MONOSEM

VACUUM PLANTER

NG Plus

2

TWIN-ROW MOUNTED PLANTER
OPERATOR & PARTS MANUAL

Includes:

INSTRUCTIONS FOR

- *Safety*
- *Operation*
- *Maintenance*

2000

2 precautions for successful planting:

1. Choose a reasonable working speed adapted to the field conditions and desired accuracy.

2. Check proper working of the seed metering, seed placement, spacing and density when starting up and from time to time during planting.

...and don't forget: accurate planting is the key to a good stand!

MONOSEM
NG+
TWIN-ROW Mounted Planter
Operator & Parts Manual

A.T.I., Inc.
17135 W. 116th Street
Lenexa, KS 66219

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 you 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 3 of this manual.

FRAME - 3-Point Mounted Rigid
7"x7" bottom & 5"x5" top toolbar frame

PLANTING UNIT
NG Plus Monosem
Pneumatic metering box
Double disc opener/gauge wheels
"V" closing wheels

STANDARD ROW SPACING
9" spacing between the twin rows
4 x 2 Row - 36"-40"
6 x 2 Row - 36"-40"
8 x 2 Row - 36"-40"
8 x 2 Row available with rigid or stacking toolbar

DRIVE SYSTEM
Ground Drive
7.60 x 15" 6-ply tires
Two drive/gauge wheels on 4x2 & 6x2 row
Four drive/gauge wheels on 8x2 row

TRANSMISSION
Two end mounted, quick change sprockets
No. 50 chain w/spring loaded idler
Three transmissions on stacking toolbar

MARKERS
Low profile single and double fold

DIMENSIONS & WEIGHTS

PLANTER SIZE	WIDTH	LENGTH	WEIGHT *
4 X 2-ROW	14' 427 cm	6' 5" 196 cm	3569 lbs 1619 kg
6 X 2 ROW	20' 609 cm	6 '5" 196 cm	4559 lbs 2068 kg
8 X 2 ROW	25' 762 cm	6' 5" 196 cm	5960 lbs 2703 kg

* The base machine weights include planter frame, optional row markers, drive components,tires and wheels, hydraulic cylinders and NG Plus row units with seed hopper and lid.

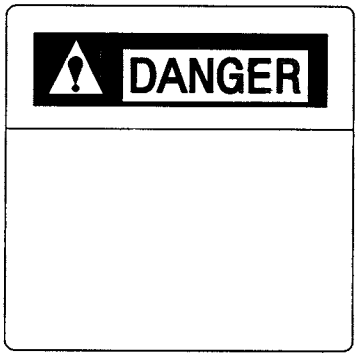
The safety warning signs placed on your machine and illustrated on the next page are a warning for your personal safety. Follow all recommended precautions. Safety of the operator is one of the main concerns in designing and developing a new piece of equipment. You, the operator, can avoid many accidents by observing the warning signs listed below and in the text of the manual.

Keep the safety warning signs clean and readable. **Replace all damaged warning labels on your machine that are not readable or are missing.**

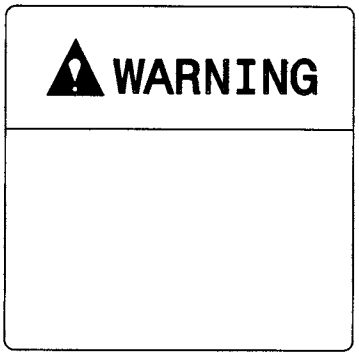
This symbol means:

ATTENTION
BECOME ALERT
YOUR SAFETY IS INVOLVED

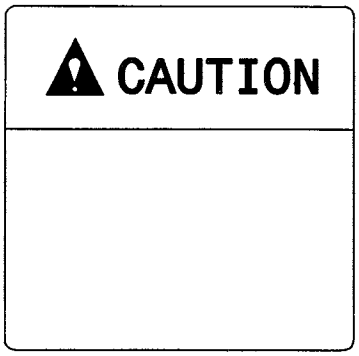
DANGER Indicates an immediate hazardous situation which, if not avoided, will result in death or serious injury.



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.



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.

CAUTION

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 electral 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 toolbar.
0891-45201

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.

Located on inside of the granular hopper lid.

WARNING

Any alterations to the design of this planter may create safety hazards. Follow safe practices to avoid injury.

Located on front of toolbar.
0891-45202

WARNING

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.

Located on rowmarker.
0891-4552

DANGER

ROTATING DRIVELINE
CONTACT CAN CAUSE DEATH
KEEP AWAY!

DO NOT OPERATE WITHOUT —
- **ALL DRIVELINE, TRACTOR AND EQUIPMENT SHIELDS IN PLACE**
- **DRIVELINES SECURELY ATTACHED AT BOTH ENDS**
- **DRIVELINE SHIELDS THAT TURN FREELY ON DRIVELINE**

L1 383333

Located on PTO shaft. 38333

WARNING

TO AVOID INJURY
Secure the locking arm of the lift drive wheel in a locked position before towing or working under the planter.

Located on locking bar. 0891-4674

Safe and careful operation of the planter at all times will contribute in the prevention of accidents. Listed below are safety precautions that should become standard practice before & during operation, transport, and maintenance of the planter.

General Safety

• Any alterations to the design of this planter may create safety hazards. In the case of alterations or changes, you MUST follow all appropriate safety standards and practices to protect you and others near this machine from injury.

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

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, fungi, 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.

• Do not 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.

• Always make sure there are no persons near the planter when the wings are being lowered from transport position.

• Before applying pressure to the hydraulic system, make sure all connections are tight and that hoses and fittings have not been damaged. Hydraulic fluid escaping under pressure can have sufficient force to penetrate skin causing injury.

• Install lock ups on markers, as provided prior to transporting the planter or working around the unit.

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.

• Limit transport speed to 15 mph. Transport only with farm tractor of sufficient size and horsepower.

• Use necessary safety lights and devices and observe legal regulations before transporting on public roads.

• No passengers allowed anywhere on, or in the planter during operation.

• Be especially observant of the operating area and terrain - watch for holes, rocks or other hidden hazards.

During Operation continued

• Always inspect the area to be planted prior to operation. Do not operate near the edge of drop-offs or banks. Be extra careful when working on inclines.

• Do not operate on steep slopes as overturn may result.

• Keep hands and clothing clear of moving parts.

• Always make sure there are no persons near the planter when the marker assemblies are in operation.

• If a marker cylinder has been removed for any reason, do not attach the rod end of the cylinder until the cylinder is cycled several times to remove any air that may be trapped in the system.

• Serious injury or death can result from contact with electric lines. Use care to avoid contact with electric lines when moving or operating this machine.

• This planter is designed to be driven by ground tires only. The use of hydraulic, electric or PTO drives may create serious safety hazards to you and the people near by. If you install such drives you must follow all appropriate safety standards and practices to protect you and others near this planter from injury.

• Lower the planter when not in use and cycle the hydraulic control lever to relieve pressure in hoses.

Following Operation

• When halting operating, even periodically, stop the tractor, set the tractor or towing vehicle brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition key.

• 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.

• As a precaution, always recheck the hardware on equipment following every 100 hours of operation. Correct all problems.

