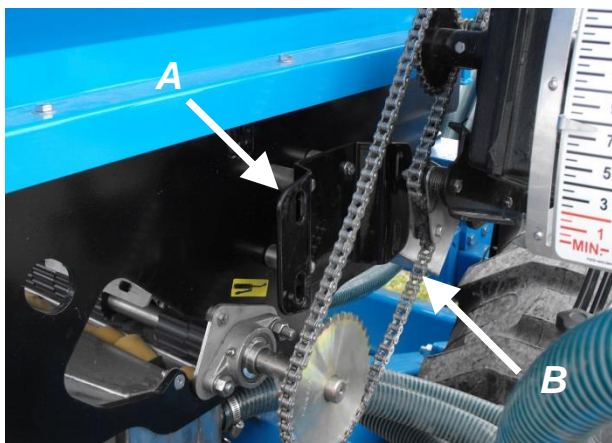


Figure 12E

3. To install the reverser, you must remove the chain between variable transmission and the distribution metering shaft [Figure 12E, **B**].
4. Install the reverser on the reverser support. The necessary bolts are fixed to the reverser. Do not tighten the bolts, they used to tighten the chains [Figure 12F].



Figure 12F

- ☞ The reverser can be installed in two ways: slow or fast position. These two positions provide a greater possibility of the variable speed transmission. For the initial installation, install the reverser to slow position [Figure 12H]. If at planting, variable transmission is around 18 on the indicator rule, you must modify the installation and install the reverser in fast position [Figure 12G].

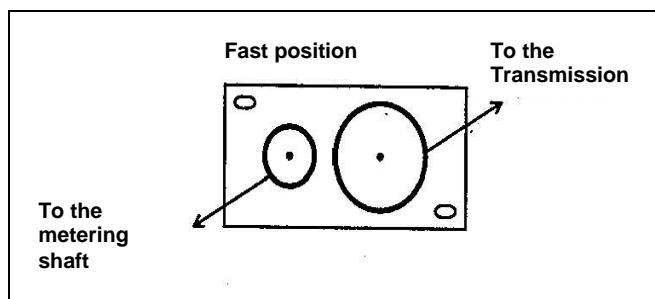


Figure 12G

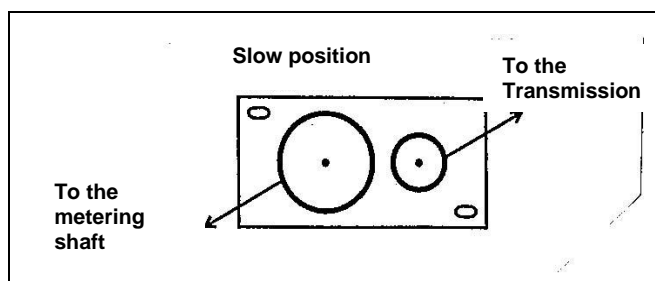


Figure 12H

5. Install the two chains provided with the reverser; one chain link to the variable transmission and the other chain link to the metering shaft [Figure 12F].

☞ Do not change the gears, each applicator as its own configuration.

6. To tighten the chains, slide the reverser down or up and left or right to reach the ideal tension. Also be very careful to align well the chains [Figure 12J].

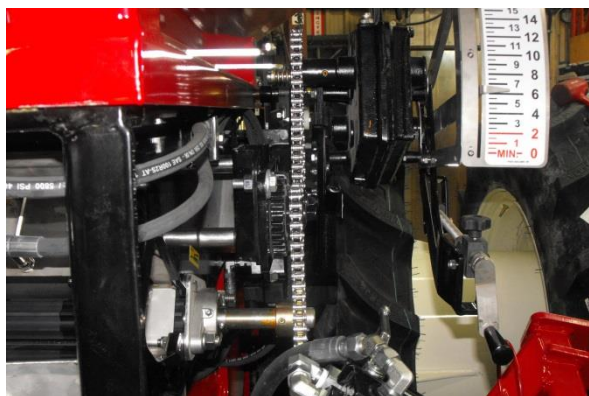


Figure 12J

☞ Do not over tighten the chains. Excessive tension will cause a premature wear and stretch of the chains.

7. Remove the flexible hoses from the fertilizer coulters drop tubes.

☞ Very important, before disassembly of the flexible hoses, identify each hoses to facilitate reassembly.

8. Install the flexible hose to the black rubber elbow installed on the seed hopper [Figure 12L, **A**]. Make sure you have removed the red cap beforehand. The flexible hose at each end have a larger diameter. Use adapters supplied by the manufacturer.

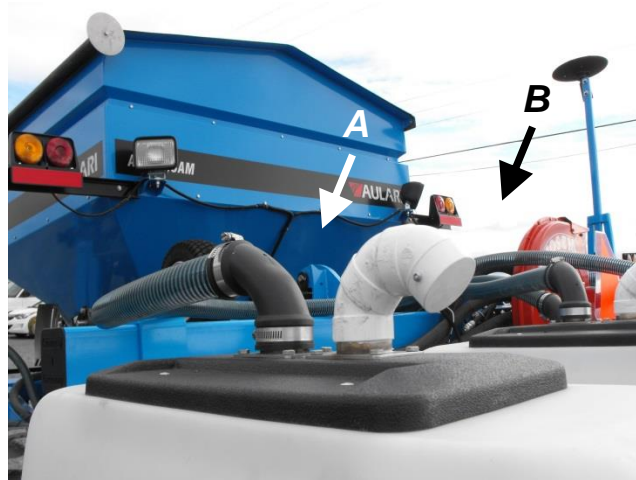


Figure 12L

9. Make sure to well attach the hoses so that they can freely move when lifting and folding maneuvers with the planter [Figure 12M].

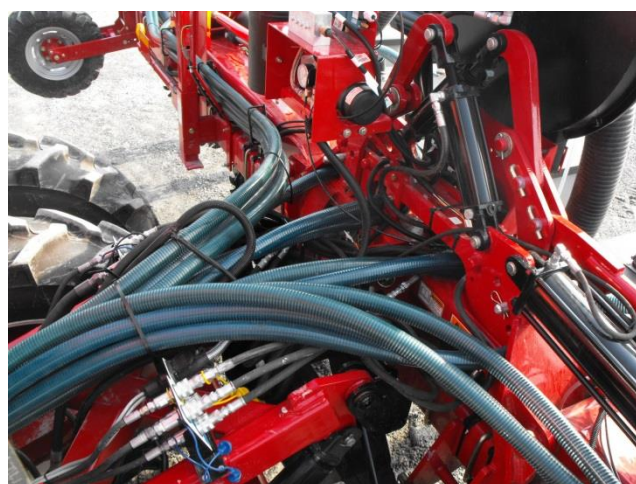


Figure 12M

10. Remove the white cap on the elbow air exhaust [Figure 12L, **B**]. This output is used to discharge the air generated by the applicator fan.
11. Remove the hopper screen from the hopper as they could affect the flow of soybean seed [Figure 12N].

- ☞ In order to not discontinue the flow of the seedling on the metering roll, it is very important that your seed is clean and free of debris.



Figure 12N

- ☞ Please note that the seeding rate is regulated by the meter on the planter row unit. Variable transmission has no influence on the total population in the field. The transmission function only to supply the seed hopper.

ADJUSTEMENTS FOR SIDE DRESSING

1. Unhook the planter from the applicator. Refer to section unhitching procedure of this manual.
 2. Set the distributor outlet to side dressing [figure 22]. This is a standard configuration. For a custom configuration, please contact the manufacturer. Check the opening of the fertiliser gates and the location of the mobile gates [figure 12A.1].
- ☞ To move the mobile gates, remove the wingnut and the two metal plates then install them where you need them.

3. Install the beam extensions on both end of the toolbar with the nuts and bolts given at the pickup of the applicator [figure 12P, **A**].

