PNEUMATIC PLANTER
HARVEST

STARTING
MANUAL

MAINTENANCE DOSAGE

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SOLÀ *seed drills, planters and fertilizer spreaders are manufactured in a highly specialized environment and our factory has a vast network of satisfied customers.*

SOLÀ *machines use highly advanced technology and are guaranteed to work without malfunctions in a large variety of conditions. The* ***SOLÀ*** *machines are provided with easy-to-use and efficient devices and perform excellently with only minimum operator maintenance.*

This manual will help you use your ***SOLÀ*** *product with the maximum efficiency.*

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Safety Information

RECOGNIZE SAFETY INFORMATION

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal or bystander injury.

UNDERSTAND SIGNAL WORDS

A signal word – DANGER, WARNING, or CAUTION, is used with the safety-alert symbol. All three signal words are used on safety decals on this equipment, as well as in this manual.

DANGER identifies hazards that could result in serious injury or death to you or others around you.

WARNING identifies hazards that could cause personal or bystander injury.

CAUTION identifies potential injury or equipment hazards if the accompanying instructions are not closely followed.

FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual as well as those in other manuals related to this equipment. Also be alert to instructions on safety decals affixed to this equipment. Keep safety decals in good condition. Replace missing or damaged safety decals. Be sure new components and replacement parts include the current safety decals. Replacement safety decals are available from your dealer.

Learn how to operate the toolbar and how to use controls properly. Do not allow anyone to operate the toolbar without proper instruction.

Keep the toolbar in proper working order. Do not modify the toolbar without the knowledge and express permission of the manufacturer.

If you need any assistance in understanding any part of this manual, contact your dealer.

Safety Information - Continued

OPERATE THE TOOLBAR SAFELY

Be careful when operating the toolbar to avoid personal or bystander injury.

If the toolbar must be raised while working on or near it, be sure cylinder safety stops are installed and all stored energy is released.

Serious injury or death can result from contact with electric lines. Use extreme care when moving or operating near electrical lines, and avoid all contact with them.

Stand clear of the toolbar when wings or row markers are being folded or unfolded. Mechanical or hydraulic failure can allow these functions to move rapidly.

Make sure hydraulic cylinders and hoses are fully pressurized with oil before operating the tool bar.

Be careful when operating on uneven terrain. Tip over can occur if this equipment runs into a hole, ditch, or other irregularity.

Be sure the toolbar is on a firm and level surface before disconnecting from the tractor. Lower and disconnect the tool bar according to instructions on page 26 of this manual.

NO PASSENGERS ALLOWED

There is no safe place on this equipment for anyone other than the operator. Keep riders off this equipment at all times, especially children.

In addition to falling off and being run over, riders can obstruct the vision of the operator, endangering bystanders, livestock, other equipment, buildings and property.

Safety Information - Continued

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and the fire department near your telephone.

WEAR PROTECTIVE CLOTHING

Wear close fitting clothing, and use safety equipment appropriate for the job.

Prolonged exposure to loud noise can cause loss of hearing. Wear a suitable hearing device such as earmuffs or earplugs to protect against hearing loss in noisy working conditions.

Operating this equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating.

USE SAFETY LIGHTS AND DEVICES

Slow moving tractors and towed implements such as the toolbar can create a hazard when transporting on public roads. The operator must be aware of other traffic to avoid injury and equipment damage from a collision.

When transporting on public roads, use a SMV (Slow Moving Vehicle) sign, flashing lights, and turn signals according to local traffic regulations. To increase visibility, especially at night, use all lights and safety devices provided with your equipment.

Keep safety items in good working condition. Replace damaged or missing items, especially burned-out or broken lights, immediately.

USE SAFETY CHAINS

Safety chains will help control the toolbar should it accidently be separated from the tractor drawbar.

Using the appropriate pins and links, attach the chain to the tractor drawbar support or another rigid chain anchor location. Provide just enough chain slack to permit turning.

Do not use safety chains for towing.

REDUCE SPEED WHEN TOWING

Attempting to stop the toolbar quickly from transport speeds can cause the toolbar to swerve and upset. Be prepared to stop the tractor and toolbar by traveling at a reduced speed in uncertain field conditions, or when traveling on public roads where other traffic is operating.

Always follow recommended speed to weight ratio guidelines.

- Maximum speed is 20 mph (32 km/h). NEVER EXCEED this speed limit.
- Reduce speed to 10 mph (16 km/h) when towing a load up to double the tractor weight.
- Do not tow loads exceeding double the tractor weight.
- Use extreme caution when towing in adverse conditions, when turning, and on inclines.

TRANSPORT SAFELY

Make sure the row markers are in the full up and locked position before transporting.

The maximum transport speed for the toolbar is 20 mph (32 km/h). DO NOT EXCEED this speed limit. Never travel at any speed which does not permit adequate steering and stopping control.
Reduce transport speed when traveling on rough terrain.

PRACTICE SAFE MAINTENANCE

Understand the service procedure before doing the work. Always keep the work area clean and dry. Remove all excess grease, oil, or other debris before service, and especially before going back to work with the toolbar.

Never lubricate, service, or adjust the toolbar while it is free to move. Disengage all power, shut off the tractor, and operate controls to relieve hydraulic system pressure. Always support components that must be raised or lowered to the ground before servicing.

AVOID HIGH-PRESSURE FLUIDS

Be sure to relieve pressure in the hydraulic system before disconnecting hoses or fittings. Be sure all hoses and fittings are tight before applying pressure to the hydraulic system.

When the system is under pressure, search for leaks with a piece of cardboard. Always protect hands and body, especially your eyes, from escaping high pressure oil.

Escaping high pressure oil can have sufficient force to penetrate skin. **Being a liquid, oil can be rapidly absorbed into body tissue causing serious injury or death. If oil is not surgically removed with a few hours, gangrene may result. If injured in any way by escaping high pressure fluid, see a medical doctor at once.**

STORE EQUIPMENT SAFELY

Store equipment and implements according to recommendations in their Operator's Manuals. Keep all children and animals away from the equipment storage area at all times.

Introduction

TRACTOR REQUIREMENTS

MINIMUM PTO HORSEPOWER REQUIRED

12 Row Narrow Basic Planter – 170 hp (126.8 kw)
with Fertilizer Attachment – 195 hp (145 kw)

16 Row Narrow Basic Planter – 195 hp (145 kw)
with Fertilizer Attachment – 210 hp (156.6 kw)

24 Row Narrow Basic Planter – 200 hp (149 kw)
with liquid fertilizer applicators and hitch used to pull a 1200 liters tank – 235 hp (175 kw)

31 Row Narrow Basic Planter – 300 hp (224 kw)
with liquid fertilizer applicators and hitch used to pull a 1200 liters tank – 350 hp (261 kw)

PRESSURE & RELIEF VALVE REQUIREMENTS

The maximum hydraulic pressure and relief valve setting is **NOT to EXCEED** 206 bar at a flow rate of 68 l/min at the couplers.

If the relief valve or hydraulic pump on the tractor is not providing the minimum required GPM or pressure, see your tractor dealer.

REMOTE CONTROL VALVE LEVER

Requires (2) two tractor remotes, (SVC's).
(1) For Toolbar raise/lower/fold/tuck.
(1) For translock/tongue/raise/lower/markers.

Case drain may be required for options/accessories that requires those types of Hydraulics.

HYDRAULIC QUICK COUPLERS

Couplers for connecting to the tractor hydraulic system are included with the toolbar. These quick couplers will fit ASAE S366 standard female couplings. If these couplings do not fit your tractor, see your tractor dealer for the correct coupler for your application.

ELECTRICAL SYSTEM

The tractor must have a 12 volt D.C. electrical system and 2 prong connector to power the console.

WHEEL TREAD

Adjust the tractor wheel width as follows:

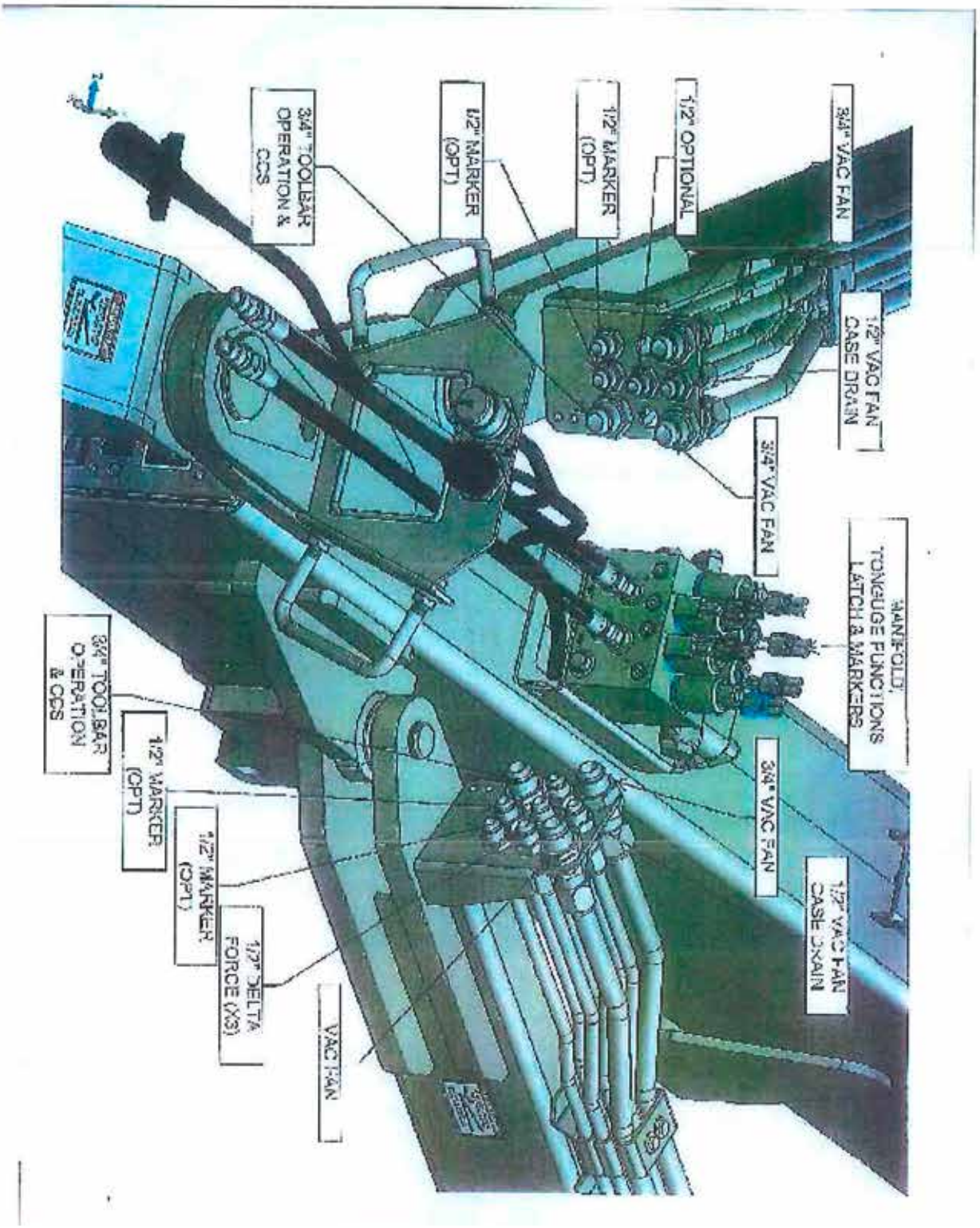
For 762 mm row spacing
tread width = 1524MM

tractors with duals, set
tread width = 3048 mm

BALLAST

Ballast the tractor as necessary with front suitcase weights, water and calcium chloride solution in tires, and or wheel weights as required. Tractor ballast may be required due to light or negative planter tongue load. Ballast may also be required in certain ground conditions.

Introduction



Cylinder Safety Stops

SAFETY STOPS

Safety stops are provided for use on the hydraulic cylinders for the toolbar carrying wheels and tongue hydraulic cylinder. Depending on toolbar model, they are placed in various locations on the center frame or tongue as shown.

CARRYING WHEEL SAFETY STOPS

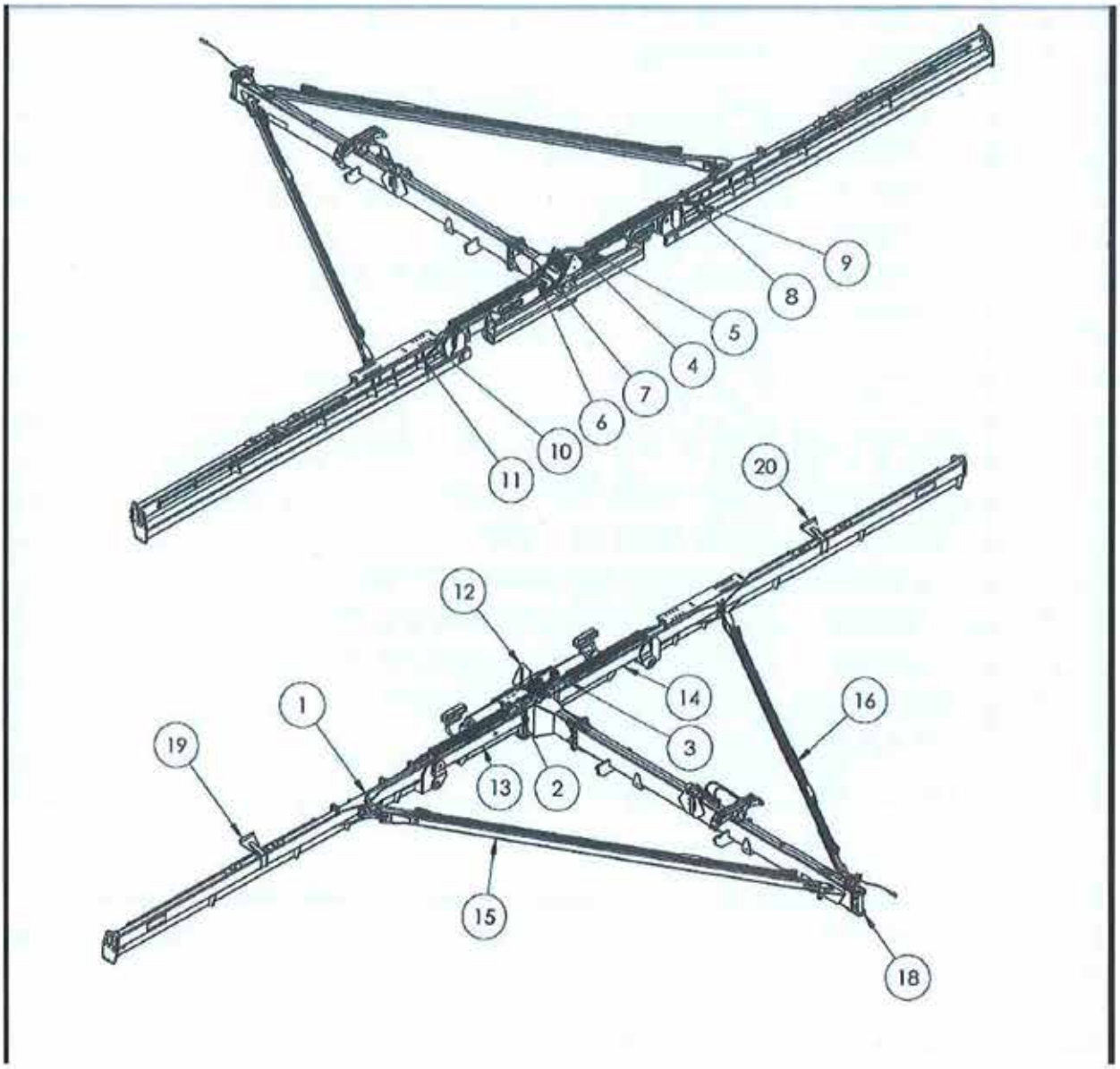
WARNING: To avoid personal injury, DO NOT transport or work under the toolbar unless the transport cylinder safety stops are installed.

