

MONOSEM

PNEUMATIC PLANTER

OPERATOR'S MANUAL



2

MOUNTED PLANTER

INCLUDES:

INSTRUCTIONS FOR

- Operation
- Adjustment
- Maintenance

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Congratulations on your purchase of a MONOSEM planter.


This manual has been prepared for your use in assembly, adjustment, operation, and maintenance of the planter. Read this manual carefully before operating your planter.

The information used in compiling this manual is current, however as production changes do occur on a continual basis, A.T.I., Inc., reserves the right to change specifications or designs without notice and without the obligation to install the same on previously manufactured machines.

Please take the time now to record your serial number and date of purchase for a reference when ordering replacement parts for your new Monosem NG Plus planter.

Serial Number _____ Date _____

The WARRANTY for your NG Plus planter is printed on the back cover.

While reading your manual you will see the symbol  and the words **CAUTION, WARNING, DANGER**. Pay particular attention to the safety information given. Failure to observe the safety symbols can cause damage to the machine and or personal injury. A detailed description of the safety symbols and their meaning is found under section 2-1 of this manual.



REMEMBER! Your best assurance against accidents is a careful and responsible operator. If there is any portion of this manual or of the machine's operations you do not understand, contact your local authorized dealer or the manufacturer.

Safety

Safety of the operator is one of the main concerns in designing and developing a new piece of equipment. Designers build in as many safety features as possible. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury, study the following precautions shown on the decals and insist those working with you, or for you, follow them.

Replace any Caution, Warning or Danger decals on your machine that are not readable or is missing.

This symbol means:

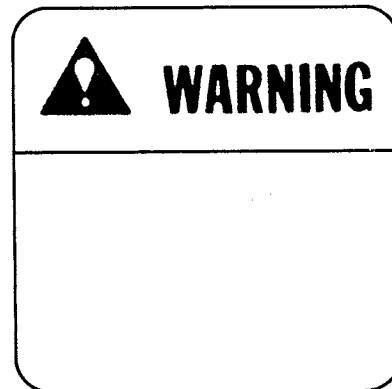
**ATTENTION
BECOME ALERT
YOUR SAFETY IS INVOLVED**



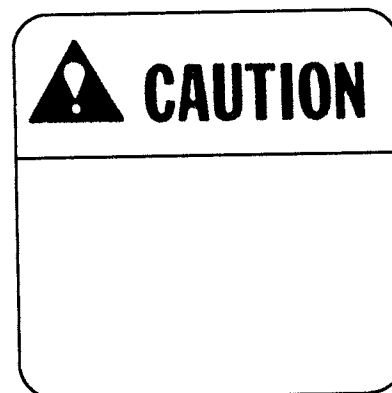
DANGER Indicates an immediate hazardous situation which if not avoided, will result in death or serious injury.



WARNING Indicates a potentially hazardous situation which, 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 which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.





Safety



The following caution, warning, and danger signs are placed on your planter. Their location and part number are listed below. Become familiar with the text written on the safety stickers and be prepared for emergencies. Operate the planter in a safe manner and use protective clothing and devices appropriate for the job at hand. This machine is dangerous to children and persons unfamiliar with its operation. The operator should be familiar with farm machinery and trained in this machines operation.

 CAUTION
<ol style="list-style-type: none"> 1. Read and understand the operators manual. 2. Do not permit riders on the planter frame. 3. Clear the area of all persons when the planter is in operation. 4. Use extreme care when operating the planter near electrical lines. 5. Lower planter to the ground on a level surface before disengagement from tractor. 6. Use necessary safety precautions as safety lights and devices and observe legal regulations before transporting planter on public roads. 7. High pressure fluids can cause injury. Relieve pressure before disconnecting hydraulic lines. Tighten connections before applying pressure.

Located on front of the toolbar . 0891-45201


 WARNING
<p>TO AVOID INJURY Stand clear, Keep others away when raising or lowering markers. Lock row markers for transport using the locking sleeve or locking pin.</p>


Located on rowmarker.
0891-4552

 WARNING

<p>Agricultural chemicals can be dangerous. Improper use can result in injury to persons, animals and soil. Handle with care and follow instructions of chemical manufacturer.</p>

Located on inside of the granular hopper lid. 8091-7104

 WARNING
<p>Any alterations to the design of this planter may create safety hazards. Follow safe practices to avoid injury.</p>

Located on front of the toolbar.
0891-45202

 CAUTION
<p>Lock this unit in the up position before stacking the machine.</p>

Located on front of hopper of the inside wing unit of stacking toolbar. 0891-7077

 DANGER

<p>ROTATING DRIVELINE CONTACT CAN CAUSE DEATH KEEP AWAY!</p> <p>DO NOT OPERATE WITHOUT —</p> <ul style="list-style-type: none"> ● ALL DRIVELINE, TRACTOR AND EQUIPMENT SHIELDS IN PLACE ● DRIVELINES SECURELY ATTACHED AT BOTH ENDS ● DRIVELINE SHIELDS THAT TURN FREELY ON DRIVELINE

Located on PTO Shaft.
38333

Before Operation:

- Carefully study and understand this manual.
- Do not wear loose-fitting clothing which may catch in moving parts.
- It is recommended that suitable protective hearing and (eye protection) sight protectors be worn.
- The operator may come in contact with certain materials which may require specific safety equipment, relative to the handling of such materials (examples: extremely dusty, molds, fungus, bulk fertilizers, insecticides, etc.).
- Assure that planter tires are inflated evenly.
- Give the planter a visual inspection for any loose bolts, worn parts or cracked welds, and make necessary repairs.
- Be sure that there are no tools lying on or in the planter.
- Don't hurry the learning process or take the unit for granted. Ease into it and become familiar with your new planter.
- Practice operation of your planter and its attachments. Completely familiarize yourself and other operators with its operation before using.
- Do not allow anyone to stand between the tongue or hitch and the towing vehicle when backing up to the planter.

During Operation:

- Beware of bystanders, particularly children! Always look around to make sure that it is safe to start the engine of the towing vehicle.
- No passengers allowed anywhere on, or in the planter during operation.
- Keep hands and clothing clear of moving parts.
- Do not clean, lubricate or adjust your equipment while it is moving.
- When halting operation, even periodically, set the tractor or towing vehicle brakes, disengage the PTO, shut off the engine and remove the ignition key.
- Be especially observant of the operating area and terrain - watch for holes, rocks or other hidden hazards. Always inspect the area prior to operation.
- Do not operate near the edge of drop-offs or banks.
- Do not operate on steep slopes as overturn may result.
- Be extra careful when working on inclines.
- As a precaution, always recheck the hardware on equipment following every 100 hours of operation. Correct all problems.

Following Operation:

- Following operation, or when unhitching, stop the tractor or towing vehicle, set the brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition keys.
- Store the planter in an area away from human activity.
- Do not permit children to play on or around the stored planter.
- The planter should be stored in a dry and dust-free location with the hydraulic cylinders closed.
- Engage all safety devices for storage.
- Wheel chocks may be needed to prevent the parked planter from rolling.

Performing Maintenance:

- Good maintenance is your responsibility.
- Make repairs in an area with plenty of ventilation. Never operate the engine of the towing vehicle in a closed building. The exhaust fumes may cause asphyxiation.
- Before working on the planter, stop the towing vehicle, set the brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition keys.
- Be certain all moving parts have come to a complete stop before attempting to perform maintenance.

Performing maintenance continued:

- Always use the proper tools or equipment for the job at hand.
- Never use your hands to locate a hydraulic leak. Use a small piece of cardboard or wood. Hydraulic fluid escaping under pressure can penetrate the skin. **If injured by escaping hydraulic fluid, see a doctor at once. Gangrene can result. Without immediate medical treatment, serious infection and reactions can occur.**
- Replace all shields and guards after servicing and before moving.
- After servicing, be sure all tools, parts and service equipment are removed.
- If the planter has been altered in any way from the original design, the manufacturer does not accept any liability for injury or warranty.

Tire Safety

- Inflating or servicing tires can be dangerous. Whenever possible, trained personnel should be called to service and /or mount tires.
- Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
- Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death.

Specifications

FRAME - 3 Point Mounted

Rigid Single Toolbar
Rigid Double Toolbar
Stacking Toolbar

PLANTING UNIT - NG PLUS MONOSEM

Pneumatic Metering Box
Double Disc Opener/Gauge Wheels
"V" Closing Wheels

STANDARD ROW SPACING

2 Row - 30" - 40" rows
 Single Toolbar Rigid Frame
4 Row Narrow - 30" rows
 Single Toolbar Rigid Frame
4 Row Wide - 36", 38", and 40" rows
 Single Toolbar Rigid Frame
6 Row Narrow - 22" - 30" rows
 Single Toolbar Rigid Frame
6 Row Wide - 36", 38", and 40" rows
 Single Reinforced Toolbar Rigid
 Frame
8 Row Narrow - 22" - 30" rows
 Single Reinforced Toolbar Rigid
 Frame
8 Row Narrow - 30" rows
 Stacking Double Toolbar Frame
8 Row Wide - 36", 38", and 40" rows
 Double Toolbar Rigid Frame
8 Row Wide - 36", 38", and 40" rows
 Stacking Double Toolbar Frame
9 Row Narrow - 22" - 30" rows
 Double Toolbar Rigid Frame
12 Row Narrow - 22" and 24" rows
 Double Toolbar Rigid Frame
12 Row Narrow - 22" and 24"
 Double Stacking Toolbar Frame
12 Row - 30" rows
 Double Toolbar Rigid Frame

DRIVE SYSTEM

Ground drive
Two drive wheels on single toolbar
Four drive wheels on double toolbar
Four drive wheels on stacking
 toolbar

GEARBOX

One on single and double toolbar
Three on stacking toolbar
Two on 12 row 30" double toolbar

HITCH

Category II and III, narrow and
 wide, bolt on and adjustable.
Category I pins available.

MARKERS/HYDRAULICS

Single marker on single frame
Double folding marker on double
 toolbar frame
Special folding marker on stacking
 toolbar frame (Monosem patent)

Hydraulic hoses of the markers can be
connected to:

- A single remote with manual or
 sequence valve
- A dual remote

Stacking toolbar requires a separate
remote.

DIMENSIONS & WEIGHTS

SIZE	TRANSPORT WIDTH	WEIGHT*
2 Row 30"-40"	7'	972 lbs
4 Row Narrow 30"	9' 6"	1510 lbs
4 Row Wide 36"-40"	11' 6"	1540 lbs
6 Row Narrow 22"-30"	14'9"	2010 lbs
6 Row Wide 36"-40"	20'	2080 lbs
8 Row Narrow 22"-30"	20'	2960 lbs
8 Row Narrow Stacking 30"	11' 6"	3750 lbs
8 Row Wide 36"-40"	25'	3720 lbs
8 Row Wide Stacking 36"-40"	13'	3900 lbs
12 Row Narrow 22"-24"	23'	5360 lbs
12 Row 22"-24" Stacking	13'	5400 lbs
12 Row Narrow 30"	30'	5500 lbs

*Weight planter only with NG Plus planter unit. Weight does not include accessories such as double gauge wheels, granular or fertilizers applicator.