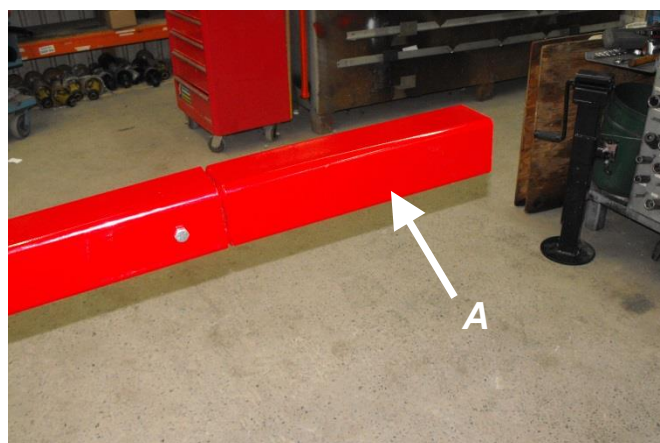


Figure 12P

4. Move the fertiliser disks toward the center of the applicator. The disks must be moved so the fertiliser is incorporated in between corn rows. [Figure 12Q2]. To be able to move the disks, untighten the nuts that hold the fertiliser disk attach [figure 12Q, **A**] and move the disks toward the center of the applicator. The disks #6 or #7 must be moved to one end of the toolbar (on one of the side dressing extension) [figure 12P]. The 13th disk (that you received with the applicator) has to be installed on the other side dressing extension.

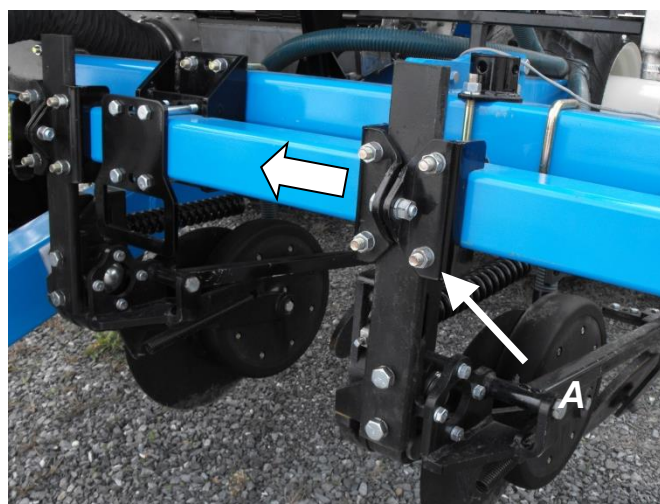


Figure 12Q



SCALE MONITOR CALIBRATION (OPTION)

Calibration factors: Kg = 05184 (display increment by 2 kg)
 Lb = 05280 (display increment by 5 lb)
 Modification = 09280

Programming procedure

Numeric entry procedure

RM	Press to increase the value on the screen.
M+	Press to decrease the value on the screen.
<u>HOLD</u> MENU	Press to move the cursor.

1. Turn on the monitor.
2. In the mode **G / D**, press and hold the **HOLD / MENU** button until you hear 3 beeps then release. **SET.PAS** appears.
3. Use the numeric entry procedure, above, to enter the password 640, and then press **PRINT SELECT** to confirm. **640** will appear on screen.
4. Press **PRINT SELECT**. : **CONFIG** appears on screen.
5. Press **PRINT SELECT** a second time.
6. Use the numeric entry procedure listed, above, to enter the 5-digit code of the calibration factor, 05280 for pound or 05184 for kg, then press **PRINT SELECT** to confirm. **CONFIG** appears on the screen.
7. Press **G/N** 2 times to valid your entry, **BUSY** appear a few seconds and the screen will return to the original mode.

Note: If your monitor has been pre-adjusted in pound or kg and you want to change the unit of measure. You must make the calibration procedure 2 to 7 using the modification code **09280**. Thereafter repeat the procedure using the unit of measure chosen.

Your monitor is now calibrated. For any other questions, check the manufacturer's manual.

IMPORTANT: Your monitor should be in **GROSS** mode to function correctly.

START-UP PROCEDURE (IN FIELD)

Carefully take the time to follow all instructions listed in this section in order to benefit from optimal performance from your applicator.

1. Adjust the speed of transmission of the distribution system. Use crank [Figure 13, **A**] for adjusting the indicator rule to the desired position. As a guide, position 6 is equivalent to approximately 225 kg / ha (200 lbs / acre). (May vary depending on the density)
2. The optimum operating zone of the variable transmission is between 3 and 18 on the indicator rule [Figure 13A]. If you can not reach your dosage in this field of action you need to change the sprocket on the metering roll shaft [Figure 13B, **A**]. The sprocket installed by the manufacturer as 16 teeth. Consult the manufacturer to obtain a replacement gear.

☞ If your dosage is too small and the transmission adjustment indicator is more than 18, then you need to change the 16 teeth sprocket for a 12 teeth sprocket. With a smaller sprocket shaft will rotate faster and increase the application rate.

☞ Refer to CALIBRATION PROCEDURE section for the calibration procedure of the applicator.



Figure 13

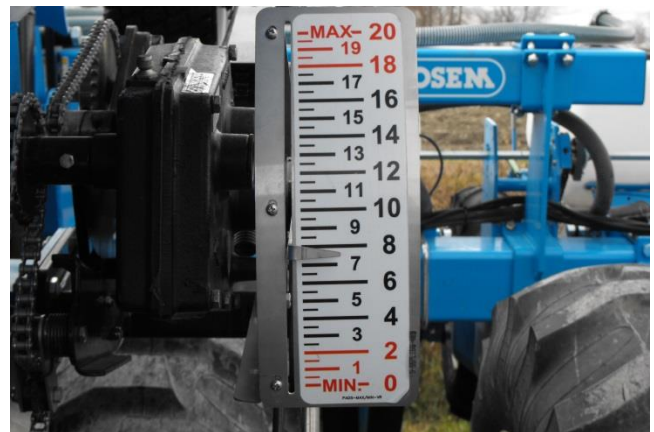


Figure 13A

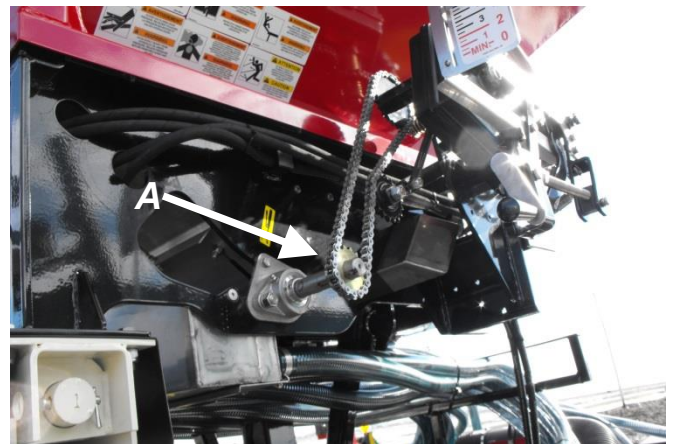


Figure 13B

3. If the applicator is equipped with an electronic scale, be sure to press the ZERO / CLEAR key [Figure 14, **A**] before filling the hopper. For more detail, refer to the section of this manual CALIBRATION PROCEDURE.

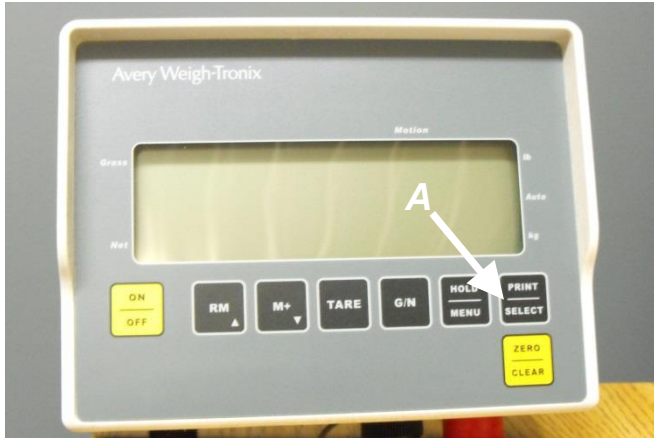


Figure 14

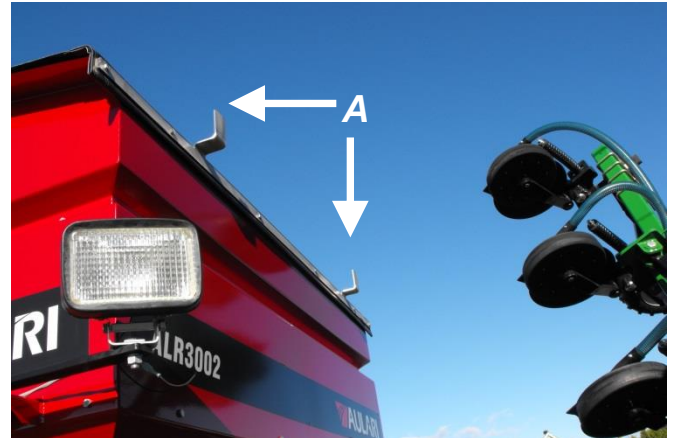


Figure 15B

- ☞ For greater precision calibration, we recommend that you use a unique method of taking data, no matter how you use to take your data, be rigorous and always use the same method. Example of taking data: tool bar and planter on the ground.
- 4. To open the tarp of your distributor: Turn the tarp wheel clockwise and lift the tarp lock latch [Figure 15A, **A**]. Then release the wheel down. Roll the tarp on itself using the tarp wheel to the tarp stopper at the other end of the hopper [Figure 15B, **A**].