Always install the cylinder safety stops on the wheel cylinders when servicing or adjusting the toolbar.

Also use the cylinder safety stops when transporting the toolbar in the field transport position.

Set-Up Instructions

TOOLBAR TERMINOLOGY



SETUP INSTRUCTIONS - Continued

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	90955	HOSE, 3/4" X 100-1/2" DRAFT TUBE TO WING HINGE, 60' BAR	1
2	90956	HOSE, 3/4" X 29.5", WING HINGE TO MANIFOLD	1
3	90956-1	SEE 90956	1
4	90957	HOSE, 1/2" X 32.5", MANIFOLD TO WING HINGE	1
5	90957-1	SEE 90957	1
6	90957-2	SEE 90957	1
7	90957-3	SEE 90957	1
8	90958	HOSE, HYD., 1/2" X 40.5" WING TO HINGE	1
9	90958-1	SEE 90958	1
10	90958-3	SEE 90958	1
11	90958-4	SEE 90958	1
12	TB90788B BASE	CENTER SECTION ASSY., PB60 SERIES SN 8979 & NEWER	1
13	TB90790A BASE	WING HINGE, RIGHT, PLANTER	1
14	TB90791A BASE	WING HINGE, LEFT, PB6030	1
15	TB90811A	DRAFT TUBE ASSY., RIGHT, 60FT BAR	1
16	TB90812A	DRAFT TUBE ASSY., 60FT PLANTER, LEFT	1
17	TB90814	INNER TONGUE ASSY. ULTRAPLANT 60	1
18	TB90869A BASE	OUTER TONGUE ASSY. PB & UM60XX	1
19	TB90916A BASE	WING, RIGHT PB6030FR	1
20	TB90917 BASE	WING, LEFT PB & UM 6030	1

Toolbar frames are shipped from the factory strapped and chained to flatbed trailer. The toolbar and parts boxes are heavy. Use the correct equipment and follow Unloading Instructions beginning on page 10 before proceeding with toolbar set-up.

After the unit has been unloaded, remove all banding and other tie downs from the toolbar and parts packages. Lay all loose components out on the floor to be assembled later. Count all small parts and fasteners against their packing lists and obtain any possible shortages before proceeding.

All reference to right or left, forward or rearward, used in these instructions are as viewed from behind the toolbar facing toward the tractor. Refer regularly to page 13, Toolbar Terminology, while assembling or working on the toolbar for the first time.

SETUP INSTRUCTIONS - Continued

TOOLBAR ASSEMBLY

1. An optional drawbar helper should be installed to the tractor drawbar as shown. Adjust and connect the top link from the tractor to the drawbar helper with hardware received with the top link. Minimum clearance between the tractor drawbar and drawbar helper must be 2 inches. If the tractor does not have a drawbar helper or top link, they are available from most tractor dealers.

2. Mount the toolbar controller box inside the cab, in a convenient location. Connect the power cord (medium size end-two prong) to the tractor power accessory plug. Place the long electrical harness (large end-multi-prong) out the rear window and connect it to the hydraulic control end from the toolbar harness.

NOTE: The small four prong harness is for planter drive switch operation.

IMPORTANT:

Clean all dirt and foreign matter off of all hydraulic hose ends and tractor couplers before connecting the Hydraulic system.

3. With the tractor engine off, relieve the systems Internal Hydraulic pressure. Then attach both hydraulic hose couplings from the toolbar to the tractor remote valve ports.

Frame Lift/Lower/Fold circuit hoses, (items 1-2)

Connect 5/8" ID. "Raise" hose from LH Hitch frame to tractor outlet showing extended cylinder. Connect 5/8" ID "Lower" hose from RH hitch frame to tractor outlet showing retracted cylinder.

Hitch Height/Marker circuit hoses (Items 3-4)

Connect 3/8" ID "lower" hose LH side of control Valve block to tractor outlet showing extended cylinder. Connect 3/8" ID "raise" hose from RH side of control Valve block to tractor outlet showing retracted cylinder.

NOTE:

If toolbar functions do not operate correctly, reverse the hose couplings. There is a check valve in the hydraulic circuit that will not allow reverse oil flow.

IMPORTANT:

If the planter hydraulic system is not full of fluid, it is necessary to prime the system. (See page 23).

IMPORTANT:

These supply hydraulic hoses ARE NOT to be connected to the "motor valve" circuit found on some tractors.

4. Connect the frame control box harness to the planter Harness by aligning the groove and tab on the collar Clockwise to secure.

5. Start the tractor engine and turn the control box on. Push the Tongue height switch while using the tractor remote valve to raise or lower the tongue hitch. It may be necessary to raise or lower the wing wheel(s) to attain the correct position.

NOTE:

Refer to Toolbar Controller Functions found on page 28 for which switches to operate for continuing set-up instructions.

6. Connect the lower swivel hitch on the toolbar to the tractor drawbar and helper as shown using a hitch pin (1) with a minimum diameter of 1 ¼".

7. Also connect the safety chain (2) as shown.

SETUP INSTRUCTIONS - Continued

8. Mount the planter monitor harness to the mating console harness.

IMPORTANT:

Connect all consoles to a 12-volt DC system only.

CAUTION:

A negative tongue load occurs when the Toolbar is in the planting position and the Carrying wheels are being lowered, raising the Toolbar. This will shift the center of gravity rearward. Do not attempt to unhitch in this position. Unhitch ONLY when the toolbar is in the fully lowered position or when in the folded transport position.

WARNING:

To avoid the possibility of injury, do not raise, or transport, or work under the toolbar unless the carrying wheel cylinder safety stops are installed.

9. With the toolbar properly connected to the tractor drawbar, extend the carrying wheels to fully raise the toolbar.

10. Remove all four cylinder safety stops from their storage positions and install them on the extended wheel cylinders.

11. After all four wheel safety stops are in place, release the pressure on the wheel carrying cylinder circuits to allow the cylinders to rest on the safety stops.

12. Make sure the wing coupling lock pins are placed in the storage position before proceeding. The lock pin should be only installed in the lock hole when transporting to and from the field, and when the toolbar is in off-season storage.

PURGING AIR & PRESSURIZING HYDRAULICS

IMPORTANT:

Before beginning the following instructions, move the toolbar to an area large enough to allow the wing sections and row markers to fully extend, with plenty of room in front of the tractor and behind the toolbar. The following procedures must be accomplished on a hard or dry surface where the carrying wheels will not compress into the soil.

NOTE:

Refer to and familiarize yourself with Toolbar Controller Functions found on page 28 before attempting to purge air or pressurize the hydraulic system.

1. Turn the power switch on the controller ON. Place the toolbar switch in the TRANSPORT position. Using the lift switch in the UP position, raise the toolbar wing wheels, freeing the safety stops. The safety stops must be removed from the wheel cylinders and placed in their storage positions.
2. Raise and lower the carrying wheels several times to purge air and pressurize this circuit.

IMPORTANT:

The tractor transmission must be in neutral and all tractor brakes off to avoid possible damage to the wings when unfolding. Be aware that the toolbar will move the tractor forward and rearward when cycling the wings.

3. Raise the toolbar wing wheels with the UP lift switch. Move the toolbar switch to the FIELD position. Raise the center section carrying wheels using the lift UP switch. Remove the safety stops from these wheels and place them in their storage position. Raise and lower these carrying wheels several times to purge air and pressurize this circuit.
4. Raise the toolbar with the lift switch, return the toolbar switch to the TRANSPORT position, lower the hitch, and lower the tongue enough to unlatch the wing coupling hooks from the receiver bracket. Using the wing fold switches, fold the wings in and out several times to fill their circuits with oil.

SETUP INSTRUCTIONS - Continued

5. With the toolbar fully raised and unfolded, place the toolbar switch in the TRANSPORT position. Cycle the drawbar switch UP/DOWN several times. As this is occurring, watch the tongue latch to make sure it is engaging and disengaging properly.

NOTE:
On those toolbars with row marker stands, the transport lock pins will have to be removed and stored prior to cycling the marker arms. Units without stands do not use transport lock pins.

6. Place the toolbar switch in the FIELD position. Slowly activate one of the marker switches to Unfold and fold one marker. Do this several times to purge and fill this circuit. Repeat on the other row marker.

7. Completely fold the toolbar to the transport position and move it to an area where the planter components can be added.

NOTE:

Toolbar assembly is now complete. Install the Planter seed or Drill components according to the instruction manuals that are received with that equipment.

Operating Instructions

SWINGING DRAWBAR (if equipped)
The swinging drawbar (sliding or roller type) must be locked in position on the tractor centerline. All possible lateral movement must be securely locked to prevent damage to the PTO, 3-point arms, etc.

Use the retainer clamps or bolts furnished with the tractor to lock the drawbar in position. Adjust the drawbar out to the required length to assemble the drawbar helper for clearance with dual tires if so equipped.

SAFETY HITCH PIN
Always use the safety hitch pin furnished to connect the toolbar to the tractor drawbar. Insert the hitch pin through the toolbar swivel hitch and drawbar. Lock the hitch pin in place with the clevis pin and hairpin clip furnished with the drawbar helper.

IMPORTANT: *Use the toolbar swivel hitch handle to hold and align the hitch in position as the tractor is backed up to the toolbar.*

SAFETY CHAIN
Always use a safety chain as a precautionary connection between the toolbar and tractor. Fasten the chain to the toolbar as shown, with the other end of the safety chain fastened to the drawbar support bracket.

Check hanging adjustment of the safety chain by driving forward and turning the tractor completely to the left and right. Adjust free chain slack as necessary.

WARNING: *A safety chain must be attached between the toolbar and tractor at all times. In case the hitch pin comes out during transport, the safety chain will keep the toolbar from running away and possibly causing injury or property damage.*

DRAWBAR CONNECTION

WARNING: *Rear tip-over can result if an attempt is make to pull from the wrong location on the tractor. Use the 3-point hitch ONLY with implements designed for 3-point attachment. The 3-point MUST NEVER be used as a drawbar.*

Before connecting the toolbar to the drawbar, raise the tractor 3-point arms to prevent interference between the arms and toolbar.

SQUARING & LEVELING THE TOOLBAR

Toolbar height must be adjusted so the row unit parallel links are parallel with the ground when operating in the field. The toolbar is equipped with an adjustable hitch frame which can be removed and raised or lowered as necessary.

The hitch frame can be adjusted in three different positions on the lower tongue. These positions allow the planter row units to run parallel to the ground. Drawbar heights will vary with each different tractor application.

The mainframe bar is carried 18 or 21 inches above the ground. This dimension is determined by which holes the carrying wheels are positioned.

Safety Alert

Watch for this **ALERT** Symbol. It identifies potential hazards to Personal **SAFETY** and your **HEALTH**. It points out Safety precautions.
This SAFETY symbol means:

ATTENTION:

BE ALERT

Why is SAFETY important to you?
THREE BIG REASONS:
***ACCIDENTS DISABLE AND KILL**
***ACCIDENTS COST**
***ACCIDENTS CAN BE AVOIDED**

Failure to read this manual before operation of this equipment is a misuse of the equipment and a needless risk to your **HEALTH** and **SAFETY.** Your life and limbs are worth keeping. Use this equipment with care.

Symbol

Signal Words:

DANGER, WARNING, CAUTION

The appropriate signal word for each message has been selected using the following guidelines below the Alert Symbol.

BE ALERT!

DANGER – Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations,
typically for machine components that, for functional purposes, cannot be guarded.
WARNING – Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.
CAUTION – Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Quick Start Guide

Starting Procedure:

1. Hitch toolbar to tractor and connect safety chain. Hitch tongue may need to be raised or lowered to proper height.
2. Connect the two 3/4" hydraulic hoses to remote #1.
3. Connect the two 3/8" hydraulic hoses to remote #2.
4. Connect wire harnesses to tractor.
5. Turn console power on.
6. Remove cylinder locks on lift wheel units only.

Step #1

Step #7

7. With console in "ROAD" select "TUCK", use remote #1 to raise wing wheel units.

- Now, toolbar is ready for transport.

Operating Instructions - Continued

Unfolding Bar:

1. Remove all four transport lock pins. There are two on each side.

2. With console in "ROAD" select "TUCK", use remote #1 to lower wing wheel units. **(Note, when folding the wings out, make sure that the transport lock arm cylinder is fully retracted and latch arms are raised up. Failure to have the latch arms fully raised could result in the latch arms damaging the hydraulic lines on the draft tubes.)**

#2) Wing Wheel Units

#2) Control Box

3. With console in "ROAD" select TRANSLOCK ON" and raise trans latch.
4. With console in "Road" select "FOLD", use remote #1 to unfold bar. Be sure to keep bar level by using remote #2 to raise or lower tongue.

Step #3) Control Box *Step #4) Control Box*

5. Once bar is completely unfolded, with console in "Road" select "TRANSLOCK" and use remote #2 to lower field latch.

Step #5) Control Box

To Raise and Lower Bar while Unfolded:

With console in "Field" use remote #1 to raise and lower bar. Use remote #2 to raise and lower tongue.

Raised Bar *Control Box*

3. With control box in "Road" and turn on "Translock" (locking light should be on), use remote #2 to raise wing latch.

Important:

Read and follow all safety instruction and warning decals prior to operating the toolbar. When in transport, make sure that all cylinder service stops are installed.

Do not transport toolbar with any installed on-board fertilizer storage equipment, loaded with product.

Field Operation Instructions

TO UNFOLD

1. Activate controller by placing the power switch in the ON position.

2. Place toolbar switch in TRANSPORT position.

3. Remove safety stops from the carrying wheel cylinders and drawbar tongue cylinder. It may be necessary to slightly extend these cylinders to free up the safety stops.

4. Remove and store both wing lock pins in the extra holes in the receiver bracket.

CAUTION: *Wing lock pins MUST be installed when tie downs are used to hold wing lift wheels in the transport position. Wings can become unhooked in transport by inadvertent cylinder drift if the wing wheels are tied up and the lock pins are not installed.*

5. Hold the drawbar tongue switch in the UP position until the toolbar is fully raised.

6. Hold the lift switch in the UP position until the wing wheels are fully lowered.

7. Lower drawbar tongue to disengage the wing carrying hooks from receivers in the receiver bracket.

8. Place tractor in neutral (use slow reverse to assist wing spread when in soft ground conditions).

9. With the mainframe tongue level with the groundline, operate fold OUT switch to unfold wings to the full-out field position.

10. Lower drawbar tongue cylinder to full down for field operation. The main tongue latches will automatically engage.

FIELD OPERATION

CAUTION: *Be aware that end turns could damage unfolded tool bar wings if ground speed is too fast. The outer end of the toolbar travels much faster than the ground speed of the tractor and the inner end travels in reverse direction of the tractor when executing turns at the end of planted rows.*

1. To lower or raise the toolbar, operate LIFT switch in desired direction, momentarily, to activate times sequence (DOWN for forward or UP for rearward, as labeled). The toolbar will react accordingly.

NOTE: To interrupt raise or lower, or to interrupt marker travel, touch lift or marker switch in desired direction, momentarily. To resume or change direction, operate switch in desired mode.

2. Place toolbar switch in the FIELD position.

3. To operate marker in or out, operate selected marker switch in desired direction, momentarily, to activate timed sequence (OUT for forward or IN for rearward, as labeled).

NOTE: Markers are individually controlled and can be operated simultaneously in the both in or both out direction.