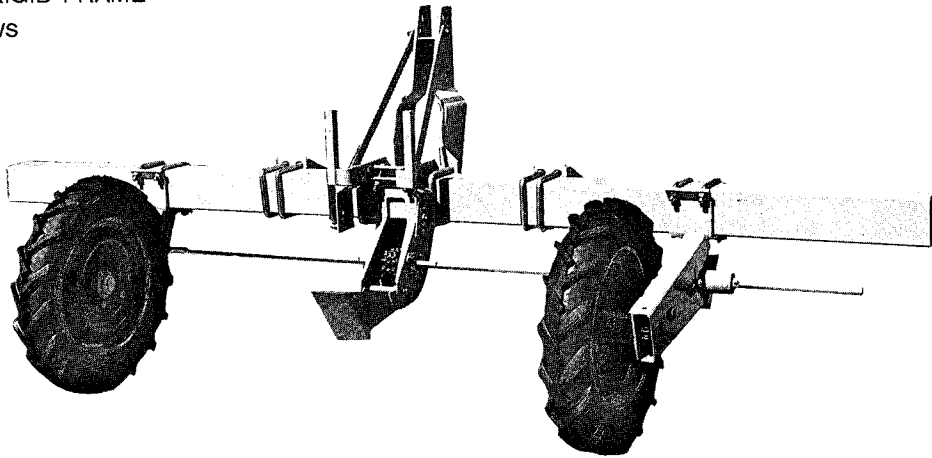
Mounted Frames

I. SINGLE TOOLBAR RIGID FRAME

2 and 4 row 30-40" rows

6 row 22" - 30" rows

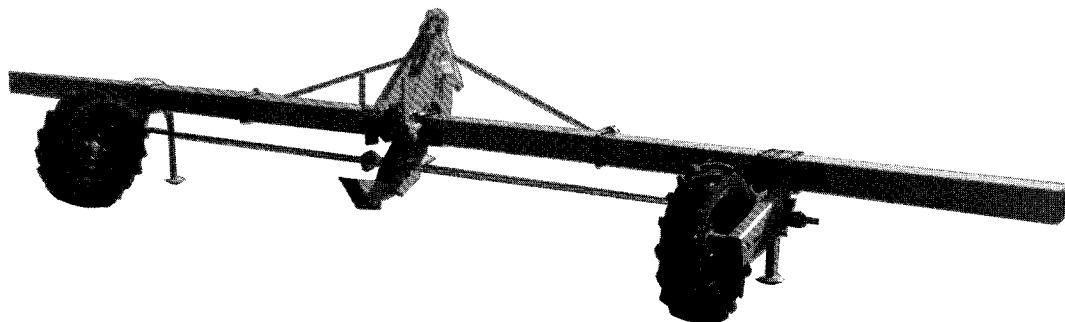
8 row 22" rows



II. SINGLE REINFORCED TOOLBAR RIGID FRAME

6 row 36", 38" and 40" rows

8 row 30" rows

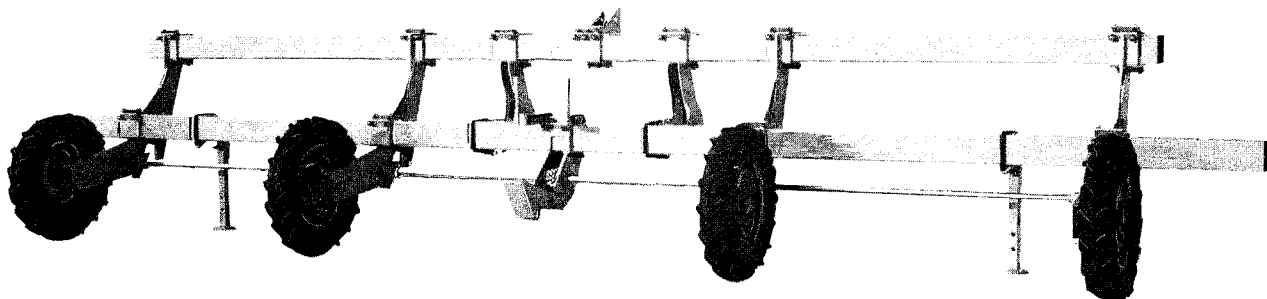


III. DOUBLE TOOLBAR RIGID FRAME

8 row 36", 38" and 40" rows

9 row 22", 24" and 30" rows

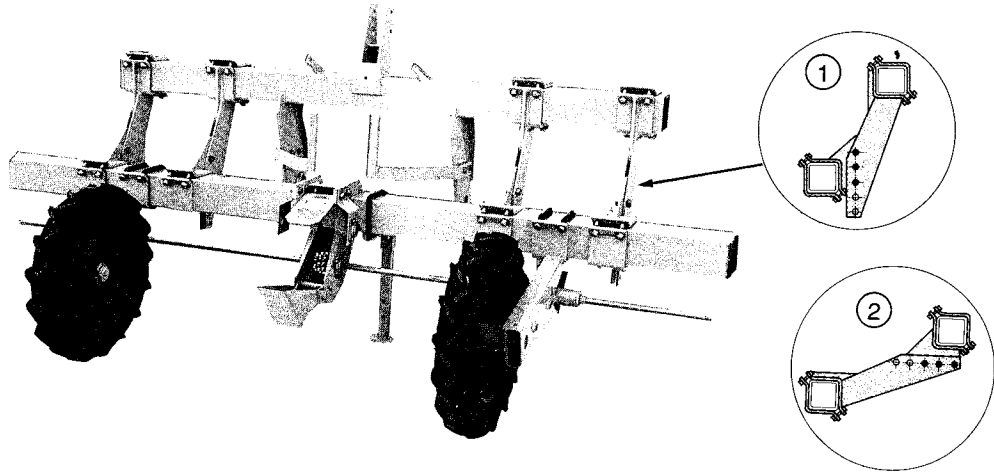
12 row 22" - 30" rows



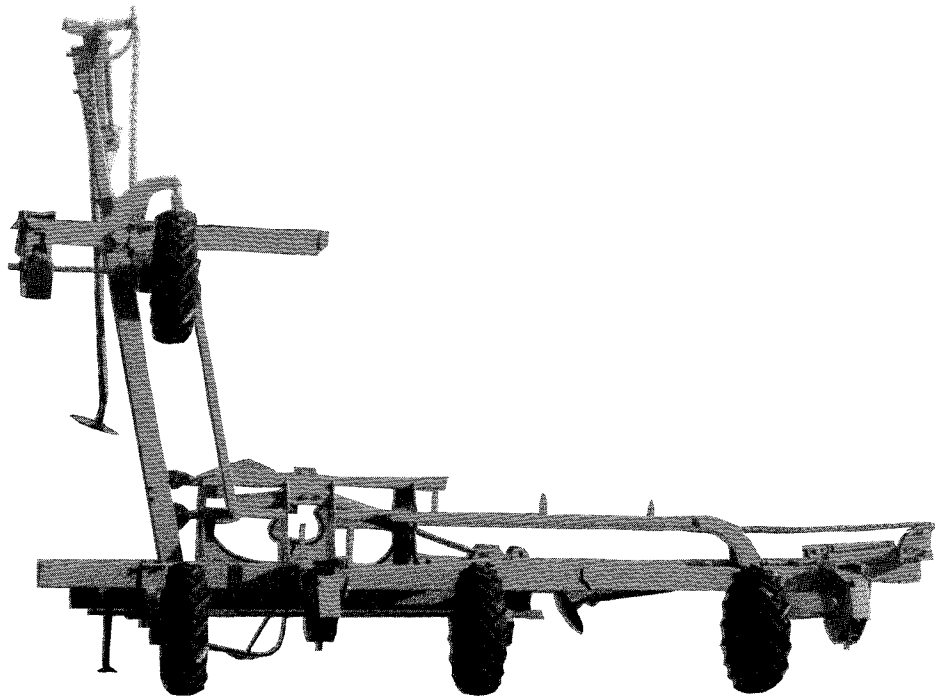
Mounted Frames

IV. ADVANCED FRAME 3, 4, 5, 6, 8, and 9 rows

- ① Spacer without fertilizer
- ② Spacer with fertilizer



V. DOUBLE TOOLBAR STACKING FRAME 8 row 30" 8 row 36", 38", and 40" 12 row 22"-24" rows



Preparing The Planter

PREPARATION

! CAUTION Before starting up the planter, check that all main bolts are properly tightened and that planting units are equipped with the proper seed disc. Also check that the shutters inside the metering boxes are adjusted correctly. (See section 8-1 metering box)

Also check that the planter is level, that the hitch is vertical, and that the toolbar is parallel to the ground when planting.

! WARNING The PTO shaft should be at a reduced angle during lifting. If the angle is too steep, reduce the PTO speed at the end of the field. (Normally the seed will remain under suction even at 400 rpm).

! CAUTION Except when absolutely necessary, do not leave the turbofan running when the planter is in a raised position.

When planting small seeds (rape seed, cabbage, uncoated sugarbeet), make sure that the hoppers fit tightly at the bottom. This may be improved if necessary by using a sealant. When planting these small seeds, it is recommended to fill the hopper only one third full.

Make sure that all tires are properly inflated.

Tire pressure:

- 5.0 x 15 tires - 1 bar (14 lbs/sq inch)
- 5.90 x 15 tires - 2.6 bar (36 lbs/sq inch)
- 6.5 x 80 tires - 2 bar (28 lbs/sq inch)

The chain rollers and tightners may be stiff because of paint. Make sure, before operation, that they are loose.

Check that the chain of the drive wheel blocks are tight. If not, tighten adjustment bolt (11) in an "up" position for fixed drive wheels, and in the "down" position for adjustable drive wheels (fig. 17).

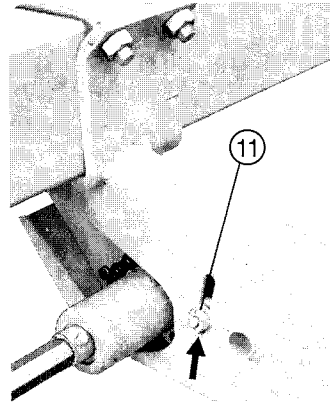


Fig. 17

Check that the bushing stops of the upper hex shaft (8) fig. 18 and the bolts (9) and (10) fig. 19 of the drive wheel blocks that secure the lower hex shaft are tight.

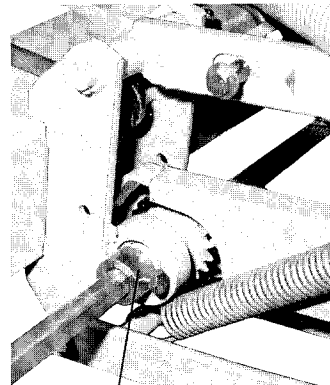


Fig. 18

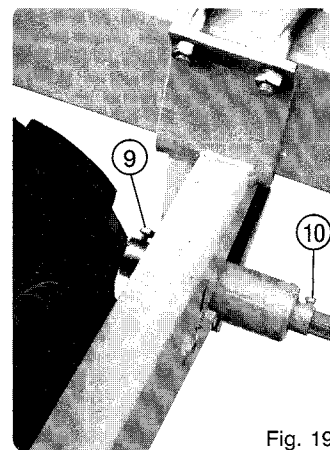


Fig. 19

LUBRICATION

All bearings (wheels, disc openers, turbofan, metering box) are self-lubricated for life and therefore no additional greasing is necessary.

The gauge wheel arms may require daily greasing.

The hub of each drive wheel block requires greasing once per season.


A general lubrication each day of the chains for the seed spacing gearbox, drive wheel blocks and metering units is recommended (preferably with a chain lubricant which does not attract dust).

Before starting up the planter, grease the hexagonal shaft where the upper sprocket cluster of the gearbox slides to allow easier alignment of the sprockets. Also lubricate the claws of the safety clutch of each planting unit to allow for disengagement in case of a blockage.

Oil the chain rollers and shafts of the metering unit chain moderately.

Check daily to see if the bolts of the hitch are tight as loose bolts can cause the brackets to break.

TRANSPORTING

 **CAUTION** Use necessary safety precautions such as safety lights and devices.

Observe legal regulations before transporting the planter on public roads.

Always drive at a safe speed relative to local conditions and ensure that your speed is low enough for an emergency stop to be safe and secure.

Do not carry passengers on transported equipment.

Watch for obstructions overhead and to the side while transporting.

Make allowances for increased length and weight of the planter when making turns, stopping, etc.

Do not drink and drive!

STORAGE

After the season, thoroughly clean the machine, especially the metering boxes. The microgranular applicator should be completely emptied and the fertilizer applicator scraped of any fertilizer residue. After emptying the trap doors, turn the shafts manually to remove any residual product from the mechanism.

Except for the microgranular applicator, protect all metal parts against oxidation by applying a coat of oil or diesel fuel.

Replace any worn parts at the end of the planting season. New parts are available for immediate delivery from your dealer.

The equipment should be stored in a dry and dust-free location with the hydraulic cylinders closed.

TRACTOR PREPARATION

The minimum tractor horse power (H.P.) required for the various models is:

- 2 Row Models - 35-50 H.P.
- 4 Row Models - 50-65 H.P.
- 6 Row Models - 55-85 H.P.
- 8 Row Models - 75-110 H.P.
- 12 Row Models - 110 & up H.P.

Be sure your tractor has adequate 3 point hitch lift capacity to lift the total weight of your planter. This includes attachments, seed, fertilizer and chemicals.

For safe and efficient field operation as well as transport safety, check the stability of your tractor front end. It may be necessary to add more weight. Refer to your tractor operation manual for weight recommendations.

Optional dual lift assist wheels (2) are recommended on some sizes of planters when used with dry fertilizer. This will also depend on the size of the tractor being used.

The 8 and 12 row stacking toolbar frames require a minimum tractor hydraulic pressure of 2200-2300 PSI to stack the wings in a transport position.

PLANTER ATTACHMENT TO TRACTOR

Use the following nine steps to attach your planter to the tractor.

1. Set the rear tractor wheels in a position that they do not run in front of a planter unit. On 30"-40" row spacing, set the tractor wheels at double the planter row spacing. For example, a planter set for

36" rows should have the tractor wheels spacing set for 72". Also set the front wheels of the tractor equal to the rear wheel spacing.

2. Adjust the lift arms on your tractor to insure a level lift of the planter from side to side and provide a high rise for planter transport clearance. To prevent a side sway, set the sway blocks on the tractor in a down position or tighten the lift arm chain.

3. Back your tractor up to the planter. Line up the 3-point tractor hitch holes and insert hitch pins and lock in place. It may be necessary to change the length of the upper link with the adjusting handle.

PLANTER HITCH

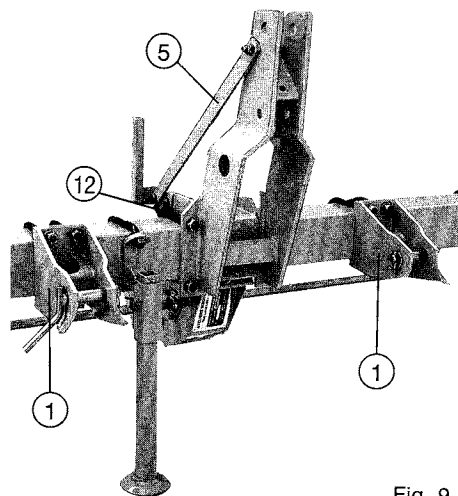


Fig. 9

The standard planter hitch consists of two lower hitch brackets (1) and one main center mast. The mounting brackets (2) can be mounted to fit a Cat. I or Cat. II 26" or 32" hitch. If necessary, the lower mounting brackets of the standard hitch can be mounted as a counter clamp of the planting unit.

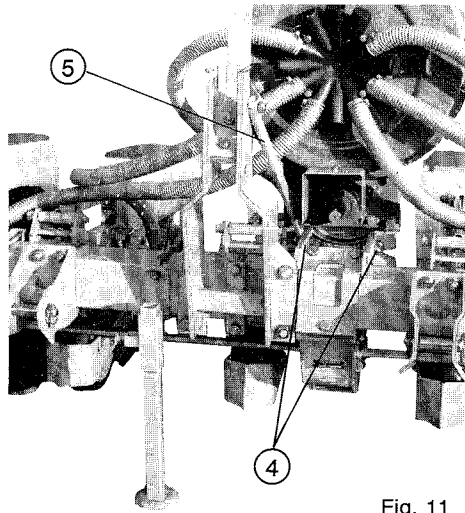
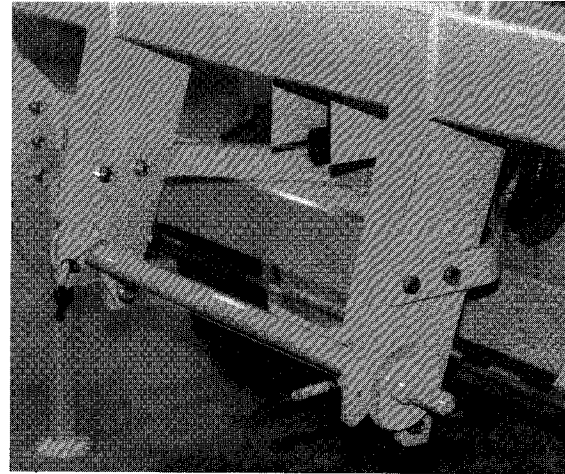


Fig. 11

The center mast can be off-set at half the inter-row spacing (fig. 11). The gearbox is then placed to the left of the central planter unit. In that case, remove one of the bearing holders (4) and use only one tie strap (5).



A semi-automatic hitch (fig. 12) is also available on certain models such as the advanced toolbar.

! CAUTION Make sure that the tractor, when placed in front of the planter, does not interfere with the lock bar of the hitch. This could result in the unlocking of the hitch.

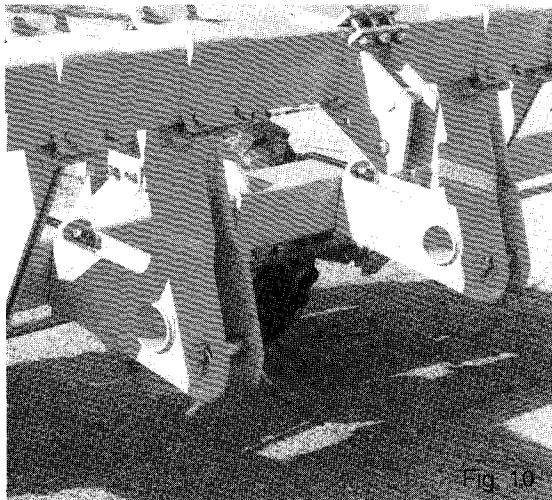


Fig. 10

The planter hitch of the double toolbar (fig. 10) consists of two lower hitch brackets and one upper mounting bracket. This bracket also can be positioned to fit a Cat. II or III 3-point hitch or quick hitch.

4. Connect the PTO drive shaft to the tractor. In addition to a standard 450/540 rpm PTO, a 1000 rpm shaft is available.

The following sticker is placed on your PTO shaft for your safety ...

! DANGER Rotating drive line contact can cause death - keep away. Do not operate without all driveline, tractor and equipment shields in place; without drivelines securely attached at both ends, and without driveline shields that turn freely on driveline.



Fig. 14

TURBOFAN

The turbofan operates at 540 rpm. For speeds of 450 or 1000 rpm a special shaft or pulley is available as optional equipment. A pump pulley (fig. 14) is also available as optional equipment.

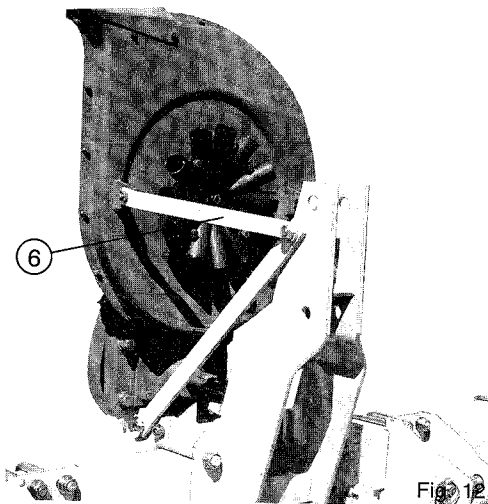


Fig. 12

Make sure the support bracket (6) (fig. 12) for single toolbar and (7) (fig. 13) for double toolbar frame are tight to eliminate any vibrations of the turbofan.

