

# **MONOSEM**

## **PNEUMATIC PLANTER**

---

### **OPERATOR'S MANUAL**



### **PULL - TYPE PLANTER**

---

*INCLUDES:*

### **INSTRUCTIONS FOR**

- Operation
- Adjustment
- Maintenance

**A.T.I., INC**  
17135 W. 116th Street  
Lenexa, KS 66219  
(913) 438-1700  
FAX (913) 438-5455



# TABLE OF CONTENTS

---

Introduction	1-1,1-2
Specifications	2-1, 2-2
Safety	3-1, 3-2, 3-3
Operation	
Planter Preparation	4-1
Tractor Preparation	4-1
Planter Attachment to Tractor	4-1
Leveling the Planter	4-2
Tire Pressure	4-2
Transmission Adjustment	4-3
Sowing Distances, Transmission Selection Chart 4,6,8,12-Row	4-4
Sowing Distances, Transmission Selection Chart, 24-Row	4-4.1
Densities, Seed Population Chart	4-5
Planting Rates, 24-Row, Beans, Beets, Sunflowers	4-5.1
Planting Rates, Soybeans 30" Row Spacing	4-5.2
Planting Rates Corn 30" Row Spacing	4-5.3
Operating Speed	4-6
Contact Drive Wheel Spring Adjustment	4-6
Tire Scraper	4-7
Ridge Planting	4-7
Sheer Protection	4-7
Manual Wing Fold	4-7.1
Hydraulic Wing Fold	7-7.2, 4-7.3
Hydraulic Row Marker Operaton	4-8
Hydraulic Planter Lift Operation	4-8
Marker Speed Adjustment	4-9
Marker Adjustment	4-9, 4-10
Metering Box	4-11
Metering Box Shutter	4-12
Metering Box Assembly	4-13
Metering Adjustments	4-14, 4-15, 4-16
Standard Seed Discs	4-15
Planter Metering Unit	4-17, 4-18
Optional Equipment	4-19, 4-20
Electronic Seed Monitor	4-21
Double Disc Fertilizer Opener	4-21, 4-22
Dry Fertilizer Attachment	4-22, 4-23
Cleaning	4-23, 4-24
Dry Fertilizer Application Rates	4-25
Liquid Fertilizer Application Rates	4-25.1
Granular Insecticide/Herbicide System	4-26
Lubrication	
Sealed Bearings	5-1
Drive Chains	5-1
Wheel Bearings	5-2
Grease Fittings	5-2, 5-3
Maintenance	6-1, 6-2
Trouble Shooting and Causes	7-1, 7-2

---

## TABLE OF CONTENTS, continued

---

Replacement Parts	8-1
Hitch and Frame Assembly	8-2, 8-3
Transport and Ground Drive Wheel Assembly	8-4, 8-5
Contact Drive Wheel and Arm Assembly	8-6, 8-7
Drive Line, 4,6,8,12,24-Row	8-8, 8-9
Transmission Assembly	8-10, 8-11
Transmission Assembly, 16, 18, 24-Row	8-11.1, 8-11.2
Conventional Marker Assembly, 4, 6-Row	8-12, 8-13
Low Profile Marker Assembly 6,8-Row	8-15, 8-15
Marker Spindle-Hub Blade	8-16, 8-17
Hydraulic System Conventional Marker, 4,6-Row	8-18, 8-19
Hydraulic System Low Profile Marker, 6, 8-Row	8-20, 8-21
Turbofan Standard, Turbofan, High Output	8-22, 8-23
Planting Unit NG Plus	8-24, 8-25
Optional Wheels, Planting Unit	8-25.1, 8-25.2
Metering Box NG Plus	8-26, 8-27
Double Disc Fertilizer Opener & Mounting Bar	8-28, 8-29
Dry Fertilizer Transmission Assembly	8-30, 8-31
Granular Insecticide/Herbicide System	8-32, 8-33
Hydraulic Wing Fold, Cylinder, Selector Valve, Marker Sequencing Flow Control Valve	8-34, 8-35
Hitch & Frame Assembly, 8-row,12-row, 24-row	8-36, 8-37
Low Profile Three-Fold Marker, 12, 24-Row, Hydraulic System	8-38, 8-39
Cylinders, Master Lift, Slave Lift	8-40, 8-41
Cylinders, Assist Lift, Marker, 24-Row	8-42
Cylinders, Assist Lift, Marker	8-43
Cylinders, Assist Lift, Marker	8-44

---

*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.

## Introduction

---

The Model NG Plus Pull-Type planter is available in various configurations and row spacings. A dry fertilizer system, insecticide and herbicide applicator and seed monitor are available.



A 6-row with fertilizer and insecticide-herbicide applicator.

### **SERIAL NUMBER**

The serial number plate is located on the center front of the toolbar. Be sure to record your serial number on page 1-1 of your manual.

## Specifications

---

### **FRAME - Pull-type**

Rigid Frame 4, 6, and 8 row  
Center Flex Manual Front Fold, 12 row  
Center Flex Hydraulic Front Fold,  
12 and 24 row

### **PLANTING UNIT - NG PLUS MONOSEM**

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

### **STANDARD ROW SPACING**

4 Row Narrow - 30" Rows  
4 Row Wide - 36" or 38" Rows  
6 Row Narrow - 30" Rows  
6 Row Wide - 36" or 38" Rows  
8 Row Narrow - 30" Rows  
8 Row Wide - 36" or 38" Rows  
12 Row Narrow - 30" Rows  
24 Row Narrow - 22" Rows

### **DRIVE SYSTEM**

Spring-loaded contact drive tire  
(4.10" x 6") with No. 40 chain. One  
on 4 row. Two on 6, 8, and 12 row,  
Four on 24 row.  
Quick-adjust end mounted seed trans-  
mission with machined sprocket  
(2 on 8, 12 and 24 row).  
7/8" hex drive and drill shafts (with  
spring-loaded, hardened wing  
couplers on 12 row).

### **TRANSPORT TIRES**

7.50"x20", 6 ply  
Two tires on 4 row  
Four tires on 6 and 8 row, six on 12,  
and 24 row  
Adjustable height wheels for ridge  
planting.

### **TYPE LIFT**

Master/slave hydraulics  
4 row master/slave rephasing  
(2 cylinders)  
6 and 8 row master/slave rephasing  
with assist cylinders (4 cylinders)  
12 row master/slave rephasing with  
assist cylinders (6 cylinders)  
24 row master/slave rephasing  
with assist cylinders (6 cylinders)

### **MARKERS**

Heavy-duty conventional:  
4 row narrow/wide and 6 row narrow  
Low profile two-fold  
6 row wide and 8 row narrow  
Low profile three-fold 12 row narrow  
Low profile three-fold 24 row narrow

### **HYDRAULICS**

Hydraulics for 4, 6 and 8 row  
Standard: Single SCV  
Optional: Dual SCV for independent  
operation of lift and markers.  
Hydraulic alternating sequence valve  
with flow controls for markers.  
  
Hydraulics for 12 and 24 row  
Dual SCV for independent operation of  
lift and markers. Hydraulic sequence  
valve with flow controls for markers.  
  
Hydraulics for front fold  
Optional for 12 and 24 row.

Specifications

<b>DIMENSIONS &amp; WEIGHTS</b>			
<b>SIZE</b>	<b>TRANSPORT WIDTH</b>	<b>SINGLE FRAME LENGTH</b>	<b>SINGLE FRAME WEIGHT*</b>
4 Row Narrow - 30"	12' 8"	12' 6"	2083
4 Row Wide - 36"-40"	14' 8"	12' 6"	2154
6 Row Narrow - 30"	17' 8"	12' 6"	3318
6 Row Wide - 36"-40"	20' 2"	12' 6"	3573
8 Row Narrow - 30"	21' 10"	12' 6"	4694
8 Row Wide - 36"-38"			
12 Row Narrow - 30"	16' 4"	17' 9"	7389
24 Row Narrow - 22"	23' 2"	24' 6"	10489

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



# Safety

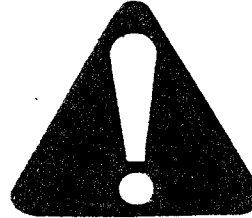
---

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:

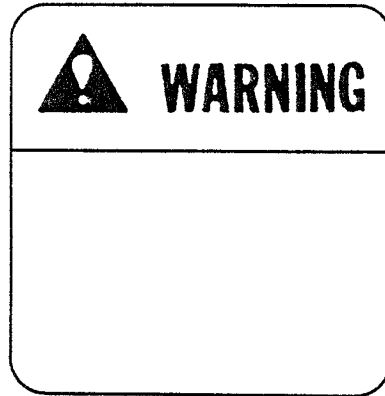
**ATTENTION  
BECOME ALERT  
YOUR SAFETY IS INVOLVED**



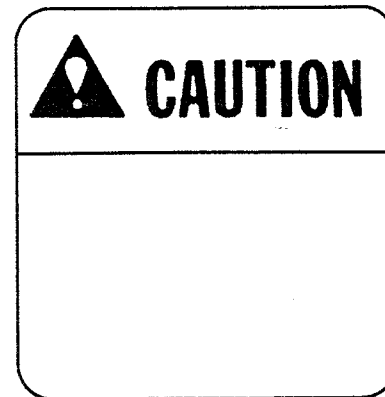
**DANGER** Indicates an immediate hazardous situation which if not avoided, will result in death or serious injury.



**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.

**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 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 toolbar. 0891-45201




**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

**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. 0891-7104

**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**

SPRING UNDER PRESSURE  
DO NOT DISASSEMBLE

7100-24

KG7100-194

**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**

**TOW ONLY WITH FARM TRACTOR**

Located on the pull hitch. 0891-4615.1a

**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

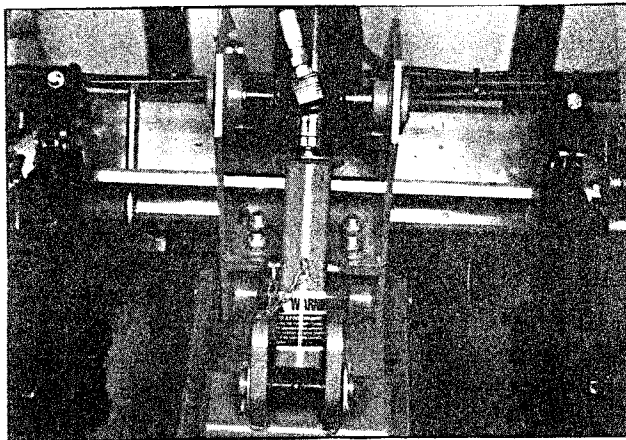
Safe and careful operation of the planter will contribute significantly to the prevention of accidents. Listed below are safety precautions that should become standard practice during the operation and transport of the planter.

**⚠ Never allow the planter to be operated by anyone who is unfamiliar with all functions of the unit.**

**⚠ Read and understand the operators manual.**

**⚠ Do not permit riders on the planter frame.**

**⚠ Clear the area of all persons when the planter is in operation.**



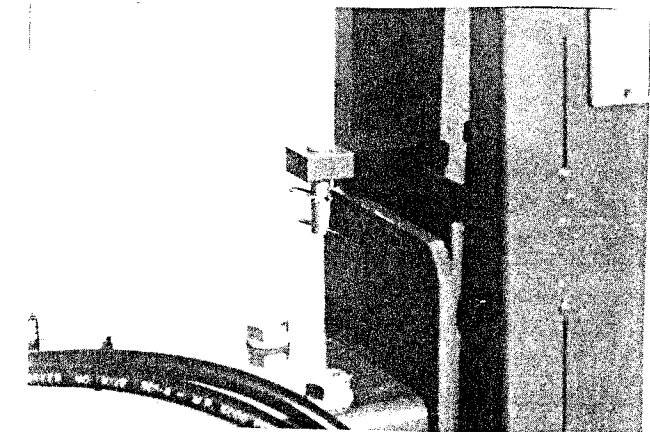
Lift Cylinder Lockup

**⚠ Always install all cylinder lockup brackets before transporting the planter.**

**⚠ Never work under the planter while in raised position without installing cylinder lockup brackets.**

**⚠ Before operating the planter for the first time and periodically thereafter, check to be sure the lug nuts on the transport wheels are tight. This is especially important if the planter is to be transported for a long distance.**

**⚠ Use extreme care when operating the planter as well as row markers near obstructions as electrical wires and tree limbs.**



Row marker locking pin.

**⚠ Stand clear and keep others away when raising or lowering the row markers. Lock row markers for transport using the locking pin.**

**⚠ Limit the towing speed to 15 mph. Tow only with farm tractor of at least 50 HP.**

**⚠ Use necessary safety lights and devices and observe legal regulations before transporting planter on public roads.**

## 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.

## TRACTOR PREPARATION


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.

One dual remote hydraulic outlet (SCV) is required on models equipped with the standard single valve hydraulic system. Two dual remote hydraulic outlets (SCV) are required on models equipped with the optional dual valve hydraulic system.


## PLANTER ATTACHMENT TO TRACTOR

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


- 1) Adjust the tractor drawbar so it is 13 to 17 inches above the ground. Adjust the drawbar so that the hitch pin hole is directly below the center line of the PTO shaft. Make sure the drawbar is in a stationary position.
- 2) Back the tractor to the planter and connect them with a hitch pin. Make sure the hitch pin is secured with a locking pin or cotter pin.
- 3) 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 of the constant velocity (double clutch) 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.