- 5. To close the tarp, turn the tarp over itself in the opposite direction. Well align the tarp on the hopper. Stretch the fabric by turning the tarp wheel while keeping the lock in the teeth of the grooved gear.
- 6. Before initial filling of the hopper, you must ensure that hopper screens are install in the hopper and that no objects or debris are on hopper screen.




Figure 15A

START-UP OF THE APPLICATOR

Once all of the adjustments in the field were made, the applicator is ready for use. The following steps, depending on your purchase; Direct tractor, PTO or mechanical pump drive must be observed to avoid damage and blockages.

A) DIRECT TRACTOR DRIVE

1. Start-up the tractor.
2. Activate the fan corresponding hydraulic outlets. If the fan doesn't start, refer to "ATTACHING PROCEDURE" in this manual.
3. Reduce the oil flow rate to the minimum, and then gradually increase the flow rate to reach the recommended operating speeds listed below

 Always turn the fan with the minimum required oil in the fan motor to prevent overheating of the tractor hydraulics.



Immediately repair any oil leaks; the high pressure could cause injury! Repair any damaged hoses and fittings with original parts.

4. If your applicator is equipped with electronic scale, make sure to take note of the weight reading and working area for future calibration.
5. Lower down planter to the ground.



Always make sure there is enough space around the planter to perform various operations.

5. Start planting, the pressure indicated on the pressure gauge [Figure 20] should be between 21 and 25 in. of water for a fan REM HE [Figure 20A] and between 30 and 36 in. of water for an applicator equipped with a REM BC172CW fan [Figure 20B].



Figure 20



Figure 20A



Figure 20B

- ☞ The fan REM HE should run at 5000 rpm.
 - ☞ The fan REM BC172CW should turn at 4500 rpm.
 - ☞ The fan system was calibrated to reach its full potential revolutions listed above. It is very important to respect these data to get the best efficiency from your distributor.
6. Always make sure there is no blockage or obstruction in the fertilizer distribution system.
 7. Stop to verify the depth of the fertilizer and its positioning relative to the seed. To make corrections, if necessary, refer to the section **ADJUSTMENTS BEFORE OPERATION** in this manual.
 8. Make regular visual inspection of the distribution system, metering shaft and air box. Clean the metering roll splines, if necessary, with the scraper designed for this purpose [Figure 21].

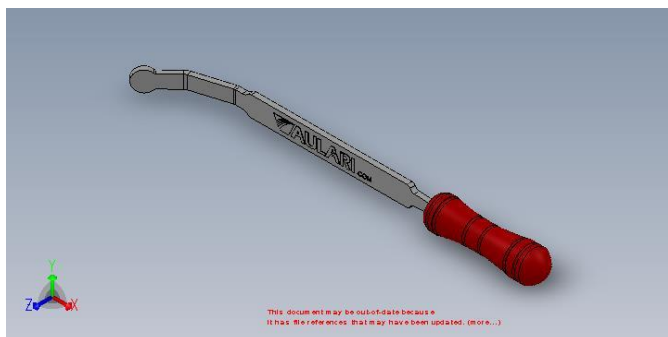


Figure 21

- ☞ If the PTO speed is not sufficient when the applicator is in movement, the flow of material could be too large and cause a blockage in the hose.



Always keep hopper screens in place for a good functioning of the distribution system.

B) PTO PUMP DRIVE

1. While the engine is running at low speed, start the tractor PTO.
2. Increase the speed of the PTO gradually to a minimum of 800 rpm.
3. If your applicator is equipped with electronic scale, make sure to take note of the weight reading and working area for future calibration.
4. Lower down planter to the ground.



Always make sure there is enough space around the planter to perform various operations.

5. Start planting, while increasing the speed of the PTO to 1000 rpm. The pressure indicated on the pressure gauge [Figure 20] should be between 21 and 25 in. of water for a fan REM HE [Figure 20A] and between 30 and 36 in. of water for an applicator equipped with a REM BC172CW fan [Figure 20B].

- ☞ The fan REM HE should run at 5000 rpm when the tractor reaches 1000 rpm to the power take.
- ☞ The fan REM BC172CW should run at 4500 rpm when the tractor reaches 1000 rpm to the power take.
- ☞ The fan system was calibrated to reach its full potential at 1000 rpm. It is very important to respect these data to get the best efficiency from your distributor.

6. Always make sure there is no blockage or obstruction in the fertilizer distribution system.
7. Stop to verify the depth of the fertilizer and its positioning relative to the seed. To make corrections, if necessary, refer to the

section **ADJUSTMENTS BEFORE OPERATION** in this manual.

8. Make regular visual inspection of the distribution system, metering shaft and air box. Clean the metering roll splines, if necessary, with the scraper designed for this purpose [Figure 21].

- ☞ If the PTO speed is not sufficient when the applicator is in movement, the flow of material could be too large and cause a blockage in the hose.



Always keep hopper screens in place for a good functioning of the distribution system.

C) MECHANICAL DRIVE

1. While the engine is running at low speed, start the tractor PTO.
2. Increase the speed of the PTO gradually to a minimum of:
 - a. 425 rpm for applicator equipped with 540 rpm PTO.
 - b. 800 rpm for applicator equipped with 1000 rpm PTO.
3. If your applicator is equipped with electronic scale, make sure to take note of the weight reading and working area for future calibration.
4. Lower down planter to the ground.



Always make sure there is enough space around the planter to perform various operations.

5. Start planting, while increasing the speed of the PDF to 540 rpm or 1000 rpm according to your PTO model. The pressure indicated on the pressure gauge [Figure 20] should be between 21 and 25

in. of water for a fan REM HE [Figure 20A] and between 30 and 36 in. of water for an applicator equipped with a REM BC172CW fan [Figure 20B].

- ☞ The fan REM HE should run at 5000 rpm when the tractor reaches 540 or 1000 rpm to the power take.
- ☞ The fan REM BC172CW should run at 4500 rpm when the tractor reaches 540 or 1000 rpm to the power take.
- ☞ The fan system was calibrated to reach its full potential at 540 or 1000 rpm. It is very important to respect these data to get the best efficiency from your distributor.

6. Always make sure there is no blockage or obstruction in the fertilizer distribution system.
7. Stop to verify the depth of the fertilizer and its positioning relative to the seed. To make corrections, if necessary, refer to the section **ADJUSTMENTS BEFORE OPERATION** in this manual.
8. Make regular visual inspection of the distribution system, metering shaft and air box. Clean the metering roll splines, if necessary, with the scraper designed for this purpose [Figure 21].

- ☞ If the PTO speed is not sufficient when the applicator is in movement, the flow of material could be too large and cause a blockage in the hose.



Always keep hopper screens in place for a good functioning of the distribution system.

CALIBRATION PROCEDURE (metric kg/ha)

Working width 4.5m (with contact wheel)

Working width : 4.5m
 Contact drive wheel (circumference) : 50.27po (1.27m)
 1 ha : 10 000m²

Calibration procedure (applicator without electronic scale)

1. Open the gate and install the calibration pan under the metering system.
2. Turn the contact drive wheel constantly for 30 rotations.
3. Weight the amount of fertilizer collected in the pan (in kg).
4. Multiply by the calibration factor 58.326 to obtain the application rate in kg/ha.
5. Adjust the transmission and if necessary repeating steps 2 to 4.

IMPORTANT : Be specific when you collect and weight the fertilizer, to ensure an accurate calibration .