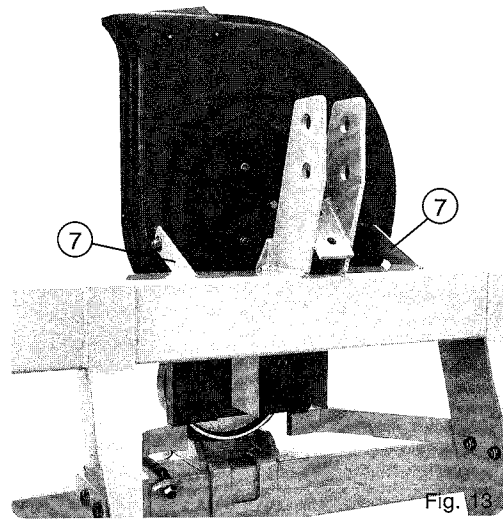


Fig. 13

5. Connect hydraulic hoses to the tractor ports. Before attaching hoses, relieve any pressure in the tractor hydraulic system.

It is important to clean the hose ends to remove any dirt before connecting the couplers to the tractor ports.

⚠ WARNING To avoid injury, stand clear and keep others away when raising or lowering markers. Lock row markers for transport using the locking sleeves or locking pin.

Double check that the locking sleeves or locking pins on the row markers are in working position.

⚠ DANGER Before applying pressure to the hydraulic system, check that all connections are tight and that the hoses and fittings have not been damaged. Hydraulic fluid escaping under pressure can penetrate the skin causing serious injury. If injured by escaping hydraulic fluid see a doctor at once. Gangrene can result.

6. Activate the PTO.
7. Slowly raise the planter and check for any interference. Release the spring-loaded pin in the toolbar stand and reposition the pin so the stand remains in a raised locked position. (Fig. 20 shows the stand in a lowered position.)

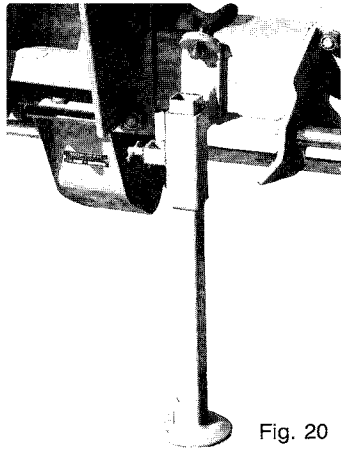


Fig. 20

8. With the planter in a raised position, turn the drive wheels by hand to make sure the drive wheels, gearbox, and planter units turn smoothly.
9. Slowly lower the planter so that the drive wheels are resting on the ground. A readjustment of the top link may be required to level the row units.

OPTIONAL EQUIPMENT

An optional hydraulic drive for the turbofan is available. If a hydraulic drive is used, it is recommended to use a 450 rpm turbofan. You must then double check that there is adequate oil flow for the turbofan to run at 450 rpm. Use an rpm gauge to check, placing it at the center of the lower pulley.

A vacuum gauge may also be mounted to the turbofan. (The vacuum gauge is standard equipment when ordering the hydraulic drive.)

HYDRAULIC DRIVE

Vacuum Settings for Hydraulic Drive shown below in inches of water column.

Corn	20-25"
Sugarbeets/Pickles	15-20"
Beans/Peanuts	25-30"

Mounting Hydraulic Drive on a 450 Turbofan Single Mounted Toolbar

Tools needed:

- 13-17-19-22-30 mm wrench or socket
- 11/16 wrench or socket
- 5/32 Allen wrench

The desired vacuum is dependent on the correct amount of oil flow to the hydraulic motor. Starving the motor of oil will cause the vacuum to drop. An excessive amount of oil flowing into the motor can result in damage to the motor or the fan blade. When attempting to shut off the turbofan, the blade must be allowed to "wind down" slowly. If the flow of oil stops abruptly, the bypass block on the motor will recirculate the oil already in the motor helping to prevent damage to the blade and motor. Still, you should not allow the flow of oil to stop suddenly. This is accomplished with the tractor's hydraulic controls. Refer to your tractor's operators manual for further information.

Controlling oil flow to the motor can be done in one of two ways; 1) with the flow control valve included with the hydraulic motor, or 2) with the tractor's hydraulic system controls.

Hydraulic Drive - continued

If your tractor has flow control capabilities, then it is recommended that you use this method and remove the in-line flow control valve. Failure to do this will cause the hydraulic oil to overheat, damaging the motor.

Oil requirements are as follows:

Regular and High Output Turbofans
6 to 7 gallons per minute

Extra High Output Turbofan
7 to 8 gallons per minute

To set vacuum level:

1. See operators manual for recommended vacuum settings or consult your local dealer.
2. Push tractor lever/switch to start oil flow to hydraulically driven turbofan and let oil warm up.
3. With some seed in the hoppers, turn drive wheels by hand or lower planter to engage drive wheels and drive forward a short distance to fill cells on seed discs with seed. This will result in a more accurate setting of the vacuum.
4. Readjust the oil flow, if necessary, until the desired vacuum level is obtained on the vacuum gauge.

It is not necessary to have to reset vacuum levels daily. Vacuum levels will be slightly lower during tractor and pump start up.

LEVELING ADJUSTMENTS

Important: The unit must operate in a level position for proper operation of the planter and row units. The hydraulics of the 3-point hitch of the tractor should be in a float position while planting.

The right and left arms of the 3-point hitch of the tractor need to be adjusted equally before attaching the planter unit. With the planter in a lowered planting position, check that the frame is level front to back and side to side. Make all necessary adjustments with the center link on the tractor.

NOTE: Tire pressure can affect the lateral leveling of the planter. Maintain the tire pressure as shown in the section 4-1.

When adjustable drive wheels are used, they need to be adjusted so the toolbar will be at the proper height (approximately 18"-20" above the planting surface.)

TOOLBAR STANDS

One or two toolbar stands are located on the front of the main frame. Position the stands so that they are not directly behind the tire of the tractor.

Planters with front mounted drive wheels do not require toolbar stands.

FIELD TEST

Before the initial operation of the planter, a field test is advised. Check for the following:

- That the planter is level (front to back and side to side).
- That the hydraulics of the 3-point hitch of the tractor is in a float position while planting.
- That all of the row units are running level and remain parallel to the ground when planting.
- That each metering unit is metering properly (see Metering Adjustments).
- That the row markers are adjusted properly.
- That you are using the proper application rates of chemicals on all rows.
- That you have set the desired depth of seed placement and checked your seed population on all rows.

CHECKING SEED POPULATION

1. Only one planting unit is necessary to check your seed population. Tie up the sets of closing wheels on one unit with a heavy cord or light chain. It may be necessary to decrease the tension of the closing wheel arm.
2. Put seed in the seed hopper.
3. Begin planting. At the end of a short distance (for example 100 yards or 90 m) check to see if seed is visible in the seed trench. Make adjustments in your seed depth if necessary.
4. Measure off 1/200 of an acre of the test row just planted. Use the chart below to find the approximate distance. Mark this distance with flags.

Count the seeds within the distance
Length of Row in Feet

Fraction of Acre	Row Width			
	22"	30"	36"	40"
1/200	119	87	72 1/2	66

between the flags. Multiply the number of seeds counted in this distance by 200. This will give you the total number of seeds planted per acre..

NOTE: When viewing the test row for seed population and placement, remember that the closing wheels were tied up in a raised position. Therefore, the seeds may have rolled or bounced and will affect your seed placement for accuracy.

Hydraulic Row Markers

The hydraulic row markers can be operated using either a single or dual remote.

A single remote can be used with either a 3-way directional valve or a sequence valve.

With a double remote, you can raise or lower each row marker independently. Both row markers and controls can be in operation at the same time.

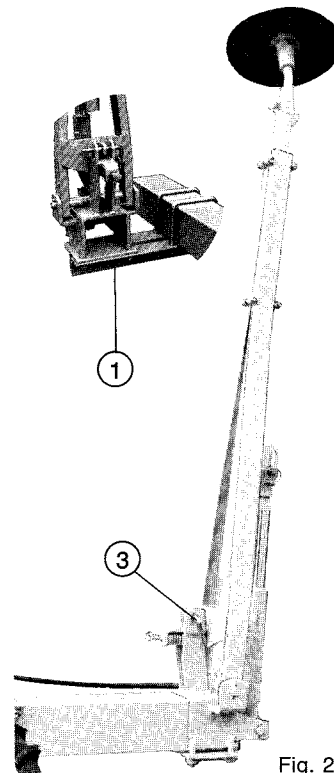
A stacking frame may be equipped with a single or double remote, however an additional remote is required to stack the wings.

Lift assist wheels will also require an additional remote valve unless it is tied into the 3-point hitch of the tractor.

⚠ WARNING To avoid injury, stand clear and keep others away when raising or lowering markers. Lock row markers for transport using the locking sleeve or locking pin (3) (fig. 29 & 30).

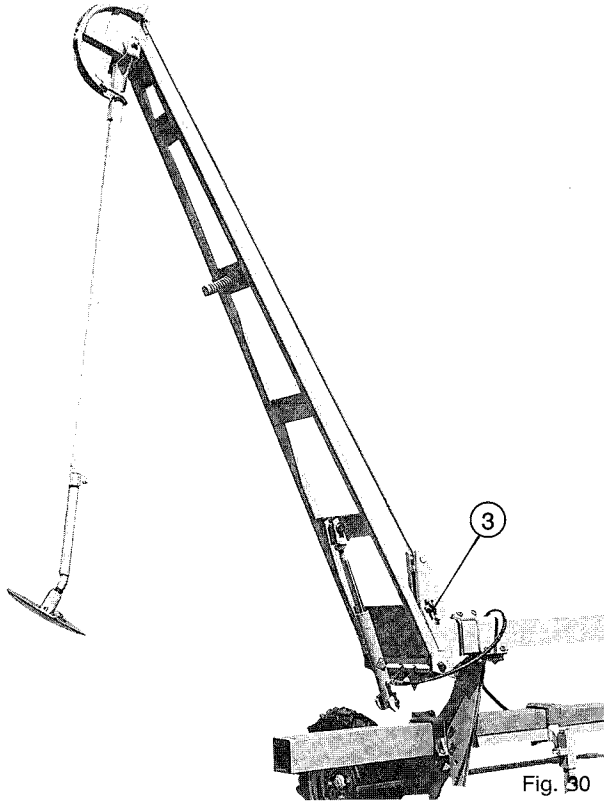
⚠ WARNING Use extreme care when operating the row markers near electrical lines.

⚠ WARNING Hydraulic fluid escaping under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic lines. Tighten connections before applying pressure.

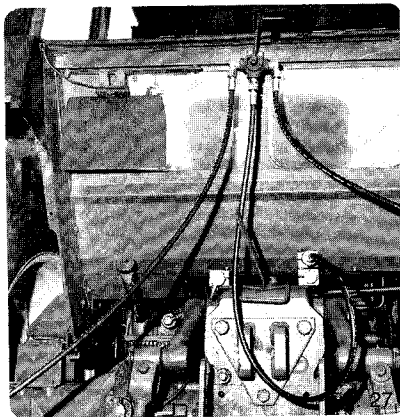


Standard hydraulic row markers for frames of 11'6" (3m5) through 20' (6m) are shown in fig. 29. Normally these row markers are mounted at the end of the toolbar. However, optional mounting brackets (1) can be provided for positioning the row marker in front of the toolbar. (For example in the case of narrow rows.)

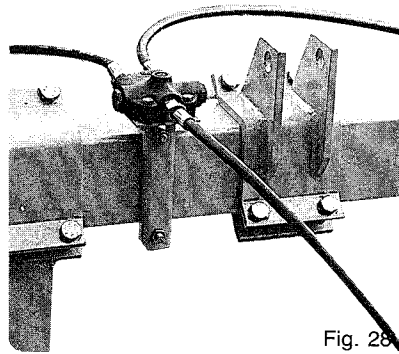
Hydraulic Row Markers



Folding row markers for larger planters with double toolbar frames (8-12 row) (Fig. 30). These row markers are mounted on the upper toolbar of the double toolbar frame.



A 3-way directional valve, mounted on the tractor to direct the hydraulic row markers (single acting hydraulic system.)



A sequence valve to automatically alternate the hydraulic row markers.

NOTE: this valve is sensitive to impurities in the oil.

NOTE: Each cylinder is furnished with a flow reducer inside the hydraulic fitting. Blockage of the hole of the flow reducer by dirt or impurities will result in malfunction of the row marker cylinder. When removing for cleaning, place the flow reducer in its original position with the internal snapping up (visible when inserted).

ROW MARKER ADJUSTMENTS

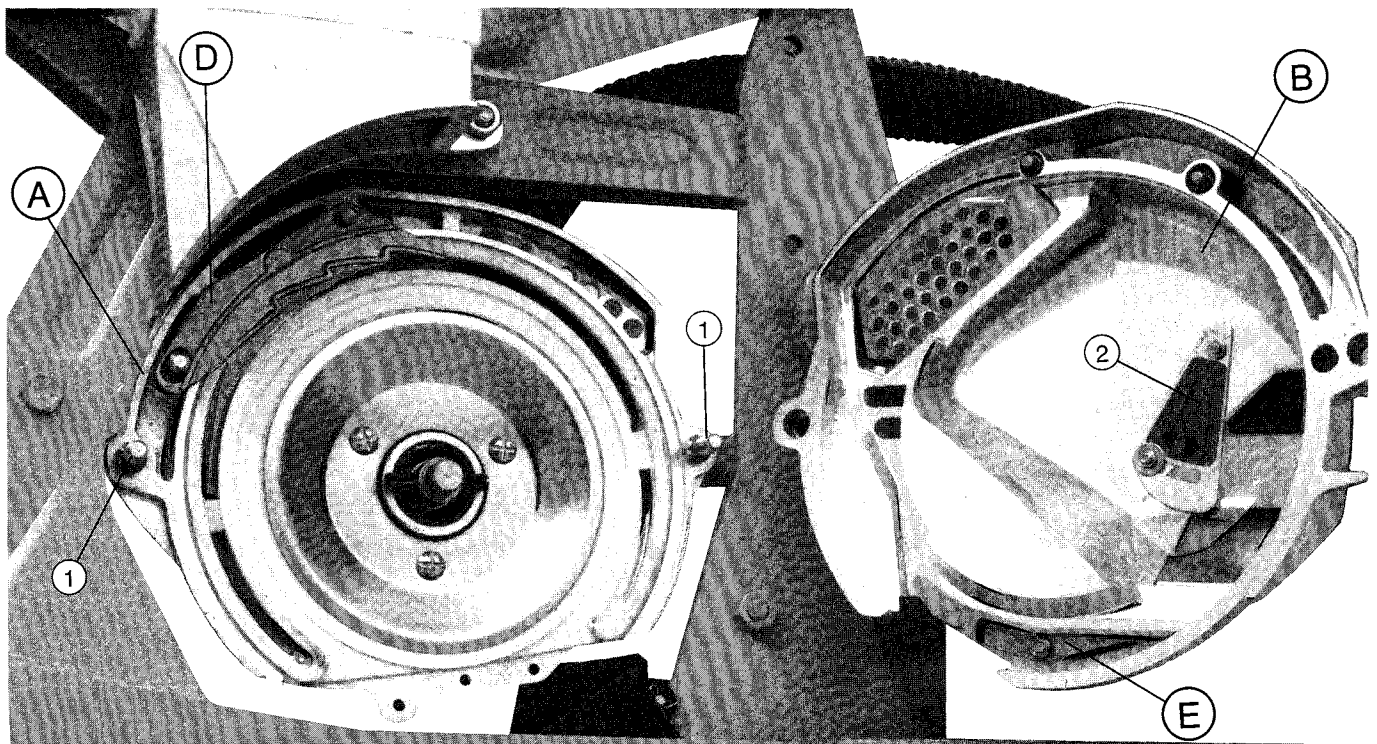
The row marker length is determined by multiplying the number of rows by the row spacing (in inches). This figure should be equal to the distance from the end of the marker blade to the center line of the planter. Adjust the left and right row markers equally to the determined length.

Example:

6 rows x 30" row spacing = 180"

Row marker extension from center of planter to end of marker blade should be 180".

Metering Box



Description: A - Main housing mounted in the planter metering unit.