- 4) 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.

- 5) Raise the jack stand and remount horizontally on the storage bracket.
- 6) Lower the planter to the planting position and check that the planter is level (front to back and side to side). If the hitch height is too high or too low, disconnect the planter and adjust the hitch clevis in an up or down position as necessary.

## LEVELING THE PLANTER

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

Unless the tractor drawbar is adjustable for height, the fore and aft level adjustment must be maintained by the position of the hitch clevis. Holes in the hitch bracket allow the clevis to be raised or lowered. When installing clevis mounting bolt, tighten hex nut to proper torque setting.

With the planter lowered to proper operating depth, check to be sure 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 pressures specified below.

## TIRE PRESSURE

Tire pressure should be checked regularly and maintained as follows:

Transport Ground Drive 7.50"x20" - 40 PSI  
Contact Drive 4.10"x6" - 60 PSI

## TIRE PRESSURE CONTINUED

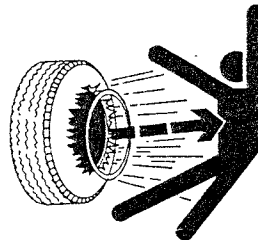
**⚠ DANGER** Rim and tire servicing can be dangerous. Explosive separation of a tire and rim parts can cause serious injury or death.

**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 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 inflating.**

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

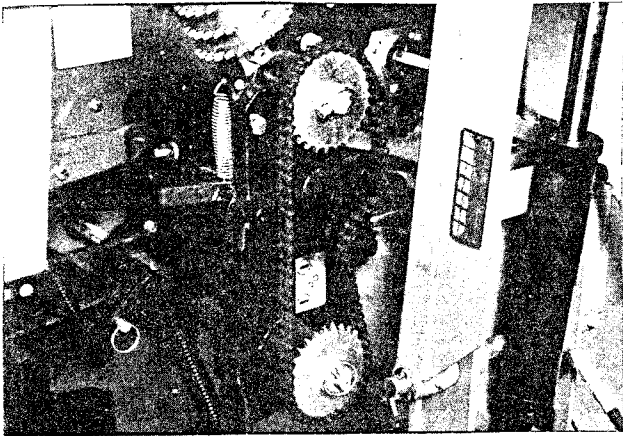


## TRANSMISSION ADJUSTMENT

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.

Chain tension is controlled by a spring-loaded dual sprocket idler. The idler assembly is adjusted with a ratchet arm. This arm has a release position to remove spring tension for replacing sprockets. The amount of spring tension on the chain can be controlled by the ratchet arm.

The planting rate chart on the next page of this section will aid you in selecting the correct sprocket combinations.

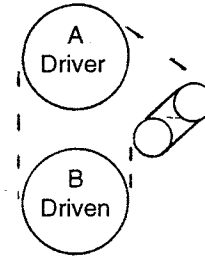


Transmission Selection Use for 4-, 6-, 8- and 12-Row Pull-Type Models

**SOWING DISTANCES**

Number of Holes in the Seed Discs

**TRANSMISSION SELECTION  
SEED SPACING SHOWN IN INCHES**



	A	30	28	26	24	28	26	25	25	27	24	24	19	19	19	17	17
	B	17	17	17	17	23	23	23	24	28	26	27	23	26	28	28	30
<b>9</b>		8.4	9.4	10	11	12.8	13.8	14.4	15	15.8	16.8	17.4	18.8	21	22.8	25.6	27.4
<b>18</b>		4.2	4.7	5.0	5.5	6.4	6.9	7.2	7.5	7.9	8.4	8.7	9.4	10.5	11.4	12.8	13.7
<b>24</b>		3.18	3.5	3.8	4.1	4.8	5.15	5.4	5.6	6.0	6.3	6.5	7.0	8.0	8.6	9.6	10
<b>30</b>		2.6	2.8	3	3.3	3.8	4.1	4.3	4.5	4.8	5.0	5.2	5.6	6.3	6.8	7.7	8.2
<b>36</b>		2.1	2.4	2.5	2.8	3.2	3.4	3.6	3.7	4.0	4.2	4.4	4.7	5.3	5.7	6.4	6.8
<b>40</b>		1.95	2.1	2.25	2.48	2.85	3.08	3.02	3.38	3.6	3.75	3.9	4.2	4.73	5.1	5.78	6.15
<b>60</b>		1.3	1.4	1.5	1.7	1.9	2.1	2.2	2.3	2.4	2.5	2.6	2.8	3.2	3.4	3.8	4.1
<b>72</b>		1.1	1.2	1.3	1.4	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.4	2.6	2.9	3.2	3.3

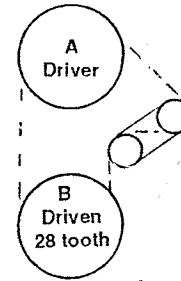
Planting distances obtained with standard assembly and sprocket system. Additional settings are possible by using different combinations or special sprockets. Please consult us in case you have such special requirements. **Important:** Poor alignment of the sprockets of the seed spacing gearbox and stiffness 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.**

**SOWING DISTANCES**

Number of Holes in the Seed Disc

**TRANSMISSION SELECTION  
SEED SPACING SHOWN IN INCHES**



	A	30	27	25	24	23	21	19	17
	B	28	28	28	28	28	28	28	28
<b>18</b> SUNFLOWER		7.2	8.0	8.7	9.0	9.5	10.4	11.5	12.8
<b>40</b> BEETS		3.2	3.6	3.9	4.1	4.3	4.7	5.1	5.78
<b>48</b> BEANS EDIBLE		2.8	3.0	3.3	3.4	3.6	3.9	4.3	4.8
<b>60</b> BEANS SOYA		2.2	2.4	2.6	2.7	2.9	3.1	3.4	3.8

Planting distances obtained with standard assembly and sprocket system. Additional settings are possible by using special sprockets or different combinations such as by changing the driven 28 tooth sprocket. 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 Population Chart**

Average  
Seed  
Spacing



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

**APPROXIMATE PLANTING RATES FOR 22" ROW SPACING**

TRANSMISSION SPROCKETS		48 CELL EDIBLE BEANS		40 CELL BEETS		18 CELL SUNFLOWERS	
DRIVE	DRIVEN	SEED SPACING	POPULATION ACRE	SEED SPACING	POPULATION ACRE	SEED SPACING	POPULATION ACRE
17	28	4.8	59,375	5.8	49,178	12.8	22,265
19	28	4.3	66,279	5.1	55,882	11.5	23,480
21	28	3.9	73,077	4.7	60,638	10.4	27,404
23	28	3.6	79,166	4.3	66,279	9.5	30,000
24	28	3.4	83,823	4.1	69,512	9.0	31,666
25	28	3.3	86,364	3.9	73,076	8.7	32,757
27	28	3.0	95,000	3.6	79,167	8.0	35,750
30	28	2.8	101,786	3.2	89,063	7.2	39,583

The above rates are theoretical and approximate. The actual output may vary slightly.

**APPROXIMATE PLANTING RATES FOR SOYBEANS AT 30" ROW SPACING**

TRANSMISSION SPROCKETS		60 CELL		60 CELL W/HIGH POPULATION SPROCKETS *	
DRIVE	DRIVEN	SPACING	POPULATION/ACRE	SPACING	POPULATION/ACRE
17	30	4.1	51,097	2.9	72,327
17	28	3.8	55,131	2.7	78,037
17	27	3.7	57,173	2.6	80,928
17	26	3.5	59,372	2.5	83,926
19	28	3.4	61,617	2.4	87,154
-----					
19	27	3.3	63,899	2.3	90,449
17	24	3.2	64,319	2.2	93,799
17	23	3.1	67,116	2.2	94,416
19	25	3.1	69,011	2.1	98,521
19	24	3.0	71,887	2.1	101,303
-----					
23	28	2.9	74,589	2.0	105,524
19	23	2.8	75,012	1.9	109,491
24	28	2.7	77,832	1.9	110,112
24	27	2.6	80,715	1.8	114,252
17	19	2.6	81,246	1.8	118,483
-----					
24	26	2.5	83,819	1.8	119,263
26	28	2.5	84,319	1.7	123,040
24	25	2.4	87,172	1.7	123,773
26	27	2.4	87,441	1.6	127,962
23	23	2.4	90,804	1.6	128,357
-----					
27	26	2.3	94,296	1.6	133,294
24	23	2.3	94,752	1.5	138,420
25	23	2.2	98,700	1.5	139,089
19	17	2.2	101,487	1.4	144,884
27	24	2.1	102,154	1.4	148,975
-----					
28	24	2.0	105,938	1.4	149,955
23	19	2.0	109,920	1.3	155,509
28	23	1.9	110,544	1.3	161,355
24	19	1.8	114,700	1.3	162,270
25	19	1.8	119,479	1.2	168,371
-----					
23	17	1.7	122,853	1.2	175,386
26	19	1.7	124,259	1.2	180,338
27	19	1.6	129,037	1.1	182,402
28	19	1.6	133,817	1.1	189,417
26	17	1.5	138,877	1.1	196,433
-----					
27	17	1.4	144,219	1.0	203,861
28	17	1.4	149,560	.9	211,702
30	17	1.3	155,600	.9	219,542

\* To achieve a higher than average population, a 23 tooth sprocket can replace the 15 tooth sprocket on the contact drive wheel. Three (3) additional chain links are needed on the contact drive wheel when using this combination. The above rates are theoretical and approximate. The actual output may vary slightly.

---

**APPROXIMATE PLANTING RATES FOR CORN AT 30" ROW SPACING**


---

TRANSMISSION SPROCKETS		30 CELL		24 CELL		18 CELL	
DRIVE	DRIVEN	SEED SPACING	POPULATION ACRE	SEED SPACING	POPULATION ACRE	SEED SPACING	POPULATION ACRE
17	30	8.2	25,548	10	20,950	13.7	15,400
17	28	7.7	27,207	9.6	21,725	12.8	16,336
17	27	7.3	28,699	9.3	22,529	12.3	16,940
17	26	7.0	29,929	8.9	23,396	11.9	17,592
19	28	6.8	30,809	8.7	24,280	11.5	18,258
<hr/>							
17	25	6.7	30,942	8.6	24,332	11.4	18,295
19	27	6.5	32,021	8.3	25,180	11.0	18,934
17	24	6.5	32,231	8.2	25,345	10.9	19,058
19	26	6.3	33,254	8.0	26,148	10.6	19,662
17	23	6.2	33,472	7.9	26,447	10.5	19,887
<hr/>							
19	25	6.0	34,418	7.7	27,195	10.2	20,449
19	24	5.8	35,850	7.4	28,326	9.8	21,300
23	28	5.6	37,199	7.1	29,391	9.5	22,101
19	23	5.6	37,410	7.0	29,558	9.4	22,226
23	27	5.4	38,608	6.8	30,480	9.1	22,919
<hr/>							
24	28	5.4	38,848	6.8	30,669	9.0	23,062
23	26	5.3	40,094	6.6	31,653	8.8	23,802
24	27	5.2	40,288	6.6	31,806	8.7	23,917
25	28	5.2	40,467	6.5	31,947	8.7	24,023
17	19	5.2	40,553	6.5	32,015	8.7	24,074
<hr/>							
23	25	5.0	41,697	6.3	32,919	8.5	24,753
24	26	5.0	41,800	6.3	33,029	8.4	24,836
25	27	5.0	41,929	6.3	33,131	8.4	24,913
26	28	4.9	42,049	6.3	33,226	8.4	24,984
23	24	4.8	43,396	6.1	34,290	8.1	25,784
<hr/>							
24	25	4.8	43,471	6.1	34,350	8.1	25,829
25	26	4.8	43,541	6.0	34,405	8.0	25,870

The above rates are theoretical and approximate. The actual output may vary slightly.

---

## 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, burdening the metering.

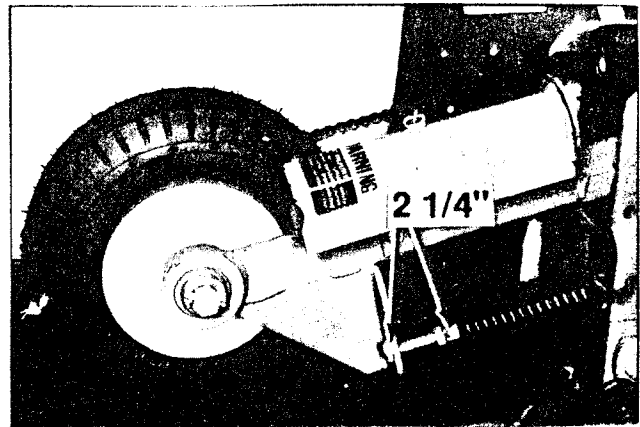
It should also be noted, and especially for corn, that misshapen and angular seeds are difficult to sow regularly, especially at high working speeds.

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 seed, 5-6 mph (8-10 km/h) is quite possible.