Procedures	Data
We select an arbitrary value of rotation of the contact drive wheel (in this case 30 rotations).	1 rotation of the drive wheel = 1.27m 30 rotations of the drive wheel = 38.10m
Multiply the distance simulated by the working width to obtain an equivalence of 30 rotations of the contact drive wheel.	38.10m x 4.5m = 171.45m ²
Divide a hectare by the simulated surface to obtain the calibration factor.	10 000m ² / 171.45m ² = 58.326
Multiply the amount of fertilizer in the pan by the calibration factor to obtain the application rate per hectare.	4.5 kg** x 58.326 = 262 kg/ha

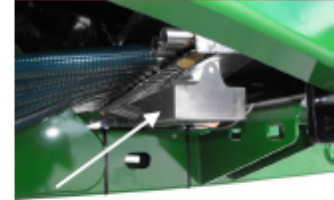
**The more rotation of the drive wheel, the greater the amount of fertilizer collected in the pan calibration will be bigger and calculating the rate of application will be accurate.

Calibration procedure (applicator with electronics scales)

1. Note the initial scale number.
2. Apply fertilizer an hectare in the field.
3. Subtract the number on the scale of the number you have noted.
(this data is the application rate at which the transmission is now adjusted)
4. Adjust the transmission if needed and repeating steps 1 to 3.



1



2



3



4-5

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CALIBRATION PROCEDURE (Imperial lbs/acre)

Working width 15ft
(with contact wheel)

Working width : 15ft
 Contact drive wheel (circumference) : 50.27in (4.19ft)
 1 acre : 43560 ft²

Calibration procedure (applicator without electronic scale)

1. Open the gate and install the calibration pan under the metering system.
2. Turn the contact drive wheel constantly for 30 rotations.
3. Weight the amount of fertilizer collected in the pan (in lb).
4. Multiply by the calibration factor 23.102 to obtain the application rate in lb/acre.
5. Adjust the transmission and if necessary repeating steps 2 to 4.

IMPORTANT : Be specific when you collect and weight the fertilizer, to ensure an accurate calibration .

Procedures	Data
We select an arbitrary value of rotation of the contact drive wheel (in this case 30 rotations).	1 rotation of the drive wheel = 4.19ft 30 rotations of the drive wheel = 125.70ft
Multiply the distance simulated by the working width to obtain an equivalence of 30 rotations of the contact drive wheel.	125.70ft x 15ft = 1885.50ft ²
Divide an acre by the simulated surface to obtain the calibration factor.	43 560ft ² / 1885.50ft ² = 23.102
Multiply the amount of fertilizer in the pan by the calibration factor to obtain the application rate per acre.	8.5 lb** x 23.102 = 196 lb/acre

**The more rotation of the drive wheel, the greater the amount of fertilizer collected in the pan calibration will be bigger and calculating the rate of application will be accurate.

Calibration procedure (applicator with electronic scale)

1. Note the initial scale number.
2. Apply fertilizer an acre in the field.
3. Subtract the number on the scale of the number you have noted.
(this data is the application rate at which the transmission is now adjusted)
4. Adjust the transmission if needed and repeating steps 1 to 3.



1



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4-5

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CALIBRATION PROCEDURE

Working width 6m (with contact wheel)

Working width : 6m
 Contact drive wheel (circumference) : 50.27po (1.27m)
 1 ha : 10 000m²

Calibration procedure (applicator without electronic scale)

1. Open the gate and install the calibration pan under the metering system.
2. Turn the contact drive wheel constantly for 20 rotations.
3. Weight the amount of fertilizer collected in the pan (in kg).
4. Multiply by the **calibration factor 65.62** to obtain the application rate in kg/ha.
5. Adjust the transmission and if necessary repeating steps 2 to 4.

IMPORTANT : Be specific when you collect and weight the fertilizer, to ensure an accurate calibration.

Procedures	Data
We select an arbitrary value of rotation of the contact drive wheel (in this case 20 rotations).	1 rotation of the drive wheel = 1.27m 20 rotations of the drive wheel = 25.40m
Multiply the distance simulated by the working width to obtain an equivalence of 20 rotations of the contact drive wheel.	25.40m x 6m = 152.40m ²
Divide a hectare by the simulated surface to obtain the calibration factor.	10 000m ² / 152.40m ² = 65.62
Multiply the amount of fertilizer in the pan by the calibration factor to obtain the application rate per hectare.	4.5 kg** x 65.62 = 295 kg/ha

** The more you do rotation of the drive wheel and the greater you collect fertilizer in the pan, much accurate will be your calibration rate.

Calibration procedure (applicator with electronic scales)

1. Note the initial scale number.
2. Apply fertilizer an hectare in the field.
3. Subtract the number on the scale of the number you have noted.
(this data is the application rate at which the transmission is now adjusted)
4. Adjust the transmission if needed and repeat steps 1 to 3.



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CALIBRATION PROCEDURE

Working width 20ft
(with contact wheel)

Working width : 20ft
 Contact drive wheel (circumference) : 50.27in (4.19ft)
 1 acre : 43560 ft²

Calibration procedure (applicator without electronic scale)

1. Open the gate and install the calibration pan under the metering system.
2. Turn the contact drive wheel constantly for 20 rotations.
3. Weight the amount of fertilizer collected in the pan (in lb).
4. Multiply by the **calibration factor 25.990** to obtain the application rate in lb/acre.
5. Adjust the transmission and if necessary repeating steps 2 to 4.

IMPORTANT : Be specific when you collect and weight the fertilizer, to ensure an accurate calibration.

Procedures	Data
We select an arbitrary value of rotation of the contact drive wheel (in this case 20 rotations).	1 rotation of the drive wheel = 4.19ft 20 rotations of the drive wheel = 83.80ft
Multiply the distance simulated by the working width to obtain an equivalence of 20 rotations of the contact drive wheel.	83.80ft x 20ft = 1676ft ²
Divide an acre by the simulated surface to obtain the calibration factor.	43 560ft ² / 1676ft ² = 25.990
Multiply the amount of fertilizer in the pan by the calibration factor to obtain the application rate per acre.	8.5 lb** x 25.990 = 221 lb/acre

** The more you do rotation of the drive wheel and the greater you collect fertilizer in the pan, much accurate will be your calibration rate.

Calibration procedure (applicator with electronic scale)

1. Note the initial scale number.
2. Apply fertilizer an acre in the field.
3. Subtract the number on the scale of the number you have noted.
(this data is the application rate at which the transmission is now adjusted)
4. Adjust the transmission if needed and repeating steps 1 to 3.



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4-5

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CALIBRATION PROCEDURE

Working width 9m (with contact wheel)

Working width : 9 m
 Contact drive wheel (circumference) : 50.27po (1.27m)
 1 ha : 10 000 m²

Calibration procedure (applicator without electronic scale)

1. Open the gate and install the calibration pan under the metering system.
2. Turn the contact drive wheel constantly for 15 rotations.
Or use the hand crank and turn for 41.5 rotations.
3. Weight the amount of fertilizer collected in the pan (in kg).
4. Multiply by the **calibration factor 58.32** to obtain the application rate in kg/ha.
5. Adjust the transmission and if necessary repeating steps 2 to 4.

IMPORTANT : Be specific when you collect and weight the fertilizer, to ensure an accurate calibration .

Procedures	Data
We select an arbitrary value of rotation of the contact drive wheel (in this case 15 rotations).	1 rotation of the drive wheel = 1.27m 15 rotations of the drive wheel = 19.05m
Multiply the distance simulated by the working width to obtain an equivalence of 15 rotations of the contact drive wheel.	$19.05m \times 9m = 171.45m^2$
Divide a hectare by the simulated surface to obtain the calibration factor.	$10\,000m^2 / 171.45m^2 = 58.32$
Multiply the amount of fertilizer in the pan by the calibration factor to obtain the application rate per hectare.	$4.5\,kg^{**} \times 58.32 = 262\,kg/ha$

** The more you do rotation of the drive wheel and the greater you collect fertilizer in the pan, more accurate will be your calibration rate.

** For the hand crank, the drive wheel-transmission ratio is 1:2.77. So, multiply the number of drive wheel rotations by 2.77 to obtain the hand crank rotation number.

Calibration procedure (applicator with electronic scale)

1. Note the initial scale number.
2. Apply fertilizer an hectare in the field.
3. Subtract the number on the scale of the number you have noted.
 (this data is the application rate at which the transmission is now adjusted)
4. Adjust the transmission if needed and repeat steps 1 to 3.