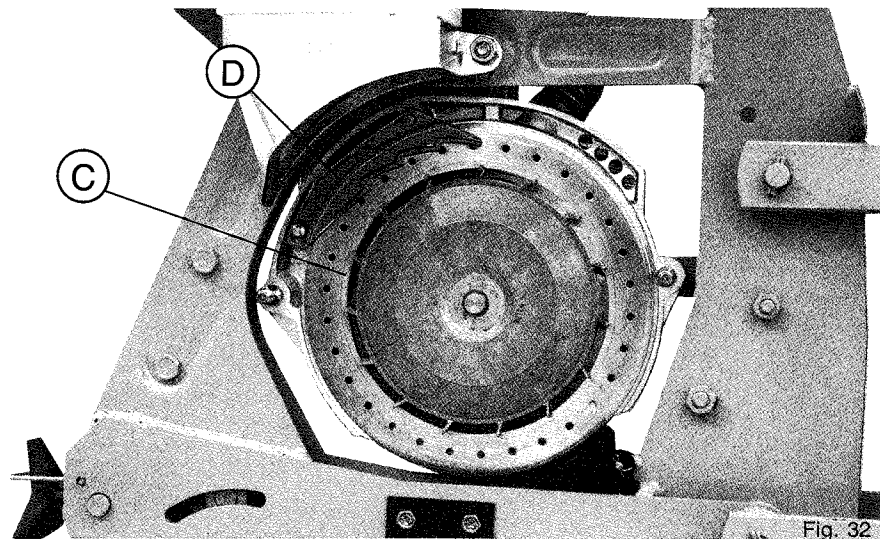
B - Cover with trap door and control window

C - Distribution disc with agitator for all seeds

D - One seed scraper for most seeds (large seeds as peanuts, use special scraper)

E - One ejector block

To change the disc, simply remove cover (B) after loosening the 2 wing nuts (1).



The seed scraper (D) is mounted on the outside of the seed disc (not between the seed disc and plastic wear gasket).

NOTE: For each type of seed, it will be necessary to use the seed disc with the proper number of holes and diameter of the holes. See list under metering adjustments. Before starting up, make sure that the metering boxes are equipped with the proper seed disc.

Metering Box

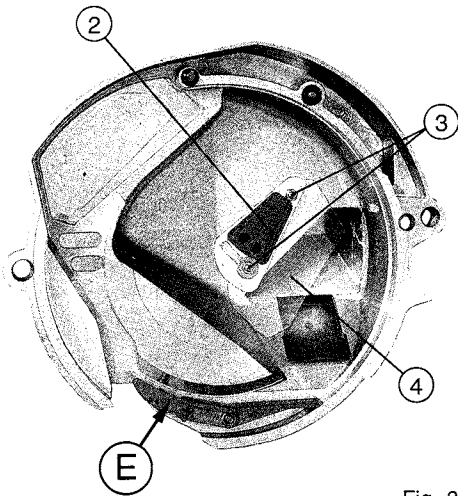


Fig. 34

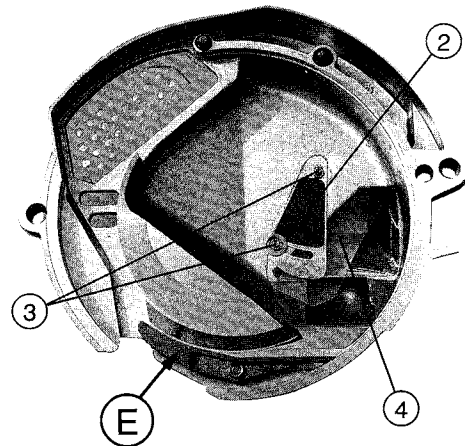


Fig. 35

A sheet metal shutter (2) is mounted inside the cover (B). This shutter regulates the flow of seeds coming from the hopper and provides a constant and sufficient level in front of the disc. According to the seed used, the shutter has to be checked and adjusted at 2 different positions before planting:

- 1- High position (fig. 34) For Large Seeds such as corn, soybean, edible beans, peanuts* cotton, etc.
- 2- Low position (fig.35) For Small Seeds such as sunflower, beet, sorghum, etc.
This low position should also be used for large seeds when the planter has to work for several hundred meters (1000' or more) on slopes of more than 20%.

The shutter is adjusted by lowering it after loosening the 2 bolts (3). A small plastic sheet (4) located under the shutter is also used to limit the level of seeds in front of the disc. Before beginning your season, make sure that it is in good condition.

* A special metering box cover with a larger opening (to improve the seed flow into the seed chamber), a larger discharge channel (to avoid blockage), and a special less aggressive seed scraper (to avoid skips) are available for the planting of large seeds such as peanuts, kidney beans and large squash.

A special metal shutter is available for planting small seeds such as cabbage, rape seed, etc., to reduce the seed flow into the seed chamber.

A special ejector block may be needed to eliminate bridging in the discharge channel in the cover for large peanuts and large squash seed.

The ejector block (E) enables the seeds to fall regularly. For this purpose, it is recommended to check its conditions periodically.

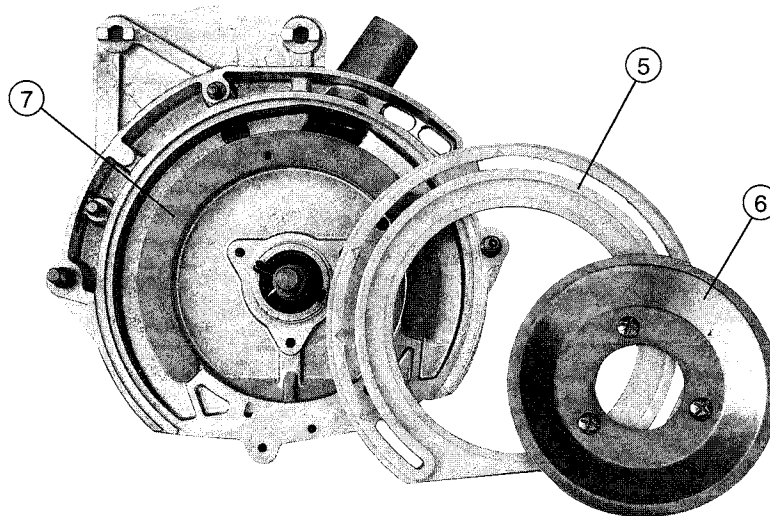


Fig. 33

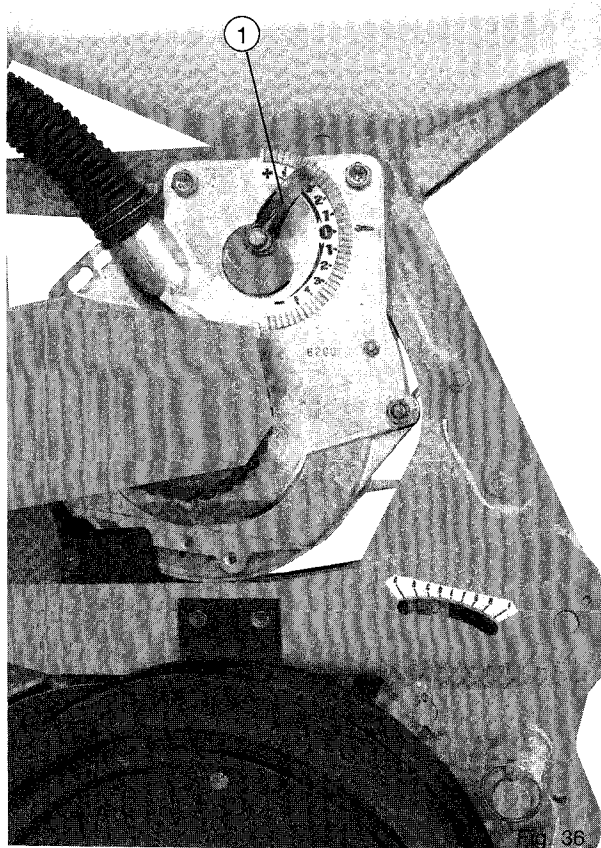
The plastic wear gasket 5 on which the seed disc rotates should be smooth and in good condition. Under normal operating conditions, it should be replaced only after 1250 to 2500 acres (500 to 1000 ha). The metal brace 7 should be positioned with its tab notched in the hole of the housing. The outer edge of the plastic wear gasket is then rotated into the groove, locking into place when the stub fits into the hole of the housing, and is then held in position by cup 6 and 3 bolts. (Fig. 33)

Note: Thoroughly clean the metering box housing before installing a new wear gasket. Any residue left from previous use will not allow the gasket to fit in the proper position.

Metering Adjustments

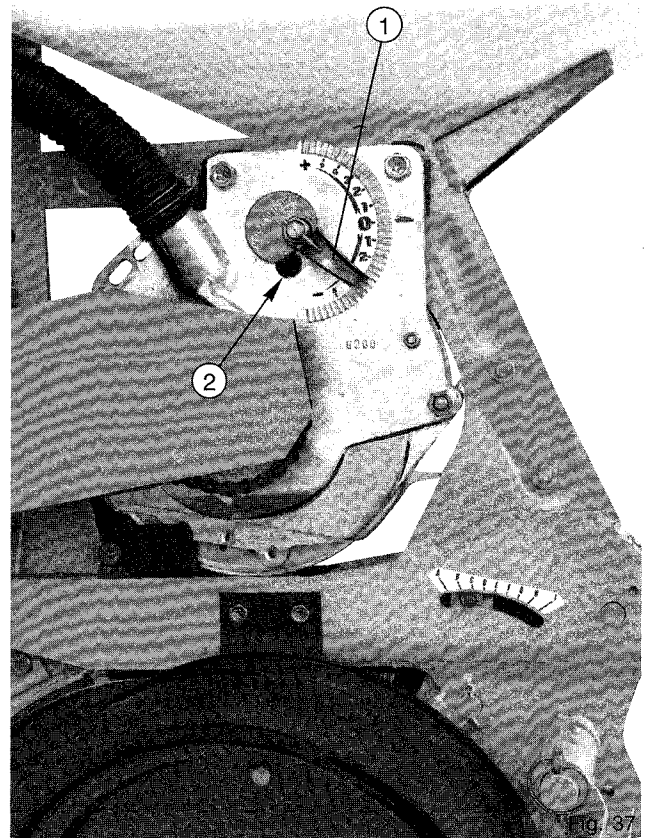
Two factors influence the degree of singulation of the seed:

1. The position of the seed scraper in relation to the holes of the disc. It is therefore necessary to adjust the height of the scraper as needed for each seed type.
2. The degree of suction (depression) at the seed disc. It is therefore necessary to adjust the degree of suction to the weight of the seed to be planted.



The (patented) Monosem system allows a unique adjustment (fig. 36-37).

- * To adjust the height of the scraper and at the same time
- * To adapt the degree of suction to the weight and size of the seed.



When the indicator (1) is positioned to the "+" (fig 36) it raises the scraper over the holes of the disc and increases the degree of suction (closing the size of the hole (2)). This may cause doubles if raised too high.

When the indicator (1) is positioned to "-" (fig 37), it lowers the scraper over the holes and reduces the degree of suction (opening the size of the hole (2)). This may cause skipping if too low.

A control window in the cover allows you to monitor the results.

Metering Adjustmens

Suggested Seed Disc Use

CROP	SEED DISC	SEED SPACING
Corn	DC1850 Low population	4 3/4" - 14"
	DC2450 Medium population	3 1/2" - 10 1/2"
	DC3050 High population	2 3/4" - 8 1/2"
Sweet corn	DC2437 Small (2,700-5,000 seeds/lb)	3 1/2" - 10 1/2"
	DC2445 Large (under 2,700 seeds/lb)	3 1/2" - 10 1/2"
Beans	DC3665 Large (Kidney)	2 3/8" - 7"
	DC4850 Large Pinto)	1 3/4" - 5 1/2"
	DC6035 Small (navy)	1 3/8" - 4 3/8"
	DC6045 Medium (Snap & Soybean)	1 3/8" - 4 3/8"
Sugarbeet	DC4016 Small,Medium,Large	2 1/8" - 6 1/2"
	DC4020 Medium,Large,Pellet	2 1/8" - 6 1/2"
Peanut	DC3060 Small to Mecium (Twin-Row)	2 3/4 - 8"
	DC3665 Large (Jumbo)	2 3/8" - 7"
	DC4060 Small to Medium	2" - 6 1/2"
Cotton	DC3635 Low population	2 3/8" - 7"
	DC6035 High population	1 3/8" - 4 3/8"
Hilldrop Cotton	DC0930D Double seed drop	9 1/2" - 28"
	DC1230D Double seed drop	7" - 21"
	DC0930T Triple seed drop	9 1/2" - 28"
Sorghum	DC3622 Low population	2 3/8" - 7"
	DC7222 High population	1 3/16" - 3 1/2"
Pickle	DC3020 Machine harvest	2 3/4" - 8 1/2"
Cucumber	DC1820 Hand harvest	4 3/4" - 14"
Melon/Small Squash	DC0325 Low population	28 1/2" - 84"
	DC3x2x2.5 Double seed drop	28 1/2" - 84"
	DC0625 Medium population	14 1/4" - 42"
	DC0925 High population	9 1/2" - 28"
Sunflower	DC1225 Low population (oils & confection)	7 1/8" - 21"
	DC1825 High population (oils & confection)	4 3/4" - 14"
Cabbage/ Cauliflower/Peppers	DC3612 Low population	2 3/8" - 7"
	DC7212 High population	1 3/16" - 3 1/2"
Pumpkin/Large Squash	DC0335 Low population	28 1/2" - 84"
	DC0635 Medium population	14 1/4" - 42"
	DC0935 High population	9 1/2" - 28"

Metering Adjustments

Recommended setting for indicator 1 (fig. 36, 8-1)

Corn	+1 (0 to +2)
Cotton	+1
Beans	+4 to +5
Sunflowers	+1 (0 to +2)
Coated sugarbeet (pellets)	+2
Uncoated sugarbeet	0 (-2 to +1)
Pickles/Melon	-1 1/2 (-1 to -2)
Soybean/Peas	+4
Sorghum	+3
Kidney beans	+5
Peanuts	+4 1/2 (+4 to +5)
Rape seed/Cabbage	+2

This applies to 540 rpm PTO speed except for large seed (kidney beans, peanuts) for which a slightly higher speed (5-10% is preferable. Then it is recommended to use a 450 rpm turbofan.

CAUTION: The above settings are theoretical, so checking before and during planting is essential.

NOTE: Use the proper seed disc for different seeds. Check your type of seed, and use the suggested seed disc chart on page 8-2 for determining the correct disc for your crop.

It is important to use seed discs that are clean and in good condition. Customized seed discs not shown are available upon request. It is not recommended to drill out your own seed discs. Any slight burrs or imperfection in drilling will alter your metering. The precision of your seed discs must be maintained to have proper metering.

Planter Metering Unit NG Plus 2

The NG Plus 2 metering unit in fig. 40 is shown with standard features. Other options are available for specific conditions or uses.

The drive chain is mounted as per fig. 41.

The individual disengaging of a metering unit is possible by removing the lynch pin ① or by disconnecting the vacuum hose.

The seed depth is adjusted by the handwheel ② which changes the height of the 2 depth wheels ③ in relation to the furrow disc openers ④. A sticker close to the handwheel, provided with a gradual scale, ensures the uniformity of the depth control on all row units of the planter.

The furrow opener and ground adjustment system guarantees an accurate and regular seed depth in all types of soil and conditions because the depth wheels are positioned perpendicular to the falling point of seeds.

The 2 rear press wheels ⑤ affect only the closing of the seed furrow. They float independently and therefore do not have any effect on the ground engaging. Their soil pressure is regulated by the handwheel ⑥. This pressure has to be chosen carefully in order to assure proper seed to soil contact. Soil should be pressed over the complete length of the row. This setting depends on the type and humidity of the soil.

In order for the furrow disc opener to remain properly cleaned, the 2 gauge wheels ③ have to touch (without pinching their outside circumference). After starting

up the planter, the factory assembly may need readjustment. Adjust gauge wheel spacing by putting the washers ⑧ from one side of the articulating arms to the other.