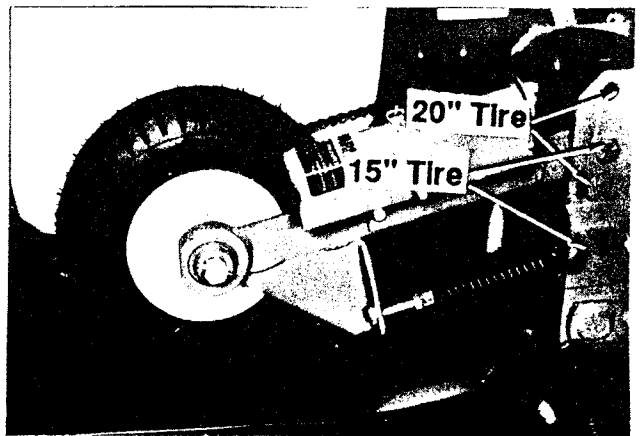
For planting of high seed population such as peanuts, edible beans, and kidney beans, best results can be obtained by not going faster than 3-4 mph (4.5 -6 km/h).

## CONTACT DRIVE WHEEL SPRING ADJUSTMENT

There are two down pressure springs on each contact drive wheel. The down pressure is factory preset and should need no further adjustment.



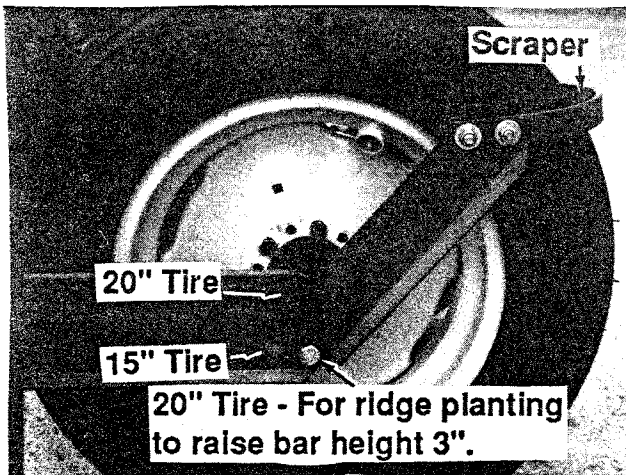
The spring tension is set leaving 2 1/4" between the spring plug and the bolt head.



On planters equipped with 20" transport tires, the contact drive wheel arms and down pressure springs are attached to the wheel module mount using the upper set of mounting holes.

## TIRE SCRAPER

When using a 20" transport tire, a tire scraper should always be used. This is due to the clearance between the wheel assembly and the transport tire. The tire scraper will prevent a buildup of dirt and mud between the wheel arm assembly and the tire. Adjust the scraper so it does not contact the tire.



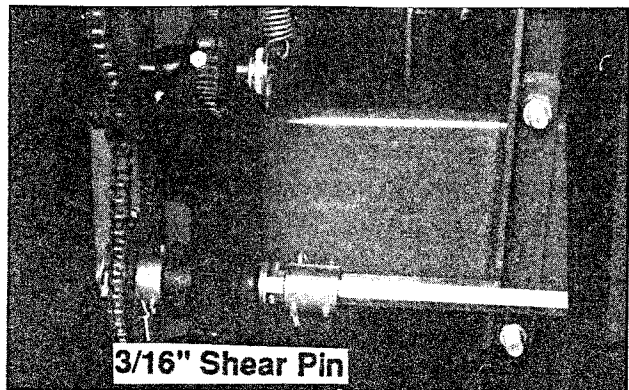
## RIDGE PLANTING

For ridge planting, to raise the bar height 3", mount the 20" tires in the lower rear holes in the ground drive wheel arm. Mount the contact drive wheel arm and springs in the lower set of mounting holes in the wheel module mount and raise the hitch height to maintain a level position from side to side and front to back.

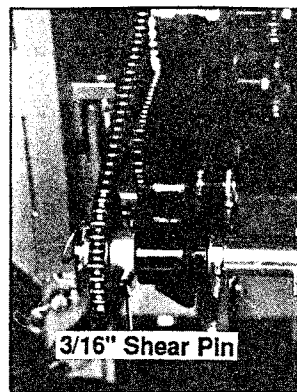
## SHEAR PROTECTION

The planter drive line is protected from damage by shear pins. If excessive load should cause a pin to shear, it is important to determine where binding has occurred before replacing the pin.

Turn the shaft by hand, checking for misalignment and for the possibility of seized parts. When the shaft can be turned by hand (with the aid of a wrench) replace shear pins with same size and type. To prevent future binding or breakage of components, check drive line alignment and follow prescribed lubrication schedules.



Transmission shaft



Dry fertilizer drive line

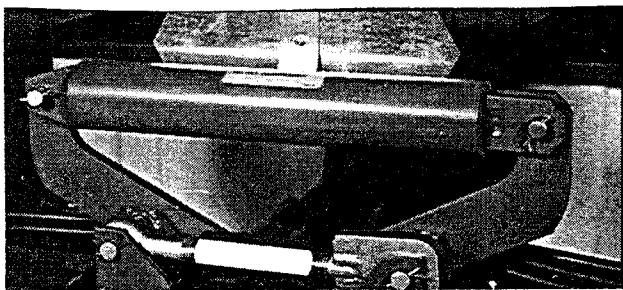
Additional shear pins can be found in the storage area located on the wheel module.

## MANUAL WING FOLD

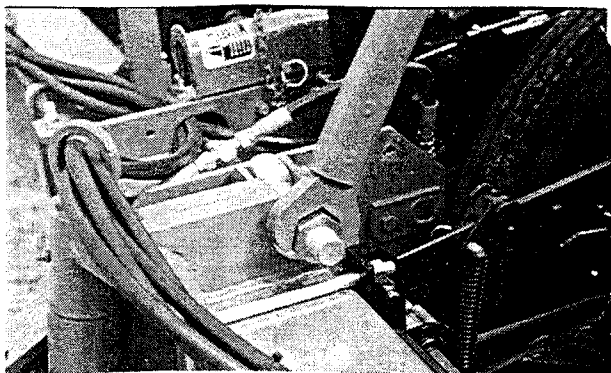
**⚠ WARNING** Be sure the planter is on a level surface. Avoid standing between the wing and main frame when folding the planter. The wing may swing suddenly.

To fold from a field to transport position, use the following 9 steps.

- 1) Fold the markers into a transport position and lower the planter to the ground.



- 2) Swing the center turnbuckle into position to lock the planter frame rigid and tighten slightly.



- 3) Loosen the 1 1/4" hex nuts which secure the wing locking bolts.
- 4) Raise the planter.

- 5) Install the cylinder lockups on the four center section lift cylinders.

- 6) Place the tractor hydraulic lever to the lowering position and hold until the wing cylinders are fully retracted, raising the wing tires.

- 7) Swing the wing locking bolt over to release the planter wing.

- 8) Swing the wing forward into a transport position and lock the wing in place at the marker support and hitch.

- 9) Repeat steps 7 and 8 for the opposite planter wing.

To fold from a transport to field position, use the following 9 steps.

**⚠ WARNING** Be sure the planter is on a level surface.

- 1) If the wing lift tires are not in a raised position, then with the cylinder lockups in place on the four center section lift cylinders, move the tractor hydraulic lever to the lowering position until the cylinders are fully retracted, raising the wing tires.

**⚠ WARNING** Avoid standing between the wing and main frame when folding the planter. The wing may swing suddenly.

- 2) With the planter raised and the cylinder lockups in place, release the wing lock pins at the marker support and hitch. Swing the wings out to operating position.
- 3) Swing the wing locking bolts into position to lock each wing.

## Operation

---

Manual wing fold continued. Transport to field position.

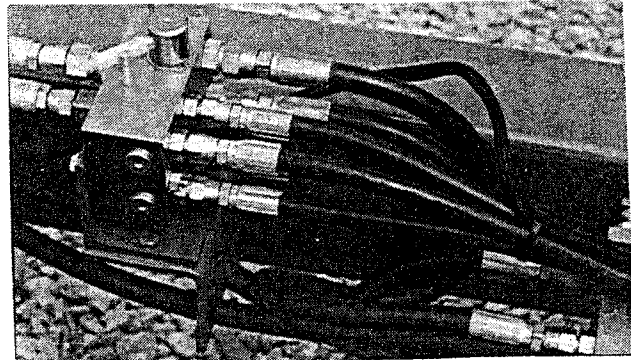
- 4) Operate the hydraulic lever to extend all the lift cylinders.
- 5) Remove the cylinder lockups from the four center section lift cylinders and place them in the storage position on the wheel module.
- 6) Lower the planter
- 7) Tighten the 1 1/4" hex nuts to secure the wing locking bolts.
- 8) Release the turnbuckle located in the center of the planter frame and fold it to one side.
- 9) Raise the planter. If the planter does not raise even, lower the planter and hold the tractor remote in the lowering position for an additional few seconds.

### HYDRAULIC WING FOLD

**⚠ WARNING** Be sure the planter is on a level surface. Avoid standing between the wing and main frame when folding the planter. The wing may swing suddenly.

To fold from a field to transport position, use the following 8 steps.

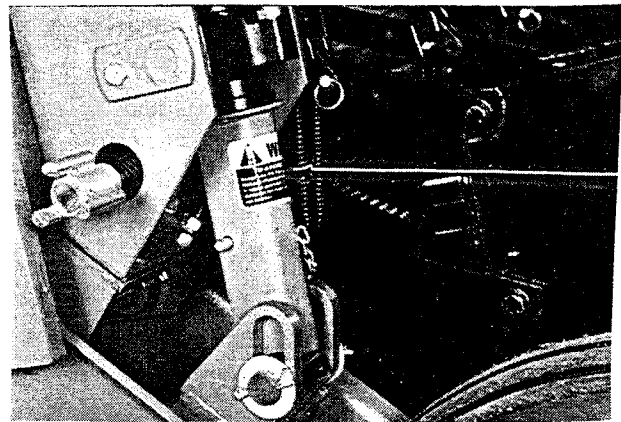
- 1) Fold the markers into transport position and lower the planter to the ground.
- 2) Swing the center turnbuckle into position and lower the planter to the ground.



- 3) Move the lever on the hand operated selector valve to the "fold" position. Remove any pressure from the hydraulic system before moving the selector handle.

- 4) Loosen the 1 1/4" hex nuts which secure the wing locking bolts. Swing the wing locking bolt on each wing over to release the planter wings.

- 5) Raise the planter.



- 6) Install cylinder lockups on the four center section lift cylinders.


- 7) Place the tractor hydraulic lever in the lowering position and hold until the wing cylinders are fully retracted, raising the wing tires.

- 8) Move the tractor hydraulic lever to fold the wings forward into transport position and lock wings in place at the marker support and hitch.



## HYDRAULIC WING FOLD

To fold from transport to field operation,  
use the following 11 steps.

 **WARNING** Be sure the planter is on a level surface. Avoid standing between the wing and main frame when folding the planter. The wing may swing suddenly.

1) Retract the wing lift tires. With the cylinder lockups in place on the four center section lift cylinders, move the tractor hydraulic lever to the lowering position until the cylinders are fully retracted, thus raising the wing tires.

2) With the planter in a raised position and the cylinder lockups in place, release the wing lock pins at the marker support and hitch.

3) Position the selector handle on the manual selector valve in the "fold" position.

4) Move the tractor hydraulic lever and fold the wings out to operating position.

5) Swing the wing locking bolts into position to lock each wing.

6) Operate the hydraulic lever to extend all the lift cylinders.

7) Remove the cylinder lockups from the four center section lift cylinders and place them in the storage position on the wheel module.

8) Lower the planter.

9) Tighten the 1 1/4" hex nuts to secure the wing locking bolts.

10) Release the turnbuckle located in the center of the planter frame and fold it to one side.


11) Remove pressure from the hydraulic system. Move the selector handle on the manual selector valve to the "marker" position.

## HYDRAULIC ROW MARKER OPERATION

The planters are equipped with a single valve hydraulic system or an optional dual valve hydraulic system. The single valve system requires the planter to be raised in order to lift the markers. Each time the planter is lowered, the row markers will alternately be lowered. If the planter is raised to cross a waterway, the opposite marker will be lowered when the planter is lowered back into the ground. Therefore, it will be necessary to stop and again raise and lower the planter to restore correct marker operation.

If planting in this type of situation, dual valve hydraulics are highly recommended. The optional dual hydraulic system allows the markers to be operated independently of the planter lift cylinders. Each time a marker is raised, the sequencing valve will direct flow to lower the opposite marker.

Both markers can be used at the same time if desired. To do this, lower the planter and the marker that has been selected. Move the tractor control lever to the raise position and immediately return it to the lower position. This will shift the marker control valve and the remaining marker will be lowered. This is useful in planting contours and terraces.


 **WARNING:** Stand clear and keep others away when raising or lowering the row markers. Lock row markers for transport using the locking pin.

## HYDRAULIC PLANTER LIFT OPERATION

The planter lift system consists of a master cylinder on one side of the planter, and a slave cylinder on the other side of the planter. On 6 row and larger models, lift assist cylinders are also used.