NOTE: For smooth operation, start marker IN sequence several seconds prior to activating lift UP sequence. Start marker OUT sequence several seconds after activating lift DOWN sequence.

TO FOLD

1. With the toolbar switch in the FIELD position, raise, fold, and store the markers. On units with storage stands, make sure the markers are fully nested and pin locked before proceeding.

2. Raise the toolbar to the full up position.

3. Place toolbar switch in TRANSPORT position.

4. Raise the drawbar tongue to the full UP position. The telescoping latch will automatically disengage.

5. Place the tractor in neutral (see slow forward to assist wing folding when in soft ground conditions).

6. With the mainframe tongue level with the groundline, operate fold switch to IN position to begin folding. When the wing braces have moved under the receiver bracket, adjust the drawbar hitch cylinder height to position the wing carrier hooks over the receiver in the receiver bracket.

7. Raise drawbar tongue to the full UP position.

8. Hold the carrying wheel lift switch in the DOWN position to tuck the wing wheels up for transport.

NOTE: Tuck the wing wheels snugly enough to depress the wing tires against each other slightly. This procedure holds the wing carrier hooks down in their respective receivers to prevent the wings from unhooking.

ROAD TRANSPORT

CAUTION: *ALWAYS install cylinder safety stops and wing and marker lock pins before transporting. NEVER transport for long distances, or over rough terrain, when the planter or drill boxes are more than ¼ full.*

1. Place all hydraulic levers and controls in neutral. Place all control switches on the OFF position.

2. Install wheel and drawbar tongue cylinder safety stops. Install marker and wing lock pins. Make sure the safety chain is connected to the tractor.

3. Turn on all tractor and flashing lights and proceed with caution.

STORAGE

1. Store the toolbar in the folded position with the wing wheels full DOWN to hold the toolbar in the ups position.

2. Install cylinder safety stops:

   a. One on each outside stub bar carrying wheel cylinder, or on the centerframe cylinders only if the toolbar has no stub bar wheel assemblies.

   b. One on each wing lift cylinder.

3. Make sure wing lock pins and marker lock pins are correctly installed in their lock positions.

4. Disconnect the safety chain from the tractor.

5. Operate the drawbar tongue cylinder to position the tongue hitch for removal from the tractor.

6. Remove the safety hitch pin from the toolbar and tractor drawbar.

IMPORTANT: *BEFORE disconnecting electrical cables and hydraulic hoses, cycle ALL controller switches several times with the POWER OFF. This will neutralize the toolbar hydraulic system insuring the safety stops are supporting the toolbar weight while in storage.*

7. Disconnect electrical cables and hydraulic hoses and drive the tractor away from the toolbar.

NOTE: If the toolbar will be stored outside for a long period of time, cover the cable and hydraulic hose ends to protect them from dirt and corrosion. Also spray each exposed cylinder rod with oil or similar lubricant to protect them from dirt and corrosion.

Transporting on Public Roads

FIELD TRANSPORT POSITION

- When transporting with the toolbar frame lowered, transport speed MUST be reduced. If speed is too fast, the reduced clearance between row units and the road surface may damage the row units.
- When transporting on public roads, always make sure the safety chain is correctly fastened from the toolbar to the tractor.
- When transporting on high crowd roads, or on rough or uneven terrain, lower the toolbar until all rear wheels contact the grounds. The toolbar may be damaged if it is not evenly supported.

SAFE TRANSPORTING ON PUBLIC ROADS

DANGER: *Slow moving tractors and towed implements, such as the toolbar/planter, can create a hazard when transporting in traffic. The operator must be aware of other vehicle traffic to avoid injury or equipment damage from a collision.*

For safe transportation of the toolbar/planter, always follow these guidelines.

1. Comply with all state and local laws governing highway safety regulations.

2. Maintain control of the toolbar/toolbar/planter at all times. Never travel at any speed which does not permit adequate steering and stopping control.

3. Always lock the tractor brake pedals together.

4. Make sure all safety lights, reflectors and the SMV sign are clean and clearly visible from the rear before towing. Always use the flashing warning lights on the tractor.

5. Check overhead clearance before passing under power or telephone lines and before entering a building.

6. Before transporting, make sure the row markers are raised and stored in their folded position, with the lock pins correctly in place. Also make sure the wings are pinned and locked in the receiver bracket.

7. Also make sure the rear carrying wheels and tongue cylinder safety stops are correctly installed and locked in place.

8. It is recommended that the tractor has a gross vehicle weight greater than the gross vehicle weight of the toolbar/planter. Regardless, always follow these recommended speed/weight ratio guidelines.

   - *Maximum road speed is 20 mph* (32 km/h).
   - Reduce speed to 10 mph, (16 km/h) when towing a load up to double the tractor weight.
   - NEVER tow loads that exceed double the tractor weight.
   - Use extreme caution when towing in adverse weather or ground conditions, when turning, or when transporting on inclines.

9. ALWAYS make sure the seed boxes and fertilizer containers are no more that ¼ full before transporting the toolbar/planter.

WARNING*: When transporting on public roads, use an SMV (Slow Moving Vehicle) sign, flashing lights and turn signals, according to traffic regulations that apply in your area. To increase the visibility of this equipment, use all lights and safety devices provided with this equipment.*

MAINTENANCE INSTRUCTIONS

CARRYING WHEEL HEIGHT ADJUSTMENTS

If different toolbar heights are required for certain conditions, other than designed height adjustments described on page 26, the toolbar can be adjusted with an optionally purchased "will-fit" Cylinder Stop Collar Kit, as follows.

Height can be changed slightly by installing these will-fit collars on the carrying wheel cylinders. Each carrying wheel cylinder requires an equal thickness of stop collars.

The cylinder safety stops provided with the toolbar will not work if optional collars are in use. Remove the stop collars before attaching the toolbar safety stops. The will-fit collars will have to be stored in the tractor toolbox while the safety stops are in use.

GENERAL PREVENTATIVE MAINTENANCE

1. Clean the toolbar and planter components regularly.

2. Replace all missing, worn or broken parts. Also replace any worn or otherwise illegible safety decals.

3. Regularly check and tighten all fasteners.

4. Make sure the safety chain is not damaged and that it is correctly attached to the toolbar and tractor when the toolbar is being used.

5. Check and or change the hydraulic oil and filter as recommended in the tractor operator's manual.

6. Replace the toolbar control system hydraulic filter at least twice each season and more often if many acres are being planted.

7. Regularly grease the toolbar as described on page 31 of this manual.

8. Keep both the tractor and toolbar tires inflated to their recommended operating air pressures.

   12 X 16.5 ----------80 PSI Cold
   255/70R X 22.5 ----------120 PSI Cold
   305/70R X 19.5 ----------120 PSI Cold
   420/55R X 22.5 Muck Master ------ 73 PSI Cold

9. Check all hydraulic connections for leakage. Tighten or repair all oil leaks immediately. The toolbar hydraulic control system can be severely damaged if dirt or cavitating air is ingested.

10. Make sure all exposed cylinder rods are protected from corrosion during storage and are clean of dirt and debris before toolbar operation.

Lubrication Instructions

GREASE FITTING LOCATIONS

Complete Hyd. Wheel Cylinder View.

Top Grease Zerk on Hyd. Wheel Cyl.

Bottom Grease Zerk on
Hyd. Wheel Cyl.

Grease Zerk on Center of
Hyd. Wheel Unit.

Lubrication Instructions

Grease Zerk Access for Inner Tongue Rollers.
Grease When Bar is Unfolded.

Grease Zerk Access for Inner Tongue Rollers
On Rear of Toolbar When Unfolded

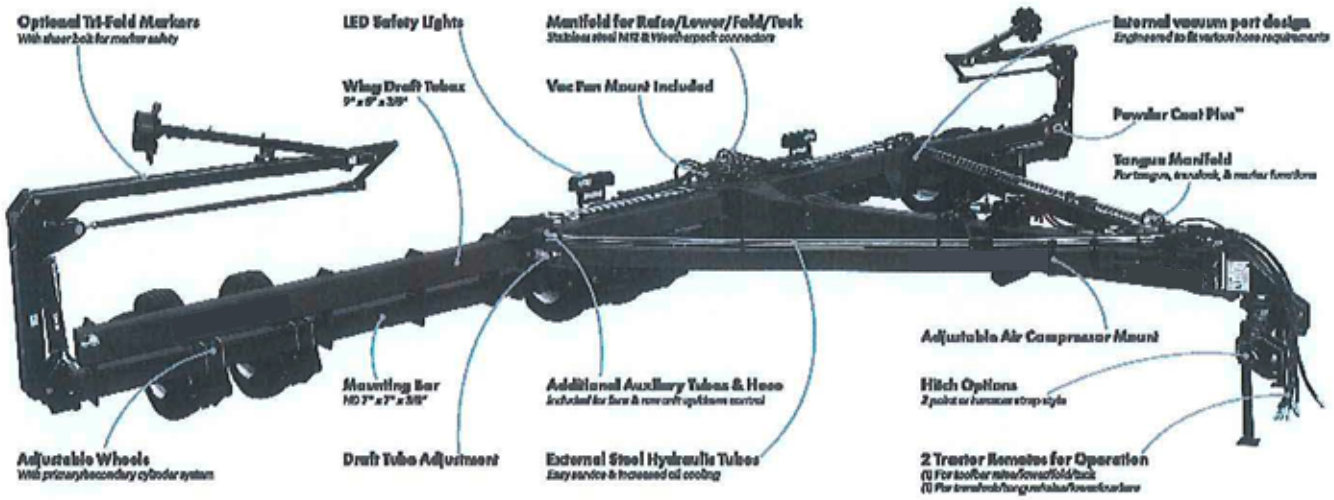
Grease Zerk on Bottom of Draft
Tube and Wing, (Left & Right).

Grease Zerk Located on Bottom side

Grease Zerk on Center of Wing
Hinge Pin. (Left & Right).

Grease Zerk on Top of Wing
Hinge Pin. (Left & Right).

Lubrication Instructions



Not Illustrated. Row Marker Pivot Pins.

All fittings should be wiped clean before attempting to grease the unit. Dirt ingested thru the fitting will damage or prematurely wear close fitting parts. Use a high-quality **#2 multi-purpose Lithium Grease** for all pressure fittings.

1. CARRYING WHEEL CYLINDER – (3 per wheel assembly) – 8 hours or daily.
2. CARRYING WHEEL BEARING HUB – (1 per wheel assembly) – 8 hours or daily.
3. WING BRACE REAR PIVOT – (1 on each side of toolbar) – 80 hours or 2 week intervals.
4. HITCH CLEVIS PIVOT – (1) – 40 hours or weekly intervals.
5. LOWER TONGUE PIVOT – (1) - 40 hours or weekly intervals.
6. MAIN TONGUE FITTINGS – (2) – 80 hours or 2 week intervals.
7. MAIN TONGUE LATCH – (2) – 80 hours or 2 week intervals.
8. VERTICAL PIVOT – (1 on each side of toolbar) – 8 hours or daily.
9. LATCH PUSH ROD PIVOT – (2) – 80 hours or 2 week intervals.
10. INNER TONGUE WEAR PLATE – (Smear on both sides when folded) – As required for conditions.
11. HORIZONTAL PIVOT – (1 on each side of toolbar) – 8 hours or daily.
12. WHEEL FRAME PIVOT – (2 per wheel assembly) – 8 hours or daily.

ROW MARKER PIVOT – (5) five, grease zerks per marker on 48' & 60' toolbar, (3) three, grease zerks on all others), grease – 8 hours or daily.

Torque Charts

STANDARD TORQUES

All torque valves apply to new or plated fasteners, or for reusable fasteners that have been cleaned and coated with clean oil.

SAE grade 5 torque valves shown are for both coarse (UNC) and fine (UNF) thread fasteners.

Separate torque valves for coarse or fine metric threads are shown on the split metric chart below.

Use the following torques for all toolbar fasteners unless called out under Special Torques below.

SAE GRADE 5		
Size	Ft. Lbs	N-m
1/4"	9-11	12-15
5/16"	17-20.5	23-28
3/8"	35-42	48-57
7/16"	54-84	73-87
1/2"	80-96	106-130
9/16"	110-132	149-179
5/8"	150-180	203-244
3/4"	270-324	366-439
7/8"	400-480	542-651
1.0"	580-696	786-943
1 1/8"	800-880	1085-1193
1 1/4"	1120-1240	1519-1631

METRIC GRADE 8.8		
Size	Ft. Lbs.	N-m
Coarse	Coarse	Coarse
M8-1.25	20-26	27-35
M10-1.5	38-46	52-62
M12-1.75	57-66	77-98
M14-2.0	96-109	130-147
M16-2.0	129-145	175-197
Fine	Fine	Fine
M8-1.0	22-31	30-42
M10-1.25	40-52	54-71
M12-1.25	62-75	84-102
M14-1.5	107-124	145-168
M16-1.5	140-158	190-214

SPECIAL TORQUES

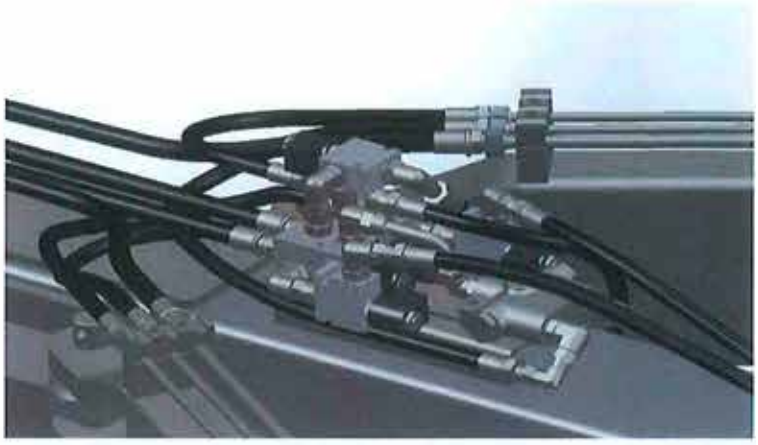
Wheel Bracket "V" Bolts.....180 to 210 ft. lbs. (244-285 N·m)
Wheel Arm Tie Bracket Bolts.....180 to 210 ft. lbs (244-285 N·m)
Wheel Lug Bolts.....66 to 77 ft. lbs (89-104 N·m)

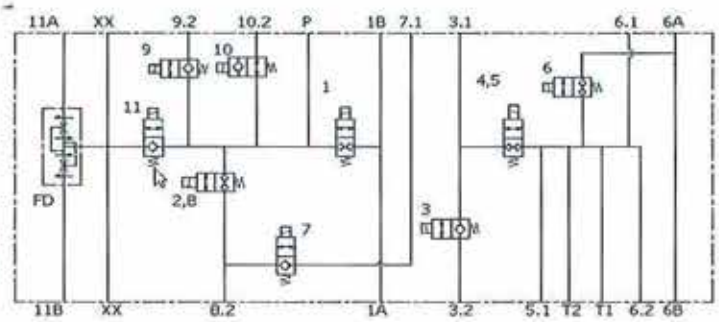
SERVICE
FRAME HYDRAULIC SYSTEM

HYDRAULIC HOOKUP

IMPORTANT:
Clean all dirt and foreign matter off all hydraulic hose ends and tractor couplers
before connecting the hydraulic system.

With the tractor engine off, relieve the system internal hydraulic pressure. Then attach both hydraulic hose couplings from the toolbar to the tractor remote valve ports





CCS OR PSD, Operation

Overview

The CCS or PSD systems work in conjunction with the raise lower function of the toolbar. It is very important that the case drain line from the CCS or PSD systems is not restricted & has free flow to the tractor. If this hose case drain is restricted damage the CCS or PSD fan will result!

