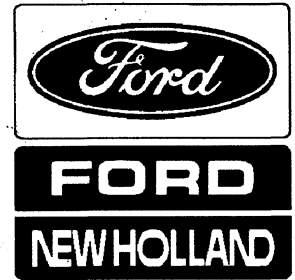


FORD



Operator's Manual

Rear Mounted
Drill Planter
Series 309



FOREWORD

THIS MANUAL HAS BEEN PREPARED TO ACQUAINT YOU WITH THE PREPARATION FOR USE, OPERATION, AND CARE OF YOUR NEW PLANTER. READ THIS MANUAL CAREFULLY BEFORE ATTEMPTING TO OPERATE THE PLANTER AND KEEP IT HANDY FOR LATER REFERENCE.

IF, AT ANY TIME, YOU HAVE A QUESTION OR PROBLEM CONCERNING YOUR PLANTER, REMEMBER THAT YOUR FORD TRACTOR-EQUIPMENT DEALER IS BEST QUALIFIED AND EQUIPPED TO SERVE YOUR NEEDS. WHEN ORDERING PARTS OR REQUESTING INFORMATION, ALWAYS SPECIFY THE SERIES NUMBER OF YOUR PLANTER.

SERVICE DEPARTMENT
TRACTOR AND IMPLEMENT OPERATIONS (U.S.)
FORD TRACTOR DIVISION
FORD MOTOR COMPANY

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OPERATION



Figure 1
Two Row Planter with Attachments

GENERAL INFORMATION

The Ford Series 309 Rear Mounted Drill Planter provides accuracy in seed and fertilizer placement through a range of planting speeds. It is an efficient unit which can be adjusted to give peak performance under a wide variety of conditions.

The seed hoppers are equipped with sturdy, smooth-running hopper drives that provide accurate planting at speeds up to 7 miles per hour in a wide range of drill spacings.

The Series 309 Planter may be attached to all tractors equipped with a Category I three-point hitch.

Planter operation is controlled by means of the tractor hydraulic system. Planting starts when the planter is lowered to the ground and stops when it is raised. The hydraulic system also allows for adjust-

ment of the planting depth during operation of the planter.

This planter is well suited for contour work. It can be equipped with any one of several edge drop seed plates to meet the various sizes and types of seed, including many varieties of beans. Row widths can be changed from 28" to 44" on the two-row units, from 28" to 42" on the four-row units, and 36" to 42" on the six-row units.

OPERATION

Attaching to the Tractor

The Series 309 Planter is attached to the rear of the tractor using the three-point hitch with adjustable top link. The top link should be fastened in the

OPERATION

lower hole of the tractor rocker for both two-row and four-row planter operation. Adjust the length of the top link to level the planter in operating position. Level the planter from side-to-side by turning the tractor lift leveling crank on the right-hand lift link.

When using a four-wheel tractor with the four-row planter, it will be necessary to add liquid ballast to the front tires and attach front wheel weights. See your Tractor Operator's Manual for tire filling information. When the four-row planter is used with a tricycle tractor, a front weight box must be attached.

For best performance of the two, four, or six-row planter, the tractor hydraulic selector lever should be set in the Constant Draft Control position, Figure 2.

The planter may be used with the tractor wheels set at any width. General practice is to adjust tread width to twice the row width. The speed at which the tractor should be driven, varies with the rate of seeding. For heavy planting rates, the planter ground speed should be reduced. Excessive speeds do not allow the seed cells to fill properly. The desired planting depth may be obtained by raising or lowering the planter with the hydraulic touch control lever.

Row Spacing

Row widths of 28" to 44" on the two-row, 28" to 42" on the four-row, and 36" to 42" on the six-row planters may be obtained by positioning the opener assemblies along the tool bars and runner frame. To vary the width between the units on the four-row