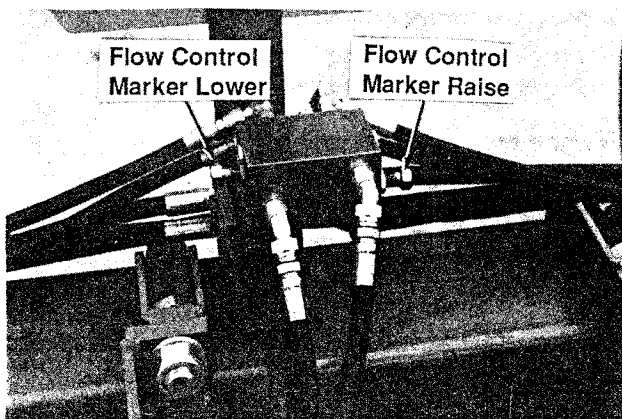
With the master/slave hydraulic lift system, oil is forced into the butt end of the master and lift assist cylinders when the hydraulic lever on the tractor is moved to the raise position. As the master cylinder is extended, oil from the rod end of the master cylinder is forced into the butt end of the slave cylinder. This displacement on the rod end of the master cylinder is equal to the displacement on the butt end of the slave cylinder. This causes the two cylinders to move at the same rate so the planter will raise and lower evenly.

**IMPORTANT:** The planter lift cylinders may get out of phase and the planter will lift unevenly. On each master cylinder and each slave cylinder, a valve located in the piston in the cylinder allows the lift system to be rephased when the cylinders are cycled by lowering the planter to the ground and holding the hydraulic lever for 5 seconds. Cycle the system until the planter lifts and lowers evenly.

 **WARNING:** Lock row markers for transport using the locking pin.

## MARKER SPEED ADJUSTMENT

The marker hydraulic system has two flow control valves. One flow control valve controls the lowering speed of both markers, and one controls the raising speed of both markers. To adjust marker speed, loosen the jam nut and turn the control clockwise or IN to slow the travel speed and counterclockwise or OUT to increase the travel speed. The adjusting bolt determines the amount of oil flow restriction through the valve, therefore determining travel speed of the markers.



**! 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.

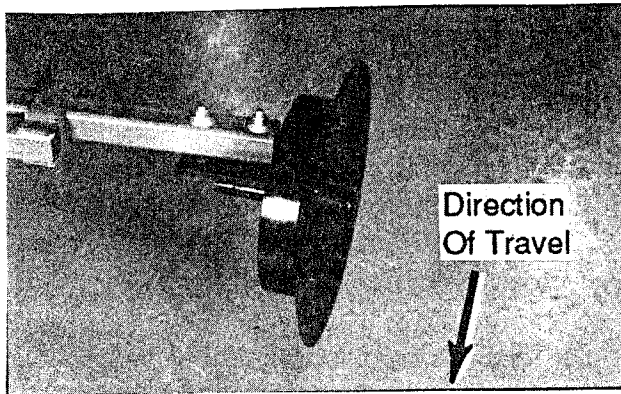
## MARKER ADJUSTMENT

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 adjustments follows:

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

8 rows x 30" spacing = 240" Marker Dimension

**MARKER ADJUSTMENT CONTINUED**



Marker blade shown with depth band.  
(Standard on 12 row narrow.)

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 1/2" x 3 1/2" cap screws and move the bracket as required. Tighten bolts to the specified torque.

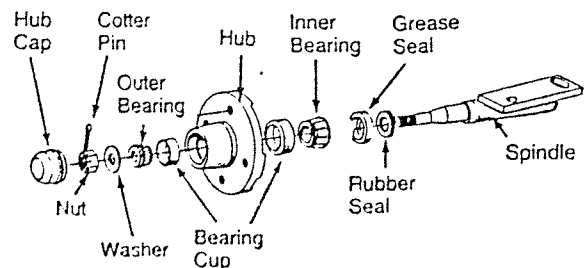
**IMPORTANT:** A marker blade assembly that is set at a sharper angle than necessary will add unnecessary stress to the complete marker assembly and shorten the life of bearings and blades. Set the blade angle only as needed to leave a clear mark.

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

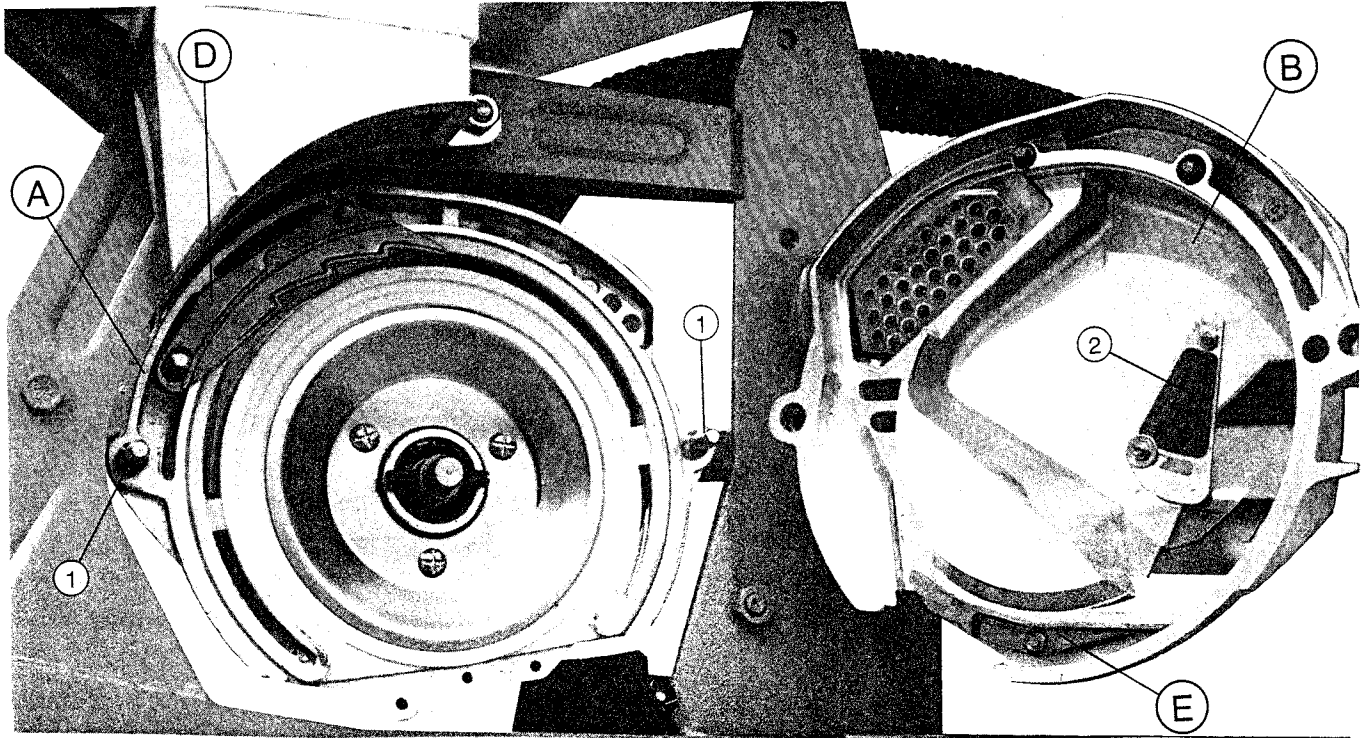
**MARKER BEARING LUBRICATION OR REPLACEMENT**

1. Remove the marker blade.
2. Remove hub cap from hub.

3. Remove cotter pin, nut and washer.
4. Slide the hub from the spindle.
5. Remove the bearings and cups and discard if bearings are being replaced. Clean hub and dry. Remove bearings only if repacking.
6. Press in new bearing cups with thickest edge facing in. (Bearing replacement procedure only.)
7. Pack bearings with heavy duty wheel bearing grease thoroughly forcing grease between roller cone and bearing cage. Also fill the space between the bearing cups in the hub with grease.
8. Place the inner bearing in place and press in new rubber seal and grease seal.
9. Clean the spindle and install hub.
10. Install outer bearing, washer and slotted hex nut. Tighten slotted hex nut while rotating hub until there is some drag. This assures that all bearing surfaces are in contact. Back off slotted nut to nearest locking slot and install cotter pin.
11. Fill the hub caps approximately 3/4 full of wheel bearing grease and install hub.
12. Install hub and hub cap retainer on hub and tighten evenly and securely.

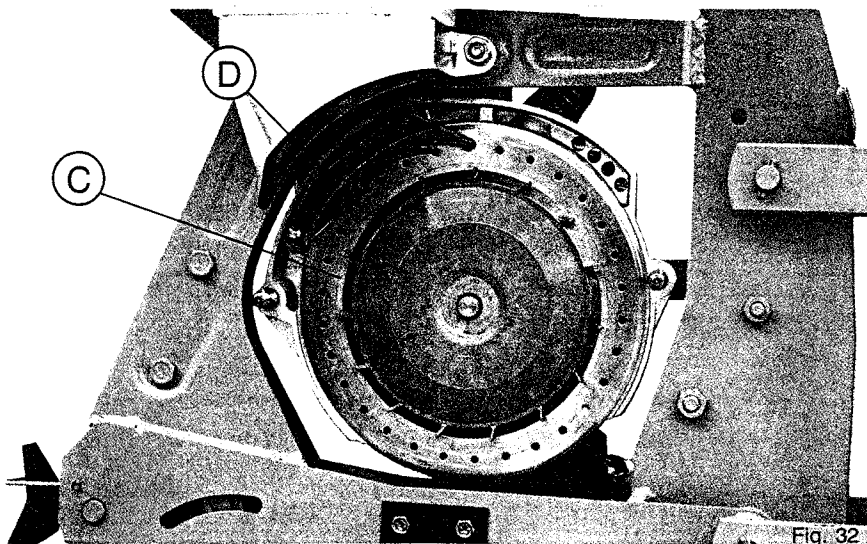


## METERING BOX



- 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

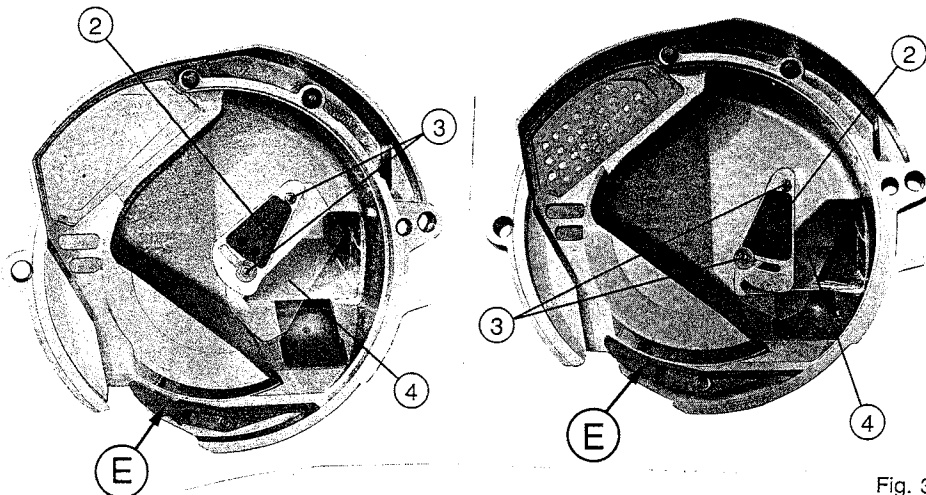


Fig. 35

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.