When then toolbar is in its lowered (field position) the tractor remote, that is used to raise/lower the toolbar will need to be placed in the lowered detent position, to supply oil to the seed delivery fan. Once the toolbar is fully lowered to the planting position, a switch on the center section wheel unit will sense that toolbar is in planting position and activate a timer in the console. This timer will cause the tractor hydraulic system to rephase the raise/lower hydraulic cylinder system.

The timer can be changed selecting the"*i*" button on the top left hand corner of the home screen on the console. This will then display the buttons that can be operator adjusted. By selecting the "CCS Time Delay" button and then turning the rotary knob on the console, the delay time can be adjusted to meet customer needs. (Please note that it is not recommended that this delay time be set for less than (5) seconds.)

Overview (cont)

CCS or PSD initial start up

1. Console is placed field mode
2. Toggle the CCS or PSD enable button on the Field Mode screen. This will automatically enable the fan delay sequence to rephase the cylinders. After the preset time has passed the seed delivery fan will begin operation.

After the fan has delivered enough seed to the row unit seed meters, begin forward travel of the planter, following seed meter manufacture recommendations. See below fan & agitator control functions.

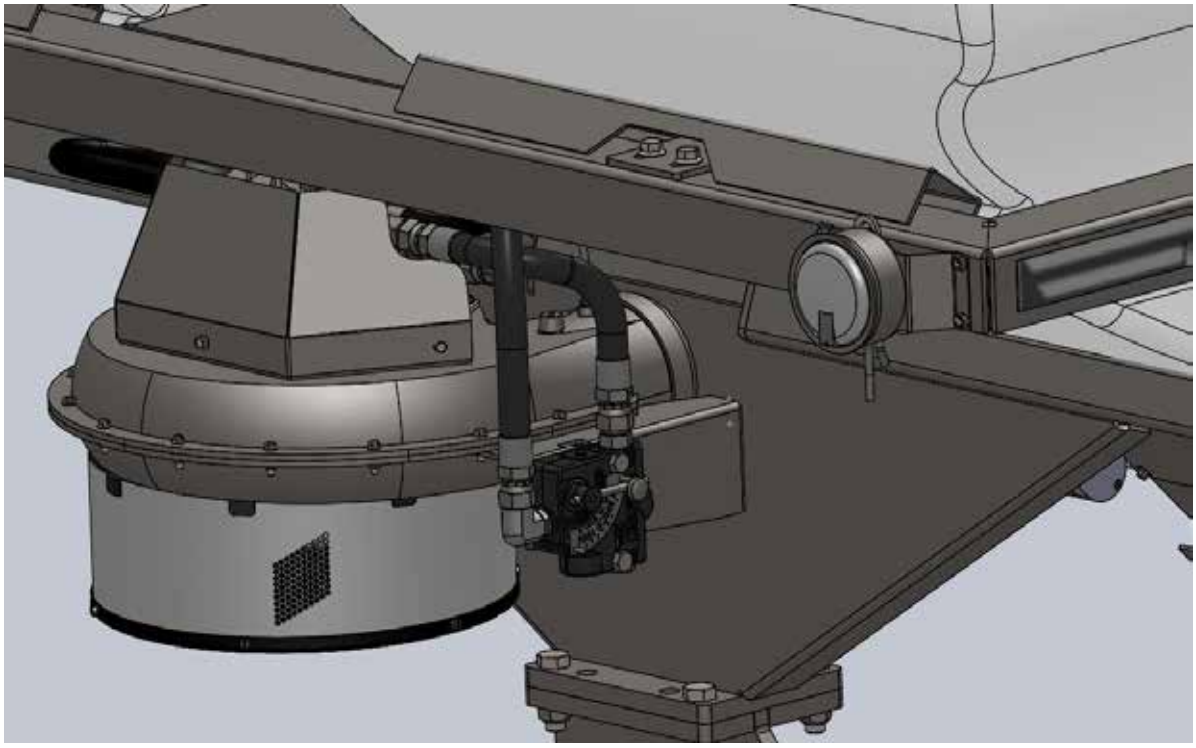
CCS or PSD initial start up (cont)

During the raise function of toolbar the seed delivery fan will automatically shut off once the tractor remote is released from detent position and toggled to the raise function.

Seed delivery fan operation:

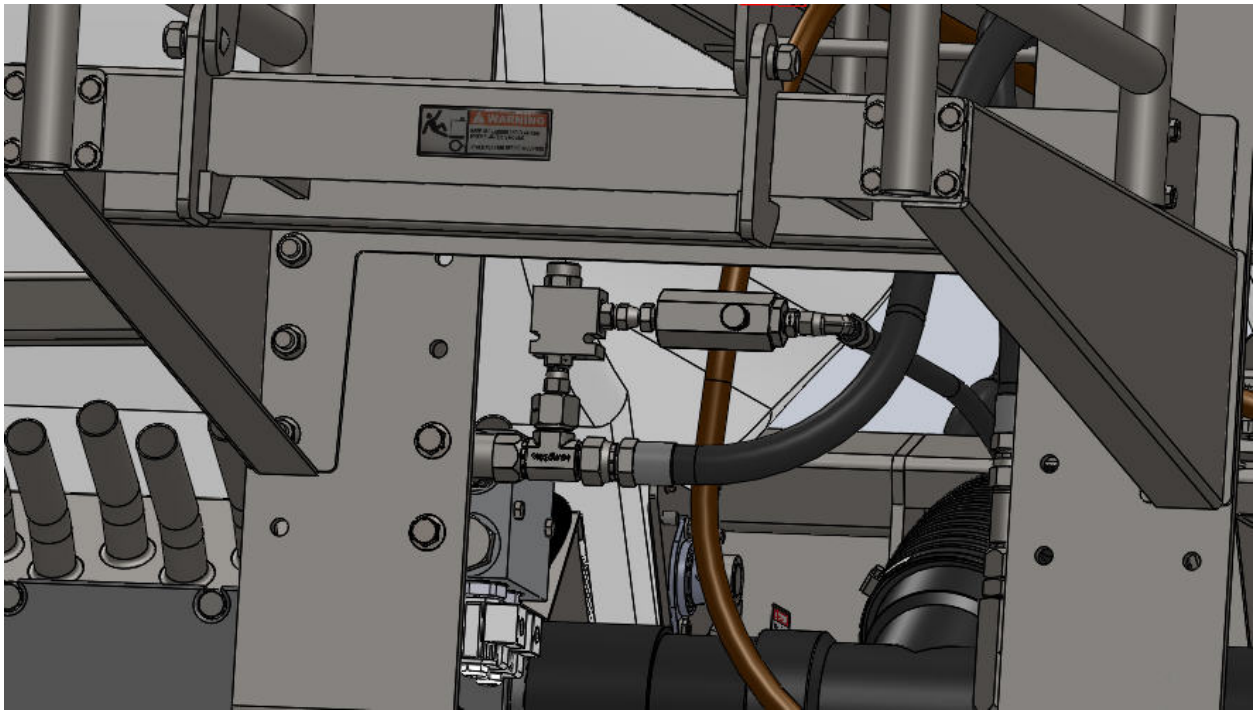
To control the amount seed being delivered to the row units by the seed delivery fan, the air flow is controlled by the flow control, valve located on the front left hand side of the seed delivery fan. This air flow is monitored via magnahelic gauge located just above the flow control valve, on the CCS or PSD tank support frame.

Fan speed can be controlled by moving the flow control valve hand clockwise/counter-clockwise to speed up or slow down the fan speed. This will increase or decrease the amount of air pressure being registered on the magnahelic gauge. Air pressure settings will need to be adjusted to meet the individual planter needs, based on # of rows, seed size, planting rates & width of planter.



Agitator Speed Control:

If the toolbar has a agitator installed in the seed delivery tanks, this agitator will automatically start/stop with the seed delivery fan on/off functions. To adjust the speed of the agitators, locate the flow control valve, located under the CCS or PSD access ladder at the rear of the toolbar. Adjust the flow control valve to set the desired speed of the agitators, by turning the flow control knob clockwise or counter-clockwise.



Additional information:

If the CCS or PSD system is equipped with low level sensors, the indicators will be display on the console on the Field Mode screen, in the lower right hand corner shown as “Hopper Status”. Green light display indicates that there is seed over the sensors; red lights indicate that seed is below the sensors.

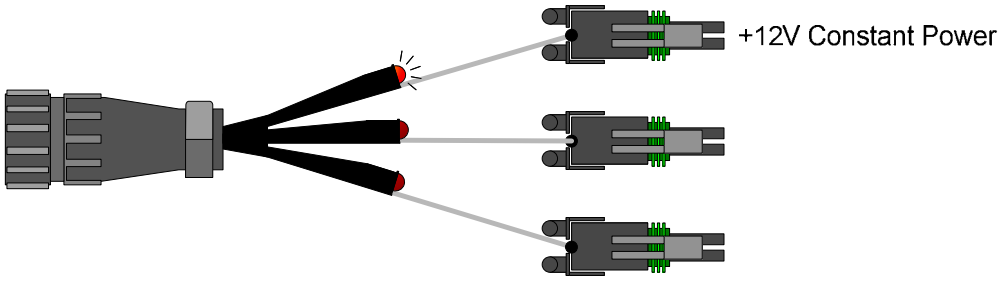
To turn off the CCS or PSD function, toggle the CCS or PSD disable function on the Field Mode screen. This will automatically shut off the timer and disable the seed delivery fan and the agitator hydraulic motors.

Universal Tractor Cab Power Adapter

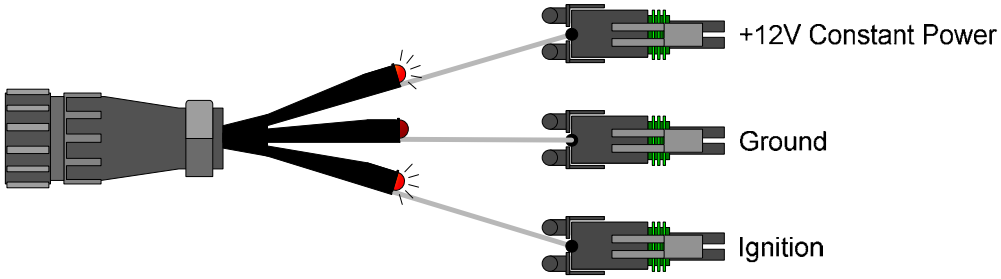
These are instructions on connecting to the tractor power plug and to determine the correct configuration when installing the Cab harness. Cab harness power connectors are labeled for connecting in diagrams below.

Caution: Verify Cab harness isn't connected to the Tool Bar harness when testing

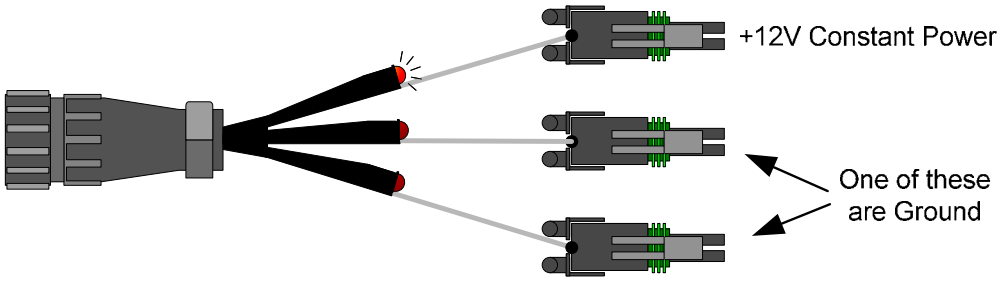
1. Verify key is off in tractor.
2. Plug adapter plug in to connector
    - If there a light is lit then this is +12V constant power.



3. Turn on ignition
    - If another light is lit then this is the keyed power. And the left over wire is ground.



    - If another light does not light up then either of the wires could be ground and there isn't an ignition wire. **Note: Ignition switch will have to be installed on Cab harness.** Connect Cab harness +12V connector to the lit connector and try the Ground on one of the other connectors to see what powers the HMI up.



6.- ADJUSTMENTS

This chapter shows the adjustments to be performed to the planter PROSEM in order to adjust it to the type of seed and terrain properties. For a correct adjustment, follow the steps indicated in section 5.3 PLANTING ADJUSTMENTS.

Values shown in this manual could be different depending on the terrain conditions, weather factors or the condition of the machine.

6.1 PLANTING DISTANCE BETWEEN SEEDS

To adjust planting distance in each row and therefore the plant population per hectare to be planted, the transmission ratio of the machine needs to be adjusted. For this purpose, the machine is provided with a gearbox.

Depending on the type of planter, the machine is equipped with one of this two gearboxes:

1- CHAIN GEARBOX (Fig. 6.1).

2- AUTOMATIC GEARBOX (Fig. 6.2).

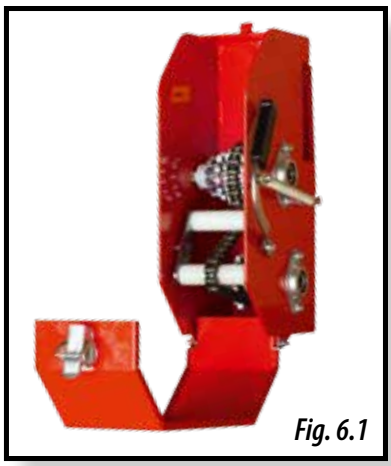


Fig. 6.1

Fig. 6.2

ADJUST THE TRANSMISSION ONLY WHEN THE MACHINE IS IN RAISED POSITION. CHECK THAT THE WHEELS THAT CONTROL THE METERING BOX'S TRANSMISSION ARE IN CONTACT WITH THE GROUND.

IN FOLDING VERSIONS OF THE MACHINE (see section 3.7.5 FOLDING FRAME). USE THE SAME ADJUSTMENTS FOR THE THREE GEARBOXES. ONE IS PLACED IN THE CENTRAL FRAME AND THE REMAINING TWO ARE PLACED IN THE FOLDING PARTS.

Depending on the type of gearbox installed in the machine, use the matching table of adjustments in order to adjust it (see sections 6.1.1 CHAIN GEARBOX or 6.12 AUTOMATIC GEARBOX). These tables show the possible ratios to be used depending on the number of holes on the assembled seed disc (see 3.6. METERING BOX).

The total plant population (number of plants per hectare) depends on the machine's row spacing and the planting distance, see the following tables.