Adjust the pressure of the scrapers of discs by tightening or loosening the bolts ⑨. Before and during each new planting season, check if the seed tubes ⑩ are in good condition as consistent and regular seeding will depend on this. Do not hesitate to replace them if they are worn or damaged. To replace them, remove pin ⑪ after removing the gauge wheel and furrow disc opener on one side (fig. 42).

The function of clod removers ⑫ is to clear the surface of the soil but not to plow a furrow. One use of the front brace of the clod remover is to slice open hard soil and move stones away from the track of the disc opener. They need to be adjusted accordingly. Using them in stony soils may be a problem because they can cause clogging and blocking. In this case it is better to choose an assembly with a flexible support bracket (fig. 46) which is efficient in difficult soil conditions.

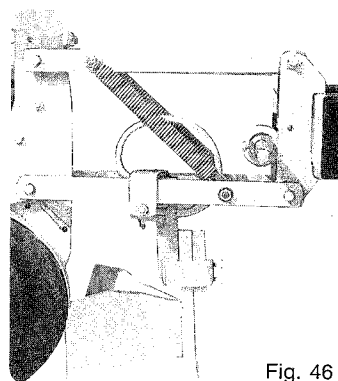


Fig. 46

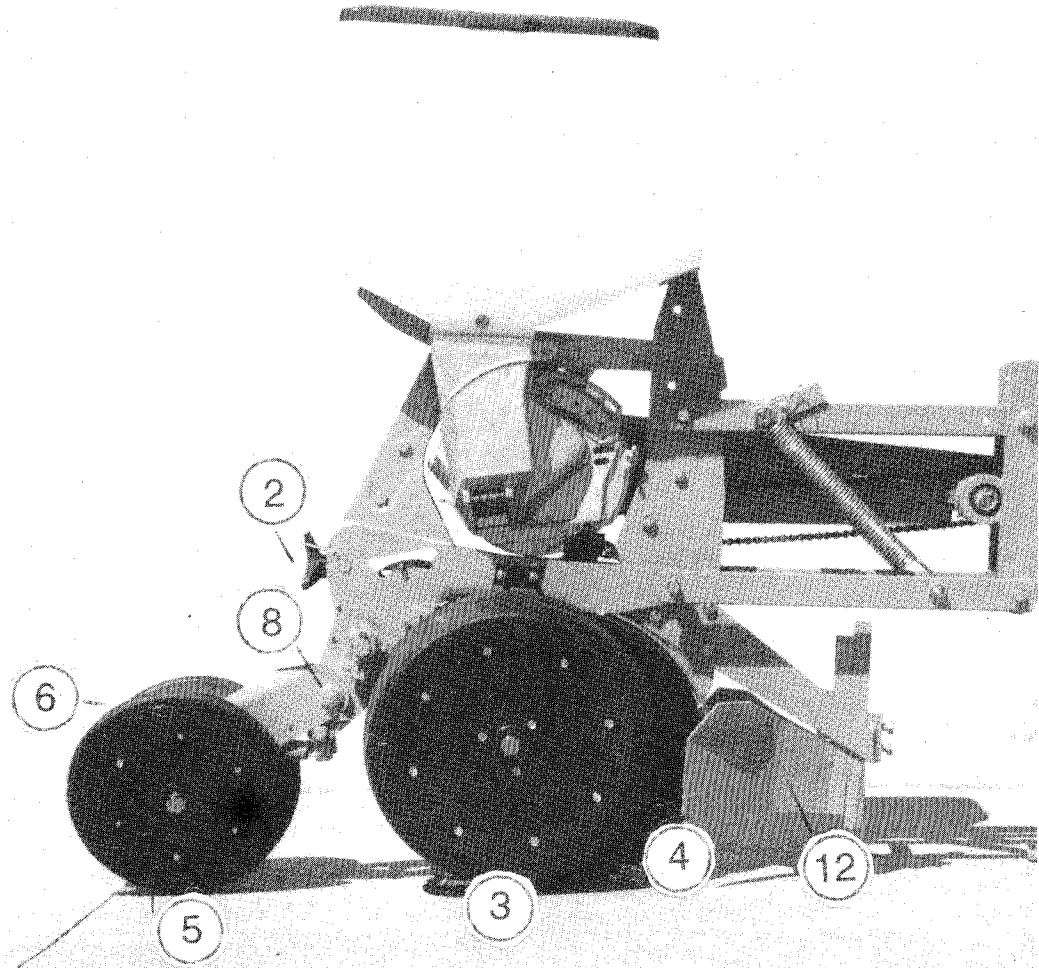


Fig. 40

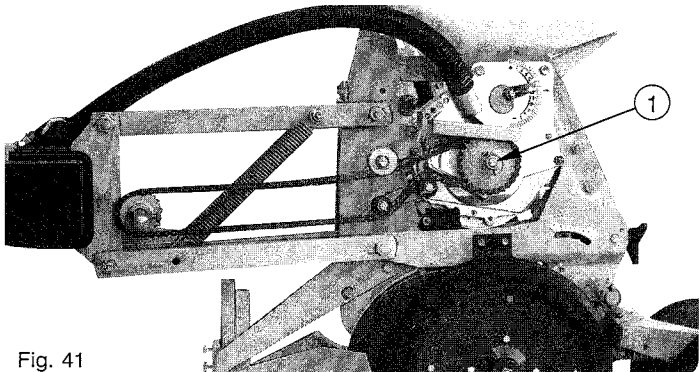


Fig. 41

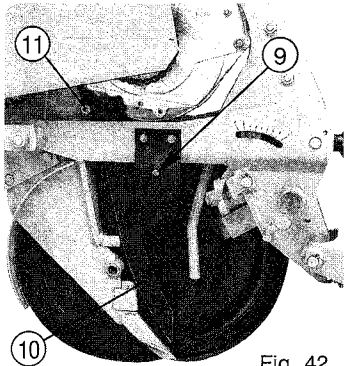
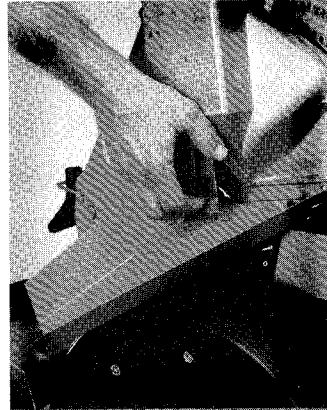


Fig. 42

A seed chute (fig. 43), supplied with each planter, simplifies emptying of the hoppers.



OPTIONAL EQUIPMENT

A locking pawl when used with a lifting handle will lock the planter unit in a raised position.

To raise and lock the unit:

- 1) Pull up the handle mounted to the planter unit.
- 2) Flip the pawl towards the planter unit and secure.

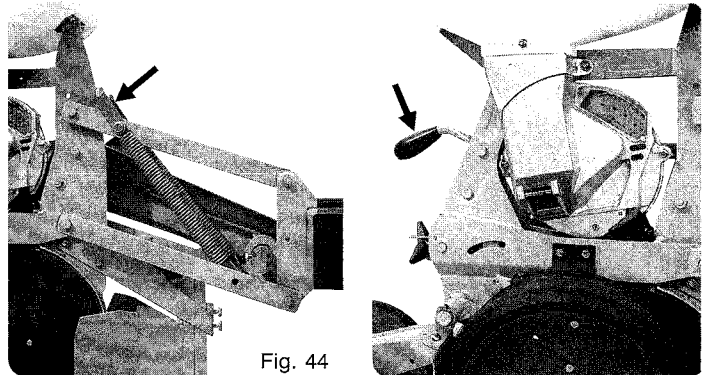


Fig. 44

Wide V-rear press wheel blocks (1 9/16") (4 cm) in width for light pressing on soft soils.

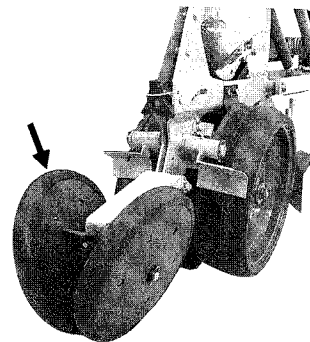
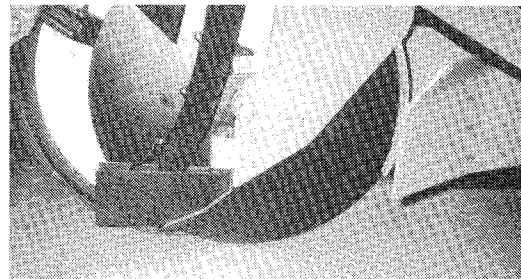


Fig. 47

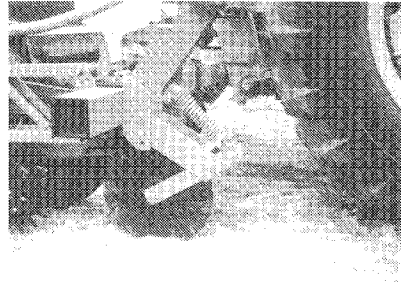
V shoe insert guides small seed accurately into the center of the row.

Caution: Remove when planting larger seeds such as beans. Will cause plugging due to normal crimping of seed tube during installation.

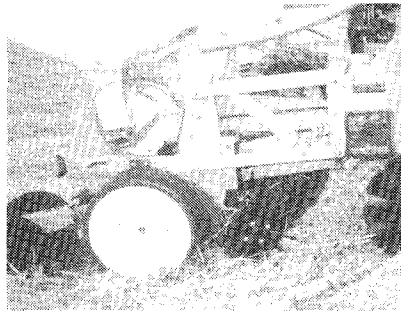


OPTIONAL EQUIPMENT (continued)

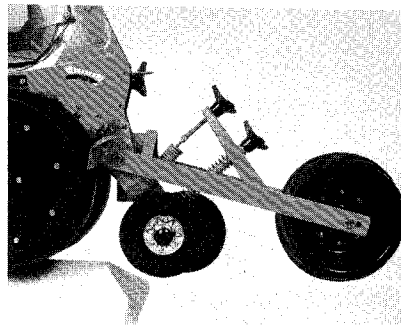
No-Till Coulter, mounted to either the toolbar frame or mounted to the planter unit.



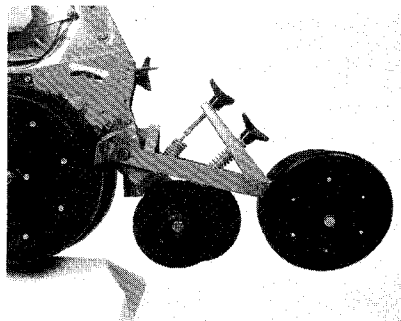
Residue Manager available for minimum and no-till situations.



Flat Press Wheel with Disc Closing System, used for cotton or other shallow planted crops, adjustable down pressure spring and an independent spring-loaded adjustment for discs.



V Press Wheel with Disc Closing System, with twin off-set discs and V press wheels features adjustable down pressure spring and an independent spring-loaded adjustment for discs.



Gearbox

Three different assemblies are possible for the standard gearbox:

- Normal assembly: (fig. 65) for planters with an even number of rows and inter-row spacing of 18" (45 cm) or more.

- Offset assembly: (fig. 66) for planters with an odd number of rows and inter-row spacing of less than 18" (45 cm). The gearbox is then mounted on the left and as close as possible to the central metering unit. To do so, remove one of the bearing brackets (4) which support the hexagonal shaft.

- Assembly for planters with 14"-15" (35-40 cm) inter-row spacing (fig. 67). Remove the 2 bearings brackets (4).

A special gearbox model is supplied for planters with narrow 10"-12" (25-30 cm) inter-row spacing.

SETTING

The standard gearbox consists of a changeable upper cluster fitted with six sprockets (two 3-sprocket clusters) and a lower fixed 3-sprocket cluster. This allows for 16 different gear ratios. The chart on the next page indicates the distances possible for each distribution disc. A decal placed on the planter will provide the same information for on the spot reference. To change the seed spacing, push the idler lever (1), lock its pawl (2) then align to the proper sprocket combination. The small upper sprocket cluster is fitted with a bolt, (3) which should be tightened to avoid any sliding of the cluster.

The special narrow gearbox uses one upper 3-sprocket cluster.