---

## METERING BOX

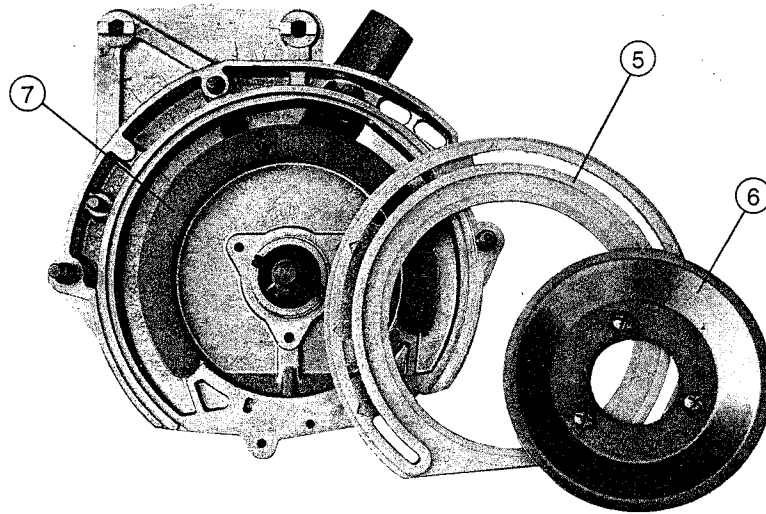


Fig. 33

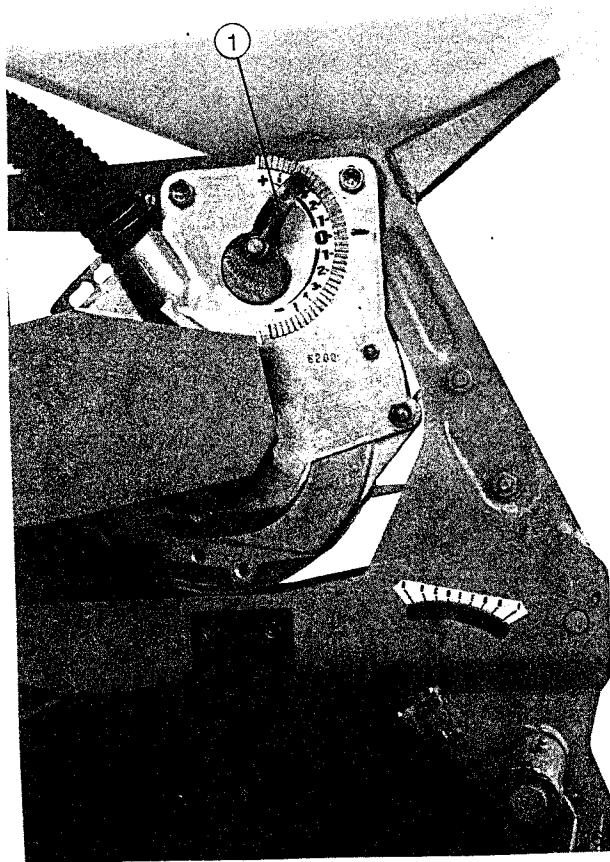
The plastic wear gasket 5 on which the seed disc rotates should be smooth and in good condition. Under normal operating conditions, it should be replaced only after 1250 to 2500 acres (500 to 1000 ha). The metal brace 7 should be positioned with its tab notched in the hole of the housing. The outer edge 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

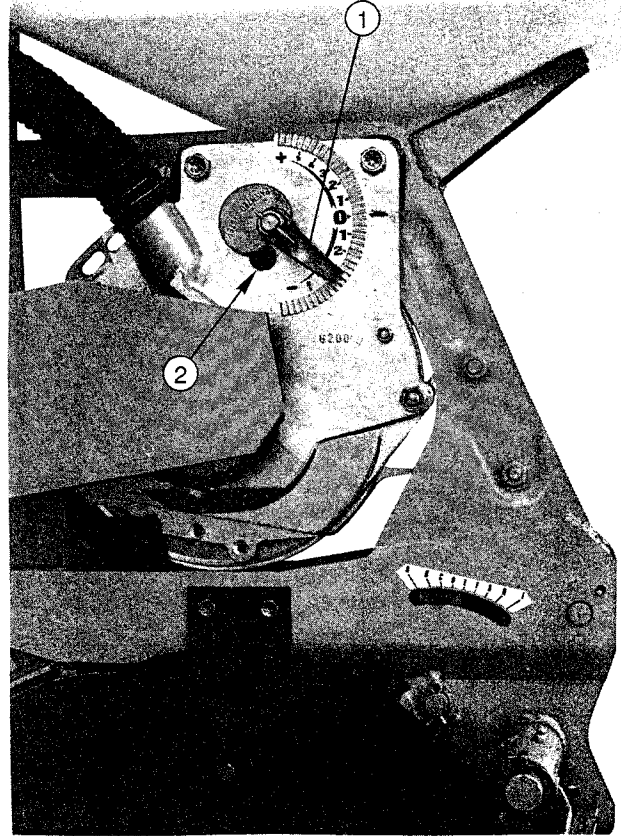
Two factors influence the degree of singulation of the seed:

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 (opening 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 (closing 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.



### 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	DC3665 Large (Jumbo)	2 3/8" - 7"
	DC4060 Small to Medium	2" - 6 1/2"
Cotton	DC3635 Low population	2 3/8" - 7"
	DC7235 High population	1 1/4" - 3 1/2"
Hilldrop Cotton	DC0930D Double seed drop	9 1/2" - 16"
	DC1230D Double seed drop	7" - 12"
	DC0930T Triple seed drop	9 1/2" - 16"
	DC1230T Triple seed drop	7" - 12"
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	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"
Onion	DC3610 Low population	2 3/8" - 7"
	DC7210 High population	1 3/16" - 3 1/2"
Sunflower	DC1225 Low population (oils & confection)	7 1/8" - 21"
	DC1825 High population (oils & confection)	4 3/4" - 14"
Cabbage/ Cauliflower	DC3612 Low population	2 3/8" - 7"
	DC7212 High population	1 3/16" - 3 1/2"
Pepper/ Tomato	DC3612 Low population	2 3/8" - 7"
	DC7612 High population	1 3/16" - 3 1/2"
Pumpkin	DC0335 Low population	28 1/2" - 84"
	DC0635 Medium population	14 1/4" - 42"
	DC0935 High population	9 1/2" - 28"

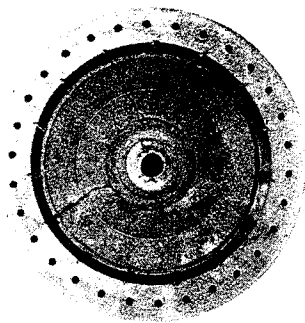
## Operation

Recommended setting for indicator 1 (fig. 36,4-14)

Corn	+1 (0 to +2)
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

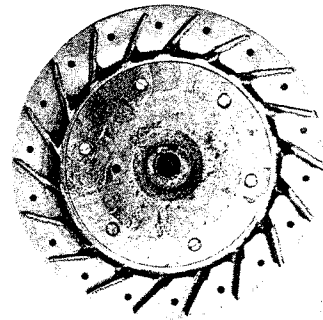
This applies to 540 rpm PTO speed except for large seed (kidney beans, peanuts) for which a slightly higher speed (5-10% is preferable. Then it is recommended to use a 450 rpm turbofan.

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

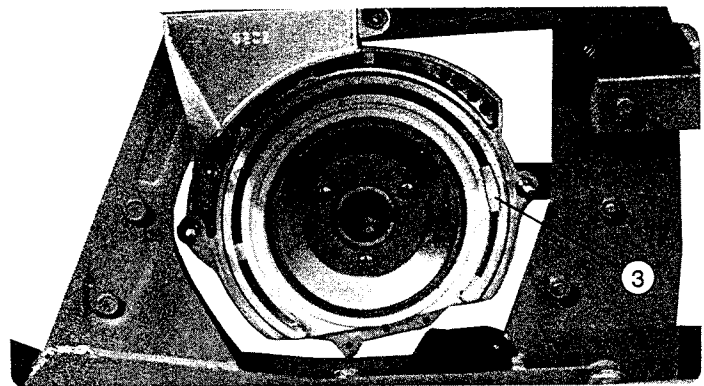


**NOTE:** Use the proper seed disc for different seeds. Check your type of seed, and use the suggested seed disc chart on page 4-15 for determining the correct disc for your crop.

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.



The metering box will also handle seed discs fitted on a traditional finger wheel. (Shown above, an 18-hole finger wheel disc.)



This equipment can be used with an 18-hole disc for corn planting or hill-dropping of cotton or beans. With the finger wheel, it is necessary to remove the ejector block from the cover (photo page 4-12), insert plug ③ (fig. 39) and use a special seed scraper.



## PLANTER METERING UNIT - NG PLUS

One version as shown opposite (fig. 40) will be offered for this type of metering unit. The options mentioned below refer only to models adapted to 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.

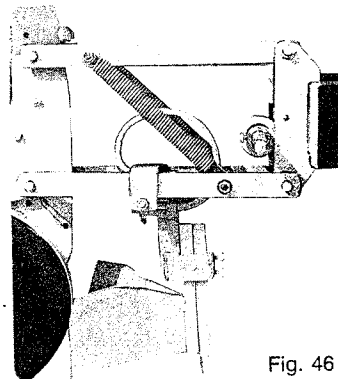


Fig. 46

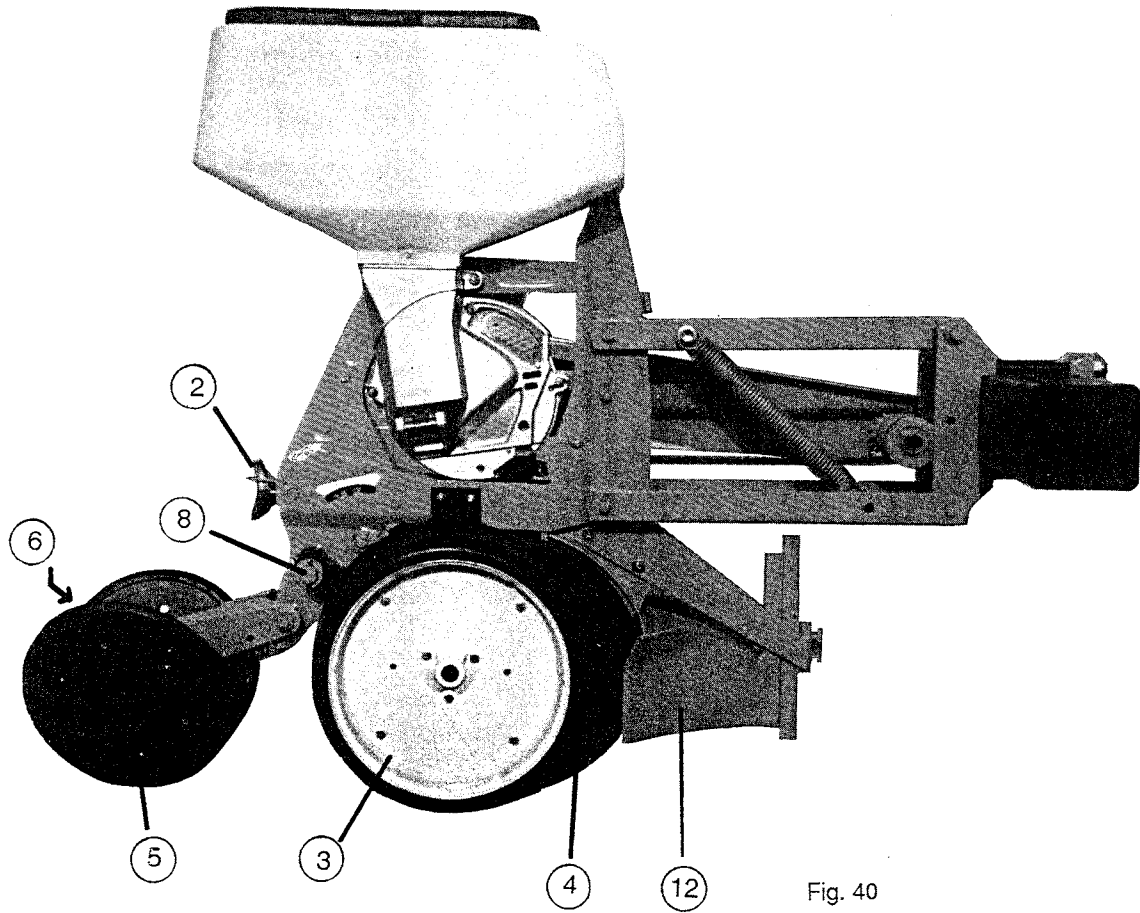


Fig. 40

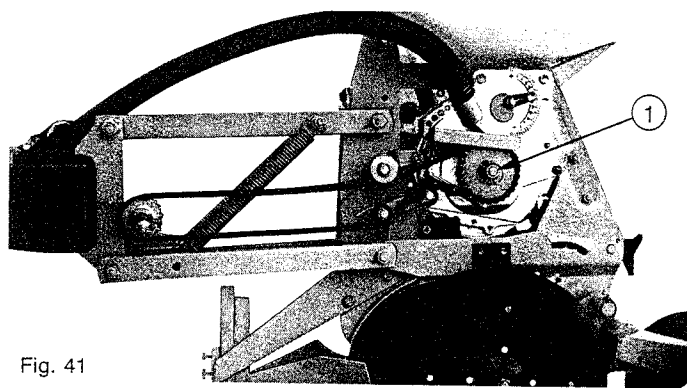


Fig. 41

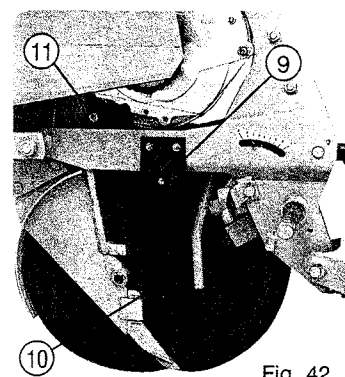
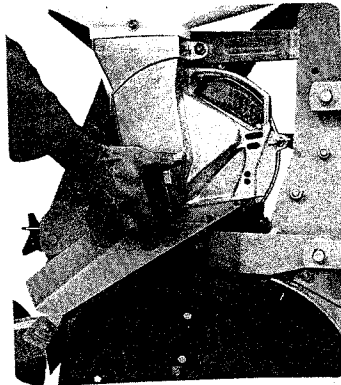


Fig. 42

## Operation

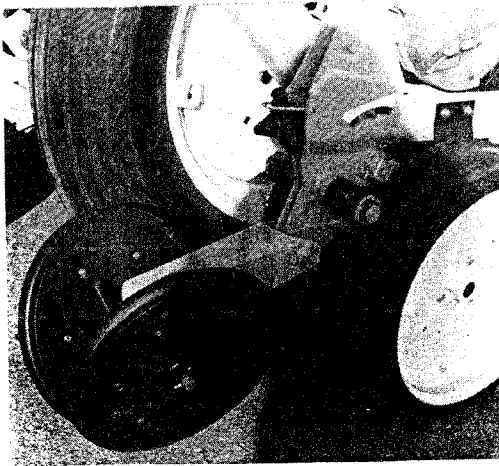
---

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



### OPTIONAL EQUIPMENT

Adjustable V-rear press wheel blocks. Three different width settings to obtain better seed to soil contact when planting shallow or small seed such as beets, and pickles.