	TABLE OF SEEDS PER HECTARE									
Row spacing (cm)	**35**	**50**	**55**	**60**	**65**	**70**	**75**	**80**	**90**	**95**
Planting distance (cm)	**NUMBER OF PLANTS PER HECTARE**									
2,0	1.428.600	1.000.000	909.100	833.300	769.200	714.300	666.700	625.000	555.600	526.300
2,3	1.242.200	869.600	790.500	724.600	668.900	621.100	579.700	543.500	483.100	457.700
2,4	1.190.500	833.300	757.600	694.400	641.000	595.200	555.600	520.800	463.000	438.600
2,6	1.098.900	769.200	699.300	641.000	591.700	549.500	512.800	480.800	427.400	404.900
2,7	1.058.200	740.700	673.400	617.300	569.800	529.100	493.800	463.000	411.500	389.900
2,8	1.020.400	714.300	649.400	595.200	549.500	510.200	476.200	446.400	396.800	375.900
3,0	952.400	666.700	606.100	555.600	512.800	476.200	444.400	416.700	370.400	350.900
3,2	892.900	625.000	568.200	520.800	480.800	446.400	416.700	390.600	347.200	328.900
3,3	865.800	606.100	551.000	505.100	466.200	432.900	404.000	378.800	336.700	319.000
3,4	840.300	588.200	534.800	490.200	452.500	420.200	392.200	367.600	326.800	309.600
3,5	816.300	571.400	519.500	476.200	439.600	408.200	381.000	357.100	317.500	300.800
3,6	793.700	555.600	505.100	463.000	427.400	396.800	370.400	347.200	308.600	292.400
3,7	772.200	540.500	491.400	450.500	415.800	386.100	360.400	337.800	300.300	284.500
3,8	751.900	526.300	478.500	438.600	404.900	375.900	350.900	328.900	292.400	277.000
3,9	732.600	512.800	466.200	427.400	394.500	366.300	341.900	320.500	284.900	269.900
4,0	714.300	500.000	454.500	416.700	384.600	357.100	333.300	312.500	277.800	263.200
4,1	696.900	487.800	443.500	406.500	375.200	348.400	325.200	304.900	271.000	256.700
4,2	680.300	476.200	432.900	396.800	366.300	340.100	317.500	297.600	264.600	250.600
4,3	664.500	465.100	422.800	387.600	357.800	332.200	310.100	290.700	258.400	244.800
4,5	634.900	444.400	404.000	370.400	341.900	317.500	296.300	277.800	246.900	233.900
4,6	621.100	434.800	395.300	362.300	334.400	310.600	289.900	271.700	241.500	228.800
4,7	607.900	425.500	386.800	354.600	327.300	304.000	283.700	266.000	236.400	224.000
4,8	595.200	416.700	378.800	347.200	320.500	297.600	277.800	260.400	231.500	219.300
4,9	583.100	408.200	371.100	340.100	314.000	291.500	272.100	255.100	226.800	214.800
5,0	571.400	400.000	363.600	333.300	307.700	285.700	266.700	250.000	222.200	210.500
5,1	560.200	392.200	356.500	326.800	301.700	280.100	261.400	245.100	217.900	206.400
5,2	549.500	384.600	349.700	320.500	295.900	274.700	256.400	240.400	213.700	202.400
5,3	539.100	377.400	343.100	314.500	290.300	269.500	251.600	235.800	209.600	198.600
5,4	529.100	370.400	336.700	308.600	284.900	264.600	246.900	231.500	205.800	194.900
5,5	519.500	363.600	330.600	303.000	279.700	259.700	242.400	227.300	202.000	191.400
5,6	510.200	357.100	324.700	297.600	274.700	255.100	238.100	223.200	198.400	188.000
5,7	501.300	350.900	319.000	292.400	269.900	250.600	233.900	219.300	194.900	184.700
5,8	492.600	344.800	313.500	287.400	265.300	246.300	229.900	215.500	191.600	181.500
5,9	484.300	339.000	308.200	282.500	260.800	242.100	226.000	211.900	188.300	178.400
6,0	476.200	333.300	303.000	277.800	256.400	238.100	222.200	208.300	185.200	175.400
6,1	468.400	327.900	298.100	273.200	252.200	234.200	218.600	204.900	182.100	172.600

	TABLE OF SEEDS PER HECTARE									
Row spacing (cm)	**35**	**50**	**55**	**60**	**65**	**70**	**75**	**80**	**90**	**95**
Planting distance (cm)	**NUMBER OF PLANTS PER HECTARE**									
6,2	460.800	322.600	293.300	268.800	248.100	230.400	215.100	201.600	179.200	169.800
6,3	453.500	317.500	288.600	264.600	244.200	226.800	211.600	198.400	176.400	167.100
6,4	446.400	312.500	284.100	260.400	240.400	223.200	208.300	195.300	173.600	164.500
6,5	439.600	307.700	279.700	256.400	236.700	219.800	205.100	192.300	170.900	161.900
6,6	432.900	303.000	275.500	252.500	233.100	216.500	202.000	189.400	168.400	159.500
6,7	426.400	298.500	271.400	248.800	229.600	213.200	199.000	186.600	165.800	157.100
6,8	420.200	294.100	267.400	245.100	226.200	210.100	196.100	183.800	163.400	154.800
6,9	414.100	289.900	263.500	241.500	223.000	207.000	193.200	181.200	161.000	152.600
7,0	408.200	285.700	259.700	238.100	219.800	204.100	190.500	178.600	158.700	150.400
7,1	402.400	281.700	256.100	234.700	216.700	201.200	187.800	176.100	156.500	148.300
7,2	396.800	277.800	252.500	231.500	213.700	198.400	185.200	173.600	154.300	146.200
7,3	391.400	274.000	249.100	228.300	210.700	195.700	182.600	171.200	152.200	144.200
7,4	386.100	270.300	245.700	225.200	207.900	193.100	180.200	168.900	150.200	142.200
7,5	381.000	266.700	242.400	222.200	205.100	190.500	177.800	166.700	148.100	140.400
7,6	375.900	263.200	239.200	219.300	202.400	188.000	175.400	164.500	146.200	138.500
7,8	366.300	256.400	233.100	213.700	197.200	183.200	170.900	160.300	142.500	135.000
7,9	361.700	253.200	230.100	211.000	194.700	180.800	168.800	158.200	140.600	133.200
8,0	357.100	250.000	227.300	208.300	192.300	178.600	166.700	156.300	138.900	131.600
8,1	352.700	246.900	224.500	205.800	189.900	176.400	164.600	154.300	137.200	130.000
8,2	348.400	243.900	221.700	203.300	187.600	174.200	162.600	152.400	135.500	128.400
8,3	344.200	241.000	219.100	200.800	185.400	172.100	160.600	150.600	133.900	126.800
8,5	336.100	235.300	213.900	196.100	181.000	168.100	156.900	147.100	130.700	123.800
8,6	332.200	232.600	211.400	193.800	178.900	166.100	155.000	145.300	129.200	122.400
8,7	328.400	229.900	209.000	191.600	176.800	164.200	153.300	143.700	127.700	121.000
8,9	321.000	224.700	204.300	187.300	172.900	160.500	149.800	140.400	124.800	118.300
9,0	317.500	222.200	202.000	185.200	170.900	158.700	148.100	138.900	123.500	117.000
9,1	314.000	219.800	199.800	183.200	169.100	157.000	146.500	137.400	122.100	115.700
9,2	310.600	217.400	197.600	181.200	167.200	155.300	144.900	135.900	120.800	114.400
9,3	307.200	215.100	195.500	179.200	165.400	153.600	143.400	134.400	119.500	113.200
9,4	304.000	212.800	193.400	177.300	163.700	152.000	141.800	133.000	118.200	112.000
9,5	300.800	210.500	191.400	175.400	161.900	150.400	140.400	131.600	117.000	110.800
9,7	294.600	206.200	187.400	171.800	158.600	147.300	137.500	128.900	114.500	108.500
9,9	288.600	202.000	183.700	168.400	155.400	144.300	134.700	126.300	112.200	106.300
10,0	285.700	200.000	181.800	166.700	153.800	142.900	133.300	125.000	111.100	105.300
10,2	280.100	196.100	178.300	163.400	150.800	140.100	130.700	122.500	108.900	103.200
10,3	277.400	194.200	176.500	161.800	149.400	138.700	129.400	121.400	107.900	102.200

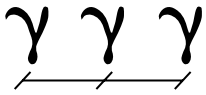
	TABLE OF SEEDS PER HECTARE									
Row spacing (cm)	35	50	55	60	65	70	75	80	90	95
Planting distance (cm)	NUMBER OF PLANTS PER HECTARE									
10,4	274.700	192.300	174.800	160.300	147.900	137.400	128.200	120.200	106.800	101.200
10,5	272.100	190.500	173.200	158.700	146.500	136.100	127.000	119.000	105.800	100.300
10,6	269.500	188.700	171.500	157.200	145.100	134.800	125.800	117.900	104.800	99.300
10,7	267.000	186.900	169.900	155.800	143.800	133.500	124.600	116.800	103.800	98.400
10,8	264.600	185.200	168.400	154.300	142.500	132.300	123.500	115.700	102.900	97.500
10,9	262.100	183.500	166.800	152.900	141.100	131.100	122.300	114.700	101.900	96.600
11,0	259.700	181.800	165.300	151.500	139.900	129.900	121.200	113.600	101.000	95.700
11,1	257.400	180.200	163.800	150.200	138.600	128.700	120.100	112.600	100.100	94.800
11,4	250.600	175.400	159.500	146.200	135.000	125.300	117.000	109.600	97.500	92.300
11,6	246.300	172.400	156.700	143.700	132.600	123.200	114.900	107.800	95.800	90.700
11,7	244.200	170.900	155.400	142.500	131.500	122.100	114.000	106.800	95.000	90.000
11,8	242.100	169.500	154.100	141.200	130.400	121.100	113.000	105.900	94.200	89.200
12,0	238.100	166.700	151.500	138.900	128.200	119.000	111.100	104.200	92.600	87.700
12,1	236.100	165.300	150.300	137.700	127.100	118.100	110.200	103.300	91.800	87.000
12,2	234.200	163.900	149.000	136.600	126.100	117.100	109.300	102.500	91.100	86.300
12,4	230.400	161.300	146.600	134.400	124.100	115.200	107.500	100.800	89.600	84.900
12,5	228.600	160.000	145.500	133.300	123.100	114.300	106.700	100.000	88.900	84.200
12,7	225.000	157.500	143.200	131.200	121.100	112.500	105.000	98.400	87.500	82.900
12,9	221.500	155.000	140.900	129.200	119.300	110.700	103.400	96.900	86.100	81.600
13,0	219.800	153.800	139.900	128.200	118.300	109.900	102.600	96.200	85.500	81.000
13,2	216.500	151.500	137.700	126.300	116.600	108.200	101.000	94.700	84.200	79.700
13,4	213.200	149.300	135.700	124.400	114.800	106.600	99.500	93.300	82.900	78.600
13,6	210.100	147.100	133.700	122.500	113.100	105.000	98.000	91.900	81.700	77.400
13,8	207.000	144.900	131.800	120.800	111.500	103.500	96.600	90.600	80.500	76.300
13,9	205.500	143.900	130.800	119.900	110.700	102.800	95.900	89.900	79.900	75.700
14,1	202.600	141.800	128.900	118.200	109.100	101.300	94.600	88.700	78.800	74.700
14,3	199.800	139.900	127.100	116.600	107.600	99.900	93.200	87.400	77.700	73.600
14,4	198.400	138.900	126.300	115.700	106.800	99.200	92.600	86.800	77.200	73.100
14,5	197.000	137.900	125.400	114.900	106.100	98.500	92.000	86.200	76.600	72.600
14,6	195.700	137.000	124.500	114.200	105.400	97.800	91.300	85.600	76.100	72.100
14,7	194.400	136.100	123.700	113.400	104.700	97.200	90.700	85.000	75.600	71.600
14,9	191.800	134.200	122.000	111.900	103.300	95.900	89.500	83.900	74.600	70.600
15,0	190.500	133.300	121.200	111.100	102.600	95.200	88.900	83.300	74.100	70.200
15,6	183.200	128.200	116.600	106.800	98.600	91.600	85.500	80.100	71.200	67.500
15,7	182.000	127.400	115.800	106.200	98.000	91.000	84.900	79.600	70.800	67.000
16,1	177.500	124.200	112.900	103.500	95.600	88.700	82.800	77.600	69.000	65.400

	TABLE OF SEEDS PER HECTARE									
Row spacing (cm)	35	50	55	60	65	70	75	80	90	95
Planting distance (cm)	NUMBER OF PLANTS PER HECTARE									
16,2	176.400	123.500	112.200	102.900	95.000	88.200	82.300	77.200	68.600	65.000
16,3	175.300	122.700	111.500	102.200	94.400	87.600	81.800	76.700	68.200	64.600
16,5	173.200	121.200	110.200	101.000	93.200	86.600	80.800	75.800	67.300	63.800
17,1	167.100	117.000	106.300	97.500	90.000	83.500	78.000	73.100	65.000	61.600
17,4	164.200	114.900	104.500	95.800	88.400	82.100	76.600	71.800	63.900	60.500
18,0	158.700	111.100	101.000	92.600	85.500	79.400	74.100	69.400	61.700	58.500
18,1	157.900	110.500	100.500	92.100	85.000	78.900	73.700	69.100	61.400	58.200
18,2	157.000	109.900	99.900	91.600	84.500	78.500	73.300	68.700	61.100	57.800
18,3	156.100	109.300	99.400	91.100	84.100	78.100	72.900	68.300	60.700	57.500
18,6	153.600	107.500	97.800	89.600	82.700	76.800	71.700	67.200	59.700	56.600
19,0	150.400	105.300	95.700	87.700	81.000	75.200	70.200	65.800	58.500	55.400
19,3	148.000	103.600	94.200	86.400	79.700	74.000	69.100	64.800	57.600	54.500
19,4	147.300	103.100	93.700	85.900	79.300	73.600	68.700	64.400	57.300	54.300
20,0	142.900	100.000	90.900	83.300	76.900	71.400	66.700	62.500	55.600	52.600
20,4	140.100	98.000	89.100	81.700	75.400	70.000	65.400	61.300	54.500	51.600
20,8	137.400	96.200	87.400	80.100	74.000	68.700	64.100	60.100	53.400	50.600
21,1	135.400	94.800	86.200	79.000	72.900	67.700	63.200	59.200	52.700	49.900
21,4	133.500	93.500	85.000	77.900	71.900	66.800	62.300	58.400	51.900	49.200
21,7	131.700	92.200	83.800	76.800	70.900	65.800	61.400	57.600	51.200	48.500
21,9	130.500	91.300	83.000	76.100	70.200	65.200	60.900	57.100	50.700	48.100
22,3	128.100	89.700	81.500	74.700	69.000	64.100	59.800	56.100	49.800	47.200
23,1	123.700	86.600	78.700	72.200	66.600	61.800	57.700	54.100	48.100	45.600
23,5	121.600	85.100	77.400	70.900	65.500	60.800	56.700	53.200	47.300	44.800
23,6	121.100	84.700	77.000	70.600	65.200	60.500	56.500	53.000	47.100	44.600
24,0	119.000	83.300	75.800	69.400	64.100	59.500	55.600	52.100	46.300	43.900
24,3	117.600	82.300	74.800	68.600	63.300	58.800	54.900	51.400	45.700	43.300
24,4	117.100	82.000	74.500	68.300	63.100	58.500	54.600	51.200	45.500	43.100
24,7	115.700	81.000	73.600	67.500	62.300	57.800	54.000	50.600	45.000	42.600
25,7	111.200	77.800	70.700	64.900	59.900	55.600	51.900	48.600	43.200	41.000
26,1	109.500	76.600	69.700	63.900	58.900	54.700	51.100	47.900	42.600	40.300
27,1	105.400	73.800	67.100	61.500	56.800	52.700	49.200	46.100	41.000	38.800
27,5	103.900	72.700	66.100	60.600	55.900	51.900	48.500	45.500	40.400	38.300
27,9	102.400	71.700	65.200	59.700	55.100	51.200	47.800	44.800	39.800	37.700
29,0	98.500	69.000	62.700	57.500	53.100	49.300	46.000	43.100	38.300	36.300
29,1	98.200	68.700	62.500	57.300	52.900	49.100	45.800	43.000	38.200	36.200
30,0	95.200	66.700	60.600	55.600	51.300	47.600	44.400	41.700	37.000	35.100