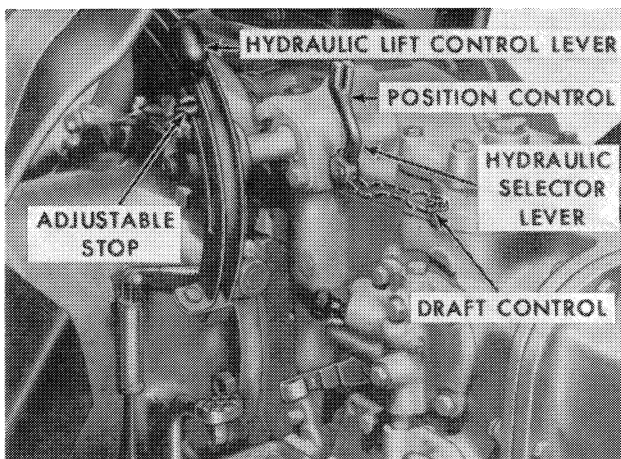


Figure 2
Hydraulic Control Levers

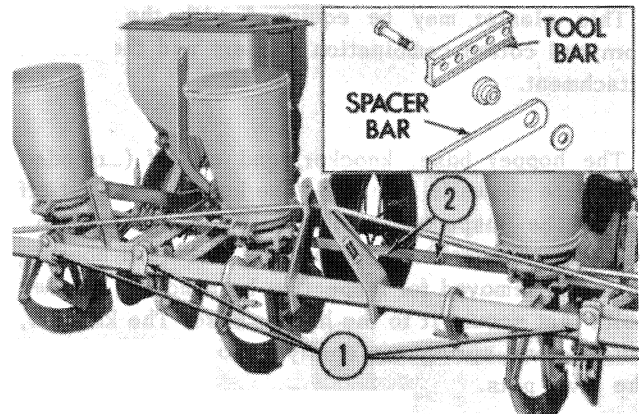


Figure 3
Flexo-Hitch Tool Bar and Four-Row Planter

planter, it is necessary to loosen the clamps (1), Figure 3, on each side of the tool bar. On the six-row planter, loosen the clamps (7), Figure 31, on each side of the tool bar. Then, remove the two spacer bar bolts shown at (2), Figure 3. The units can then be positioned closer together or further apart by sliding them along the tool bar. **Planter units must always be positioned an equal distance from each side of the center of the tool bar.** When the desired spacing is obtained, the two bolts must be replaced in the spacer bar and the clamps tightened on the tool bar.

SEED HOPPERS

Hopper Information

The seed hoppers, whether they are the full bushel or the half-bushel size, mount on the hopper support in the same manner. The hoppers have a three-point mounting and are secured in position with wing nuts. The center dome of the hopper has a cup molded in the bottom, which guides over the pilot cone of the hopper support for seed plate drive alignment.

The seed plates are guided on their outside circumference and pilot on the machined inner surface of the hopper base. The seed plates contact the ring gear, and are driven by two drive lugs which permit a positive self-aligning drive.

The base plate has a groove on one side and is smooth on the other side. It is reversible and may be operated with either side next to the seed plate. The grooved side next to the seed plate will provide deeper cell depth and will permit a plate to be used for a wider range of seed sizes. Seed plates are not included with the hoppers. For seed plate information for the various crops, refer to page 9 of this manual.

OPERATION

This planter may be equipped with the corn or corn and cotton combination hoppers and the peanut attachment.

The hopper base, knocker, and cut-off (exploded view) are shown in Figure 4. The knocker and cut-off should be inspected periodically for free action, proper spring tension, and wear. The cut-off housing is easily removed for inspection by removing the two bolts that secure it to the hopper base. The knocker, cut-off, and spring are easily removed by removing the pivot pins.

NOTE: Occasionally, individual seeds may work into the cut-off housing and interfere with the cut-off and knocker action. Housings should be inspected and cleared periodically to avoid this.

Corn Hoppers

Two sizes of corn hoppers are available Component No. 12-183 has a full one bushel capacity and Component No. 12-184 is a half-bushel size. Both hoppers are equipped with a corn base and may be used to plant corn, beans, acid delinted cotton seed, peas, sorghum, and other smooth seeds.