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CALIBRATION PROCEDURE

Working width 30ft (with contact wheel)

Working width : 30 ft
 Contact drive wheel (circumference) : 50.27in (4.19ft)
 1 acre : 43560 ft²

Calibration procedure (applicator without electronic scale)

1. Open the gate and install the calibration pan under the metering system.
2. Turn the contact drive wheel constantly for 15 rotations.
 Or use the hand crank and turn for 41.5 rotations.
3. Weigh the amount of fertilizer collected in the pan (in lb).
4. Multiply by the **calibration factor 23.102** to obtain the application rate in lb/acre.
5. Adjust the transmission and if necessary repeating steps 2 to 4.

IMPORTANT : Be specific when you collect and weight the fertilizer, to ensure an accurate calibration .

Procedures	Data
We select an arbitrary value of rotation of the contact drive wheel (in this case 15 rotations).	1 rotation of the drive wheel = 4.19ft 15 rotations of the drive wheel = 62.85ft
Multiply the distance simulated by the working width to obtain an equivalence of 15 rotations of the contact drive wheel.	$62.85ft \times 30ft = 1885.50ft^2$
Divide an acre by the simulated surface to obtain the calibration factor.	$43\ 560ft^2 / 1885.50ft^2 = 23.102$
Multiply the amount of fertilizer in the pan by the calibration factor to obtain the application rate per acre.	$8.5\ lb^{**} \times 23.102 = 196\ lb/acre$

** The more you do rotation of the drive wheel and the greater you collect fertilizer in the pan, more accurate will be your calibration rate.

** For the hand crank, the drive wheel-transmission ratio is 1:2.77. So, multiply the number of drive wheel rotations by 2.77 to obtain the hand crank rotation number.

Calibration procedure (applicator with electronic scale)

1. Note the initial scale number.
2. Apply fertilizer an acre in the field.
3. Subtract the number on the scale of the number you have noted.
 (this data is the application rate at which the transmission is now adjusted)
4. Adjust the transmission if needed and repeat steps 1 to 3.

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CALIBRATION PROCEDURE

Working width 12m (with contact wheel)

Working width : 12 m
 Contact drive wheel (circumference) : 50.27po (1.27m)
 1 ha : 10 000 m²

Calibration procedure (applicator without electronic scale)

1. Open the gate and install the calibration pan under the metering system.
2. Turn the contact drive wheel constantly for 12 rotations.
Or use the hand crank and turn for 33 rotations.
3. Weight the amount of fertilizer collected in the pan (in kg).
4. Multiply by the **calibration factor 54.68** to obtain the application rate in kg/ha.
5. Adjust the transmission and if necessary repeating steps 2 to 4.

IMPORTANT : Be specific when you collect and weight the fertilizer, to ensure an accurate calibration .

Procedures	Data
We select an arbitrary value of rotation of the contact drive wheel (in this case 12 rotations).	1 rotation of the drive wheel = 1.27m 12 rotations of the drive wheel = 15.24m
Multiply the distance simulated by the working width to obtain an equivalence of 12 rotations of the contact drive wheel.	$15.24m \times 12m = 182.88m^2$
Divide a hectare by the simulated surface to obtain the calibration factor.	$10\,000m^2 / 182.88m^2 = 54.68$
Multiply the amount of fertilizer in the pan by the calibration factor to obtain the application rate per hectare.	$4.5\,kg^{**} \times 54.68 = 246\,kg/ha$

** The more you do rotation of the drive wheel and the greater you collect fertilizer in the pan, more accurate will be your calibration rate.

** For the hand crank, the drive wheel-transmission ratio is 1:2.77. So, multiply the number of drive wheel rotation by 2.77 to obtain the hand crank rotation number.

Calibration procedure (applicator with electronic scale)

1. Note the initial scale number.
2. Apply fertilizer an hectare in the field.
3. Subtract the number on the scale of the number you have noted.
 (this data is the application rate at which the transmission is now adjusted)
4. Adjust the transmission if needed and repeat step 1 to 3.

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CALIBRATION PROCEDURE

Working width 40ft (with contact wheel)

Working width : 40 ft
 Contact drive wheel (circumference) : 50.27in (4.19ft)
 1 acre : 43560 ft²

Calibration procedure (applicator without electronic scale)

1. Open the gate and install the calibration pan under the metering system.
2. Turn the contact drive wheel constantly for 12 rotations.
Or use the hand crank and turn for 33 rotations.
3. Weight the amount of fertilizer collected in the pan (in lb).
4. Multiply by the **calibration factor 21.658** to obtain the application rate in lb/acre.
5. Adjust the transmission and if necessary repeating steps 2 to 4.

IMPORTANT : Be specific when you collect and weight the fertilizer, to ensure an accurate calibration .

Procedures	Data
We select an arbitrary value of rotation of the contact drive wheel (in this case 12 rotations).	1 rotation of the drive wheel = 4.19ft 12 rotations of the drive wheel = 50.28ft
Multiply the distance simulated by the working width to obtain an equivalence of 12 rotations of the contact drive wheel.	50.28ft x 40ft = 2011.20ft ²
Divide an acre by the simulated surface to obtain the calibration factor.	43 560ft ² / 2011.20ft ² = 21.658
Multiply the amount of fertilizer in the pan by the calibration factor to obtain the application rate per acre.	8.5 lb** x 21.658 = 184 lb/acre

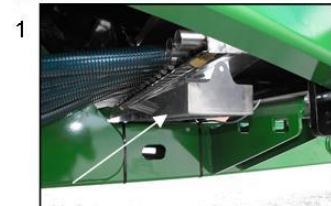
** The more you do rotation of the drive wheel and the greater you collect fertilizer in the pan, more accurate will be your calibration rate.

** For the hand crank, the drive wheel-transmission ratio is 1:2.77. So, multiply the number of drive wheel rotation by 2.77 to obtain the hand crank rotation number.

Calibration procedure (applicator with electronic scale)

1. Note the initial scale number.
2. Apply fertilizer an hectare in the field.
3. Subtract the number on the scale of the number you have noted.
 (this data is the application rate at which the transmission is now adjusted)
4. Adjust the transmission if needed and repeat step 1 to 3.

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PF-PCAL-40P12M-RC

SERVICE ON THE APPLICATOR



Always follow the warning sign and maintenance instruction applicable to the applicator.

The applicator was quality control at the factory. It is warranted to be free from defects and technical service.

However, to ensure efficient use without failure and / or premature wear, it is imperative to strictly follow maintenance procedures; maintenance and cleaning are included in this manual, and that, at recommended intervals.

Practice Safe Maintenance

- ☞ Understand service procedure before doing work. Keep area clean and dry.
- ☞ Never lubricate, service, or adjust machine while it is moving. Keep hand, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.
- ☞ Securely support any machine elements that must be raised for service work.
- ☞ Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any build-up of grease, oil, or debris.
- ☞ On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.
- ☞ On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

Cleaning of the applicator

That your hopper is in steel or stainless steel, we recommend a deep cleaning of the hopper to maximize its lifetime.

Perform high pressure cleaning work regularly, either after the spring and/or subsequent use. Do not leave deposits of fertilizers accumulate at the bottom of the distribution system and/or the frame of the applicator.

For ease of maintenance, open the stainless steel air box in the front, allowing you to clean inside. Take care **not to move** the plastic caps inside the box [figure 22A].

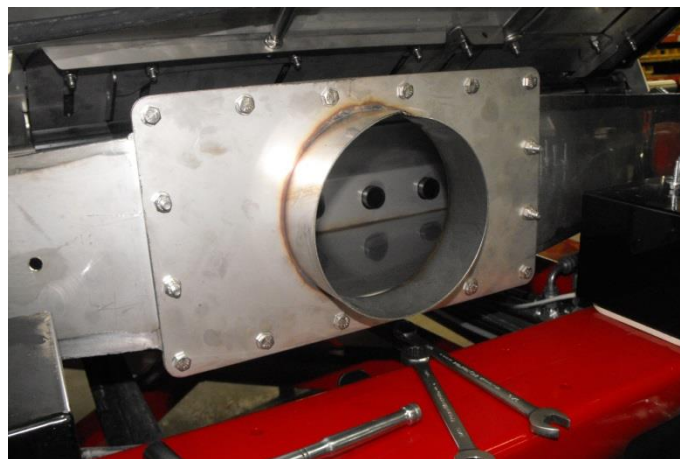


Figure 22A

Keep the flutes of the metering roller clean of residue during use [Figure 22B]. The accumulation of fertilizer on the flutes will effectively reduce the amount of fertilizer applied to the field. Use scraper provides for this purpose for maintenance [Figure 21].