	TABLE OF SEEDS PER HECTARE									
Row spacing (cm)	35	50	55	60	65	70	75	80	90	95
Planting distance (cm)	NUMBER OF PLANTS PER HECTARE									
31,2	91.600	64.100	58.300	53.400	49.300	45.800	42.700	40.100	35.600	33.700
31,4	91.000	63.700	57.900	53.100	49.000	45.500	42.500	39.800	35.400	33.500
32,1	89.000	62.300	56.600	51.900	47.900	44.500	41.500	38.900	34.600	32.800
32,4	88.200	61.700	56.100	51.400	47.500	44.100	41.200	38.600	34.300	32.500
32,6	87.600	61.300	55.800	51.100	47.200	43.800	40.900	38.300	34.100	32.300
32,9	86.800	60.800	55.300	50.700	46.800	43.400	40.500	38.000	33.800	32.000
34,2	83.500	58.500	53.200	48.700	45.000	41.800	39.000	36.500	32.500	30.800
34,7	82.300	57.600	52.400	48.000	44.300	41.200	38.400	36.000	32.000	30.300
36,0	79.400	55.600	50.500	46.300	42.700	39.700	37.000	34.700	30.900	29.200
36,1	79.100	55.400	50.400	46.200	42.600	39.600	36.900	34.600	30.800	29.200
36,4	78.500	54.900	50.000	45.800	42.300	39.200	36.600	34.300	30.500	28.900
36,6	78.100	54.600	49.700	45.500	42.000	39.000	36.400	34.200	30.400	28.800
37,1	77.000	53.900	49.000	44.900	41.500	38.500	35.900	33.700	29.900	28.400
38,0	75.200	52.600	47.800	43.900	40.500	37.600	35.100	32.900	29.200	27.700
40,1	71.300	49.900	45.300	41.600	38.400	35.600	33.300	31.200	27.700	26.300
40,7	70.200	49.100	44.700	41.000	37.800	35.100	32.800	30.700	27.300	25.900
42,3	67.500	47.300	43.000	39.400	36.400	33.800	31.500	29.600	26.300	24.900
42,9	66.600	46.600	42.400	38.900	35.900	33.300	31.100	29.100	25.900	24.500
44,6	64.100	44.800	40.800	37.400	34.500	32.000	29.900	28.000	24.900	23.600
47,0	60.800	42.600	38.700	35.500	32.700	30.400	28.400	26.600	23.600	22.400
48,6	58.800	41.200	37.400	34.300	31.700	29.400	27.400	25.700	22.900	21.700
49,5	57.700	40.400	36.700	33.700	31.100	28.900	26.900	25.300	22.400	21.300
51,4	55.600	38.900	35.400	32.400	29.900	27.800	25.900	24.300	21.600	20.500
52,2	54.700	38.300	34.800	31.900	29.500	27.400	25.500	23.900	21.300	20.200
54,3	52.600	36.800	33.500	30.700	28.300	26.300	24.600	23.000	20.500	19.400
55,0	51.900	36.400	33.100	30.300	28.000	26.000	24.200	22.700	20.200	19.100
58,0	49.300	34.500	31.300	28.700	26.500	24.600	23.000	21.600	19.200	18.100
58,3	49.000	34.300	31.200	28.600	26.400	24.500	22.900	21.400	19.100	18.100
60,0	47.600	33.300	30.300	27.800	25.600	23.800	22.200	20.800	18.500	17.500
62,4	45.800	32.100	29.100	26.700	24.700	22.900	21.400	20.000	17.800	16.900
65,1	43.900	30.700	27.900	25.600	23.600	21.900	20.500	19.200	17.100	16.200
65,8	43.400	30.400	27.600	25.300	23.400	21.700	20.300	19.000	16.900	16.000
69,4	41.200	28.800	26.200	24.000	22.200	20.600	19.200	18.000	16.000	15.200
72,0	39.700	27.800	25.300	23.100	21.400	19.800	18.500	17.400	15.400	14.600
73,3	39.000	27.300	24.800	22.700	21.000	19.500	18.200	17.100	15.200	14.400

6.1.2 AUTOMATIC GEARBOX

POSITION OF THE LEVERS		NUMBER OF HOLES ON THE SEED DISC								
A	B	10	20	30	40	50	60	80	100	120
1	1	32,4	16,2	10,8	8,1	6,5	5,4	4,1	3,2	2,7
1	2	34,2	17,1	11,4	8,5	6,8	5,7	4,3	3,4	2,8
1	3	36,1	18,0	12,0	9,0	7,2	6,0	4,5	3,6	3,0
1	4	38,0	19,0	12,7	9,5	7,6	6,3	4,8	3,8	3,2
2	1	40,1	20,0	13,4	10,0	8,0	6,7	5,0	4,0	3,3
2	2	42,3	21,1	14,1	10,6	8,5	7,0	5,3	4,2	3,5
2	3	44,6	22,3	14,9	11,1	8,9	7,4	5,6	4,5	3,7
2	4	47,0	23,5	15,7	11,8	9,4	7,8	5,9	4,7	3,9
3	1	49,5	24,7	16,5	12,4	9,9	8,2	6,2	4,9	4,1
3	2	52,2	26,1	17,4	13,0	10,4	8,7	6,5	5,2	4,3
3	3	55,0	27,5	18,3	13,8	11,0	9,2	6,9	5,5	4,6
3	4	58,0	29,0	19,3	14,5	11,6	9,7	7,3	5,8	4,8
4	1	62,4	31,2	20,8	15,6	12,5	10,4	7,8	6,2	5,2
4	2	65,8	32,9	21,9	16,5	13,2	11,0	8,2	6,6	5,5
4	3	69,4	34,7	23,1	17,4	13,9	11,6	8,7	6,9	5,8
4	4	73,3	36,6	24,4	18,3	14,7	12,2	9,2	7,3	6,1



PLANTING DISTANCE (cm)

BEFORE MODIFYING THE TRANSMISSION RATIO, CHECK THAT THE POSITION OF THE LEVERS IN THE AUTOMATIC GEARBOX IS THE CORRECT ONE FOR THE NUMBER OF HOLES ON THE DISC AND FOR THE PLANTING DISTANCE.

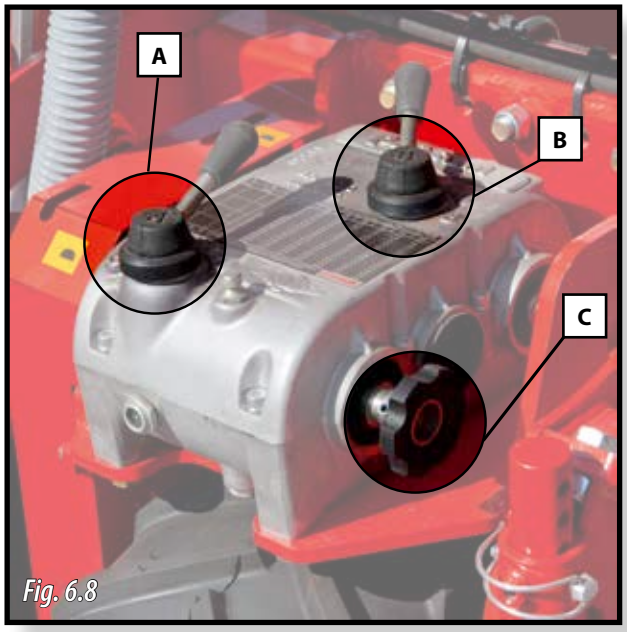


Fig. 6.8

To change the transmission ratio, follow these steps:

1- Raise the machine to prevent that the wheels that control the metering box's transmission are in contact with the ground.

2- Place the lever "A" (fig. 6.8) in the correct position and turn the wheel (C, Fig. 6.8) in the forward direction until the gear clutches in. Alternatively, turn the drive wheel using your foot in the forward direction.
Repeat this operation using the lever "B".

IF, AFTER 3 OR 4 WHEEL TURNS, THE GEAR HAS NOT CLUTCHED IN, POSSIBLY THE LEVER IS MISPLACED AND THE POSITION SHOULD BE CORRECTED.

6.2 REPLACING SEED DISC

1- Loosen the two securing knobs to remove the lid from its original place (Fig. 6.9).

2- Pull the seed selector (1, Fig. 6.10) to remove it from the securing groove. Then loosen the knob of the seed ejector in order to remove it (2, Fig. 6.10).

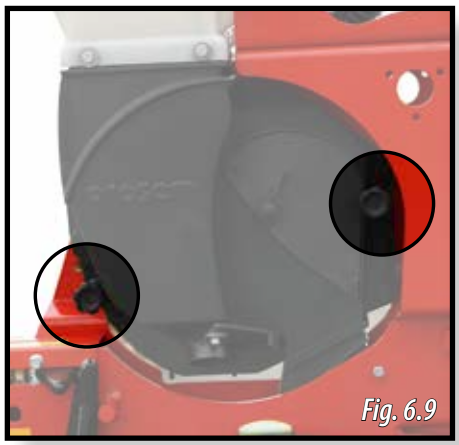


Fig. 6.9

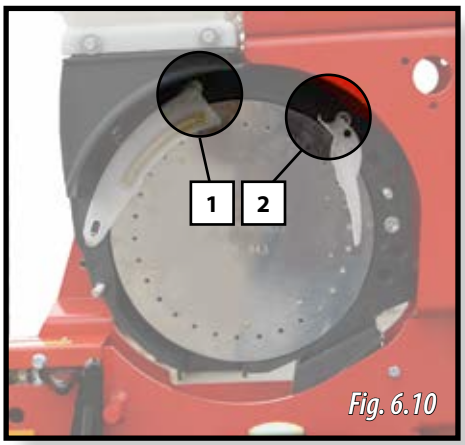


Fig. 6.10

3- The seed disc is secured magnetically. Use both hands to pull the disc to remove it. Once it has been removed, the vacuum chamber of the metering box will be visible (Fig. 6.11).

4- Place the selected seed disc.

IMPORTANT: fit the tips of the seed disc's reverse into the holes of the metering box's vacuum chamber (3, Fig. 6.11).

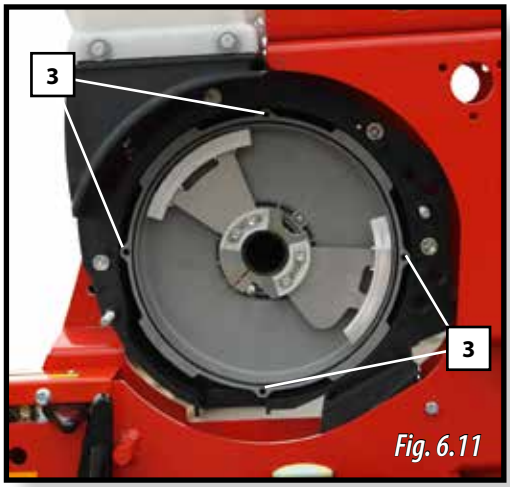


Fig. 6.11

5- Place both the seed selector and the seed ejector back. Use the knob to fix the seed ejector at the correct position as shown in section 6.3.2 Adjusting the seed ejector.

6- Place the lid back and fix it using the two knobs.

To select the correct seed disc, see the tables in sections 6.1.1 CHAIN GEARBOX or 6.1.2 AUTOMATIC GEARBOX.

USE ALWAYS THE SUITABLE SEED DISCS FOR EACH TYPE OF SEED (SEE SECTION 3.6 METERING BOX).


Fig 6.12

6.3 SEED DISTRIBUTION IN THE SEED DISC

The following adjustments affect directly on the quality of the seed dosing:

1. The selector's position in relation to the disc's holes. It is important to adjust the selector's position depending on the type of seed to be distributed (see section 6.3.1. ADJUSTING THE SELECTOR).

2. The seed ejector's position in relation to the disc's holes. In order to achieve a better seed dosing, the metering box PROSEM is provided with a seed ejector slide (see 6.3.2 ADJUSTING THE SEED EJECTOR).

3. The suction power needs to be adjusted to the weight of the seeds to be planted (see section 6.4 SUCTION SYSTEM – FAN).

IN ORDER TO GET AN EVEN AND PRECISE SOWING, IT IS RECOMMENDED TO NOT SURPASS 9 KM/H IN MACHINES PROSEM K AND 6 KM/H IN MACHINES PROSEM P.

6.3.1 ADJUSTING THE SELECTOR

The selector's lever can be adjusted from 0 to 10. When the lever is placed at a higher number, the selector is being moved away from the hole and, therefore, the suction power is increased. This causes a tendency towards the emergence of doubles. On the other side, when the lever is placed at a lower number, the selector is being moved closer to the hole and, therefore, the suction power is reduced. This causes a tendency towards the lack of seeds in the disc's hole.

Recommended selector's positions depending on the type of seed to be planted using **standard seed discs** (see section 3.6 Metering Box).

	VALOR SELECTOR		
TYPE OF SEED	MINIMUM	MAXIMUM	RECOMMENDED
Sorghum	2,4	3,2	**2,8**
Sunflower	2,4	3,2	**2,8**
No-pilled sugar beet	2,6	3,4	**3**
Rape	2,8	3,6	**3,2**
Corn	3,1	3,9	**3,5**
Small Corn	2,8	3,6	**3,2**
Soya / Peas	3,1	3,9	**3,5**
Pilled sugar beet	3,1	3,9	**3,5**
Cotton	4,6	5,4	**5**
Beans	4,6	5,4	**5**
Chick peas	6,6	7,4	**7**
Broad beans (*)	9,6	10,4	**10**

* Using a special selector.

THE SELECTOR'S POSITIONS INDICATED ABOVE ARE APROXIMATIVE; IT IS ESSENTIAL TO PERFORM TESTS AT THE BEGINNING AND DURING THE SOWING SEASON.

To check that the selector's position is the right one, follow these steps:

1. Raise the machine from the ground.

2. Use the PTO to pressurize the pneumatic system until the pressure is appropriate (see section 6.4 SUCTION SYSTEM – FAN).

3. Turn manually a driving wheel in the forward direction, loosen the inspection knob (Fig. 6.13) to check the seed distribution inside the seed disc.

4. Adjust the selector's lever position (Fig. 6.14) depending on the seed distribution inside the disc checked in the previous point. For a correct adjustment, see Fig. 6.15.


Fig. 6.13

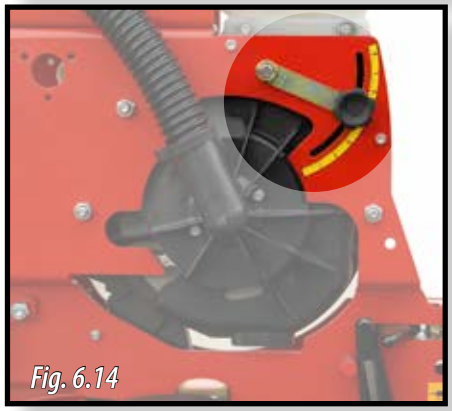


Fig. 6.14

ADJUST THE SEED SELECTOR USING THE CORRECT SUCTION POWER LEVELS, AS SHOWN IN THE TABLE OF THE PREVIOUS PAGE (see section 6.4 Suction system – Fan).

5. Close the inspection gates of the metering boxes.

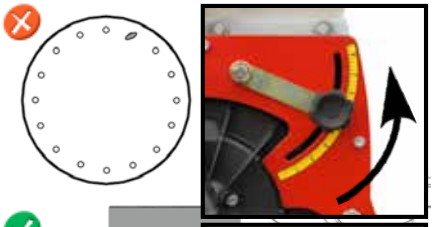
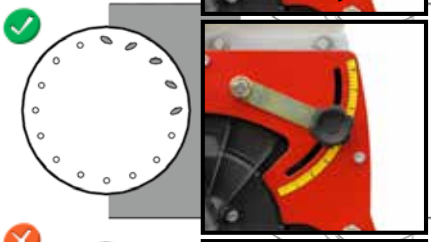
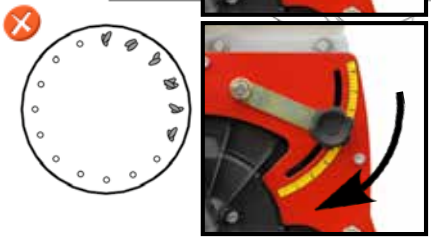
Lack of seed in the disc's holes. **INCORRECT**		Place the lever at a **HIGHER** number (for example from 2,8 to 3). If this is not enough, **increase the suction pressure.**
CORRECT position, one seed per hole		Fix the lever.
Double seeds emerge in the seed disc		Place the lever at a **LOWER** number (for example from 2,8 to 2,6). If this is not enough, **reduce the suction pressure**.