• 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.

• Never work under the planter while it is in a raised position.

• 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. Do not attempt to mount a tire unless you have the proper equipment and experience to do the job. Whenever possible, trained personnel should be called to service and/or mount tires.

• Failure to follow proper procedures when mounting a tire on a rim can produce an explosion which may result in serious injury or death.

PLANTER PREPARATION

For the initial preparation of the planter, lubricate the planter and row units as outlined in the lubrication section of this manual. Make sure all tires are properly inflated, that all drive chains have the proper tension, alignment and lubrication.

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

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, 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.

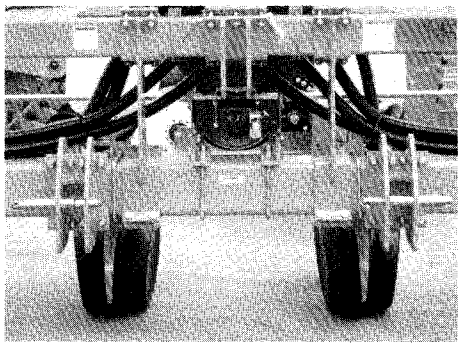
TRACTOR PREPARATION & HOOKUP

Consult your dealer for information on the minimum tractor horse power requirements and tractor capability. Tractor requirements will vary with planter options, tillage and terrain.

1. Set tractor rear wheel spacing at double the planter row spacing. On wide front end tractors set the front wheel spacing equal to rear wheel spacing. Check tractor operators manual for correct front and rear tire pressure.

2. Adjust the lift links on the tractor so the planter will lift level from side to side and raise high enough for planter transport clearance. Set the sway blocks on the tractor in position to prevent side sway. Be sure the individual lift link arms are in the float position.

3. Back the tractor up to the planter. Position the lower hitch pins and spacers as shown in the photo below for your type of tractor hitch. Line up the holes and insert hitch pins and lock in place with pins provided. It may be necessary to change the length of the upper link with the adjusting handle.



Note: If the tractor has an adjustable center link, using the lowest adjustment hole will provide maximum clearance in the raised position and yet allow the planter to remain level during field operation.

 **DANGER** Never transport folding models with lift assist wheels without a quick hitch in place. If a quick hitch is not in place, a sudden stop could allow the toolbar to rotate forward causing serious personal injury or damage to the equipment.

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

 **CAUTION** Make sure that you connect the proper end of the PTO to the tractor. An arrow on the PTO indicates the end that is attached to the tractor.

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.**

5. Connect the hydraulic hoses to tractor ports in a sequence which is both familiar and comfortable to the operator.

 **DANGER Before applying pressure to the hydraulic system, make sure all connections are tight and hoses and fittings have not been damaged. Hydraulic fluid escaping under pressure can have sufficient force to penetrate skin, causing injury or infection.**

 **CAUTION** Always wipe hose ends to remove any dirt before connecting couplers to tractor parts.

6. Raise the planter slowly and watch for any interference. Remove pin from each parking stand and raise each to the transport. Secure stands in the raised position with the pin in the lowest hole.

7. Lower planter so drive wheels rest on the ground and check to be sure that the planter is level. Readjust the top link as required to level row units.

 **CAUTION**: As a general safety practice and to avoid damage to the tractor hydraulic system, always lower the planter when not in use.

LEVELING THE PLANTER

For proper operation of the planter and row units, it is important that the unit operate level.

With the planter lowered to proper operating depth, check to be sure that the frame is level fore and aft (front to back and side to side). Recheck once the planter is in the field.

It is also important for the planter to operate level laterally. Tire pressure must be maintained at 35 PSI.

On planters equipped with the optional dual lift assist wheels, adjustment holes on the lift assist cylinder mounts allow for adjustment for lift height and adjustment for leveling the planter frame. Depth stops on the lift assist cylinders can be added or removed for additional adjustment.

TIRE PRESSURE

Tire pressure should be checked regularly and maintained as follows:

Transport ground drive: 7.60x 15 35 PSI

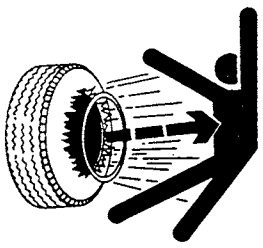
DANGER Rim and tire servicing can be dangerous. Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. This should only be done by properly trained and equipped people to do the job.

Maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.

When inflating tires, use a clip-on air chuck and extension hose long enough to allow you to stand to one side, and not in front of or over the tire assembly. Use a safety cage to enclose the tire and assembly when inflation.

Inspect tires and wheels daily. Do not operate with low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.



LUBRICATION

Proper lubrication of all moving parts will help ensure efficient operation of your Monosem planter and prolong the life of friction producing parts.

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.

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.

All transmission and drive chains should be lubricated daily with a chain lubricant (which does not attract dust). Extreme operating conditions such as dirt, temperature or speed may require more frequent lubrication. If a chain becomes stiff, it should be removed, soaked and washed in solvent to loosen and remove dirt from the joints. Then soak the chain in oil so the lubricant can penetrate between the rollers and bushings.

WHEEL BEARINGS

Wheel bearings should be repacked with clean, heavy-duty axle grease once a year or at the beginning of each planting season. This applies to all drive wheels, transport wheels, and marker hubs. Follow the procedure outlined for wheel bearing replacement with the exception that bearings and bearing cups are reused.

GREASE FITTINGS

Those parts equipped with grease fittings should be lubricated at the frequency indicated with an SAE multipurpose type grease. Be sure to clean the fitting thoroughly before using a grease gun. The frequency of lubrication recommended is based on normal operating conditions. Severe or unusual conditions may require more frequent attention.

There are a number of sealed bearings on your planter to provide trouble free operation. These sealed bearings are lubricated for life.

Frequency of lubrication:

Chain lubricant
Daily - Unit drive chains
Wheel block drive chains
Transmission chains & rollers
Insecticide drive chains
Liquid fertilizer squeene pump drive
Chain rollers and shafts on unit drive chains

Grease
Daily - Gauge wheel arms
Row marker hinge points

Weekly - Row unit closing wheel/ disc closing assembly pivot points.

CHAIN TENSION ADJUSTMENT

The drive chains are spring loaded and therefore self adjusting. The only adjustment needed is to shorten the chain if wear stretches the chain and reduces spring tension. The pivot point of these idlers should be checked periodically to ensure they will rotate freely.

VALVE BLOCK ASSEMBLY INSPECTION

The valve block assembly consists of the marker sequencing and flow control valves in one assembly. The sequencing valve consists of a chambered body containing a spool and series of check valves to direct hydraulic oil flow. Should the valve malfunction, the components may be removed for inspection as follows:

1) Remove valve block assembly from planter.
2) Remove detent assembly and port adapter assemblies from rear of valve block.
3) Remove plug from both sides of valve block and remove spool.
4) Inspect all parts for pitting, contamination or foreign material. Also check seating surfaces inside the valve. Replace any parts found to be defective.
5) Lubricate spool with a light oil and reinstall. Check to be sure spool moves freely in valve body.

Important: Make sure the correct check ball(s) and spring are installed in each valve bore before reassembly.