Wide V-rear press wheel blocks (1 9/14" (4 cm) in width for light pressing on soft soils.

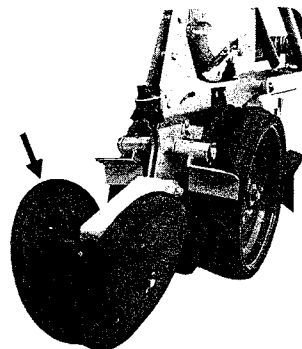
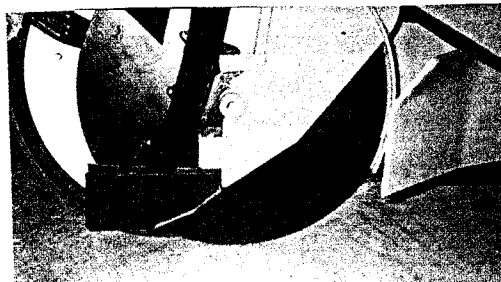


Fig. 47

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



## Operation

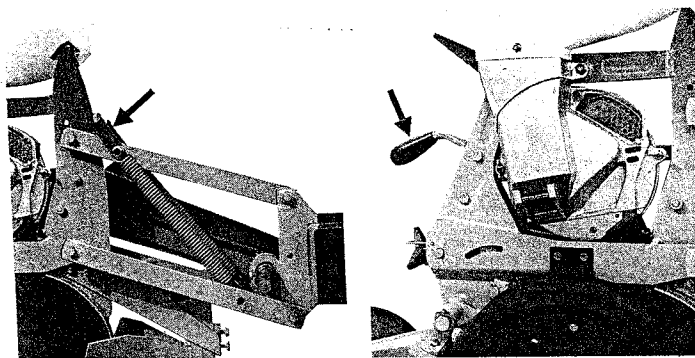
---

### OPTIONAL EQUIPMENT (continued)

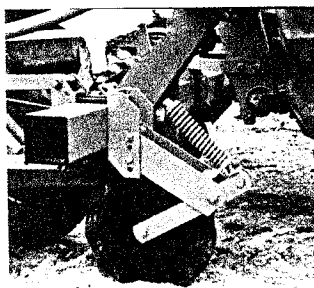
A locking pawl when used with a lifting handle will lock the planter unit in a raised position.

To raise and lock the unit:

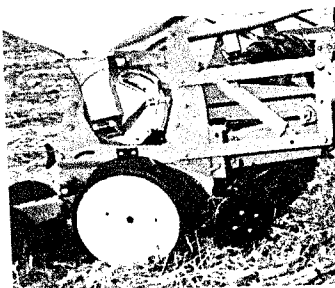
- 1) Pull up the handle mounted to the planter unit.
- 2) Flip the pawl towards the planter unit and secure.



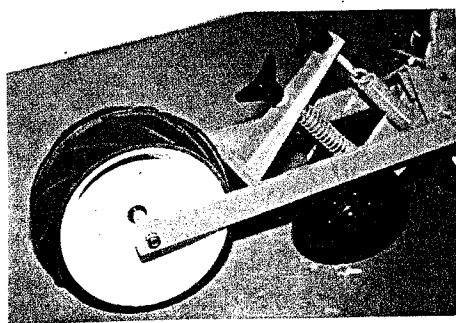
No-Till Coulter, mounted to either the toolbar frame or mounted to the planter unit.



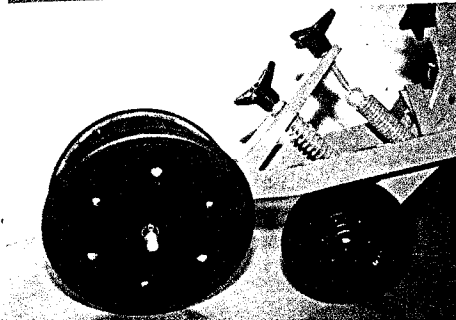
Residue Manager available for minimum and no-till situations.



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.



## 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 model features a flashing light for each row and an audible alarm for malfunctions. The DJPM 3000 displays additional data such as seed population, seed spacing and area planted.

For further information, installation, operation, or troubleshooting, refer to the Dickey John manual that is included with your electronic seed monitor system.

## DOUBLE DISC FERTILIZER OPENER

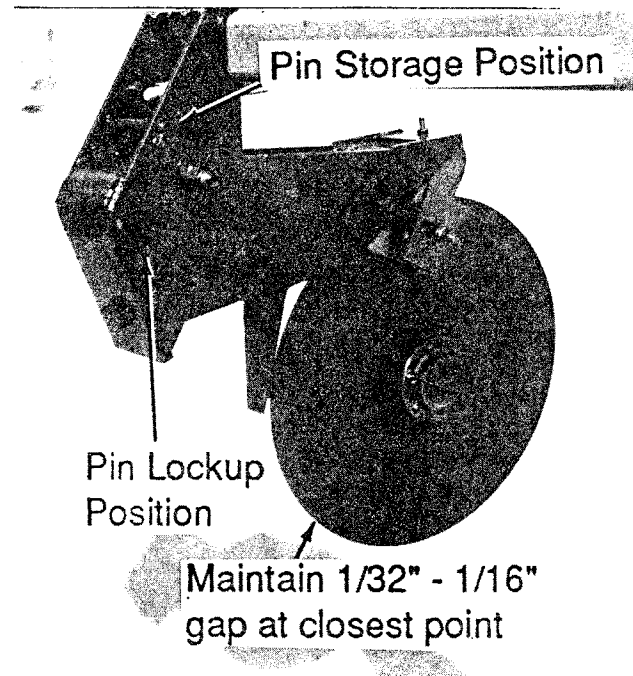
The double disc fertilizer openers should be positioned during assembly to place the fertilizer no closer than 2" to either side of the row. If planter frame is level and at proper planting height, fertilizer depth will be approximately 4". Soil conditions can affect depth slightly.

The down pressure spring is factory preset at 250 pounds down pressure but may be adjusted for various soil conditions. To adjust spring tension, loosen the jam nut with a 15/16" wrench and use a 1" wrench to turn the adjustment bolt clockwise to increase tension or counter-clockwise to

decrease tension. Securely tighten the jam nut upon completion of tension adjustment. Do not attempt to set opener depth with spring pressure. The opener is designed to operate against depth stop and spring up when encountering a foreign object or hard ground.

**⚠ CAUTION:** Do not operate the double disc openers at full down pressure tension when planting in rocky ground. Chipping of the blades will occur.

A gap of 1/32" to 1/16" should be maintained between the opener blades at the closest point. Blade adjustment can be made by moving inside spacer washers to the outer side of the blade. After making this adjustment, check to be sure bearing assembly rivets are not hitting shank. The outer scrapers on each blade may



also be adjusted to make up for wear that may occur. Make sure the scraper is adjusted to allow only slight contact with the blade.

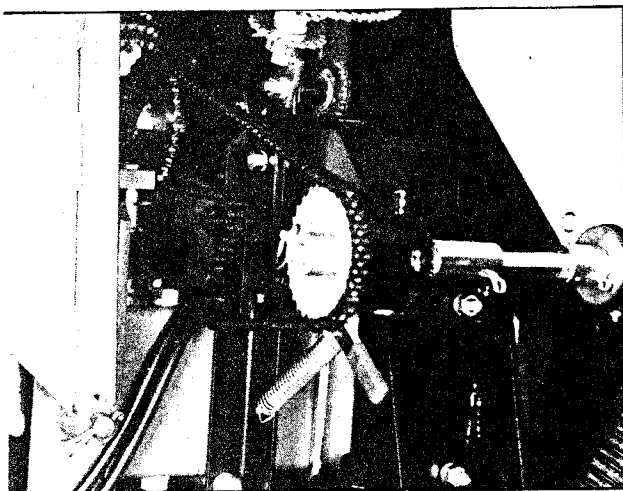


### DOUBLE DISC FERTILIZER OPENER

The opener assembly is designed to be locked in a raised position when the fertilizer attachment is not in use or during storage. To lock the opener, first raise the planter and place blocks under the openers. Then lower the planter until the hole in the pivot section aligns with the hole in the mounting bracket. Remove the lockup pin from the storage position in the mounting bracket and install it through the lockup hole and secure with cotter pins.

**! DANGER:** Always install all cylinder lockup brackets before working under the unit.

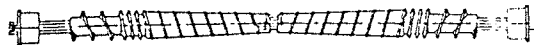
### DRY FERTILIZER ATTACHMENT



The rate of fertilizer application is determined by the drive/driven sprocket combination on the fertilizer drive and by the auger position in the hopper.



Shown with augers positioned for low rate delivery.



Shown with augers positioned for high rate delivery.

Remove 1/4" stainless steel cap screws holding augers in place on shaft and reposition augers to change delivery rate.

See the Dry Fertilizer Application Rate Chart. Uneven delivery of fertilizer will occur if the high rate position is used at too low a rate setting.

A fertilizer transmission is located on the right side of the planter directly ahead of the row unit transmission on all models. This transmission is designed to allow simple, rapid changes in sprockets to obtain the desired fertilizer application rates. By removing the pins on the hexagonal shafts, sprockets can be interchanged with those on the sprocket storage rod bolted to the transmission plate. Chain tension is controlled by a spring loaded idler. This idler is adjusted with a ratchet arm located to the inside of the transmission. This arm has a release position to remove spring tension for replacing sprockets. The amount of spring tension on the chain can be controlled by the ratchet arm. The fertilizer application chart will aid you in selecting the correct sprocket combinations.

**IMPORTANT:** After each sprocket combination adjustment, make a field check to be sure you are applying fertilizer at the desired rate.

## Operation

---

### DRY FERTILIZER ATTACHMENT CONTINUED

The dry fertilizer attachment meters granules by volume rather than weight. For this reason, and given the variances in brands and fertilizer analysis, the weight metered during actual application may vary considerably. Use the chart for reference only. It is suggested that a container be used to catch and measure application (as explained following the application rate chart) to obtain a closer estimate.

Since most fertilizers absorb moisture, it is important that fertilizer be kept dry during use and storage. In addition to waste, deposits of fertilizer left in the hopper can cause metal corrosion. Hoppers should be emptied at the end of each day's use.

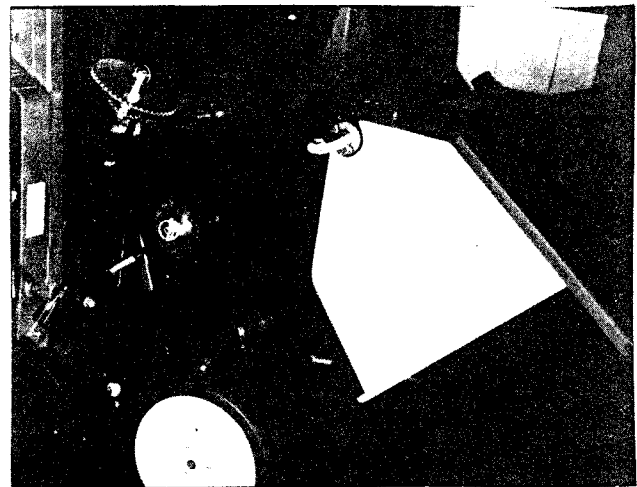
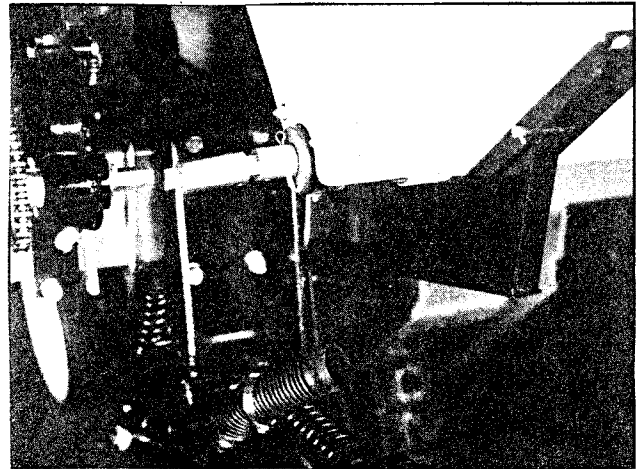
**IMPORTANT:** Certain analysis of fertilizer, if placed too close to the seed, may cause germination or seedling damage especially if used in amounts in excess of fertilizer manufacturer's recommendations. Check with your fertilizer dealer or manufacturer for the correct amount and placement.

**⚠ 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.

### CLEANING

The dry fertilizer hoppers are designed to tip forward for dumping and ease of cleaning. To dump hoppers, first disconnect the drive shaft from the transmission or adjacent hopper. **LOOSEN HOSE CLAMPS AND REMOVE HOSES FROM EACH HOPPER.**

Remove the two rear 1/2" x 1 1/4" cap screws from between hopper support and opener mounting bar. Loosen the two front 1/2" x 1 1/4" cap screws. Rotate hopper lids to the back side of the hopper and carefully tip hopper forward. After dumping contents, flush all loose fertilizer from the hopper and hoses.