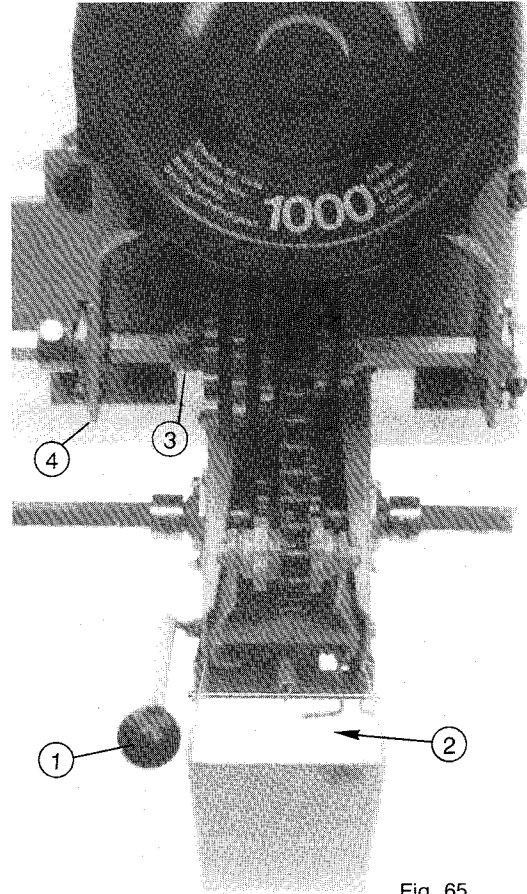


Fig. 65

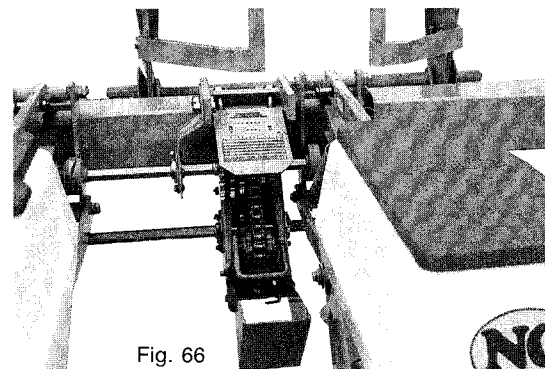


Fig. 66

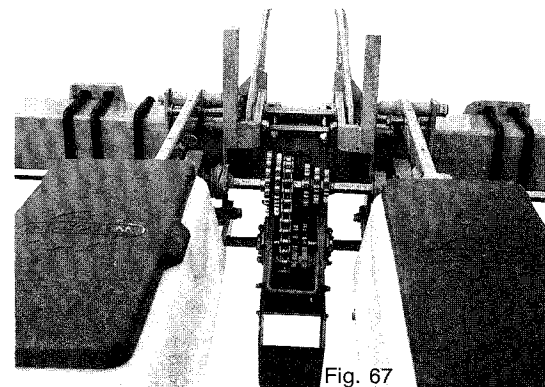


Fig. 67

Gearbox

Number of holes in the seed disc ↓	SOWING DISTANCES																Selection of Gearbox		
	C 6	C 5	B 6	C 4	B 4	A 5	C 3	A 4	C 2	B 3	C 1	B 2	A 3	B 1	A 2	A 1			
9	inches	9 1/2	10 1/4	11	12 5/8	14	14 1/2	16 1/8	17 1/4	18	19	20	21 1/4	22 1/2	23 1/4	25 1/4	28		
	cm	24	26	28	32	35	37	41	44	46	48	51	54	57	59	64	71		
18	inches	4 3/4	5 1/8	5 1/2	6 5/16	7	7 1/4	8 1/16	8 5/8	9	9 1/2	10	10 5/8	11 1/4	11 5/8	12 5/8	14		
	cm	12	13	14	16	17,5	18,5	20,5	22	23	24	25,5	27	28,5	29,5	32	35,5		
24	inches	3 9/16	4	4 1/4	4 1/2	5 1/8	5 1/2	6 1/8	6 1/2	7	7 1/16	7 1/2	8	8 1/2	8 5/8	9 1/2	10 1/2		
	cm	9	10	10,5	11,5	13	14	15,5	16,5	17,5	18	19	20	21,5	22	24	26,5		
30	inches	2 3/4	3 1/8	3 3/8	3 3/4	4 1/4	4 3/8	4 3/4	5 1/8	5 1/2	5 3/4	6 1/16	6 5/16	6 3/4	7 1/16	7 3/4	8 1/2		
	cm	7	8	8,5	9,5	10,5	11	12	13	14	14,5	15	16	17	18	19,5	21,5		
36	inches	2 3/8	2 1/2	2 3/4	3 1/8	3 9/16	3 3/4	4	4 3/8	4 1/2	4 3/4	4 7/8	5 3/8	5 1/2	5 3/4	6 5/16	7 1/16		
	cm	6	6,5	7	8	9	9,5	10	11	11,5	12	12,5	13,5	14	14,5	16	18		
40	inches	2 1/8	2 3/8	2 1/2	2 3/4	3 1/8	3 3/8	3 9/16	4	4 1/4	4 3/8	4 1/2	4 3/4	5 1/8	5 3/8	6 1/16	6 1/2		
	cm	5,5	6	6,5	7	8	8,5	9	10	10,5	11	11,5	12	13	13,5	15	16,5		
48	inches	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2		3 3/4	4	4 1/4	4 3/8	4 3/4	5 1/2		
	cm	4,5	5	5,25	5,75	6,5	7	7,75	8,25	8,75	9	9,5	10	10,75	11	12	13,25		
60	inches	1 3/8	1 5/8		1 3/4	2	2 1/8	2 3/8	2 1/2	2 3/4		2 7/8	3 1/8	3 3/8	3 9/16	4	4 3/8		
	cm	3,5	4		4,5	5	5,5	6	6,5	7		7,5	8	8,5	9	10	11		
72	inches	1 3/16		1 3/8	1 5/8	1 3/4		2	2 1/8		2 3/8	2 1/2		2 3/4	2 7/8	3 1/8	3 9/16		
	cm	3		3,5	4	4,5		5	5,5		6	6,5		7	7,5	8	9		
120	inches	11/16	13/16		7/8	1	1 1/16	1 3/16	1 1/4	1 3/8		1 7/16	1 9/16	1 11/16	1 7/8	2	2 3/16		
	cm	1,75	2		2,25	2,5	2,75	3	3,25	3,5		3,75	4	4,25	4,5	5	5,5		

The above indicated spacings are theoretical and may vary from 5 to 10% depending on soil conditions, tire and pressure. **IMPORTANT** Poor alignment of the sprockets of the seed spacing gearbox and stiffness of the chain will cause premature side wear on the sprocket. Grease the hexagonal shaft **under the upper sprocket cluster** so that the sprocket cluster will slide easily into alignment. Make sure the chain does not jam (use chain lubricant, not oil).

The operating speed needs to be selected as a function of:

- The desired consistency in the row
- The ground conditions
- The density of the seed.

A high speed is not conducive to accuracy, especially in rough or rocky conditions which will cause the unit to bounce.

Likewise, a high seed density may cause the disc to rotate fast, burdening the metering.

It should also be noted, and especially for corn, that misshaped and angular seeds are difficult to sow regularly, especially at high working speeds.

A base speed of 3 1/2 to 4 1/2 mph (5-7 km/h) assures good results for most seeds in the majority of conditions. However when planting corn at lighter population more than 6" (15 cm) between the seeds, 5-6 mph (8-10 km/h) is quite possible.

For planting of high seed population such as peanuts, edible beans, and kidney beans, best results can be obtained by not going faster than 3-4 mph (4.5 -6 km/h).

SPRING LOADED ADJUSTABLE DRIVE WHEEL ADJUSTMENTS

Refer to figure 1.

A. To lower the drive wheel, turn the hand wheel (1) counterclockwise.

B. To raise the drive wheel, turn the hand wheel (1) clockwise.

The spring loaded drive wheel adjustment assembly is intended to act as a "shock absorber" on each drive wheel block. It will allow the drive wheel to flex up and down with variances in the seedbed, yet maintain contact with the soil surface and let the toolbar remain at approximately the proper operating height. To make the drive wheel block rigid, tighten the nylon locknut (2) on top of the spring housing all the way down (clockwise). This will compress the spring inside the housing and minimize any upward or downward travel of the wheel block. You may still raise and lower the drive wheel by turning the hand wheel (1) in directions A and B above.

The complete assembly may be ordered as part #650610 and includes all items shown in figure 2.

Figure 1

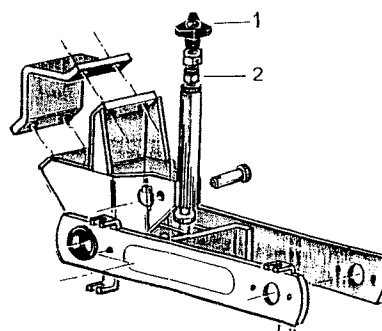
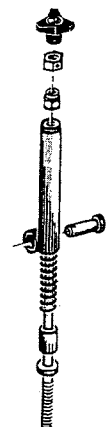


Figure 2



Seed Population Chart

Average
Seed
Spacing



Densities - Seed Population Chart

Row Spacing

	22"	26"	30"	34"	36"	38"	40"
2"	142600	120600	104600	92200	87200	82500	78400
2 3/4"	103600	87800	76000	67000	63400	60000	57000
3 1/4"	87800	74200	64400	56800	53600	50800	48200
3 1/2"	81900	69300	60100	53000	50000	47400	45000
3 3/4"	76034	64300	55800	49200	46500	44000	41800
4"	71300	60300	52300	46100	43600	41250	39200
4 1/4"	67000	56800	49200	43400	41000	38800	36900
4 1/2"	63400	53600	46500	41000	38700	36700	34850
5"	57000	48250	41800	36900	34850	33000	31400
5 1/2"	51800	43900	38000	33500	31700	30000	28500
6"	47500	40200	34850	30750	29000	27500	26100
6 1/2"	43900	37100	32200	28400	26800	25400	24100
7"	40950	34650	30050	26500	25000	23700	22500
7 1/2"	38000	32200	27900	24600	23200	22000	20900
8"	35750	30300	26250	23150	21850	20700	19675
8 1/2"	33500	28400	24600	21700	20500	19400	18450
9"	31750	26900	23300	20550	19425	18387	17475
9 1/2"	30000	25400	22000	19400	18350	17375	16500
10"	28575	24200	20950	18475	17475	16537	15725
10 1/2"	27150	23000	19900	17550	16600	15700	14950
11 1/2"	24800	21000	18200	16050	15150	14350	13650
12"	23750	20100	17425	15375	14500	13750	13050
13"	21950	18550	16100	14200	13400	12700	12050
13 1/2"	21213	19163	15563	13725	12950	12275	11650
14 1/2"	20475	17938	14488	12775	12050	11425	10850

Electronic Acre Counter

Calibration

Use the formulas below to determine your implement calibration factor.

DT = Distance traveled with one counter shaft rotation (when working with 2 magnets, divide DT by 2).

WW = Working width of implement

Example: 6 - 30 inch rows = 180 inches

Determining Factor

Acres DT (in) x WW (in) ÷ 6272640 = Factor

Feet DT (in) ÷ 12 = Factor

Chains DT (in) ÷ 792 = Factor

Rods DT (in) ÷ 198 = Factor

Miles DT (in) ÷ 63360 = Factor

Hectares DT (meters) x WW (meters) ÷ 1000 =
Factor

Meters DT (meters) = Factors

Example

Unit of measure: Acres

Implement: Corn planter with 6-30" rows

- 1) Obtain implement working width (WW)
WW = 6 x 30 = 180 inches
- 2) Measure the Distance Traveled (DT) in inches, by the implement, for the counter shaft to make one revolution.
Ex. Forward travel is 3'7" = 43 inches
- 3) $180 \times 43 \div 6272640 = .001234$

NOTE: Whenever a gear change is made on the shaft being monitored, you will need to recalibrate the counter. Write the implement name and factor on the label provided for future use.

Entering Calibration Factor

- 1) Turn on the calculator
- 2) Round off to 5 digits (if necessary)
- 3) Enter factor
- 4) Depress $\boxed{+}$ key
- 5) Push =

After entering factor, place counter in the case and close. Secure the counter case with the straightened end of the cable clip by hooking it through the hole at the base of the counter case and secure the other end to the implement.

Memory

The memory will store a cumulative total. The acre counter is equipped with long-life batteries; therefore, we recommend that the unit be left on throughout the implement season. The memory will be cleared when the unit is shut off.

To store totals in memory for a cumulative total, depress $\boxed{M+}$ key.

To read memory, depress \boxed{REM} key.

To start new measurement, depress \boxed{C} key.

NOTE: A slight slippage (5-10%) of the drive wheels is always possible on certain soils. This has not been taken into account for calculating the seeded area.

Installing the Magnet Housing

Remove the counter loop clamps from the two-part magnet housing assembly. Please note how they fit in the grooves on the magnet housing.

Place a magnet in one of the side cavities of one half of the magnet housing. The extra magnet may be used when the implement has an exceptionally long forward travel for a shaft rotation. When using the second magnet, place it in the magnet housing so the two magnets are opposite each other.

Place an insert in each half of the magnet housing. The insert will align with the slots in the bracket. If the shaft is 1 1/8" diameter, inserts are not used.

Place the two halves of the magnet housing together around the shaft on the implement. Secure with the 4 nuts and bolts provided.

Place the counter loop clamps around the magnet housing. The clamps should spin freely.

Attaching Case to Magnet Housing

Remove the counter from the case. Secure case to the loop clamps with the two self-tapping screws provided. Place the eyelets of the case between the screw holes on the counter loop clamps.

The electronic seed monitor consists of:

- A console
- Seed tubes with sensors
- Planter harness

The console is mounted on the tractor, a seed tube with sensor is installed on each planter row unit, and the harness connects the individual seed tube sensor to the console.

The DJPM 1000 or DJPM 3000 models feature a flashing light for each row and an audible alarm for malfunctions. The DJPM 3000 displays additional data as seed population, seed spacing and area planted.

Installing the DJPM 1000 & 3000 Monitor

The control console should be located inside the tractor cab where it is accessible to the operator without obstructing his normal driving view.

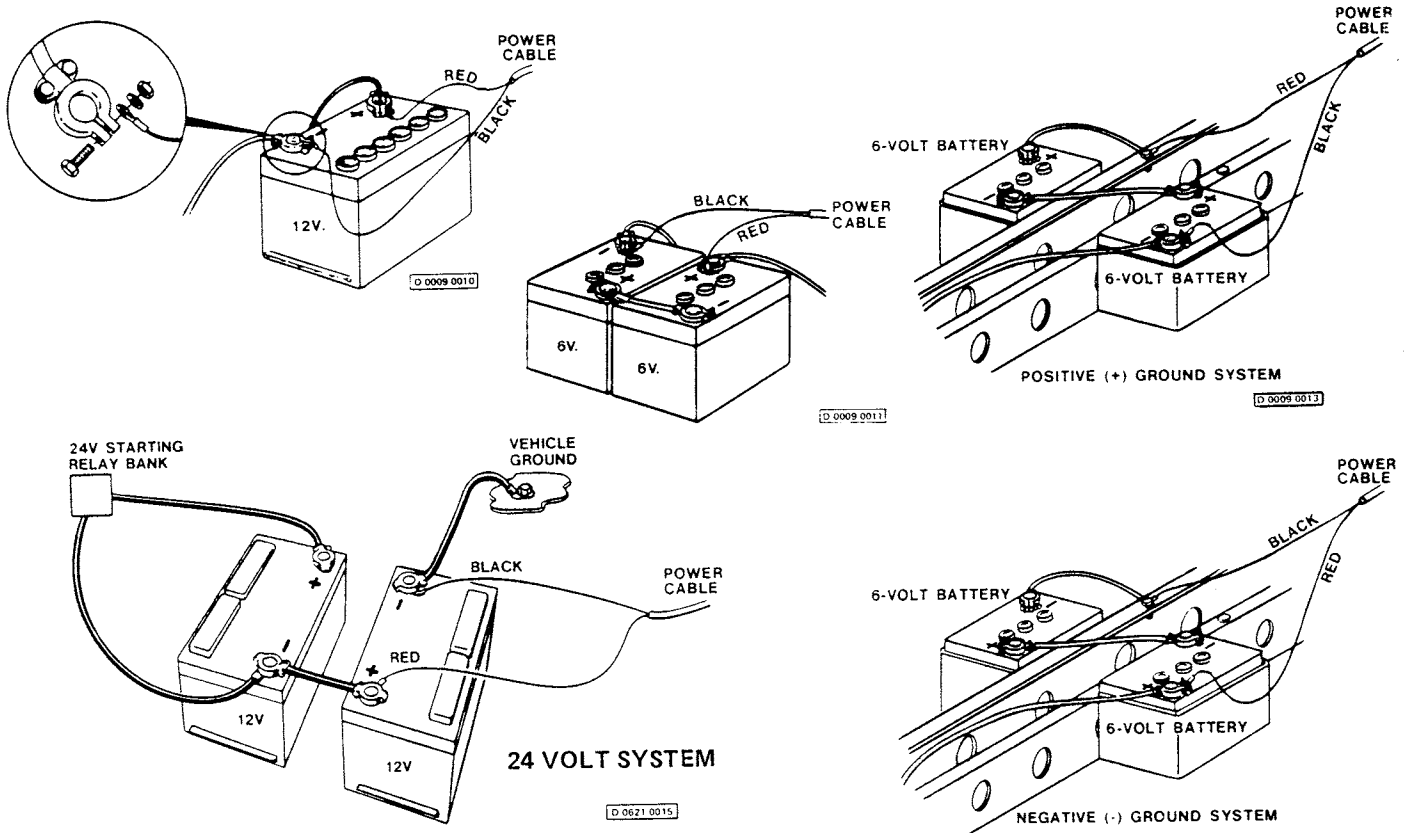
1) Drill two 9/32 " mounting holes and insert two 1/4-20x1/2" bolts with lock washers to hold bracket in place.

2) Secure the control console to the mounting bracket using the two knobs supplied. Do not overtighten.

3) Route the main console cable (with 37-pin CPC connector) to the rear of the tractor, near the hitch. The cable should run on the side of the tractor, opposite the alternator and spark plugs, and be located where it will not be pinched, cut, etc. Secure the cable in place with tie wraps, making certain it can be disconnected from the planter harness (at the hitch) without removing any tie wraps.

Electronic Seed Monitor

Power Connections



Operation DJPM 1000

Turn on the monitor. If a row indicator lamp does not light up when the console is powered up, it indicates that a problem exists with either the sensor, planter harness, or a burned out row indicator lamp. Begin planting and observe the row indicator lamps. If one of the row lamps is flashing at a slower rate than the others, it indicates a slower planting rate. The corresponding row should be checked for proper seed population. The monitor continuously checks for seed flow while planting, as indicated by the flashing row indicator lamps on the console. If any planter unit is not detecting seeds, the alarm will sound continuously and the row indicator lamp corresponding to the planter row unit will stop flashing.

Operation DJPM 3000

Upon initial power-up, or whenever memory is lost, there are three constants which must be entered into the console before the system will enter the OPERATE mode. The three constants are row spacing, number of rows and speed set.

Row Spacing Enter the distance between the planter rows in inches using the Digit Select and Digit Set switches.

Number of Rows Enter number of rows on your planter using the Digit Select and Digit Set switches.

Speed Set The speed set calibration number matches the console to the ground speed sensor when calibrated over

Operation DJPM 3000 Speed Set Cont.

a specified measured distance. When the calibration procedure is completed and the Speed Set constant established, the value should be written down and retained in the event battery voltage is removed from the console and the information in the memory is lost. In this event, the constant could be re-entered manually using the Digit Select and Digit Set switches.