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.

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.

Grease the exposed areas of cylinder rods. Also grease or paint the disc openers to prevent rust.

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

Remove all trash that may be wrapped on sprockets or shafts and remove dirt that can draw and hold moisture.

Clean all drive chains and coat with a rust preventative spray, or remove chains and submerge in oil.

Lubricate planter and row units at all lubrication points.

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

OPERATING SPEED

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 causes the unit to bounce.

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

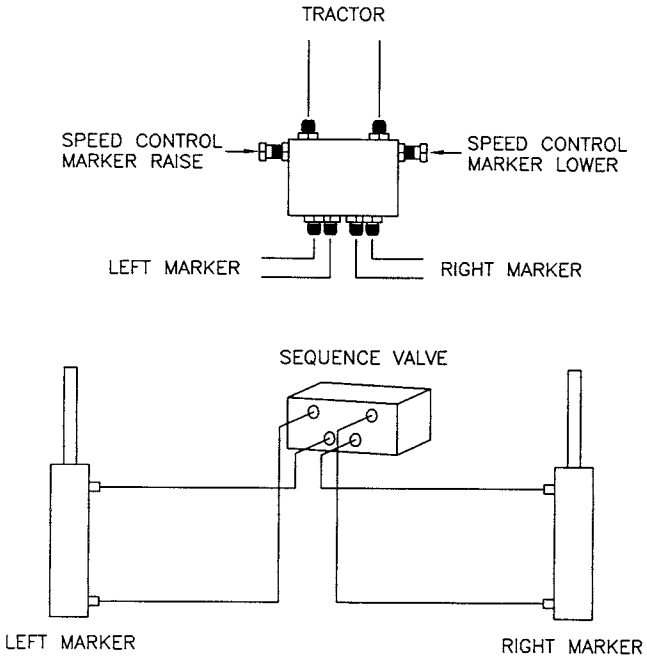
It should be noted, and especially for corn, that misshapen and angular seeds are difficult to sow regularly, particularly at high working speeds.

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

MARKER SPEED ADJUSTMENT

Markers come standard with automatic sequence valves. A flow control valve controls the lowering and raising speed of the markers. To adjust the marker speed, loosen the jam nut and turn the control clockwise or "in" to slow the travel speed and counter clockwise or "out" to increase the travel speed. The adjusting bolt determines the amount of oil flow restriction through the flow control valve, therefore determining travel speed of the markers.



Single central marker sequence valve

DANGER The flow controls should be properly adjusted before the marker assembly is first put into use. Excessive travel speed of the markers can be dangerous and/or damage the marker assembly

Note: When oil is cold, hydraulics operate slowly. Make sure all adjustments are made with warm oil.

Note: On a tractor where the oil flow can not be controlled, the rate of flow of oil from the tractor may be greater than the rate at which the marker cylinder can accept it. The tractor hydraulic control lever will have to be held until the cylinder reaches the end of its stroke. This occurs most often on tractors with an open center hydraulic system.

On tractors with a closed center hydraulic system, the tractor's hydraulic flow control can be set so the tractor's detent will function properly.

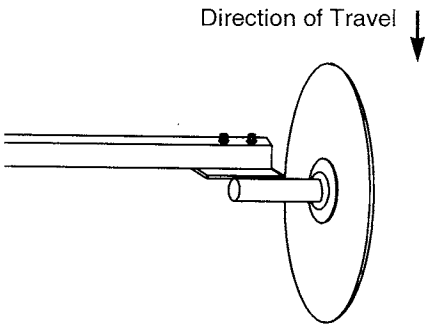
MARKER ADJUSTMENT

To determine the correct length to set the marker assemblies, multiply the number of rows by the average row spacing in inches. This provides the total planting width. Adjust the marker extension so the distance from the marker blade to the center line of the planter is equal to the total planting width previously obtained. Both the planter and marker assembly should be lowered to the ground when measurements are taken. The measurement should be taken from the point where the blade contacts the ground. Adjust right and left marker assemblies equally and securely tighten clamping bolts.

An example of marker length adjustment:

Number of rows x Row spacing = Dimension between planter center line and marker blade

8 rows x 30" spacing = 240" marker dimension

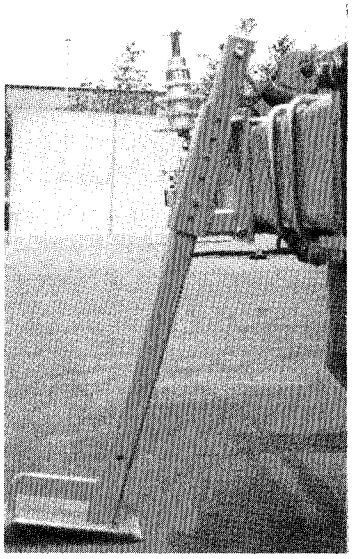


The marker blade is installed so the concave side of the blade is outward to throw dirt away from the grease seals. The spindle bracket is slotted so the hub and blade can be angled to throw more or less dirt. To adjust the hub and spindle, loosen the hardware and move the bracket as required. Tighten bolts to the specified torque.

IMPORTANT: A marker blade assembly that is set at a sharper angle than necessary will add unnecessary stress to the complete marker assembly and shorten the life of bearings and blades. Set the blade angle only as needed to leave a clear mark.

A field test is recommended to ensure the markers are properly adjusted. After the field test is made, make any minor adjustments necessary.

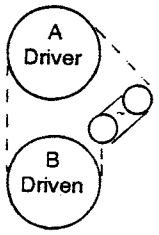
PARKING STAND ADJUSTMENT



Two parking stands are standard and located on the front side of the main frame. Do not position the stands directly behind the tractor tire or they will hit when the planter is raised. Raise the stand to top position and pin when planting, lower and pin for parking and storage. On planters equipped with front mounted drive wheels, parking stands are not required. Each parking stand has six positioning holes. This allows for setting the main frame height from 19" to 25".

TRANSMISSION ADJUSTMENT

Planting population rate changes are made at the end mounted transmission. The planter is designed to allow simple, rapid changes in sprockets to obtain the desired planting population. By removing the lynch pins on the hexagon shafts, sprockets can be interchanged with those from the sprocket storage rod bolted to the transmission. The planting rate chart will aid you in selecting the correct sprocket combinations.