At the end of the planting season, or when fertilizer attachment is not going to be used for a period of time, the hoppers should be disassembled, cleaned and metal surfaces coated with a rust preventative.

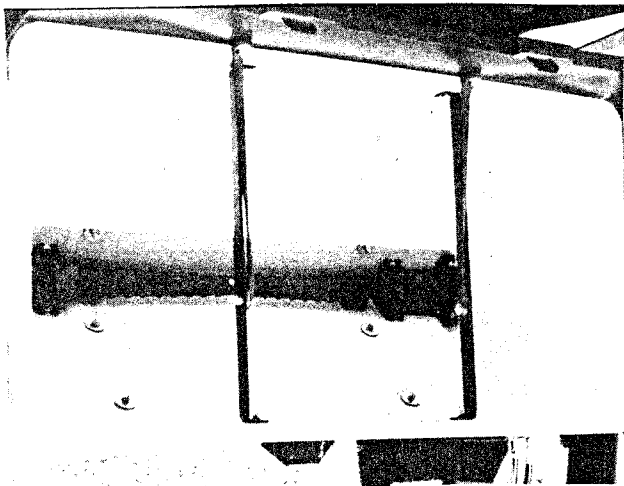
## Operation

---

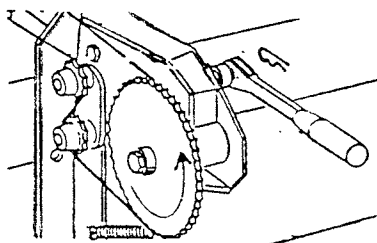
### CLEANING CONTINUED

To disassemble auger assemblies, remove 1/4" cotter pin and bearing from one end of the shaft. Pull auger assembly from opposite end of hopper. Remove stainless steel cap screws from auger shaft and remove all auger components for cleaning. Coat all parts with rust preventative before reassembly. Reinstall auger halves in proper low rate or high rate position.

To reassemble, slide auger assembly through the outlet housing back into the hopper. Secure in place by reinstalling the bearing and cotter pin.



Check auger installation by rotating shaft in the direction of planter travel to see that the spirals on the auger move toward the ends of the hopper. If not, remove auger assembly, turn 180° and reinstall.



Direction of rotation

Be certain augers turn freely. If not, loosen the 5/16" carriage bolts in the outlet housings, rotate the auger several times and retighten the 5/16" carriage bolts. This should allow the housings to realign themselves with the auger.

Install auger baffles over the augers and secure in place with two hair pin clips in each hopper. Do not operate fertilizer attachment without auger baffles in place.

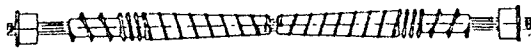
**IMPORTANT:** Frequent lubrication of auger bearings is critical to ensure that the augers will turn freely. Check lubrication section for frequency.

**NOTE:** Be sure the auger assembly is installed so the flighting on the augers move material to the outer openings in the hopper when the augers are rotated in the direction they will turn when the planter is in operation.

**DRY FERTILIZER APPLICATION RATES  
APPROXIMATE RATE IN POUNDS PER ACRE**

Drive Sprocket	Driven Sprocket	Low Rate Setting			High Rate Setting		
		30" Rows	36" Rows	38" Rows	30" Rows	36" Rows	38" Rows
15	35	32	26	25	94	78	74
15	33	36	30	28	109	91	86
15	30	39	33	31	120	100	95
19	33	45	37	36	135	114	107
19	30	50	42	39	153	126	120
15	19	58	48	46	174	144	136
30	35	61	51	48	188	156	148
30	33	67	55	52	200	166	157
33	35	69	58	55	206	172	163
35	33	76	63	61	214	193	183
33	30	81	67	64	241	200	190
19	15	93	77	73	278	230	219
30	19	116	96	91	347	288	274
33	19	127	105	100	382	317	301
35	19	133	111	106	402	335	318
30	15	146	121	115	440	365	347
33	15	161	134	127	482	400	380
35	15	168	141	133	510	424	403

Direction  
Of Rotation



High Rate Position



Low Rate Position

Above chart for planters equipped with contact drive. See "Tire Pressure" for recommended tire pressures.

This chart was calculated with a bulk density of 65 pounds per cubic foot.

**IMPORTANT:** Fertilizer application rates can vary from the weights calculated in the above chart. To prevent application miscalculations, make field checks to be sure you are applying fertilizer at the desired rate.

To check the exact number of pounds your fertilizer attachment will actually deliver on a 30 inch row spacing, proceed as follows:

Remove one spout from one of the fertilizer hoppers and attach a container under the opening. Engage the fertilizer attachment and drive forward for 174 feet. Weigh the amount of fertilizer caught in the container and multiply that amount by 100. The result will be the pounds of fertilizer delivered per acre when planting in 30 inch rows. To convert this delivery rate for wider rows, multiply by the following conversion factors:

- 36" multiply by 0.83
- 38" multiply by 0.79

**LIQUID FERTILIZER APPLICATION RATES**

**APPROXIMATE GALLONS PER ACRE**

DRIVE	DRIVEN	ROW SPACING			
		30"	36"	38"	40"
8	31	6.2	5.0	4.9	4.7
8	30	6.4	5.1	5.1	4.8
8	31	7.0	5.6	5.5	5.3
9	30	7.2	5.8	5.7	5.4
9	26	7.4	5.9	5.9	5.6
10	31	7.8	6.2	6.2	5.9
9	26	8.4	6.7	6.6	6.3
8	23	8.4	6.7	6.6	6.3
8	22	9.2	7.0	7.0	6.9
10	26	9.3	7.5	7.3	7.0
9	23	9.4	7.6	7.5	7.1
9	22	9.9	7.9	7.8	7.4
10	23	10.5	8.4	8.3	7.9
10	22	11.0	8.8	8.7	8.1
15	31	11.7	9.3	9.2	8.8
15	30	12.1	9.7	9.5	9.1
8	15	12.8	10.3	10.2	9.6
15	26	13.9	11.1	11.0	10.4
9	15	14.5	11.6	11.4	10.9
15	23	15.8	12.6	12.4	11.9
10	15	16.1	12.8	12.8	12.1
15	22	16.5	13.2	13.0	12.4
22	31	17.2	13.7	13.6	12.9
22	30	17.7	14.2	14.0	13.3
23	31	18.0	14.3	14.2	13.5
23	30	18.5	14.8	14.6	13.9
8	10	19.4	15.5	15.2	14.6
26	31	20.2	16.2	16.0	15.2
22	21	20.4	16.4	16.1	15.3
26	30	20.9	16.7	16.5	15.7
23	26	21.4	17.1	16.9	16.1
8	9	21.5	17.2	17.0	16.1
9	10	21.7	17.4	17.2	16.3
22	23	23.1	18.5	18.2	17.3
30	31	23.4	18.7	18.5	17.6

DRIVE	DRIVEN	ROW SPACING			
		30"	36"	38"	40"
31	30	25.0	20.0	19.7	18.8
23	22	25.3	20.2	20.0	19.0
10	9	26.8	21.4	21.2	20.1
9	8	27.2	21.7	21.5	20.4
26	23	27.3	21.8	21.6	20.5
30	26	27.9	22.4	22.0	21.0
26	22	28.5	22.8	22.5	21.4
31	26	28.8	23.1	22.7	21.6
10	8	30.2	24.1	23.8	22.7
30	23	31.5	25.2	24.9	23.7
31	23	32.6	26.0	25.7	24.5
36	22	32.9	26.3	26.0	24.7
31	22	34.1	27.3	26.8	25.6
22	15	35.5	28.3	28.0	26.7
15	10	36.3	29.0	28.6	27.3
23	15	37.0	29.7	29.2	27.8
15	9	40.3	32.2	31.8	30.3
26	15	41.9	33.5	33.1	31.5
15	8	45.3	36.3	35.7	34.0
30	15	48.3	38.6	38.2	36.3
31	15	49.9	40.0	39.4	37.5
22	10	53.2	42.5	42.0	40.0
23	10	55.5	44.4	43.9	41.7
22	9	59.0	47.3	46.6	44.3
23	9	61.8	49.5	48.8	46.4
26	10	62.8	50.2	49.6	47.2
22	8	66.4	52.8	52.4	49.9
23	8	69.4	55.5	54.8	52.1
26	9	69.8	55.8	55.1	52.4
30	10	72.5	58.0	57.2	54.4
31	10	74.9	60.0	59.1	56.2
26	8	78.5	62.8	62.0	59.0
30	9	80.5	64.4	63.6	60.5
31	9	83.2	66.6	65.7	62.5
30	8	90.6	72.5	71.5	68.0
31	8	93.6	74.9	73.9	70.3

The above chart for planters equipped with contact drive. See "Tire Pressure" for the recommended tire pressures. This chart was calculated based on liquid fertilizer solution weighing ten pounds per gallon.

**IMPORTANT:** Fertilizer application rates can vary from the above chart. To prevent application miscalculations, make field checks to be sure you are applying fertilizer at the desired rate.



**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.

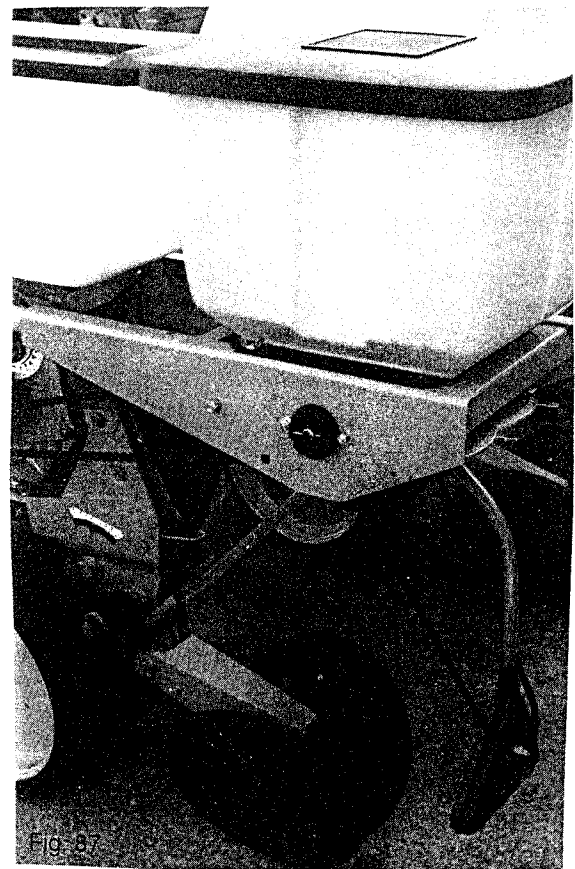
<u>Row Width</u>	<u>Factor</u>
38"	1.7
36"	1.8
30"	2.2
22"	3

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, 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.

## **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.

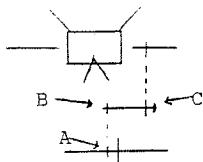
**Note:** Avoid moisture contamination. This unit should be used only with microgranulars and not with powders or granulates. It is possible to meter large granulars provided the inside auger is changed for a special one.

The 2-row metering box can be changed into a 1-row box by replacing the double outlet with a single outlet (9520.1) and installing a shield (9574) 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 - Drive Sprockets to be Used



A = Double sprocket on hex shaft - driven 1  
 B = Interchangeable sprocket - driven 2

		C = 12 or 20 teeth																																
		6.5# per acre			8.6# per acre			10.8# per acre			12.9# per acre			15.1# per acre			17.2# per acre			17.4# per acre			21.6# per acre			23.7# per acre			25.4# per acre			28.1# 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	15	20	25	14	20	25	12	20			
	LORSBAN 36"	12	18	20	25	16	12	25	22	20	25	18	20	25	15	20	25	14	20	25	12	20												
	15G 40"	12	15	20	25	15	12	25	12	12	25	15	20	25	14	20	25	12	20															

		C = 12 or 20																																			
		7.1# per acre			7.9# per acre			8.7# per acre			10.5# per acre			11.7# per acre			13.1# per acre			14.9# per acre			17.5# 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	12	12	12	25	12	12	22	12	12	20	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	12	12	12	12	12	25	22	12	12	12	12												
	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																																			
		6.1# per acre			7.7# per acre			9.8# per acre			11.3# per acre			12.1# per acre			13.8# per acre			16.3# per acre			18.4# 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	25	22	12	12	15	20	25	18	12	25	15	12	25	18	20	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																																
		6.5# per acre			7.8# per acre			8.7# per acre			9.7# per acre			11.9# per acre			13.5# 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	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																													
		16.3# per acre			19.4# per acre			24.2# per acre			27.1# per acre			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	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																																
		2.2# per acre			4.3# per acre			per acre			10.8# per acre			13.2# per acre			16.2# per acre			21.5# per acre			26.9# per acre			32.3# 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	22	20						
	30"										12	22	20	12	18	20	12	15	20	25	12	12	25	18	20	25	15	20						
	36"										12	18	20	12	15	20	25	12	12	25	20	20	25	15	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						

		C = 12 or 20																													
		2.2# per acre			per acre			5.4# per acre			10.8# per acre			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	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.