There are 8 dual switches on the 3000 console. The upper half of each dual function switch is brown and contains the OPERATE functions. After your constants have been calibrated, you are now free to use the Area/HR, Area, Speed, Scan, Seed Population, Seed Spacing and Row Select operation function keys.

OPTIONAL

Radar Ground Speed Sensor

The optional radar provides a more accurate reading because it senses ground situations as wheel slippage and different soil conditions. The installation instructions are provided with the sensor.

Trouble Shooting

Sensors

Check for excessive dirt inside sensor. Dust and seed treatment may accumulate on the sensing elements of the sensor due to static electricity of dry soil or low humidity. Clean the inside of the sensors using a dry bottle brush.

If sensor leads are damaged, carefully cut away the cable covering the damaged area. Repair damaged wire by soldering wires together, matching colors, and tape the repaired wire as well as the cut portion of the cable cover.

Planter Harness and Console Cable

Repair cut or damaged wire or wires by soldering wires together, matching wire colors. Tape each repaired wire as well as the cut cable covering.

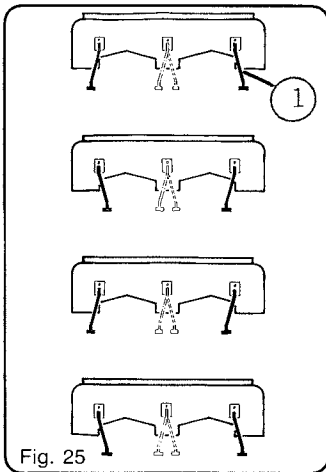
Console

Check for a blown fuse (5 amp type AGC), located on the console rear panel. Check battery connections and make certain they are clean and tight. Consult your dealer for any defective parts.

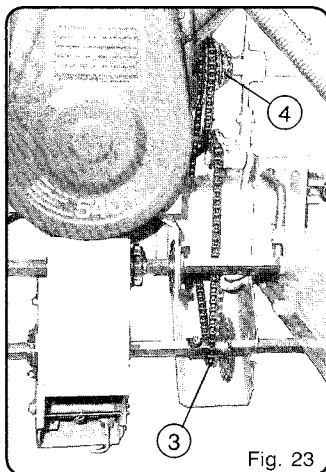
Fertilizer Attachment

Assemble as shown in figures.

The supports (1) can be attached at two different widths on the hoppers, and can be easily attached to available spots on the bar.

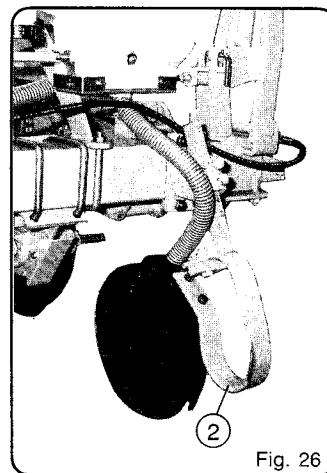
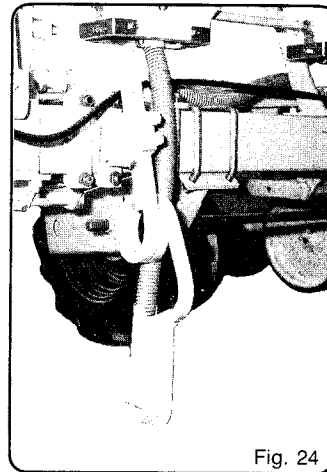


The drive is mounted as close as possible to the seed spacing gearbox on the right side (for 4 rows or more (fig. 23).



If the connector tubes between the hoppers are too long, cut them to size during assembly.

The fertilizer should be between 2" and 4" (6 and 10 cm) on the side of the row. Counter clamp the knife supports (fig. 24) or discs (fig. 26) to the planter metering units. The two inner rows can not always be mounted in this manner because of the hitch brackets. As half the fertilizer knives are off-set to the left and the other half off-set to the right, they can be adjusted as needed.



NOTE: With double disc openers (fig. 26) the wheels of the tractor must be perfectly centered on the inter-rows or the spring leaves (2) will come in contact with the tires during lifting.

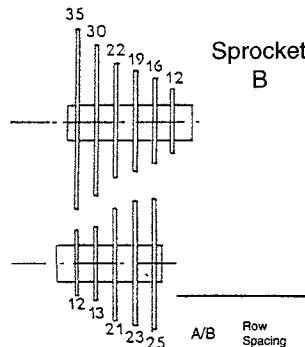
Fertilizer Attachment

The primary adjustment is set by using the lower double sprocket (3), the final adjustment is made by using one of the sprockets of the upper sprocket cluster (4). Outputs can thus be obtained between approximately 80 to 350 lbs/acre (80-350 kg/ha).

Different outputs are available on request either by replacing the auger with a differently pitched model or by a special gear.

As a guide, an output of 80 lbs/acre (80 kg/ha) approximately between 1.2 lb for each 334 feet (600-650 grams every 100 m) is obtained with many types of fertilizers using the small lower sprocket (3) and the big upper sprocket (4).

As an option, a 2 row hopper can feed 3 or 4 outlets, and a 3 row hopper can feed 4, 5 or 6 outlets. The fertilizers are then delivered with a meter specially equipped and plugs to allow certain outlets to be blocked off as desired.



FERTILIZER ADJUSTMENTS

A/B	Row Spacing	22"	30"	36"	40"			
12/35	92	217	68	160	57	133	51	120
13/35	101	238	74	175	62	146	56	131
12/30	110	258	81	190	67	159	60	142
13/30	116	272	85	200	71	166	64	150
12/22	145	340	106	250	88	208	79	187
13/22	162	380	119	280	99	233	89	210
21/35	165	388	121	285	101	238	91	214
12/19	170	401	125	295	105	246	94	221
23/35	176	414	130	305	108	254	97	229
13/19	185	435	136	320	113	267	102	240
21/30	190	448	140	330	117	275	105	248
25/35	193	455	142	335	119	279	107	251
12/16	202	476	149	350	124	292	111	262
23/30	208	490	153	360	128	300	115	270
13/16	219	516	162	380	135	317	121	285
25/30	225	530	166	390	138	325	125	293
21/22	257	605	189	445	158	371	142	334
12/12	272	639	200	470	167	392	150	353
23/22	283	666	208	490	173	408	156	368
13/12	295	693	217	510	181	425	163	383
21/19	300	707	221	520	184	433	166	390
25/22	306	720	225	530	187	441	169	398
23/19	329	775	242	570	202	475	182	428
25/19	355	836	261	615	218	512	196	461
23/16	387	911	285	670	237	558	214	503
25/16	425	999	312	735	260	612	234	551
21/12	477	1122	351	825	292	687	263	619
23/12	520	1224	383	900	319	750	287	675
25/12	566	1333	417	980	347	816	312	735

U.S. Measure of dry fertilizer chrt shown Lbs/Acre approx. delivery rate based on bulk density of 65 Lbs/CuFt.

- Standard Auger Blue
- High Output Auger Red

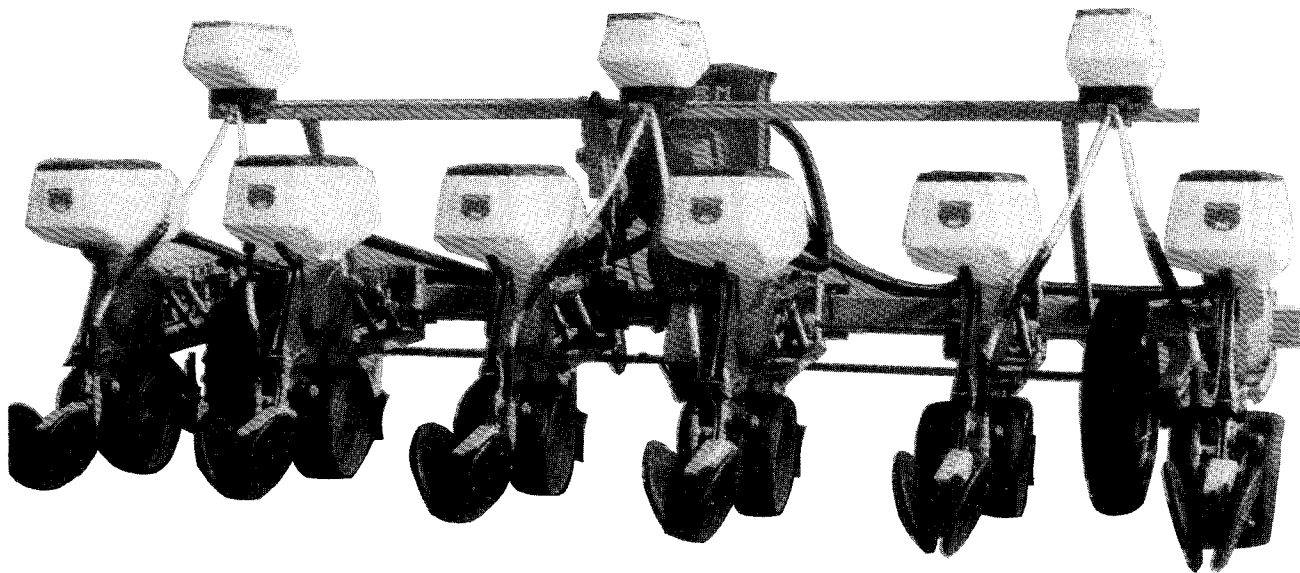
important: Fertilizer application rates can vary from the weights calculated in the above chart due to different brands, temperature, humidity, etc. Check your manual for procedure to measure your fertilizer to the above chart.



Fig. 22

! WARNING Agricultural chemicals can be dangerous. Improper use can result in injury to persons, animals and soil. Handle with care and follow instructions of chemical manufacturer.

Microsem Microgranular Applicator - Mounted to toolbar



The Microsem system meters microgranular products such as insecticide or herbicide. It is mounted to the toolbar frame, reducing the weight on the planter unit. The Microsem system with auger is equipped with a telescoping outlet, and its output starts from a minimum of 2-3 lbs/acre (2-3 kg/ha).

On the NG Plus planter, the drive (fig. 80 page 15-3) is positioned on the **LEFT** of the seed spacing gearbox and turbofan. For this model, it will be necessary for inter-row spacing of 30" (75 cm) to offset the central 3rd point mounting bracket, turbofan and seed spacing gearbox by approximately 1" (2 cm) to the right (fig. 83).

Avoid placing the drive next to a drive wheel. In case a tractor quick-hitch is used and the central 3rd point mounting bracket needs to be positioned in the center, the Microsem drive can be off-set and mounted between row numbers 2 & 3. In that case, a special support bracket for the hex shaft is used.

4-6 row at 75 cm (30")
Assembly of drive
Microsem insecticide and fertilizer

- (A) Offset central mounting frame 2 cm (1") to the right.
- (B) Micro-insecticide drive to the left of the turbofan.
- (C) Fertilizer drive to the right of the turbofan.

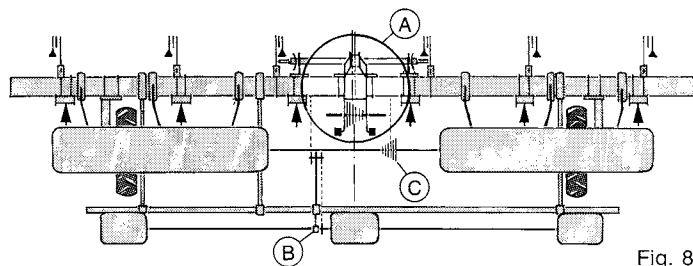


Fig. 83

The double sprocket (1) is mounted on the lower hexagonal shaft (fig. 80 next page). The hoses direct the product directly between the disc openers (see drop tubes fig. 82) or behind the disc openers (see spreader tubes fig. 82.a).

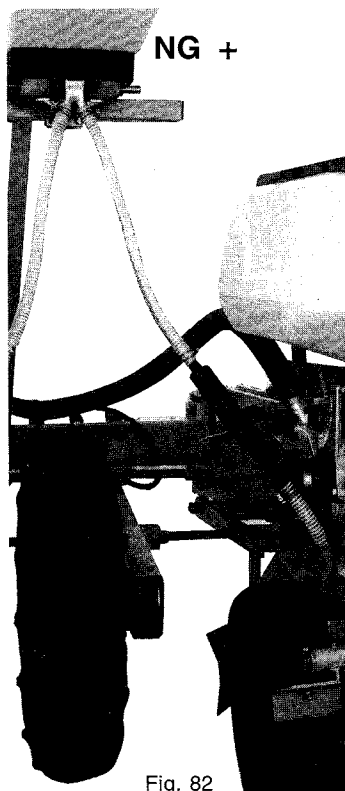
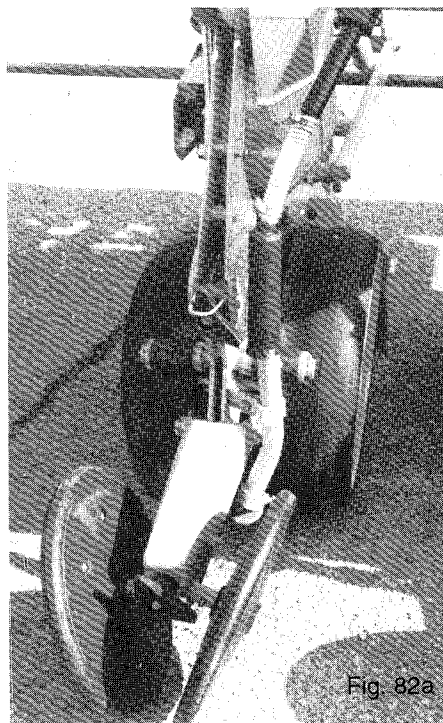
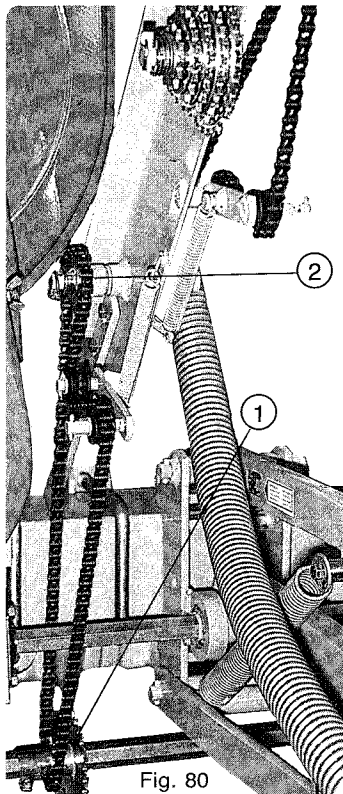


Fig. 82



Mounting of insecticide spreader tube

Screw the mounting clamp onto the NG Plus unit at the mounting hole. Attach one insecticide tube per unit. Each pair of units will have insecticide tubes mounted directly below the Microsem hopper. Reverse the position of the clamp (1) to attach the tube to the opposite side. Attach the spreader (with screw) to desired position.



Setting of the Output

The output is a function of the number of rotations of the spindle of the metering boxes. The drive system is a central drive system which is set primarily with the double sprocket (1) and the interchangeable sprockets (2) (fig. 80). The chart on page 15-4 will assist with the setting and also indicates the sprockets to be used for the principal commercial products. The furnished information is a recommendation only. Always double check when starting up the machine.

NOTE: Avoid moisture contamination. This unit should be used only with microgranulars and not with powders or granulates. It is possible to meter large granulars provided the inside auger is changed for a special one.

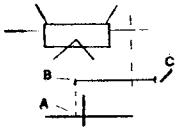
The 2-row metering box can be changed into a 1-row box by replacing the double outlet with a single outlet and installing a shield in the inside.

⚠ WARNING Agricultural chemicals can be dangerous. Improper use can result in injury to persons, animals and soil. Handle with care and follow instructions of chemical manufacturer.