SOWING DISTANCES

TRANSMISSION SELECTION
SEED SPACING SHOWN IN INCHES

NUMBER OF HOLES IN THE SEED DISC

	A	26	24	23	26	24	23	24	23	19	19	17	19	17	14	14	14
	B	17	17	19	23	23	24	26	26	23	24	23	28	28	24	26	28
9		8.8	9.6	11.2	12	13	14.2	14.6	15.4	16.4	17.2	18.4	20	22.4	23.2	25.2	27.2
18		4.4	4.8	5.6	6	6.5	7.1	7.3	7.7	8.2	8.6	9.2	10	11.2	11.6	12.6	13.6
24		3.3	3.6	4.2	4.5	4.9	5.3	5.5	5.8	6.2	6.4	6.8	7.5	8.4	8.7	9.4	10.2
30		2.7	2.9	3.4	3.6	3.9	4.2	4.4	4.6	4.9	5.1	5.5	6	6.7	7	7.6	8.1
36		2.2	2.4	2.8	3	3.2	3.5	3.7	3.8	4.1	4.3	4.5	5	5.6	5.8	6.3	6.8
40		2	2.2	2.5	2.7	2.9	3.2	3.3	3.5	3.7	3.9	4.1	4.5	5	5.2	5.7	6.1
48		1.65	1.8	2.1	2.25	2.45	2.65	2.75	2.9	3.1	3.2	3.4	3.75	4.2	4.35	4.7	5.1
60		1.3	1.4	1.7	1.8	2	2.1	2.2	2.3	2.5	2.6	2.7	3	3.4	3.5	3.8	4.1
72		1.1	1.2	1.4	1.5	1.6	1.7	1.8	1.9	2	2.1	2.3	2.5	2.8	2.9	3.1	3.4

Planting distances obtained with standard assembly and sprocket system. Additional settings are possible by using different combinations or special sprockets. Please consult us in case you have such special requirements.
Important: Poor alignment of the sprockets of the seed spacing gearbox and stiffness of the chain will cause premature side wear on the pinions. Make sure the chains are tight and properly lubricated, and the tires are properly inflated.
The above indicated spacings are theoretical and may vary from 5-10% depending on soil conditions.

DENSITIES - SEED POPULATIN CHART

AVERAGE SEED SPACING ↓	ROW SPACING 36"	38"	40"
1"	348800	330000	313600
2"	174400	165000	156800
2 3/4"	126800	120000	114000
3 1/4"	107200	101600	96400
3 1/2"	100000	94800	90000
3 3/4"	93000	88000	83600
4"	87200	82500	78400
4 1/4	82000	77600	73800
4 1/2"	77400	73400	69700
5"	69700	66000	62800
5 1/2"	63400	60000	57000
6"	58000	55000	52220
6 1/2"	53600	50800	48200
7"	50000	47400	45000
7 1/2"	46400	44000	41800
8"	43700	41400	39350
8 1/2"	41000	38800	36900
9"	38850	36774	34950
9 1/2"	36700	34750	33000
10"	34950	33074	31450
10 1/2"	33200	31400	29900
11 1/2"	30300	30700	27300
12"	29000	27500	26100
13"	26800	25400	24100
13 1/2"	25900	24550	23300
14 1/2""	24100	22850	21700

HYDRAULIC OPERATION

One, two or three control valve systems may be required depending on the model and how the planter is equipped.

Rigid frame models may be equipped with either a single or dual control valve system for the optional row markers.

MARKER HYDRAULIC OPERATION

With the single valve marker system, both markers can be used at the same time by first lowering the marker and moving the hydraulic control lever to the raise position and immediately returning it to the lower position. This will shift the marker control valve spool and the remaining marker will be lowered. This is useful in planting contours and terraces.

An additional control is required for the optional lift assist package unless it is tied into the tractor 3-point lift system. Check with your tractor dealer for parts required.

WARNING Always stand clear of marker assemblies and blades when planter is operating.

WARNING Always position lockups in "Safety" position when transporting or storing planter.

DANGER If a marker or wing lift cylinder has been removed for any reason, do not attach the rod end of the cylinder until the cylinder is cycled several times to remove any air that may be trapped in the system.

DANGER Serious injury or death can result from contact with electric lines. Use care to avoid contact with electric lines when moving or operating this machine.

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. 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 are shown below in inches of water column.

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

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 hydraulic controls. Refer to your tractor operator 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 hydraulic system controls.

HYDRAULIC DRIVE - TURBOFAN

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 & high output turbofans -
6 to 7 gallons per minute
Extra high output turbofans -
7 to 8 gallons per minute

To set the vacuum level:
1. See operator's 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.

TURBOFAN

The turbofan operates at 540 rpm For speeds of 450 or 1000 rpm a special shaft or pulley is available as optional equipment. The high output turbofan operates at 500 or 900 rpm. A pump pulley is also available as optional equipment.

Make sure that the brackets attaching the turbofan to the hitch are tight to eliminate any vibrations of the turbofan.

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.

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 meters) 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

Length of Row in Feet

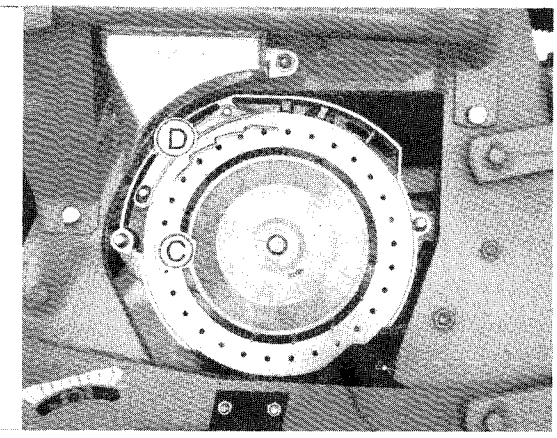
Row Width	22"	30"	36"	40"
1/200 fraction of an Acre is	119 ft.	87 ft.	$72^{1/2}$ ft.	66 ft.

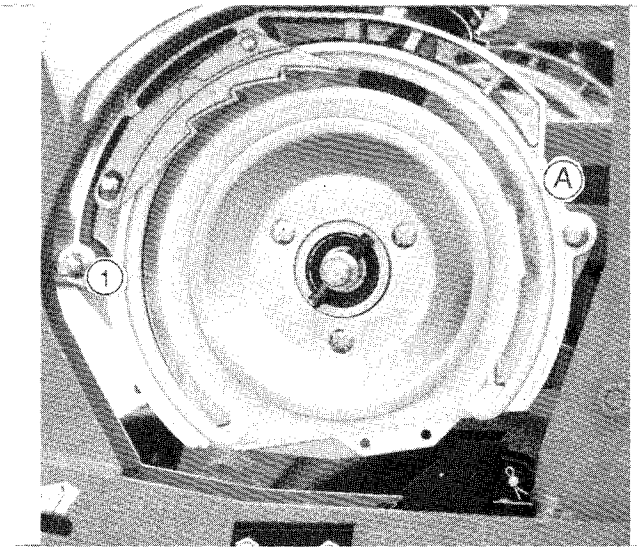
Count the seeds within the distance between the flags. Multiply the number of seeds counted in this distance by 200. This will give you the total number of seeds planted per acre.

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.

METERING BOX

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





Description:

A - Main housing mounted in the planter unit
B - Cover with trap door and control window
C - Seed disc with agitator for all seeds
D - One seed scraper for most seeds
(large seeds as peanuts use a special scraper)
E - One ejector block for most seeds
(large seeds as peanuts use a special ejector)

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

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.