Figure 22B

Service/Prior to operation every season

Make a complete inspection of the applicator each beginning of season. Clean dirt and grease accumulated on the moving parts, gears and chains; this will prevent the abrasive action of the dust.

Storage and service at the end of season

When the season of use is over, completely clean the applicator to remove residual fertilizer, dirt and debris that hold moisture and cause rust.

Lubricate grease points as explained in the LUBRICATION section. Grease the piston rods of the hydraulic cylinder to protect against corrosion. Protect the machine against rust by spraying anti-rust oil.

Check that there are no missing, damaged or worn parts. Consult your dealer to obtain the wear parts and/or other replacement parts.

Lubricants and capacities

- ☞ To make lubrication on the applicator, use multipurpose grease EP2.
- ☞ The variable transmission [Figure 23] which drives the distribution system uses clear trans-hydraulic oil. Capacity: 1.75 liters.

- ☞ The oil reservoir [Figure 23A] of the metering drive system uses Dextron III oil. Capacity 8 liters.
- ☞ The PTO Gearbox [Figure 23B] (PTO pump drive option) uses gear oil API GL5 (SAE 80W90) or synthetic oil (SAE 75W90). Capacity: 0.350 liter
- ☞ Oil reservoir [Figure 23C] (PTO pump drive option) uses clear trans-hydraulic oil. Capacity: 70 liters.
- ☞ The fan gearbox (mechanical drive Option) [Figure 24, **A**] used gear oil API GL5 (SAE 80W90) or synthetic oil (SAE 75W90). Capacity: 1 liter



Pay special attention to the fan bearings. A failure thereof may cause a major breakdown of the components of the fan.

- ☞ **Attention** : An excess of grease in the bearing can cause damage to the seal.

Variable transmission oil

Change the oil in the variable transmission at the beginning of each planting season or application. The temperature changes during the offseason can cause condensation on insides of the transmission, thus reducing the efficiency of the lubrication.

To drain the oil; remove the drain plug [Figure 23, **A**] at the bottom of the transmission housing. To facilitate the flow, remove the filler plug [Figure 23, **B**]. Reinstall the drain plug and fill the transmission with clear trans-hydraulic oil to recommended level. A window indicates the oil level [Figure 23, **C**]. Check the oil level every day, fill as needed.

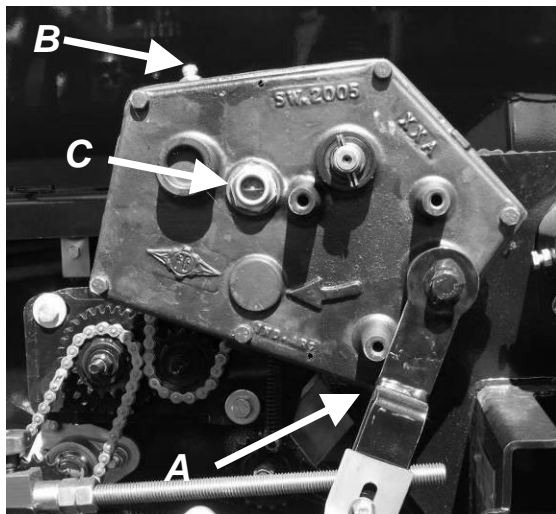


Figure 23

Oil reservoir (Distribution)

Change the oil and filter from the small tank [Figure 23A] of the distribution system at the beginning of each planting season or application. The temperature changes during the offseason and can cause condensation insides of the transmission, thus reducing the efficiency of the lubrication.

To drain the oil, remove the drain plug [Figure 23A, **A**] at the bottom of the tank. To facilitate the flow, remove the filler cap [Figure 23A, **B**] and filter [Figure 23A, **C**]. Reinstall the drain plug and a new filter, then fill the tank with Dextron III oil to the recommended level, approximately 8 liters. A window indicates the oil level [Figure 23A, **D**]. Check the oil level every day, fill as needed.

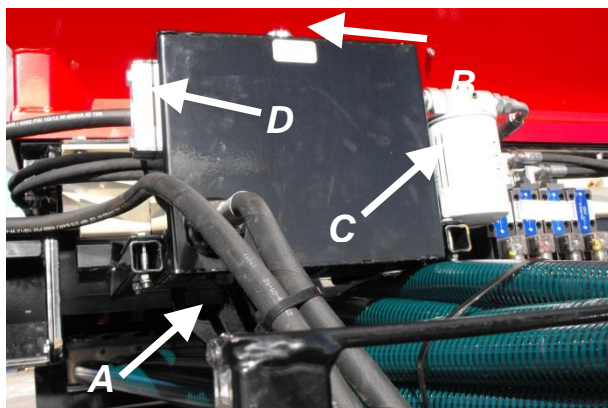


Figure 23A

PTO gearbox (PTO pump option)

Change the oil in the PTO gearbox [Figure 23B] at the beginning of each planting season or application. The temperature changes during the offseason and can cause condensation insides of the transmission, thus reducing the efficiency of the lubrication.

To drain the oil, remove the drain plug [Figure 23B, **A**] at the bottom of the gearbox casing. To facilitate the flow, remove the filler cap [Figure 23B, **B**]. Reinstall the drain plug and fill the gearbox with gear oil API GL5 (SAE 80W90) or synthetic oil (SAE 75W90) to the recommended level, approximately 0.35 liters. A window indicates the oil level [Figure 23B, **C**]. Check the oil level every day, fill as needed.

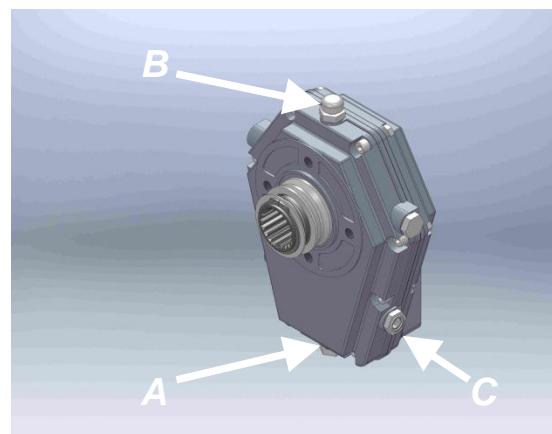


Figure 23B

Oil reservoir (PTO pump drive option)

Change the oil and filter from the oil tank [Figure 23C] at the beginning of each planting season or application. The temperature changes during the offseason and can cause condensation insides of the transmission, thus reducing the efficiency of the lubrication.

To drain the oil, remove the drain plug [Figure 23C, **A**] at the bottom of the tank. To facilitate the flow, remove the filler plug [Figure 23C, **B**]

filter [Figure 23C, C]. Reinstall the drain plug and a new filter, and then fill the tank with clean trans-hydraulic oil to the recommended level, approximately 70 liters. A window indicates the oil level [Figure 23C, D]. Check the oil level every day, fill as needed.

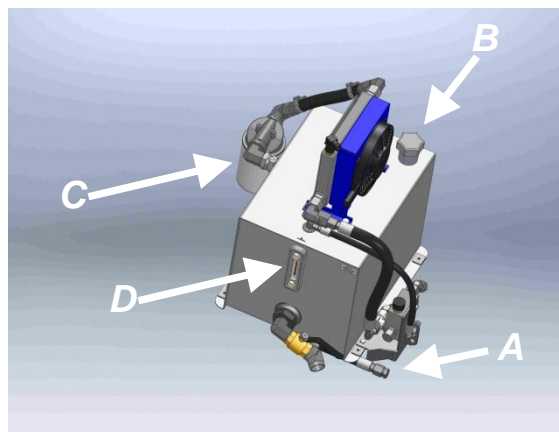


Figure 23C
Lubrication of the fan gear box (mechanical drive option)

Change the oil in the fan gear box [Figure 24] at the beginning of each planting season or application. Temperature changes during the offseason and can cause condensation insides of the gear box, thus reducing the efficiency of the lubrication.

To drain the oil, vacuum the lubricant from the housing of the gear box with a manual suction pump. Use the level plug to fill the gear box with gear oil API GL5 (SAE 80W90) or synthetic oil (SAE 75W90) [Figure 24, **A**], about 1 liter. Check the oil level every 50 hours; fill as needed.