Microsem Microgranular Applicator

Microsem Setting Chart Drive Sprockets to be Used

A = Double sprocket on hex shaft driven ① (fig. 80)
 B = Interchangeable sprocket - driven ② (fig. 80)



		C = 12 or 20 teeth																																
		5.4# per acre			7.13# per acre			8.91# per acre			10.7# per acre			12.5# per acre			14.25# per acre			16.04# per acre			17.82# per acre			19.6# per acre			21.4# per acre			23.2# per acre		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
COUNTER 15G	22"	12	18	12	12	22	20	25	22	12	25	18	12	25	15	12	25	22	20	25	12	12	25	18	20	25	16	20	25	15	20	25	14	20
	30"	12	22	20	12	15	20	25	15	12	25	22	20	25	18	20	25	16	20	25	15	20	25	14	20	25	12	20						
LORSBAN 15G	36"	12	18	20	25	16	12	25	22	20	25	18	20	25	15	20	25	14	20	25	12	20												
	40"	12	15	20	25	15	12	25	12	12	25	15	20	25	14	20	25	12	20															

		C = 12 or 20																																			
		5.85# per acre			6.5# per acre			7.2# per acre			8.7# per acre			9.7# per acre			10.8# per acre			12.3# per acre			14.5# per acre			per acre			per acre			per acre					
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
FURADAN 15G	22"	12	25	12	12	22	12	12	20	12	12	18	12	12	18	12	12	22	12	12	15	12	12	12	12												
	30"	12	22	12	12	20	12	12	18	12	12	15	12	12	22	20	12	12	12	25	22	12	12	15	20												
	36"	12	18	12	12	16	12	12	15	12	12	12	12	12	18	20	25	22	12	12	15	20	25	15	12												
	40"	12	16	12	12	15	12	12	22	20	12	18	20	25	22	12	12	15	20	25	15	12															

		C = 12 or 20																																			
		5# per acre			6.5# per acre			8.1# per acre			9.3# per acre			10# per acre			11.4# per acre			13.5# per acre			15.2# per acre			per acre			per acre			per acre					
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
DASANIT 15G	22"				12	12	12	25	22	12	12	15	20	25	18	12	25	15	12	25	22	20															
	30"	12	18	20	25	20	12	25	18	12	25	15	12	25	22	20	25	18	20																		
	36"	22	22	12	25	16	12	25	22	20	25	12	12	25	18	20	25	15	20																		
	40"	25	20	12	25	15	12	25	12	12	25	18	20	25	15	20	25	14	20																		

		C = 12 or 20																																
		5.35# per acre			6.42# per acre			7.22# per acre			8.03# per acre			9.82# per acre			11.15# per acre			per acre			per acre			per acre								
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
THIMET 20G	22"	12	18	12	12	15	12	12	22	20	12	12	12	12	15	20	25	18	12															
	30"	12	22	20	12	18	20	25	20	12	25	18	12	25	15	12	25	22	20															
	36"	12	18	20	12	15	20	25	16	12	25	15	12	25	12	12																		
	40"	25	22	12	25	18	12	25	15	12	25	22	20																					

		C = 12 or 20																										
		13.5# per acre			16# per acre			20# per acre			22.4# per acre			per acre			per acre			per acre			per acre					
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
AMEBIN	22"	25	18	12	25	15	12	25	12	12	25	18	20															
	30"	25	22	20	25	18	20	25	15	20																		
	36"	25	18	20	25	15	20	25	12	20																		
	40"	25	12	12	25	13	20																					

		C = 12 or 20																																
		1.78# per acre			3.56# per acre			4.45# per acre			8.9# per acre			10.95# per acre			13.35# per acre			17.8# per acre			22.25# per acre			26.7# per acre			per acre			per acre		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
TEMIK 15G GYPSUM	22"										12	18	12	12	15	12	12	22	20	12	15	20	25	15	12	25	15	12	25	22	20			
	30"										12	22	20	12	18	20	12	15	20	25	12	12	25	18	20	25	15	20	25	15	20			
	36"										12	18	20	12	15	20	25	12	12	25	20	20	25	15	20	25	12	20	25	12	20			
	40"				12	25	12				25	22	12	25	18	12	25	15	12	25	18	20	25	12	20	25	12	20	25	12	20			

		C = 12 or 20																																
		1.78# per acre			3.56# per acre			4.45# per acre			8.9# per acre			10.95# per acre			13.35# per acre			17.8# per acre			22.25# per acre			26.7# per acre			per acre			per acre		
		A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
TEMIK 15G CORNCOB GRIT	22"							12	15	12	25	12	12																					
	30"	12	25	12				25	22	12	25	18	20																					
	36"	12	22	12				12	15	20	25	15	20																					
	40"	12	18	12				25	15	12	25	12	20																					

The above settings are theoretical and approximate. Actual output may vary. Other outputs can be obtained by using different sprocket arrangements of the Microsem drive, however travel speed variations will not affect the output.

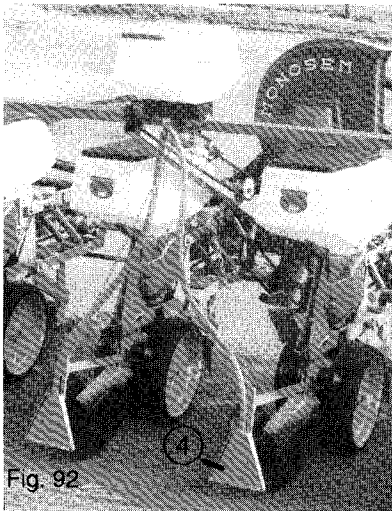


Fig. 92

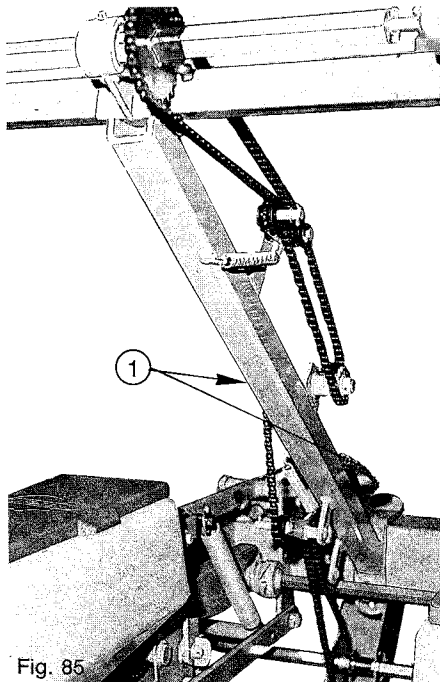


Fig. 85

Microsem - Herbicide Applicator

Shown opposite:

- Fig. 92 for spreader assembly for localized treatment (narrow).
- Fig. 85 for the drive system.

The general herbicide applicator for localized treatment has one hopper for each 2 rows (fig. 92) and one narrow spreader for each row (4). The chain assembly allows the sprocket support bracket to articulate when the planter is raised.

Make sure that the metering boxes are similar to those in fig. 92 (shape of the hoppers and direction of the outlets.)

Set the height of the spreaders and adjust the length of the hoses in the field for the proper working conditions.

Setting of the output

A series of interchangeable sprockets 1 (fig. 85) allow the metering device to be adjusted to the number of rotations needed for the product to be distributed (as for the insecticide system on the preceding page.)

⚠ WARNING Agricultural chemicals can be dangerous. Improper use can result in injury to persons, animals and soil. Handle with care and follow instructions of chemical manufacturer.

Granular Insecticide-Herbicide System Mounted Behind Planter Unit

The granular chemical hopper has a total capacity of 70 lbs., and using the divider, each side has a 35 lb. capacity.

The system is mounted to the planter unit and has a hand clutch (fig.87) to engage or disengage the metering mechanism for easy removal of the hopper.

For an accurate check for the number of lbs/acre of chemicals to be applied, use the following method:

- Attach a plastic bag to each chemical diffuser.
- Lower the planter and drive 500 feet at your planting speed.
- Weigh (in ounces) the amount of chemicals in one bag.
- Multiply the number of ounces by the factors shown below for your row width.

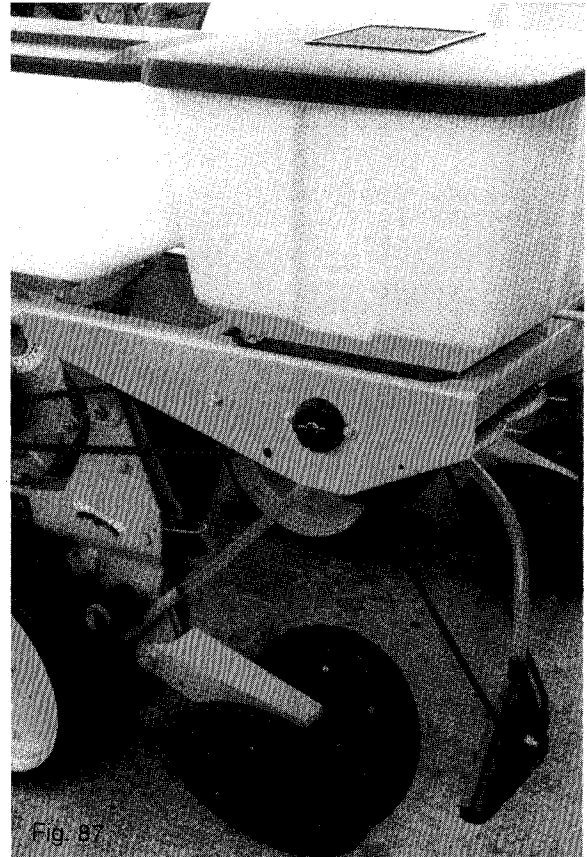
<u>Row Width</u>	<u>Factor</u>
38"	1.7
36"	1.8
30"	2.2
22"	3

Example: You have driven 500 feet for 30" row spacing and you collected 4.5 ounces in the plastic bag. Multiply 4.5 times the factor 2.2 which equals 9.9 lbs/acre.

If you do not have the desired amount of chemicals per acre, adjust the output gauge accordingly. Zero for minimum output to 45 for maximum output.

ATTENTION: Once you have the proper setting, do not vary your planting speed as this would affect the output.

The granular insecticide can be directed through a spreader tube behind the disc opener, (fig. 82a page 15-2) or between the disc openers (fig. 87). The granular herbicide is normally directed through a spreader behind the closing wheels (fig. 87).

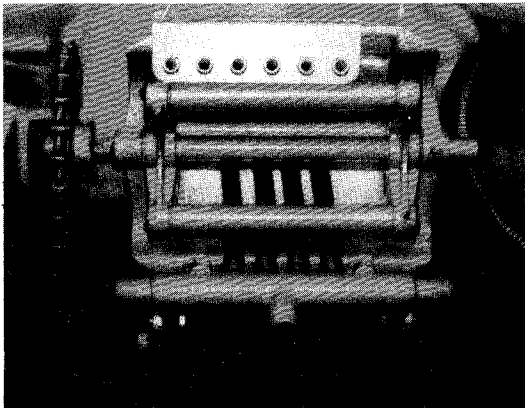


! WARNING Agricultural chemicals can be dangerous. Improper use can result in injury to persons, animals and soil. Handle with care and follow instructions of chemical manufacturer.

Liquid Fertilizer System

Pump Mounting and Hose Arrangement

The squeeze pump is shipped with the discharge manifold in the rearward or non-operating position. Before operating or mounting the pump, position the discharge manifold in the forward or operating position and secure by tightening the wing nuts as shown.



The pump should always be mounted even with or lower than the fertilizer tank for accurate metering. The rate of liquid fertilizer application is determined by the combination of sprockets on the squeeze pump and the drive shafts (see chart). When changing the sprocket combinations, check that the sprockets are in alignment, that the sprocket retaining collars are tight and that the chain tension is restored.

The shut-off valves should be closed to shut off the flow when the pump is not in use, either overnight, or an extended amount of time. Also close the valves when servicing either the pump or hoses.

Storage and Cleaning

Use the following steps to prevent hose deformation and prolong the hose life:

1. Unscrew (1/2") the wing nuts holding the spring anchor bar to the pump frame. This releases pressure against the hoses.
2. Loosen the wing nuts on the discharge manifold and shift the manifold rearward.

The tank should be rinsed out with water at the end of the season, or for periods of non use. Flush the tanks, hoses and metering pump before storing.

! WARNING Agricultural chemicals can be dangerous. Improper use can result in injury to persons, animals and soil. Handle with care and follow instructions of chemical manufacturer.

Liquid Fertilizer System

The following chart is an approximate application rate only. The actual delivery will vary according to the temperature and fertilizer being used. **Important:** If the fertilizer is placed too close to the seed, it may cause germination or seedling damage. Check with your fertilizer dealer or manufacturer for the correct amount and placement of fertilizer.

LIQUID FERTILIZER OUTPUT CHART

8 Tooth Driver Sprocket

Sprocket Part #	Driven	Row Spacing			
		40"	38"	36"	30"
L-1384	G 9	19.1	20.4	21.0	25.3
L-1385	A 10	17.2	18.3	18.9	22.7
L-1386	L 15	11.4	12.1	12.5	15.0
L-1387	/ 22	7.7	8.2	8.5	10.2
L-1388	A 23	7.5	8.0	8.3	9.6
L-1389	C 26	6.7	7.1	7.3	8.8
L-1390	R 30	5.8	6.2	6.4	7.7
L-1391	E 31	5.6	5.9	6.1	7.4

15 Tooth Driver Sprocket

L-1383	G 8	40.4	43.0	44.5	53.3
L-1384	A 9	35.9	38.2	39.5	47.4
L-1385	L 10	32.2	34.3	35.5	42.6
L-1387	/ 22	14.6	15.6	16.1	19.3
L-1388	A 23	14.0	14.9	15.4	18.4
L-1389	C 26	12.5	13.3	13.7	16.5
L-1390	R 30	10.7	11.4	11.8	14.2
L-1391	E 31	10.3	11.0	11.3	13.6

The above chart is for pump with 1/2" hose. For 5/16" hose, cut gal/acre in half.

Trouble Shooting and Causes

Excessive Skipping

- Transfer scraper too low (incorrect setting on indicator).
- Transfer scraper is bent (not flat).
- Seed disc is bent or worn.
- Transfer scraper is dirty with chemical product.
- Plastic wear surface of metering box wrapped or used up.
- Holes of seed disc too small (do not match)
- Holes of seed disc clogged (sugarbeets, rapeseed, cabbage). To be double checked from time to time.
- Excessive working speed.
- Defective vacuum hoses.
- Insufficient vacuum suction.
- PTO speed in too low.
- Foreign material mixed with seed.
- Seed blockage in the hopper (seed treatment product too moist): see adjustment of shutter on page 8-1.
- Fan belt is too loose.

Excessive Doubling

- Transfer scraper too high (bad setting on indicator).
- Transfer scraper worn.
- Holes of seed disc too large (do not fit).
- Excessive PTO speed.
- Excessive working speed.
- Seed level too high in the metering box: see adjustment of shutter on page 8-1.

Irregular Seeding (skipping-doubles)

- Excessive working speed.
- Holes of seed disc too large (cut off seeds).
- Fields are too steep (see page 7-2)
- Shutter adjusted incorrectly (see page 8-1)
- Ejector is damaged.

Irregular Spacing

- Excessive Working speed
- Soil too wet and sticking to drive wheel tires.
- Incorrect tire pressure (1 bar)
- Shutter adjusted incorrectly (see page 8-1)

Safety Slipclutch is Activated

- Seizing of metering box.
- Foreign material in the seed.
- Blockage in transmission units.

Occasional Blockage of the Drive

- Connection between moving and fixed parts (check shaft and frame wheel block unit screws and spacing gearbox tightner).

Fertilizer (output of chutes varies)

- Foreign material in fertilizer.
- Clods/clumps in fertilizer.
- Clogging of outlet or chute caused by moisture.
- Auger is defective (warped).

Microsem (output varies between chutes and cases)

- Foreign material mixed with product
- Attention: moisture in product.
- Improper assembly of metering unit (auger reversed).
- Outlet chute unit warped.
- Hose clogged because too long or bent.