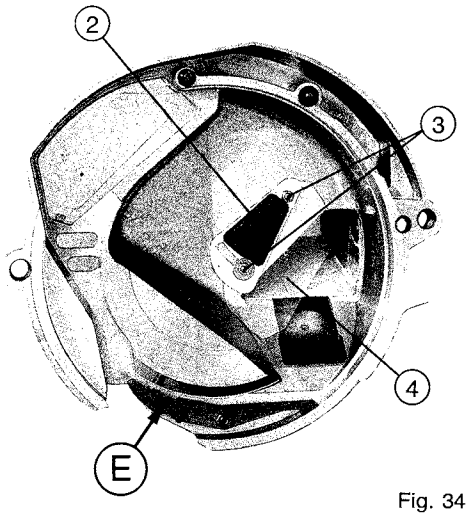


Fig. 34

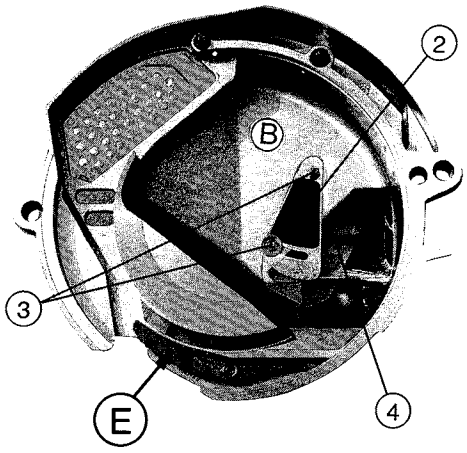


Fig. 35

A sheet metal shutter ② is mounted inside the cover Ⓑ. 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 (1,000' 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 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 Ⓔ enables the seeds to fall regularly. For this purpose, it is recommended to check its conditions periodically.

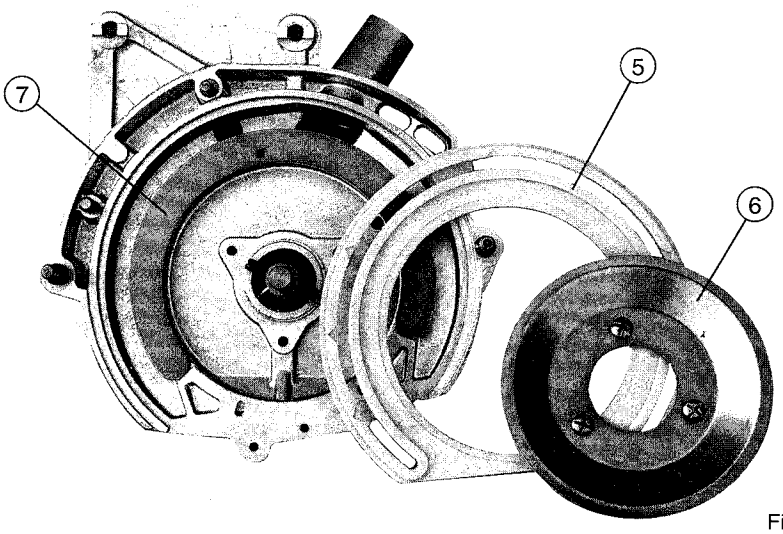


Fig. 33

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 1,250 to 2,500 acres (500 to 1,000 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 cap ⑥ and 3 bolts. (fig. 33)

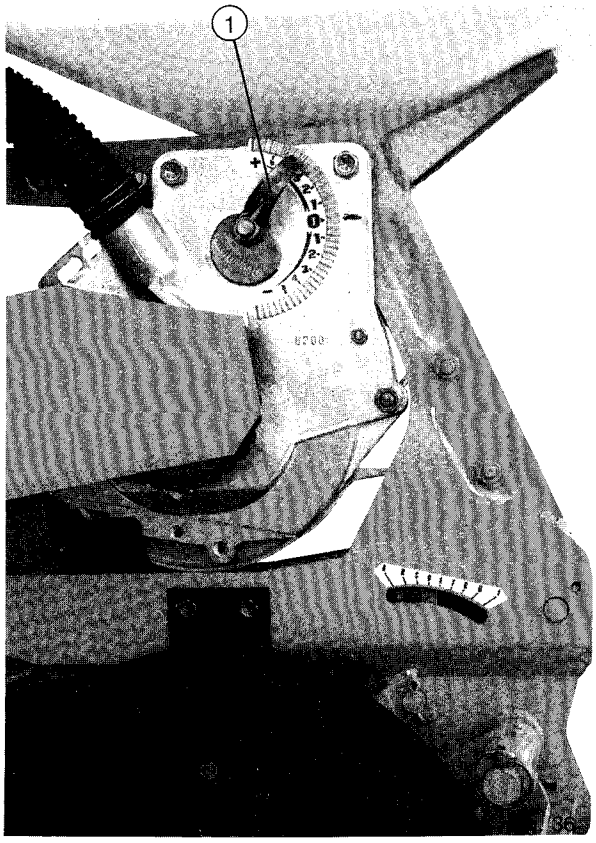
Note: Thoroughly clean the metering box housing before installing a new wear gasket. Any residue left from previous use will not allow the gasket to fit in the proper position.

*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.

Two factors influence the degree of singulation of the seed:

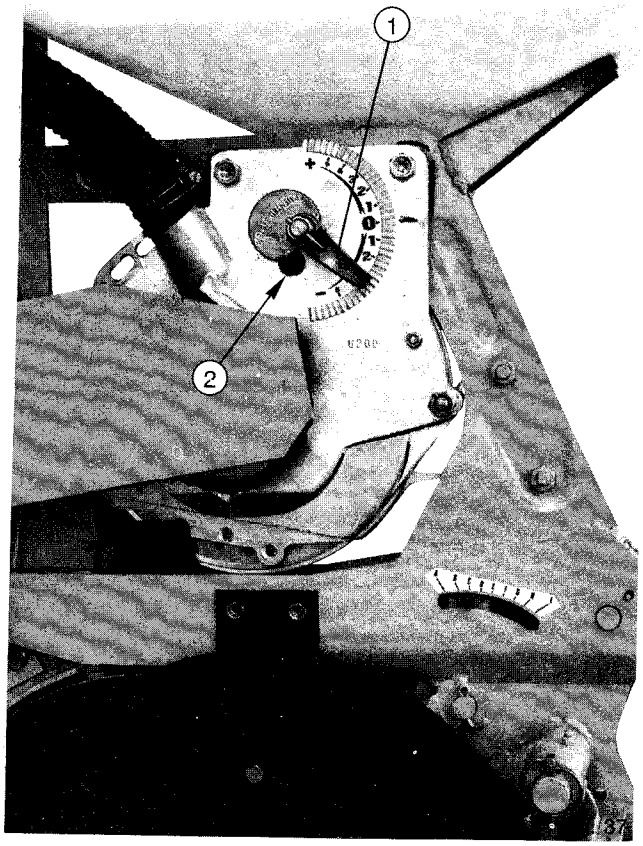
1. The position of the seed scraper in relation to the holes in the disc. It is therefore necessary to adjust the height of the scraper as needed for each seed type.

2. The degree of suction 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 (figs. 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 the "-" (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.

Recommended setting for indicator ① (fig. 36).

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 500 rpm PTO speed except for large seed (kidney beans, peanuts) for which a slightly higher speed (5-10%) is preferable. It is then recommended to run at 540 rpm PTO speed.

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

Notes for seed disc use:

SEED DISC

Use the proper seed disc for different seeds. Check your type of seed, and use the suggested seed disc chart on the following page to determine 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.