Fig. 6.15

IMPORTANT: IN CASE THAT THE ADJUSTING VALUES ARE BIGGER OR SMALLER THAN THE ONES IN THE PREVIOUS TABLE AND THE LACK OF SEEDS IN THE DISC PERSISTS, REPLACE THE DISC BY ANOTHER ONE WITH BIGGER HOLES. IN CASE THE EMERGENCE OF DOUBLES PERSISTS, REPLACE THE DISC BY ANOTHER ONE WITH SMALLER HOLES.

THE SEED SELECTOR IS ADJUSTED USING THE LEVER PLACED OUTSIDE THE METERING BOX. FOR THIS REASON IT SHOULD NOT BE ADJUSTED MANUALLY WHEN HANDLING THE INSIDE OF THE METERING BOX. THE SEED SELECTOR SHOULD ONLY BE REMOVED TO PERFORM MAINTENANCE OR CLEANING OPERATIONS, OR TO REPLACE THE SEED DISC

6.3.2 ADJUSTING THE SEED EJECTOR

CAUTION: THE SEED EJECTOR SHOULD BE ADJUSTED BEFORE FILLING THE SEED HOPPER.

The seed ejector places every single seed in the same way on the seed disc's holes and ejects them when they reach the same place. Therefore, they are precisely placed into the furrow bed.


Fig. 6.16

To adjust the seed ejector, follow these steps:

1- Remove the two securing knobs of the metering box's lid. (Fig. 6.16).

2- Remove the metering box's lid.

3- Loosen the slide's securing knob (Fig. 6.17).

4- Place the slide at the correct position. For the standard adjusting, place the slide tangent to the exterior of the disc's hole that coincide with the vacuum cut-off line. See the mark on the slide (in red, Fig. 6.18)


Fig. 6.17

THE MARK ON THE SLIDE (IN RED, FIG. 6.18) INDICATES THE ADJUSTING POINT IN STEP 4.

WHEN PLANTING PILLED SEEDS, PLACE THE SLIDE SO THAT IT COVERS ¼ OF THE HOLE, AS SHOWN IN THE PICTURE (A, FIG. 6.19).

WHEN PLANTING VERY BIG SEEDS, MOVE THE SLIDE AWAY ¼ OF THE HOLE, AS SHOWN IN THE PICTURE (B, FIG. 6.19).

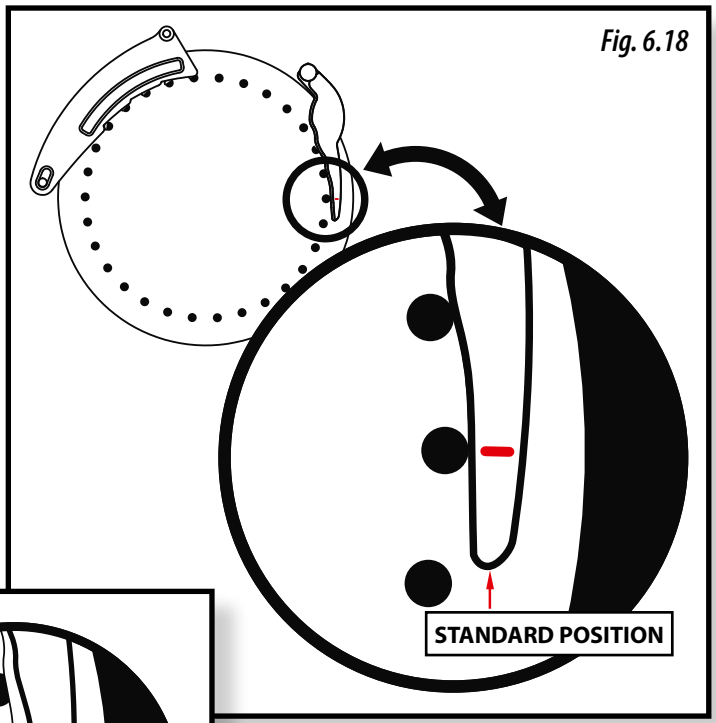


Fig. 6.18

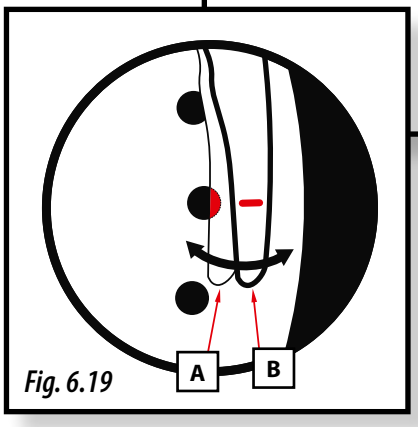


Fig. 6.19

6.3.3 SEED'S INLET TO THE METERING BOX

The seed level inside the metering box is controlled using the seed entering gate place in the lid of the metering box.

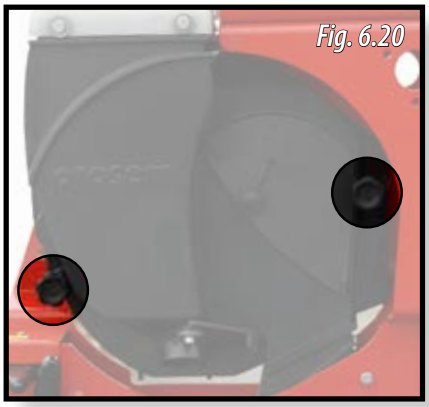


Fig. 6.20

IMPORTANT: THE SEED LEVEL INSIDE THE METERING BOX HAS TO BE THE CORRECT ONE FOR EACH TYPE OF SEED. IF THE LEVEL IS TOO HIGH OR TOO LOW, THE PLANTING DISTANCE IN THE SAME ROW WILL HAVE PRECISION MISTAKES.

CAUTION: THE ADJUSTMENT SHOULD BE PERFORMED BEFORE FILLING THE SEED HOPPER.

To adjust the opening of the seed entering gate, follow these steps:

1. Remove the metering box's lid by loosening the 2 securing knobs (Fig. 6.20).

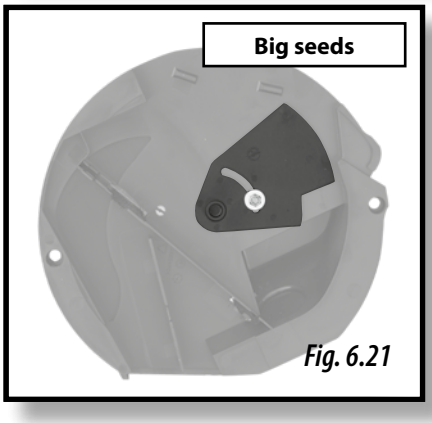


Fig. 6.21

2. In the inner part of the metering box's lid, turn the gate in the appropriate direction to open or close the seed flow. Place the gate in the correct position depending on the seed type:

A- Big seeds (Fig. 6.21), for example corn, soya, chickpeas.
B- Regular size seeds (Fig. 6.22), for example sunflower.
C- Small seeds (Fig. 6.23), for example sugar beet, tomato.

TO ADJUST CORRECTLY THE SEED LEVEL INSIDE THE METERING BOX, THERE ARE MARKS IN THE GATE CORRESPONDING TO THE SEED SIZE, ARRANGED FROM BIG TO SMALL SIZE (FIG. 6.24). TO ADJUST THE GATE, THE MARK IN THE LID (WHICH DEPENDS ON THE SEED'S SIZE) HAS TO BE ALIGNED WITH THE SCREW'S SIZE (BIG FIG 6.21; REGULAR FIG. 6.22 OR SMALL FIG. 6.23).

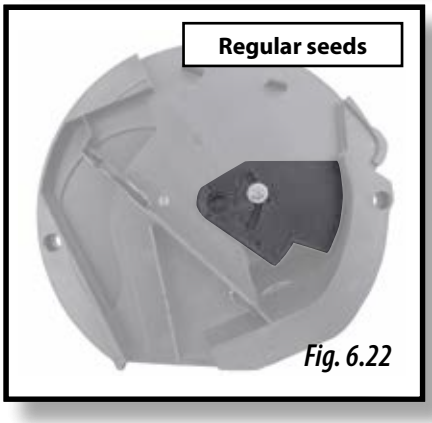


Fig. 6.22

WHEN USING PILLED SEEDS, FOR EXAMPLE SUGAR BEET, THE TURNING MOVEMENT OF THE SEED DISC ABOVE THE SEED COULD BREAK IT. FOR THIS REASON, IT IS RECOMMENDED TO HAVE THE SMALLEST NUMBER OF SEEDS IN CONTACT WITH THE DISC. FOR THIS PURPOSE, ADJUST THE GATE'S POSITION FOR SMALL SEEDS (FIG. 6.23).

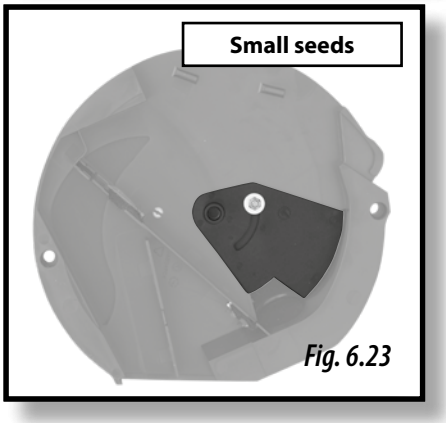


Fig. 6.23

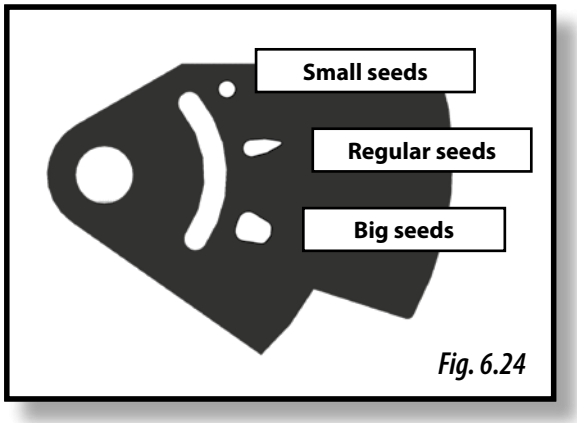


Fig. 6.24

6.4 Suction system – Fan

The suction system works by means of a fan, which can create the vacuum inside the metering boxes.

There are two different types of fan:

- **MECHANICAL FAN**
  - PTO shaft's speed: 540 rpm (standard)
  - PTO shaft's speed: 1000 rpm (optional)

- **HYDRAULIC FAN (optional).**

The fan's suction power is measured using the vacuum gauge (Fig. 6.25). Depending on the type of seed, it is recommended to adjust the suction power using the next table:

Fig. 6.25

		DEPRESSURE (mbar de H_2O)							
		20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 – 80	80 - 90	90 - 100
TYPE OF SEED	Sunflower					●			
	Corn						●		
	Small Corn					●			
	Sorghum					●			
	Cotton				●				
	Rape			●					
	Sugar beet				●				
	Beans						●		
	Fabes (Asturian Beans)							●	
	Broad beans							●	
	Tomato			●					
	Leek		●						
	Green Beans						●		
	Chick peas							●	
	Frijoles (Mexican beans)							●	
	Round green beans					●			
	Cauliflower		●						
	Soya beans							●	
	Carrots		●						

* The de-pressure values shown in the previous table correspond to standard seed discs (see section 3.6 METERING BOX).

KEEP THE AIR OUTLETS FREE OF OBSTACLES.

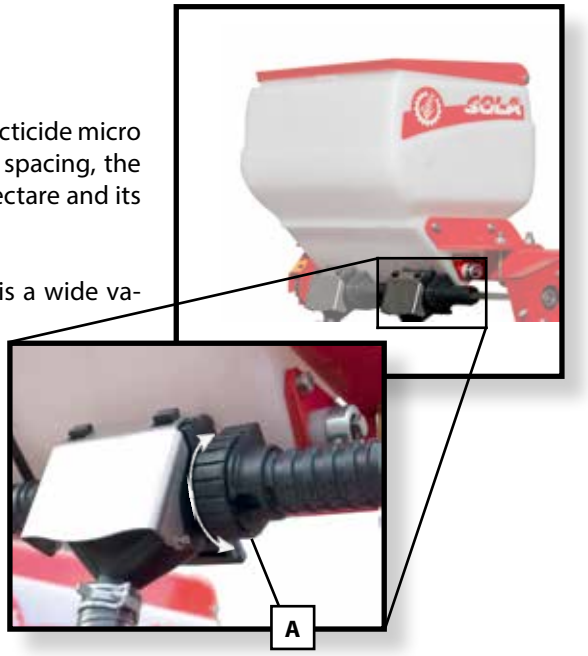
SUBMINISTRATE ENOUGH POWER TO THE PNEUMATIC SYSTEM UNTIL REACHING THE MINIMUM SUCTION POWER VALUES SPECIFIED IN THE TABLE. CHECK THE DEPRESSURE VALUES AFTER RUNNING THE FIRST 10 METRES.

VERY IMPORTANT: IN MODELS EQUIPPED WITH MECHANICAL FAN, THE FAN'S SUCTION POWER DEPENDS ON THE ENGINE'S RPM OF THE TRACTOR. FOR THIS REASON, KEEPING A REGULAR TURNING SPEED IS ESSENTIAL.

IN MODELS EQUIPPED WITH MECHANICAL FAN, THE TIMING BELT SHOULD BE TENSIONED. IT SHOULD BE CHECKED WHEN STARTING THE SOWING SEASON, SINCE WEAR OR DAMAGE COULD CAUSE A PRESSURE LOSS IN THE SUCTION CIRCUIT (SEE SECTION 9.3 FANS).

IF THE PRESSURE LEVEL IS LOWER THAN THE ONE RECOMMENDED BY THE MANUFACTURER, THE SEED DISC'S HOLES COULD HAVE A LACK OF SEEDS. ON THE OTHER HAND, IF THE PRESSURE IS EXCESSIVE, DOUBLES COULD EMERGE OR THE DISTANCE BETWEEN SEEDS COULD BE IRREGULAR.

6.19 INSECTICIDE MICROGRANULATOR (OPTIONAL)



In order to adjust the distribution of the insecticide micro granulator, it is necessary to know the row spacing, the quantity of product to be distributed per hectare and its specific weight.

It should be taken into account that there is a wide variety of products, each one with its particular density and granulometry. Therefore, precise adjustments are difficult to achieve.

Micro granulated insecticide is placed along with the seeds (Fig. 6.129).

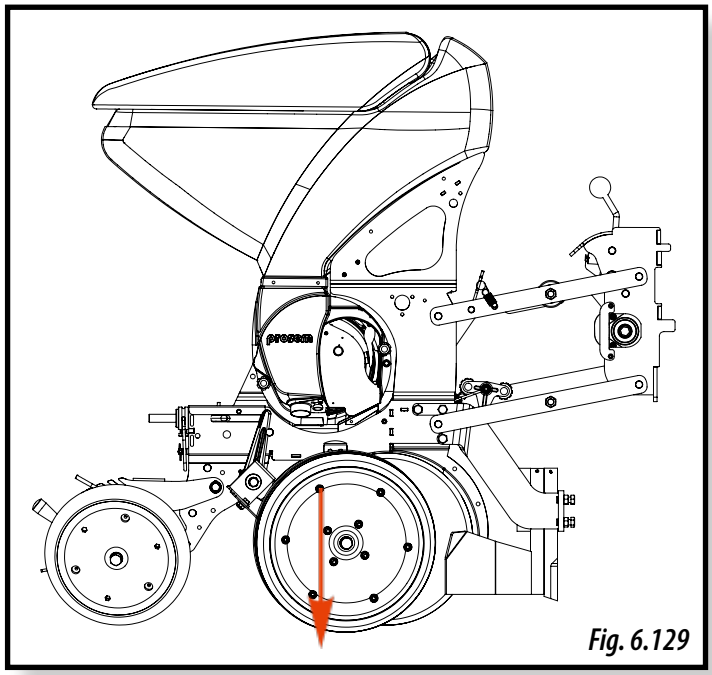


Fig. 6.129

If the specific weight of the insecticide to be used is different from the ones in the dosing tables, apply the following formula to calculate the Kg/ha which are going to be spread:

$$Z = \frac{Weight_T}{Weight_R} \times V$$

WHERE:

Z = Kg/ha which are going to be spread.