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

**⚠ DANGER** Always install safety lockups or lower to the ground before working under the machine.

### LUBRICATION SYMBOLS



Lubricate at frequency indicated with an SAE multipurpose type grease

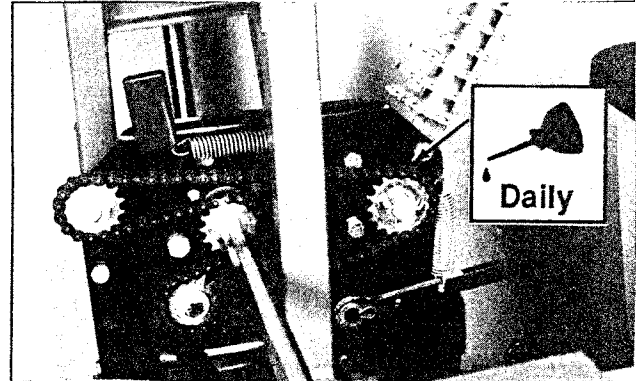
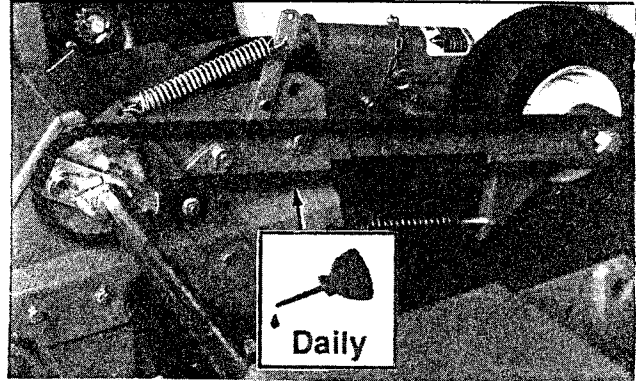


Lubricate at frequency indicated with a high quality SAE 10 weight oil or a quality spray lubricant.

### SEALED BEARINGS

A number of sealed bearings are used on your NG Plus Monosem planter to provide trouble free operation. Located in the drive shaft, row units, transmission, and turbofan, they are lubricated for life.

### DRIVE CHAINS



All transmission and drive chains should be lubricated daily with a high quality SAE 10 weight oil or a quality spray lubricant. 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

**LUBRICATION CONTINUED**

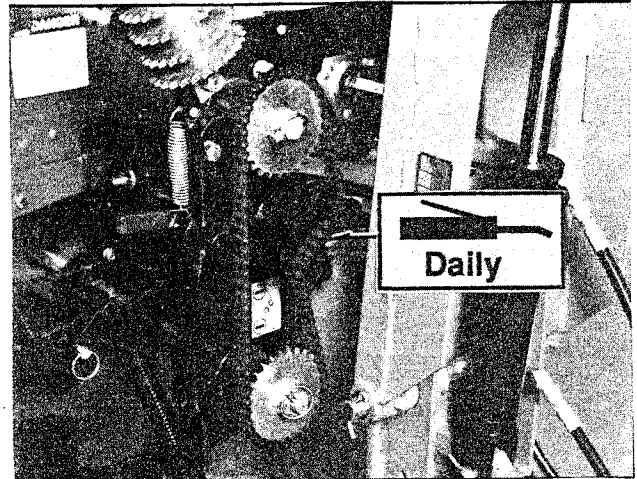
oil so the lubricant can penetrate between the rollers and bushings.

**WHEEL BEARINGS**

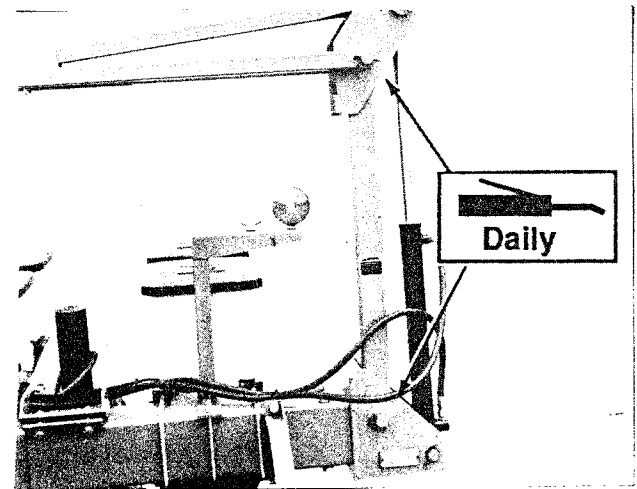
Wheel bearings should be repacked with clean, heavy-duty axle grease once a year or at the beginning of each planing season. This applies to all drive wheels, transport wheels, and marker hubs. Follow the procedure outlined for wheel bearing replacement with the exception that bearings and bearing cups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

**GREASE FITTINGS**

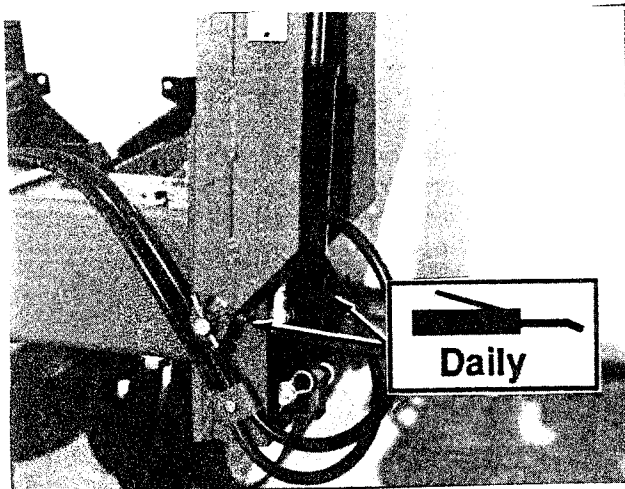
Those parts equipped with grease fittings should be lubricated at the frequency indicated with an SAE multipurpose type grease. Be sure to clean the fitting thoroughly before using grease gun. The frequency of lubrication recommended is based on normal operating conditions. Severe or unusual conditions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



Transmission assembly - 1 zerk (idler).



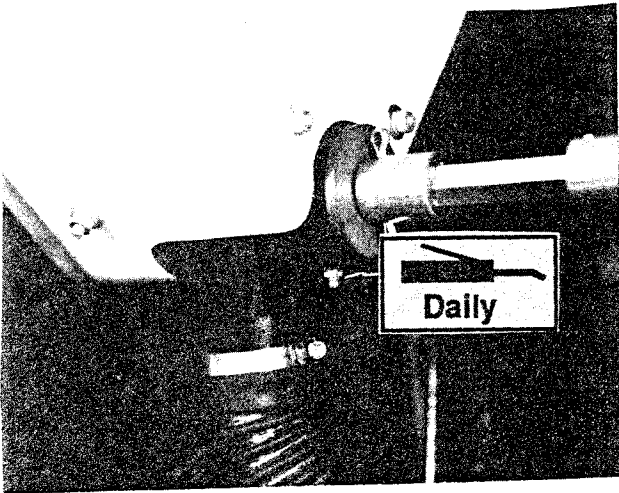
Low profile marker assembly- 2 zerks per assembly.



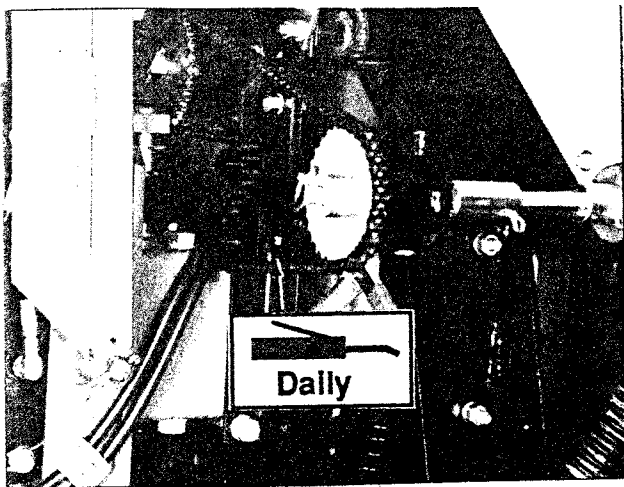
Conventional marker assembly - 4 zerks per assembly.

## Lubrication

---



Fertilizer hopper - 2 zerks per hopper.



Fertilizer transmission - 1 zerk per transmission.

## **MOUNTING BOLTS AND HARDWARE**

Before operating the planter for the first time, check to be sure all nuts and bolts are tight. Check all nuts and bolts again after approximately the first 50 hours of operation and at the beginning of each planting season thereafter.

## **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.

Additional chain links can be found in the storage box located inside the wheel module.

## **PREPARATION FOR STORAGE**

Store the planter in a dry sheltered area.

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.

Inspect the planter for parts that are in need of replacement.

Make sure all seed, herbicide and insecticide hoppers are empty and clean.

Clean seed meters and store in a dry area.

Grease exposed areas of cylinder rods before storing planter.

Grease or paint disc openers to prevent rust.

Empty dry fertilizer hoppers, clean hoppers, disassembly and clean metering augers, reassemble coating all metal parts with rust preventative.

## **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:

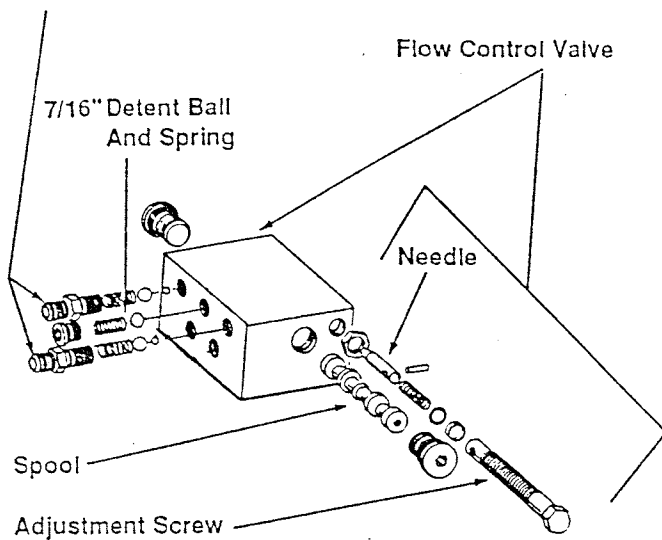
1. Remove valve block assembly from planter.
2. Remove detent assembly and port adapter assemblies from rear of valve block.
3. Remove plug from both sides of valve block and remove spool.
4. Inspect all parts for pitting, contamination or foreign material. Also check seating surfaces inside the valve. 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 correct check ball(s) and spring are installed in each valve bore before reassembly.**

Valve Block continued

A flow control valve is located on each side of the block assembly. The flow control valves should be adjusted for raise and lower speed as part of the assembly procedure or upon initial operation. If the valve fails to function properly or requires frequent adjustment, the needle valve should be removed for inspection. Check for foreign material and contamination. Be sure the needle moves freely in adjustment screw. Replace any components found to be defective.

Port Adapter, Spring, 7/16" Check Ball,  
1/4" Steel Ball

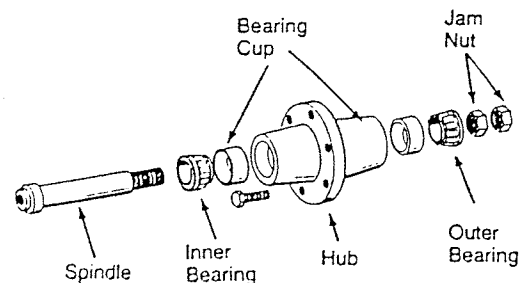


**WHEEL BEARING LUBRICATION OR REPLACEMENT**

1. Raise the tire clear of the ground and remove wheel.
2. Remove the double jam nuts and slide the hub from the spindle.
3. Remove the bearings and cups and discard if bearings are being replaced. Clean the hub and dry. Remove the

bearings only if repacking.

4. Press in new bearing cups with thickest edge facing in. (Bearing replacement procedure only.)
5. Pack bearings with heavy-duty wheel bearing grease thoroughly forcing grease between roller cone and bearing cage. Also fill the space between the bearing cups in the hub with grease.
6. Place inner bearing in place.
7. Clean spindle and install hub.
8. Install outer bearing and nut. Tighten the jam nut while rotating the hub until there is some drag. This assures that all bearing surfaces are in contact. Back off jam nut 1/4 turn or until there is only slight drag when rotating the hub. Install second jam nut to lock against first.
9. Install wheel on hub and tighten evenly and securely.



## 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 warped or worn
- 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 4-14
- 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 4-14

### **IRREGULAR SEEDING (skipping-doubles)**

- Excessive working speed
- Blocked or worn seed tubes
- Holes of seed disc too large (cut off seeds).
- Fields are too steep (see page 4--12)  
Shutter adjusted incorrectly (see page 4-14)
- Ejector is damaged.

### **IRREGULAR SPACING**

- Excessive working speed
- Soil too wet and sticking to drive wheel tires.
- Incorrect tire pressure (see page 4-2)
- Shutter adjusted incorrectly (see page 4-14)

### **FERTILIZER (output of chutes varies)**

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

## Trouble Shooting and Causes

---

### ROW MARKER OPERATION

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 and 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.

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.