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 Medium (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"
	DC3x3x2.5	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"

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.

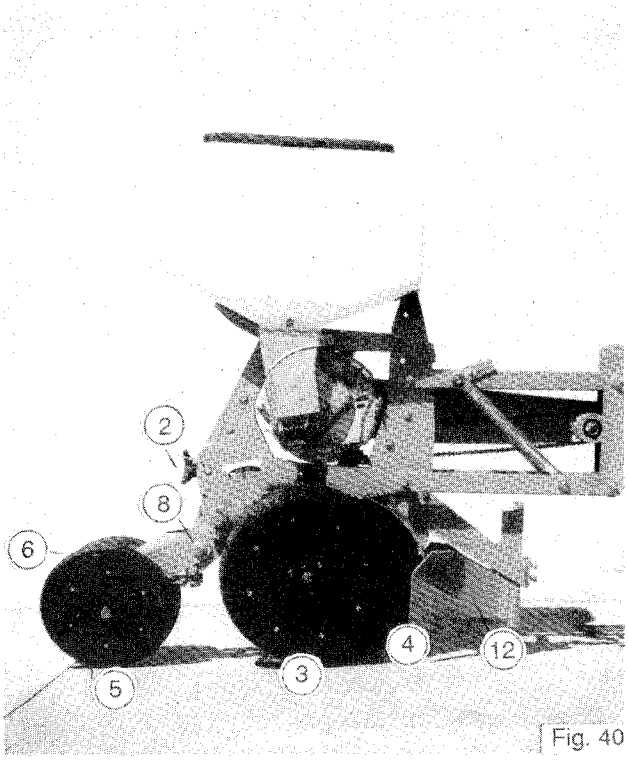


Fig. 40

The seed depth is adjusted by the handwheel ② which changes the height of the depth gauge 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 two adjustable 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. There are two different width settings to obtain better seed to soil contact when planting shallow or small seed such as beets and pickles.

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.

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 conditions.

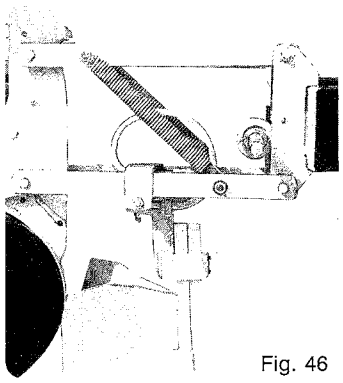


Fig. 46

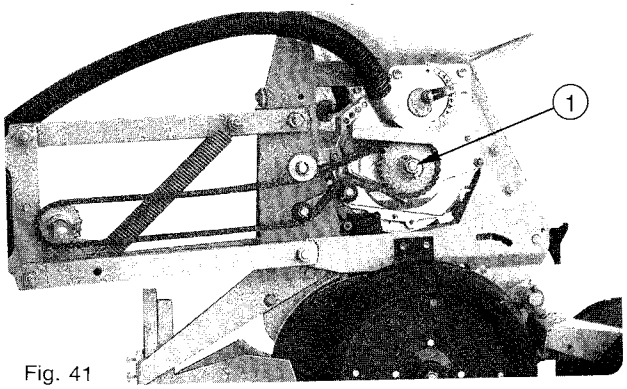


Fig. 41

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

The drive chain is mounted as shown in fig. 41.

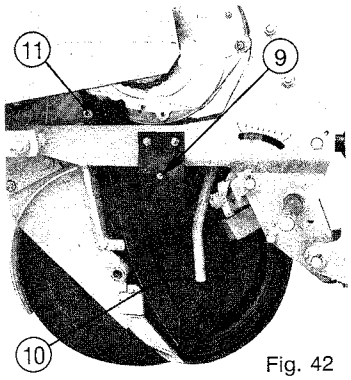
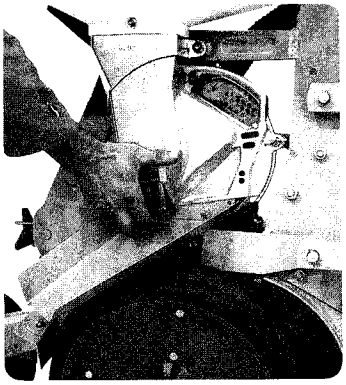


Fig. 42

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, remove pin 11 after removing the gauge wheel and furrow disc opener on one side (fig. 42).

Note: If the optional V shoe insert is used for small seed, it must be removed when planting larger seeds such as beans, as it will cause plugging due to normal crimping of the seed tube during installation.



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

OPTIONAL ITEMS

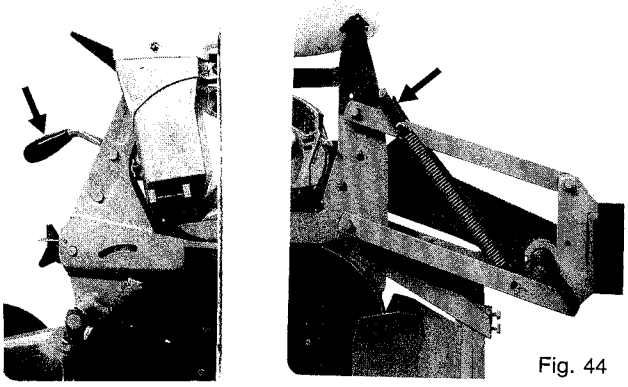
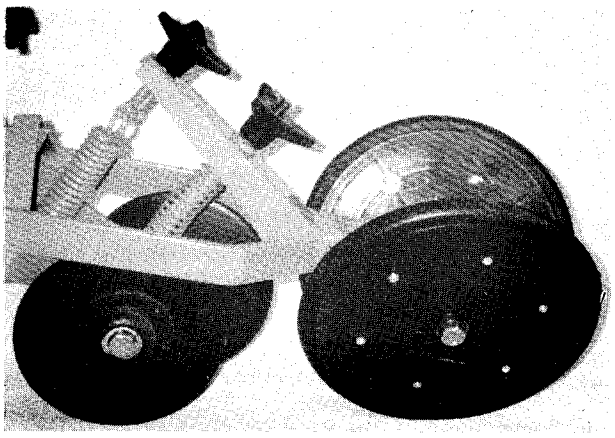


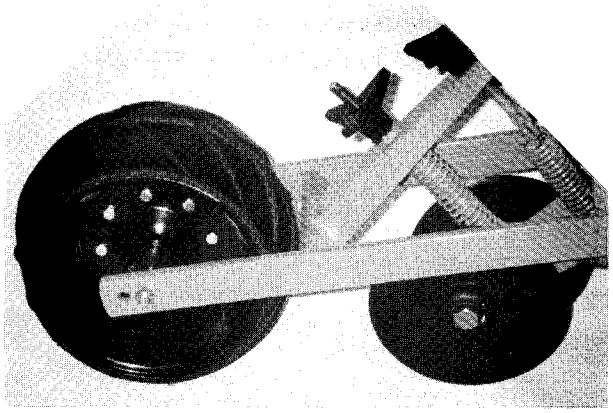
Fig. 44

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

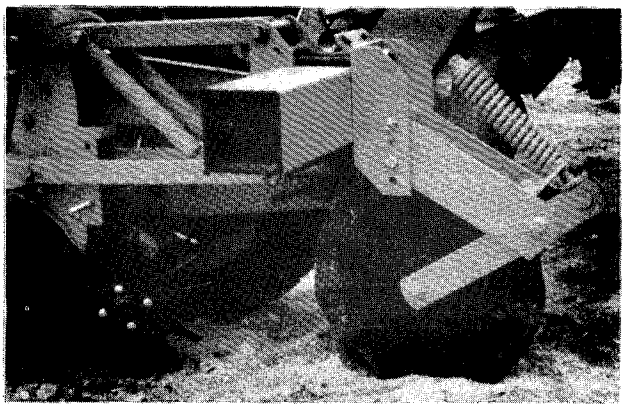


A **V press wheel with disc closing system** with twin off-set discs and a V press wheels features an adjustable down pressure spring and an independent spring-loaded adjustment for discs.