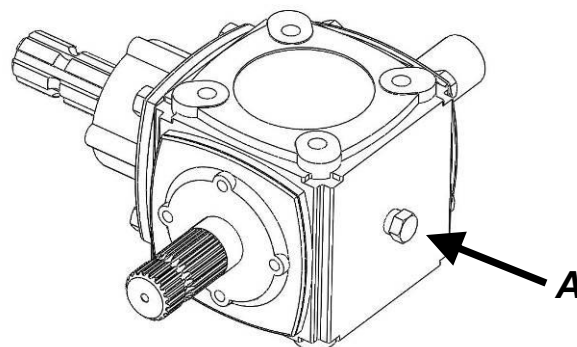


Figure 24

Belt tension (mechanical drive option)

For verification of belt tension, open the safety shield. Make sure the belt is not cracked or fissured. Adjust the tensioner [Figure 25, **A**] by tightening the adjustment nut [Figure 25, **B**], so that the spring [Figure 25, **C**] is stretched to 5 in. / 13 cm length [Figure 25A]. In addition it is important to check the alignment of the belt.

- ☞ Too much tension on the belt could cause premature wear of rolling bearings and tensioner pulley.

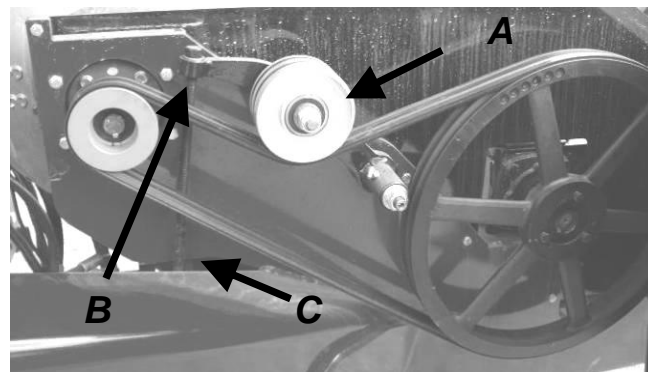


Figure 25



Figure 25A



Pay special attention to the fan bearings. A failure thereof may cause a major breakdown of the components of the fan.

Attention : An excess of grease in the bearing can cause damage to the seal.

Adjustment and removal of the metering shaft

If you need to remove the metering shaft for maintenance purposes, or to repair or change the metering roller, remove the drive chain, and then loosen the bolts that hold the bearing supports, 1 bolt on each side [Figure 27, **A**].

Move the metering shaft forward, then pull it out in the space provided on the sides. When repositioning, make sure that the spline distribution shaft is 6 mm / ¼ inch from the bottom of the hopper on each side. Measure with a steel shim.

Install the shim on an edge groove and not on the fluted part [Figure 26, **A**]. This measurement should be constant over the entire length of the metering shaft.

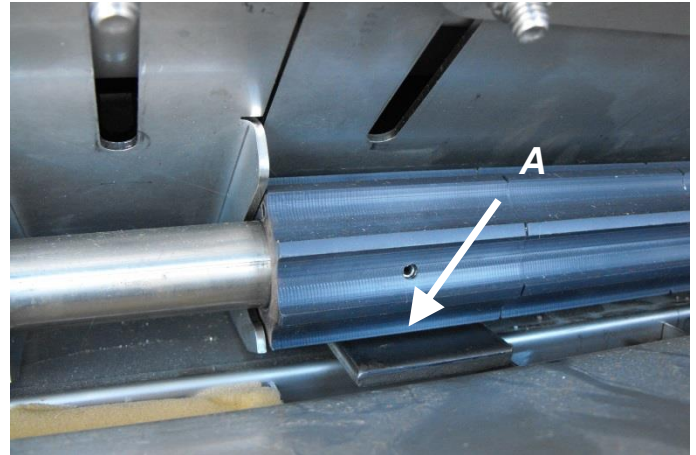


Figure 26

- ☞ If this measure is not met, the flow will be compromised and uniformity of distribution will be reduced.
- ☞ Verify daily the bearings, failure thereof may affect the proper functioning of your metering shaft and affect the fertilizer rate. The shaft should turn easily by hand if the chain of the variable transmission is disassembled.

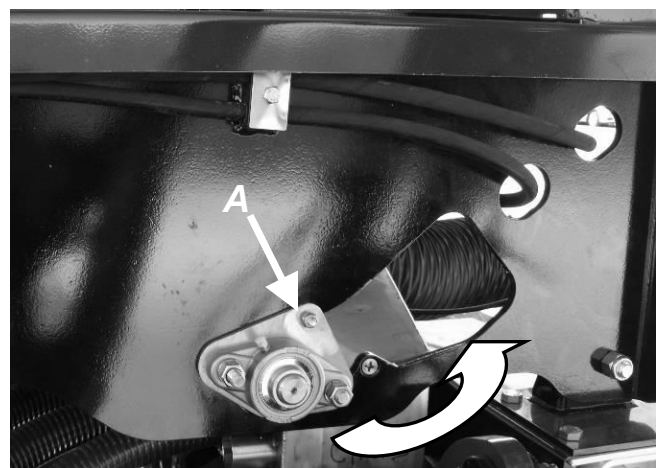


Figure 27

Drive arm adjustment (Special configuration)

Some models are equipped with a drive arm with an inner chain [Figure 28, **A**]. The stainless steel chain can be adjusted. Simply rotate on itself the plastic tensioner to reach the ideal tension.

- ☞ Do not over tighten the chains. Excessive tension will cause a premature wear and stretching of the chains.

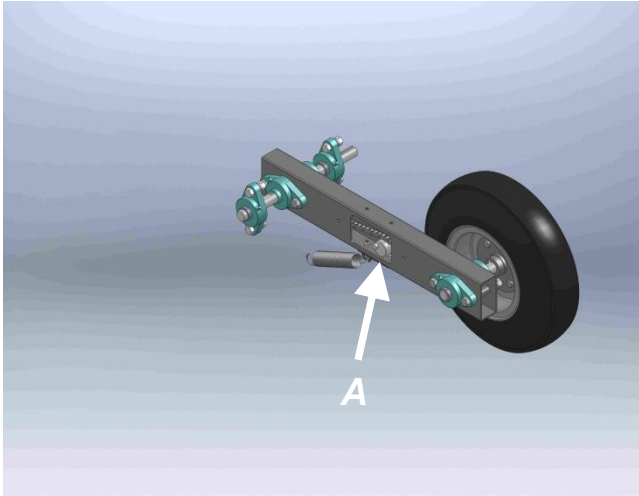


Figure 28

TABLE OF LUBRICATION (GREASE)

Zone	Lubrication zone	Number of grease fitting	Interval
1	Fan drive system (HE ou BC172)	2	100 hours
2	Drive arm (standard)	4	100 hours
3	Distribution system drive	2	100 hours
4	PTO shaft and belt tensioner (mechanical drive option)	4	100 hours
5	Drive arm (special configuration)	6	100 hours

Use EP2 universal grease

Attention: An excess of grease in the bearings can cause damage to the seal.