V = Kg/ha in the table depending on the dosing adjustment, the row spacing and the insecticide's specific weight shown in the table.

$Weight_T$ = specific weight shown in the table depending on the selected value "V"

$Weight_R$ = actual specific weight of the insecticide.

In case to spread insecticide at a different row spacing from the ones in the dosing tables, apply the following formula:

$$Z = \frac{D_{TABLE}}{D_{DESIRED}} \times V$$

WHERE:

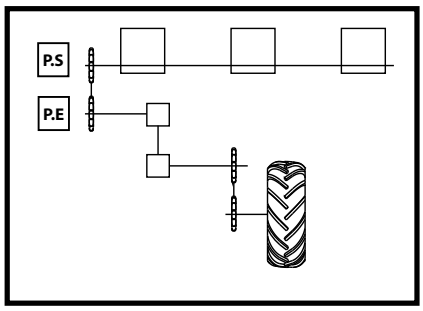
Z = Kg/ha which are going to be spread.

V = Kg/ha in the table depending on the dosing adjustment, the row spacing and the insecticide's specific weight shown in the table.

D_{TABLE} = row spacing shown in the table.

$D_{DESIRED}$ = desired row spacing.

VERY IMPORTANT: $D_{TABLE} > D_{DESIRED}$



TO ADJUST THE DISTRIBUTION OF INSECTICIDE, PROCEED BY APPROXIMATION USING THE FOLLOWING TABLES:

TRANSMISSION	P.S=22Z	ROW SPACING																											
		35 cm				50 cm				60 cm				70 cm				75 cm				80 cm				95 cm			
	P.E=12Z	SPECIFIC WEIGHT OF THE PRODUCT³KG/DM																											
		0,8	1	1,2	*1,4	0,8	1	1,2	*1,4	0,8	1	1,2	*1,4	0,8	1	1,2	*1,4	0,8	1	1,2	*1,4	0,8	1	1,2	*1,4	0,8	1	1,2	*1,4
DOSING ADJUSTMENT		KG/HA																											
	A/6	4,3	5,4	6,4	12,7	3,0	3,8	4,5	8,9	2,5	3,1	3,8	7,4	2,2	2,7	3,2	6,3	2,0	2,5	3,0	5,9	1,9	2,4	2,8	5,5	1,6	2,0	2,4	4,7
	A/8	4,5	5,7	6,8	14,0	3,2	4,0	4,8	9,8	2,6	3,3	4,0	8,2	2,3	2,8	3,4	7,0	2,1	2,6	3,2	6,6	2,0	2,5	3,0	6,1	1,7	2,1	2,5	5,2
	B/0	5,5	6,9	8,2	15,4	3,8	4,8	5,8	10,8	3,2	4,0	4,8	9,0	2,7	3,4	4,1	7,7	2,6	3,2	3,8	7,2	2,4	3,0	3,6	6,8	2,0	2,5	3,0	5,7
	B/5	6,9	8,7	10,4	18,9	4,9	6,1	7,3	13,2	4,0	5,1	6,1	11,0	3,5	4,3	5,2	9,4	3,2	4,0	4,9	8,8	3,0	3,8	4,5	8,3	2,6	3,2	3,8	7,0
	C/0	8,6	10,8	12,9	22,3	6,0	7,5	9,0	15,6	5,0	6,3	7,5	13,0	4,3	5,4	6,5	11,2	4,0	5,0	6,0	10,4	3,8	4,7	5,6	9,8	3,2	4,0	4,8	8,2
	C/5	10,3	12,8	15,4	25,7	7,2	9,0	10,8	18,0	6,0	7,5	9,0	15,0	5,1	6,4	7,7	12,9	4,8	6,0	7,2	12,0	4,5	5,6	6,7	11,3	3,8	4,7	5,7	9,5
	D/0	11,9	14,9	17,9	29,2	8,4	10,5	12,5	20,4	7,0	8,7	10,5	17,0	6,0	7,5	9,0	14,6	5,6	7,0	8,4	13,6	5,2	6,5	7,8	12,8	4,4	5,5	6,6	10,7
	D/5	13,4	16,7	20,0	32,6	9,4	11,7	14,1	22,8	7,8	9,8	11,7	19,0	6,7	8,4	10,0	16,3	6,2	7,8	9,4	15,2	5,9	7,3	8,8	14,3	4,9	6,2	7,4	12,0
	E/0	14,8	18,5	22,2	36,0	10,4	13,0	15,6	25,2	8,6	10,8	13,0	21,0	7,4	9,3	11,1	18,0	6,9	8,6	10,4	16,8	6,5	8,1	9,7	15,8	5,5	6,8	8,2	13,3
	E/5	15,8	19,7	23,6	39,5	11,0	13,8	16,6	27,6	9,2	11,5	13,8	23,0	7,9	9,9	11,8	19,7	7,4	9,2	11,0	18,4	6,9	8,6	10,4	17,3	5,8	7,3	8,7	14,5

* Producto BELEM (densidad 1,4 Kg/dm³)

TRANSMISSION	P.S=12Z	ROW SPACING																											
		35 cm				50 cm				60 cm				70 cm				75 cm				80 cm				95 cm			
	P.E=22Z	SPECIFIC WEIGHT OF THE PRODUCT³KG/DM																											
		0,8	1	1,2	*1,4	0,8	1	1,2	*1,4	0,8	1	1,2	*1,4	0,8	1	1,2	*1,4	0,8	1	1,2	*1,4	0,8	1	1,2	*1,4	0,8	1	1,2	*1,4
DOSING ADJUSTMENT		KG/HA																											
	B/0	18,5	23	28	43	12,9	16,2	19,4	30	10,8	13,5	16,2	25	9,2	11,5	13,9	21	8,6	10,8	12,9	19,9	8,1	10,1	12,1	18,6	6,8	8,5	10,2	15,7
	B/5	23	29	35	47	16,3	20	24	33	13,6	17,0	20	28	11,6	14,6	17,5	24	10,9	13,6	16,3	22	10,2	12,7	15,3	21	8,6	10,7	12,9	17,4
	C/0	29	36	43	52	20	25	30	36	16,9	21	25	30	14,5	18,1	22	26	13,5	16,9	20	24	12,7	15,8	19,0	23	10,7	13,3	16,0	19,1
	C/5	35	43	52	63	24	30	36	44	20	25	30	37	17,3	22	26	32	16,1	20	24	30	15,1	18,9	23	28	12,7	15,9	19,1	23
	D/0	40	50	60	75	28	35	42	52	23	29	35	44	20	25	30	37	18,7	23	28	35	17,6	22	26	33	14,8	18,5	22	28
	D/5	45	56	67	87	31	39	47	61	26	33	39	50	22	28	34	43	21	26	31	40	19,7	25	30	38	16,6	21	25	32
	E/0	50	62	75	98	35	44	52	69	29	36	44	57	25	31	37	49	23	29	35	46	22	27	33	43	18,3	23	28	36
	E/5	53	66	80	110	37	46	56	77	31	39	46	64	27	33	40	55	25	31	37	51	23	29	35	48	19,5	24	29	40

Next to each dosing device there is an adjusting wheel (A, Fig. 6.128). Turn it to adjust the insecticide distribution.

The spindle has a adjusting scale marked from A to E, and the nut has 10 numbers for each letter. For each dosing device adjust the ratchet's letter to the nut's number (A, Fig. 6.128).

IT IS NOT RECOMMENDED USE POSITIONS LOWER THAN B/0 SINCE THEY MAY RESULT IN AN IRREGULAR DISTRIBUTION.

To empty the insecticide or helicide micro granulator's hoppers, see section 8.3 INSECTISIDE MICROGRANULATOR'S AND/OR HELICIDE MICROGRANULATOR'S HOPPERS.

The insecticide micro granulator is equipped with a double cog that allows to change the transmission of the dosing device. In this way, there is a wider range of possible dosages. Previous table shows both possible transmissions **P.S=12Z P.E=22Z** or **P.S=22Z P.E=12Z**.

6.19.1 CHANGING THE MICRO GRANULATOR'S TRANSMISSION

To change the micro granulator's transmission, proceed as follows:

1- Remove the wing nut and the upper screw of the drive's lid (Fig. 6.130).

2- Turn the lid downwards.

3- Using two wrenches, loosen the tensioners (Fig. 6.131).

4- Push the tensioner downwards to loosen the chain.

5- Change the chain's position (Fig. 6.132).

6- Tighten the chain using the 2 tensioners.

7- Lock the tensioner's position using the securing nuts.

8- Finally, close the lid and fix it using the screw and the wing nut.


Fig. 6.130

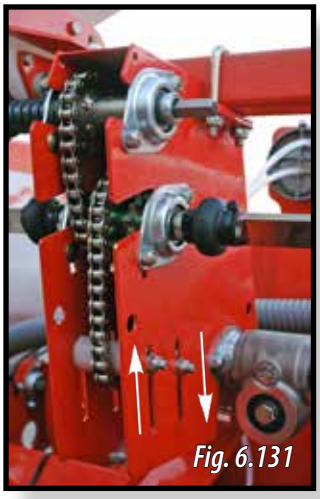


Fig. 6.131

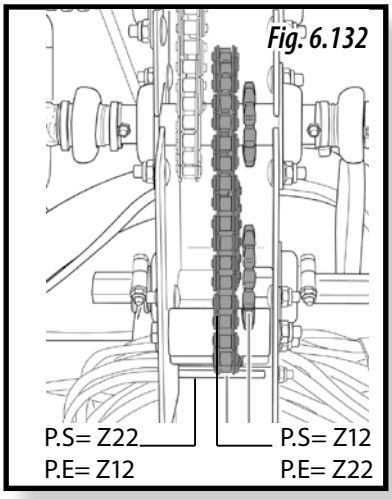


Fig. 6.132

6.19.2 EXCLUDING THE MICRO GRANULATOR

To disconnect the transmission of the micro granulator hoppers, it is necessary to operate on the transmission's box of the micro granulator hoppers (see section 3.1 PLANTER OVERVIEW). There are three types of gearboxes, all of them have the clutch on one of the axles (shown in red, Fig. 6.133).

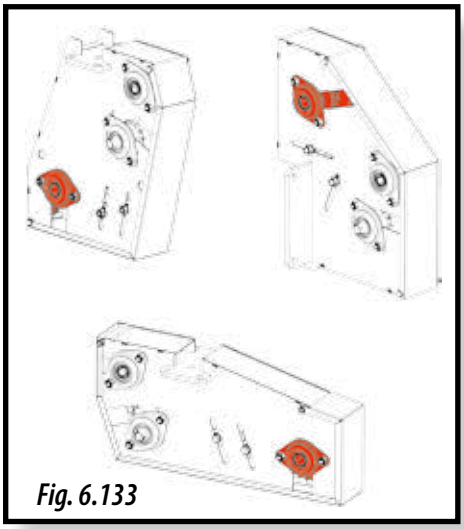


Fig. 6.133

Disconnect the transmission when fertilizing the field is not required.

To exclude the transmission, follow these steps:

1- Remove the wing nut and the upper screw of the drive's lid (Fig. 6.134).

2- Turn the lid downwards.

3- In the transmission axle where the clutch is (Fig. 6.133), pull the securing knob and turn it 90º to lock it at the free transmission position (Fig. 6.135).

4- Close the lid and fix it using the screw and the wing nut.


Fig. 6.134

To reconnect the transmission:

1- Remove the wing nut and the upper screw of the drive's lid (Fig. 6.134).

2- Turn the lid downwards.

3- On the transmission axle where the clutch is (Fig. 6.133), pull the securing knob and turn it 90º to lock it at the transmission position (Fig. 6.136).

4- Close the lid and fix it using the screw and the wing nut.

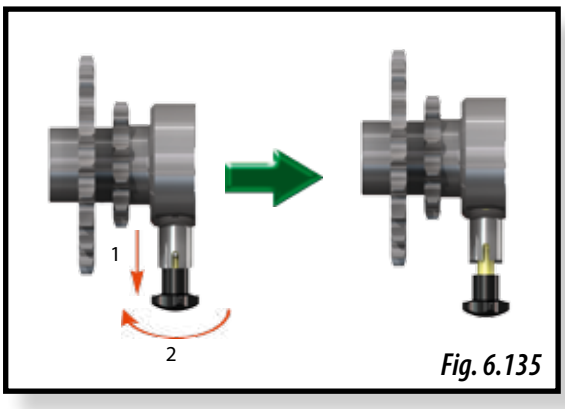


Fig. 6.135

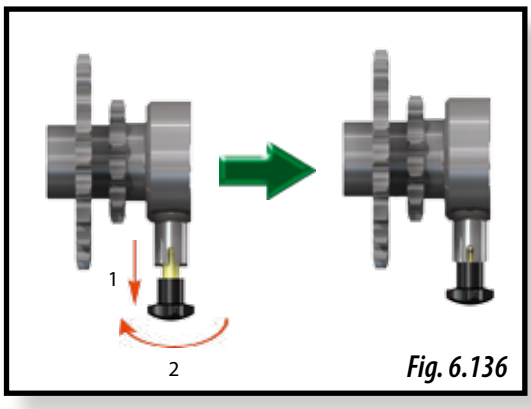


Fig. 6.136

10- WARRANTY

MAQUINARIA AGRÍCOLA SOLÀ, S.L. ensures the smooth functioning of any product according sold to the technical specifications of the WARRANTY CERTIFICATE provided with each machine. Any delivery note accompanying the goods will eventually result in a VAT invoice. If the BUYER considers the goods to be in warranty and they should not be invoiced, the problem will be analyzed and, if appropriate, your account will be credited. In order for the warranty to be valid, the WARRANTY CERTIFICATE must be returned once it has been properly filled in by the DEALERSHIP and the BUYER.

MAQUINARIA AGRÍCOLA SOLÀ, S.L. will not be held responsible for any damage caused by misuse, or by not checking the smooth functioning of the goods when either starting the machine or during the sowing season (see section 3.2).

Neither the DEALERSHIP or the BUYER or the USER will be able to claim compensation to MAQUINARIA AGRÍCOLA SOLÀ, S.L. for incidental damages such as labour costs, transport, faulty work, damages to persons or goods, harvest loss or reduced harvest, etc.

Material exchanges or returns will be paid by the buyer with the previous consent of MAQUINARIA AGRÍCOLA SOLÀ, S.L.
OPTIONAL EQUIPMENT and SPARE PARTS which have surpassed three months since delivery or have been manufactured ex professo, will only be accepted as an exception.
Parts eligible for warranty coverage need to be returned to the factory to be checked and eventually exchanged, They need to be returned accompanied with a note explaining the problem and containing the machine model and serial number. Warranty coverage remains subject to the decision of MAQUINARIA AGRÍCOLA SOLÀ, S.L. Any repair which has not been approved by MAQUINARIA AGRÍCOLA SOLÀ, S.L. will not be covered under WARRANTY.

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