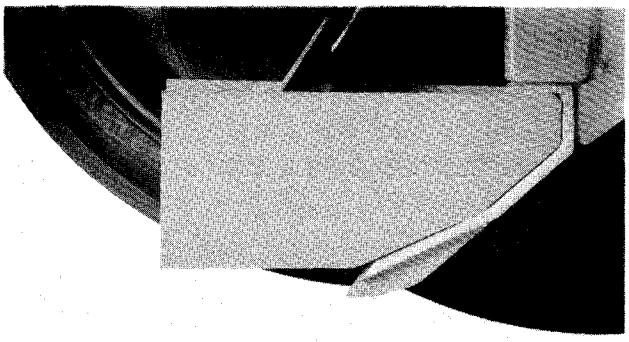
Gauge Wheel Scrapers keep sticky soil off of the gauge wheel.



A **flat press wheel with disc closing system** is used for cotton or other shallow planted crops, features an adjustable down pressure spring and an independent spring-loaded adjustment for discs.



No-till coulter, mounted to either side of the toolbar frame or mounted to the planter unit.
A **residue manager** is available for minimum and no-till situations.



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

ELECTRONIC SEED MONITOR

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.

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 sensors. 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.

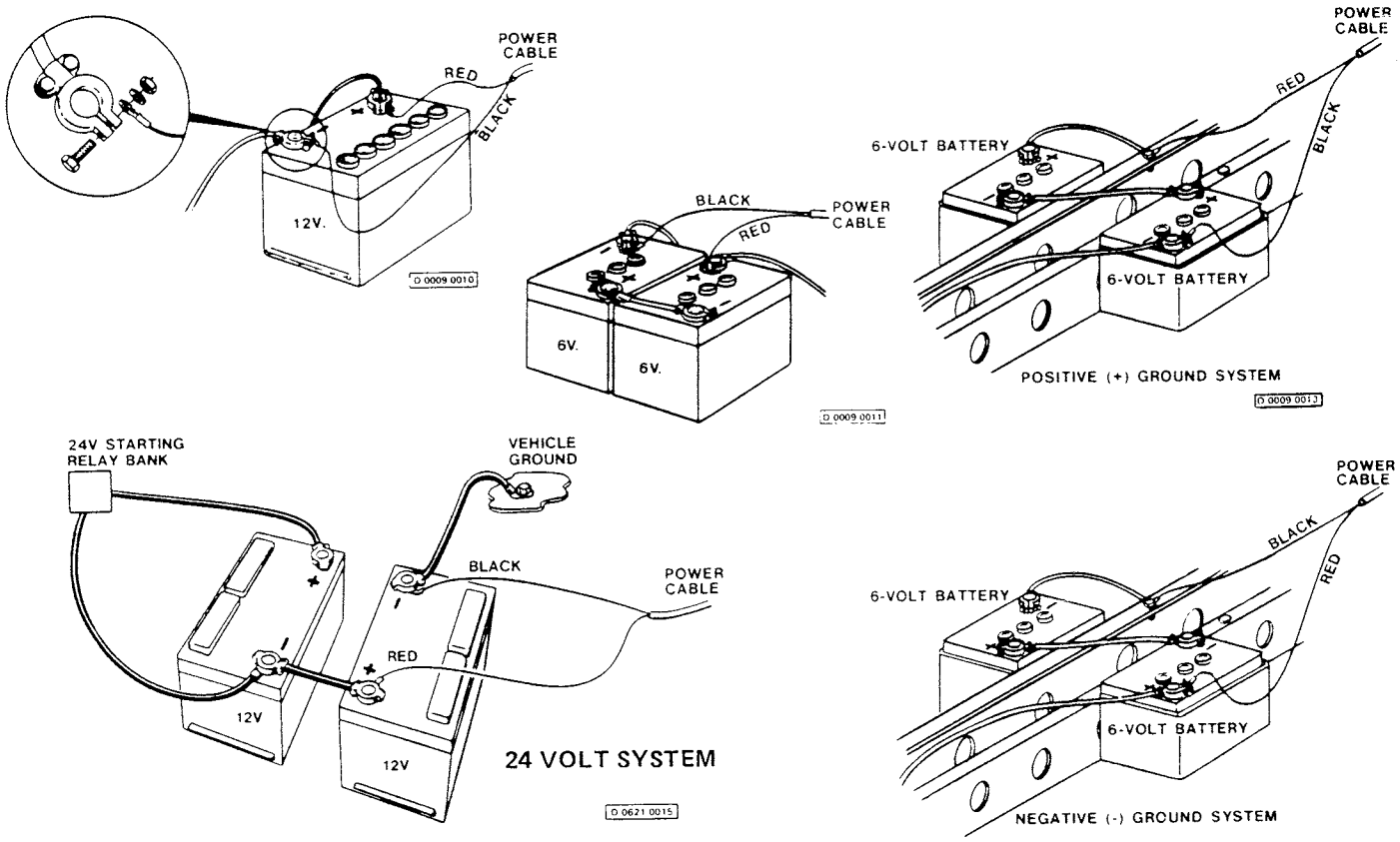
If sensor leads are damaged, carefully cut away the cable covering the damaged area. Repair damaged wire by soldering wires together, matching colors. Tape each repaired wire as well as the cut cable covering.

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.

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.

ELECTRONIC SEED MONITOR



POWER CONNECTIONS

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 the 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 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.

GRANULAR INSECTICIDE

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.

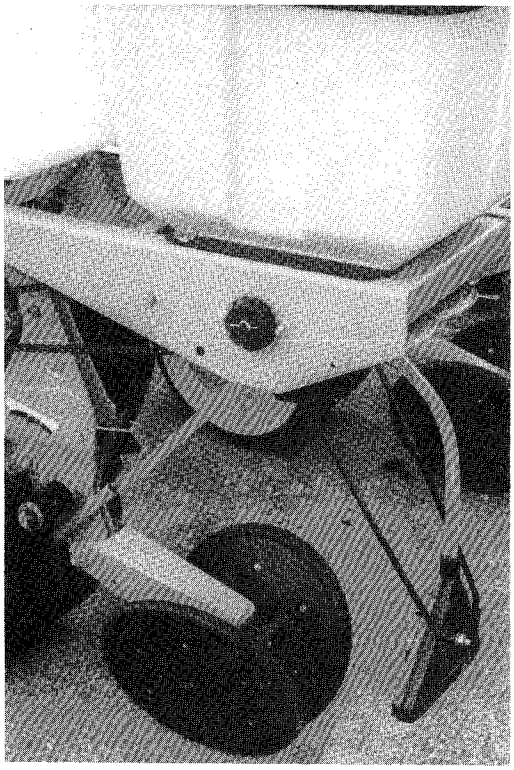
Row Width	Factor
38"	1.7
36"	1.8
30"	2.2
22"	3.0

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 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 or between the disc openers. The granular herbicide is normally directed through a spreader behind the closing wheels.