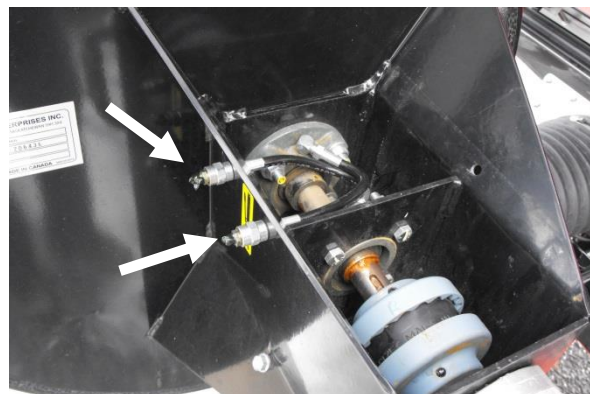
- ZONE 1**



Outside bearing FAN REM HE

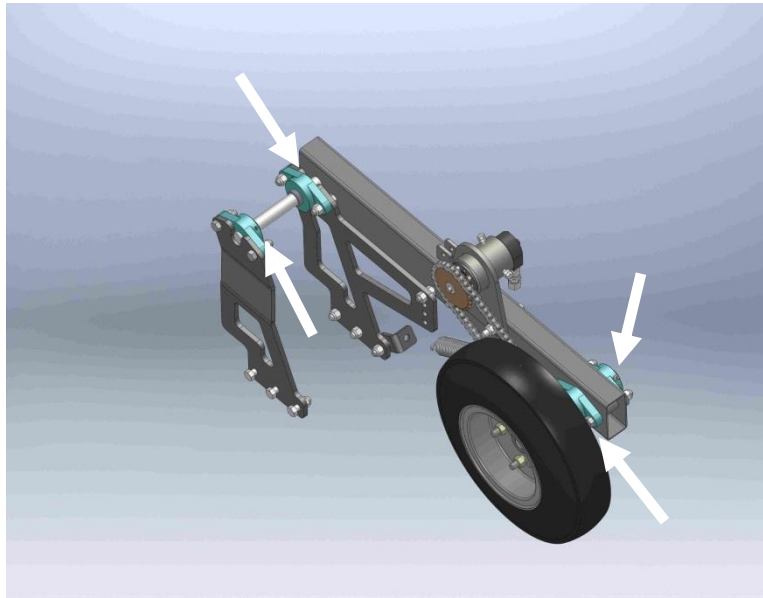


Inside bearing FAN REM HE



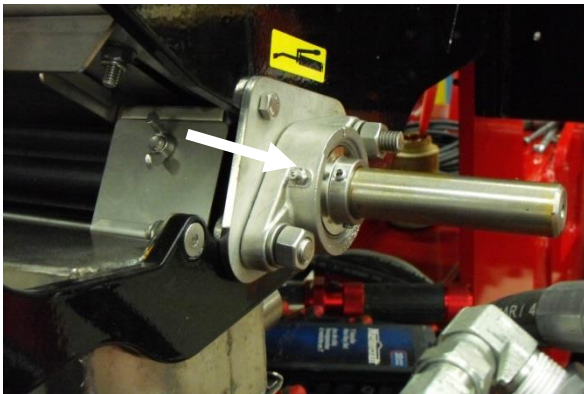
Bearing FAN REM BC172

- **ZONE 2**

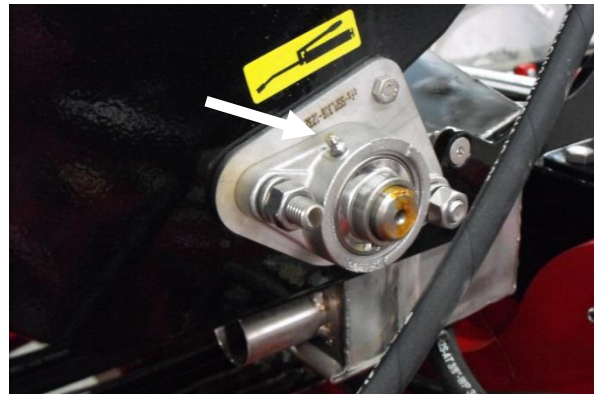


Drive arm (Standard)

- **ZONE 3**



Bearing spline distribution shaft (Left)



Bearing spline distribution shaft (Right)

- **ZONE 4**

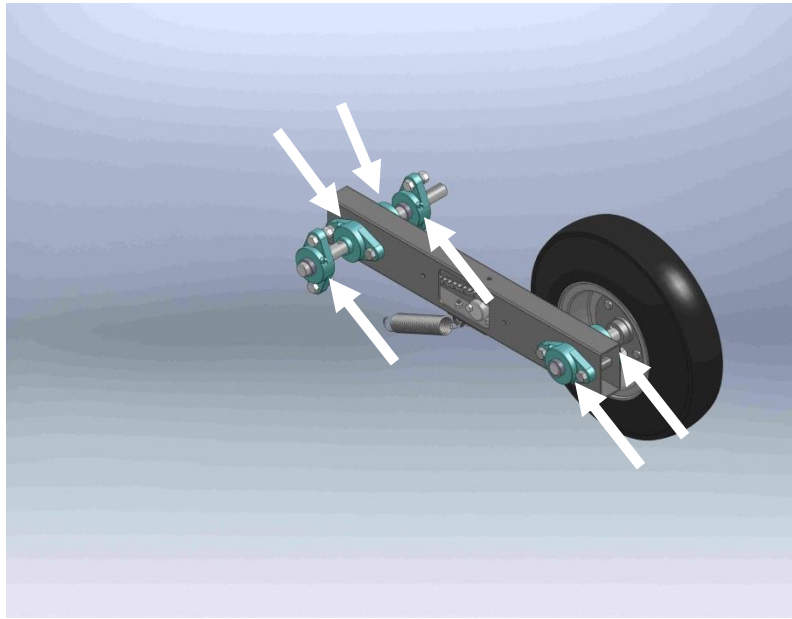


PTO Shaft



Belt tensioner

- ZONE 5



Drive arm (Special configuration)

TABLE OF LUBRICATION (OIL)

Lubrication parts	Lubricant type	Quantity	Interval
Variable transmission [figure 23]	Clear trans-hydraulic oil.	1.75 liters	Once per season Check level daily
Oil reservoir (Distribution system) [figure 23A]	Dextron III oil	8 liters	Once per season Check level daily
PTO pump gearbox (PTO pump option) [figure 23B]	Gear oil A.P.I. GL5 (SAE 80W90) or synthetic oil (SAE 75W90).	0.350 liters	Once per season Check level daily
Oil reservoir (Option pompe PTO) [figure 23C]	Clear trans-hydraulic oil.	70 liters	Once per season Check level daily
Gear box (Mechanical drive option) [figure 24]	Gear oil A.P.I. GL5 (SAE 80W90) or synthetic oil (SAE 75W90).	1 liter	Once per season Check level daily

OTHER MAINTENANCE

Other maintenance or verification	Interval
Chains tension	Daily
Fan rubber spider	Daily
Emptying of the water that accumulates in the fan	Beginning of season
Check the condition of the fan drive (Mechanical drive option) (PTO shaft, tension and condition of belts, etc)	Daily

TORQUE VALUES CHART

Unified Inch bolt

Size	Grade 2		Grade 5		Grade 8	
	Nm	Lb-ft	Nm	Lb-ft	Nm	Lb-ft
5/16 - 18	15.5	11.5	24	17	33	25
3/8 - 16	27.5	20	42	31	59	44
7/16 - 14	44	32.5	67	49	95	70
1/2 - 13	67	49	105	76	145	105
9/16 - 12	95	70	150	110	210	155
5/8 - 11	130	97	205	150	285	210
3/4 - 10	235	170	360	265	510	375
7/8 - 9	225	165	585	430	820	605
1 - 8	340	250	875	645	1230	910

Identification of standard bolts

Grade 2 = No line on the bolt head

Grade 5 = 3 lines on the bolt head

Grade 8 = 6 lines on the bolt head

Metric bolt

Size	Grade 5.8		Grade 8.8		Grade 10.9	
	Nm	Lb-ft	Nm	Lb-ft	Nm	Lb-ft
M5 x0,8	4	3	6	5	9	7
M6 X 1	7	5	11	8	15	11
M8 X 1,25	17	12	26	19	36	27
M10 X1.5	33	24	52	39	72	53
M12 X 1.75	58	42	91	67	125	93
M14 X 2	92	68	145	105	200	150
M16 X 2	145	105	225	165	315	230
M18 X 2,5	195	145	310	230	405	300
M20 X 2,5	580	205	440	325	610	450
M24 X 3	480	355	760	560	1050	780

Identification of metric bolts

The value of the grade of the bolt is stamped on the bolt head.

The higher the value, the higher the grade.

CONVERSION CHART

1 acre	=	0.405 ha
1 ha	=	2.471 acres
1 kg	=	2.204 lbs
1 lb	=	0.4536 kg
1 in	=	2,54 cm
1 ft	=	30.40 cm
1 ft	=	0.3040 meter
1 cm	=	0.3937 in
1 meter	=	39.37 in
1 meter	=	3.28 ft
1 km/hr	=	0.62 mph
1 mph	=	1.61 km/hr
1 square in	=	6.452 square cm
1 square cm	=	0.155 square in
1 square ft	=	0.093 square meter
1 square mile	=	259.0 ha
1 square mile	=	2.590 square kilometer
1 square km	=	0.386 square mile
1 gallon (Can)	=	1.201 gallon (USA)
1 gallon (Can)	=	4.546 Liters
1 gallon (USA)	=	3.78 Liters
1 liter	=	0.2642 gallon (USA)
1 bushel (USA)	=	1.0321 bushel (Can)
1 bushel (Can)	=	274.92 liters
1 bushel (USA)	=	3.78 liters

NOTES