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 is ground driven, and the output is set by means of a transmission which is unaffected by a change in planting speed. The microsem system is mounted to the toolbar frame to reduce weight on the planter unit. Each microsem hopper has a 33 lb capacity.

Setting of the Output

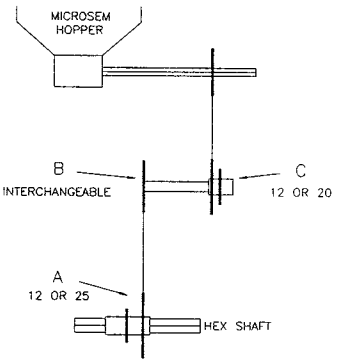
The output is a function of the number of rotations of the spindle of the metering boxes. The drive system is a central drive system which is set primarily with the double sprocket and the interchangeable sprockets. The microsem setting chart will assist with the setting and also indicates the sprockets 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. 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 SETTING CHART - TWIN ROW



MICROSEM SETTING CHART - Drive sprockets to be used

A = Double sprocket on hex shaft - driven 1

B = Interchangeable sprocket - driven 2

C = 12 or 20 tooth sprocket

#'s PER ACRE		10.7	12.84	14.44	16.06	19.64
		A/B/C	A/B/C	A/B/C	A/B/C	A/B/C
THIMET	36"	12/18/20	12/15/20	25/16/12	25/15/12	25/12/12
20G	38"	25/22/12	25/18/12	25/15/12	12/12/20	
	40"	12/10/12	25/16/12	12/12/20	25/22/20	
#'s PER ACRE		11.7	13	14.4	17.4	19.4
		A/B/C	A/B/C	A/B/C	A/B/C	A/B/C
FURADAN	36"	12/18/12	12/16/12	12/15/12	12/12/12	12/18/20
15G	38"	12/16/12	12/15/12	12/23/20	25/24/12	25/22/12
	40"	12/15/12	12/15/12	12/22/20	12/18/20	25/22/12
#'s PER ACRE		10.8	14.26	17.82	21.4	25
		A/B/C	A/B/C	A/B/C	A/B/C	A/B/C
COUNTER 15G	36"	12/18/20	25/16/12	25/22/20	25/18/20	25/15/20
LORSBAN 15G	38"	12/10/12	25/15/12	12/10/20	25/10/12	25/14/20
	40"	12/15/20	12/12/20	25/12/12	25/15/20	25/12/20
#'s PER ACRE		7.12	17.8	21.9	26.7	
		A/B/C	A/B/C	A/B/C	A/B/C	
TEMIK	36"		12/18/20	12/15/20	25/15/12	
15G	38"		25/22/12	25/18/12	25/22/20	
GYPSUM	40"	12/25/12	12/10/12	25/15/12	25/12/12	

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 varations will not affect the output.

MICROSEM SETTING CHART - TWIN ROW

#'s PER ACRE		3.56	8.9	17.8					
		A/B/C	A/B/C	A/B/C					
TEMIK 15G	36"	12/22/12	12/15/20	25/15/20					
CORNCOB	38"	12/20/12	25/16/12	25/12/20					
GRIT	40"	12/18/12	25/15/12	25/12/20					
#'s PER ACRE		5.4	6.4	7.4	9				
		A/B/C	A/B/C	A/B/C	A/B/C				
ZENECA FORCE	36"	12/15/12	12/22/20	12/18/20	12/15/20				
3G	38"	12/23/20	12/12/12	25/22/12	25/18/12				
	40"	12/22/20	12/18/20	12/10/12	25/18/12				
#'S PER ACRE		6/8	8	9.2	9.8				
		A/B/C	A/B/C	A/B/C	A/B/C				
RIDOMIL	36"	12/22/20	25/24/12	12/18/20	12/15/20				
GOLD GR	38"	12/21/20	25/22/12	25/22/12	25/18/12				
PC11G	40"	12/12/12	25/20/12	12/10/12					
#'s PER ACRE		6.2	7	8.4	10.2	5.7	7	8.5	10.6
		A/B/C	A/B/C	A/B/C	A/B/C	A/B/C	A/B/C	A/B/C	A/B/C
GOLD PC	36"	12/15/12	12/22/20	12/18/20	12/15/20	25/18/12	25/22/20	25/12/12	12/12/12
	38"	12/23/20	12/21/20	25/22/12	25/18/12	25/16/12	25/22/20	25/18/20	
	40"	12/22/20	12/12/12	12/10/12	25/18/12				
#'s PER ACRE		27							
		A/B/C							
AMEBIN	36"	25/12/12							
	38"	25/10/12							
	40"	25/18/20							

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.

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

Excessive Doubling
- Seed scraper too high (bad setting on indicator)
- Seed 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

Irregular Seeding (Skipping/Doubles)
- Excessive working speed
- Holes of seed disc too large (cut off seeds)
- Fields are too steep
- Shutter adjusted incorrectly

Irregular Spacing
- Excessive working speed
- Soil too wet and sticking to drive wheel tires
- Incorrect tire pressure
- Shutter adjusted incorrectly
- Ejector is damaged

Microsem (variations between the outlets or metering boxes)
- 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

Row Marker
- Both markers lowering and only one raising at a time:
- Hoses from cylinders to valve connected backwards
- Check hosing diagram in manual and correct

- Same marker always operating:
- Spool in sequencing valve not shifting
- Remove spool, inspect for foreign material, making sure all ports in spool are open, clean and reinstall

Both markers lower and raise at same time:
- Foreign material under check ball in sequencing valve
- Remove hose fitting, spring and balls, and clean. May be desirable to remove spool and clean as well.
- Check ball missing or installed incorrectly in sequencing valve.
- Disassemble and correct.

Marker (in raised position) setting down
- Damaged O-ring in marker cylinder or cracked piston
- Disassemble cylinder and inspect for damage or repair
- Spool in sequencing valve not shifting completely because detent ball or spring is missing.
- Check valve assembly and install parts as needed
- Spool in sequencing valve shifting back toward center position
- Restrict flow of hydraulic oil from tractor to sequencing valve.

Row Marker continued

Neither marker will move
- Flow control closed too far
- Loosen locking nut and turn flow control adjustment bolt out or counterclockwise until desired speed is set

Markers moving too fast
- Flow control open too far
- Loosen locking nut and turn flow control adjustment bolt in or clockwise until desired speed is set

Sporadic marker operation speed
- Needle sticking open in flow control valve
- Remove flow control, inspect and repair or replace