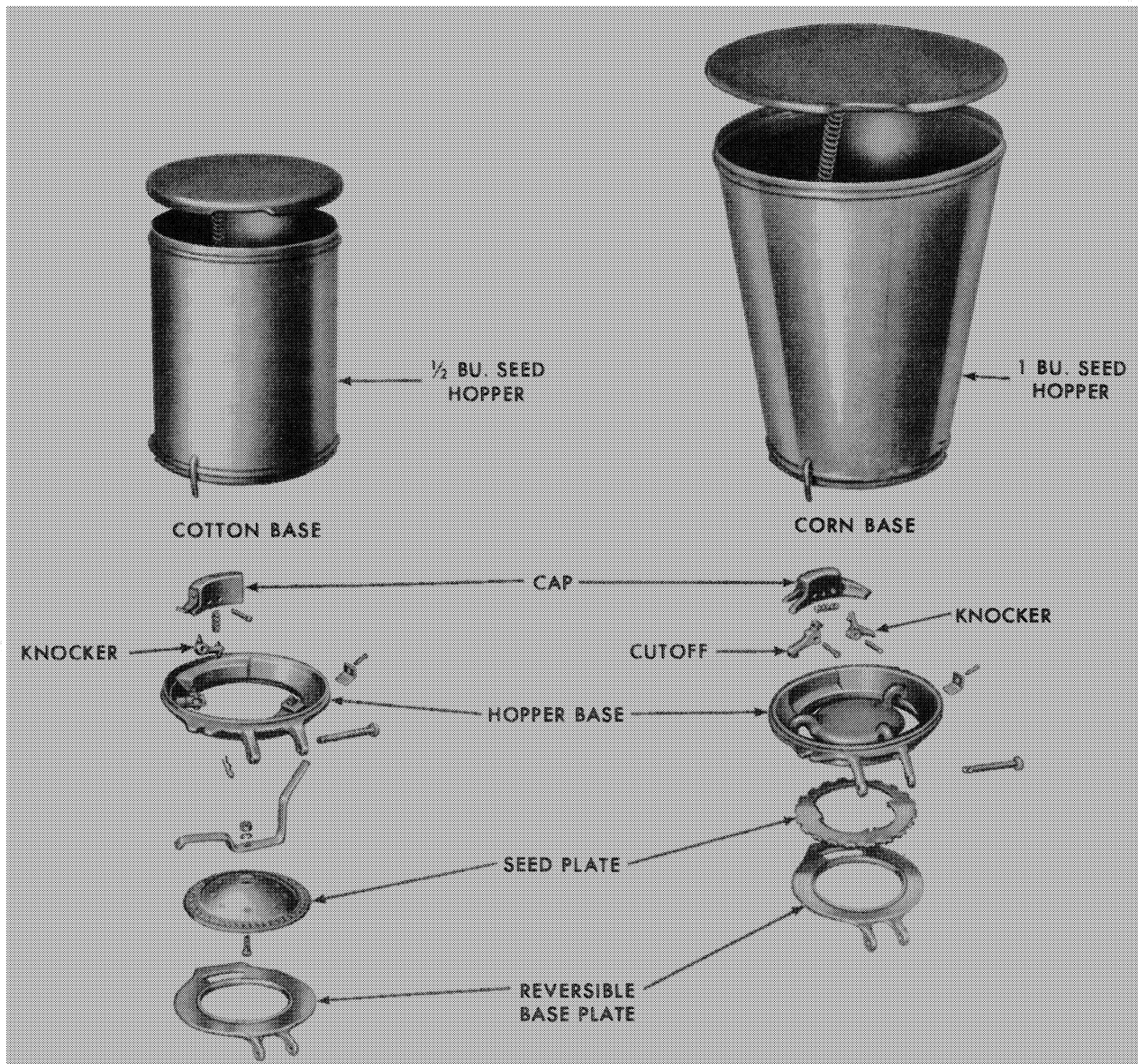


Figure 4
Seed Hoppers and Bases

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Corn and Cotton Hoppers

Two sizes of corn and cotton hoppers are available. 12-185 has a full one bushel capacity and 12-186 is a half-bushel size. For planting corn, beans, acid delinted cotton seed, peas, sorghum, and other smooth seeds, the corn hopper base and edge drop seed plates are used. For planting gin run or mechanically delinted cotton seed, the hopper base is used.

Peanut Hopper Attachment

The 12-220 Peanut Hopper Attachment, shown in Insert A, Figure 37, is used with the 12-186 half-bushel corn and cotton hopper. When used with the 12-185 one bushel hopper, fill hopper only half full.

SEED PLATES

Seed Plate Information

The output rate of seed plates will vary with planting speeds, slippage of the drive wheels, and the size of the seed planted. Slippage will vary with soil conditions and will cause a decrease in planting rates. Normally, a slight increase in planting rates will occur with smaller-than-average seed.

Always check the seed plate to be used against the seed to be planted.

Seed plate selection is of prime importance. Check by driving the planter on hard ground. Calculate the average seed or hilldrop spacing over a ten foot span.

Field checks should be made periodically to determine if placement and output is satisfactory.

If problems in selecting the proper seed plate are encountered, see your Ford Tractor—Equipment Dealer. A two quart sample of seed is required for proper analysis and seed selection.

Corn Plates

Ford Seed Plates for corn are of the edge-drop design and have 20 cells each. This permits a lower plate speed than that required by 16 or 12 cell plates. The desired planting distances or seed population per acre are obtained by using the proper combination of sprockets on the axle shaft and the

seed shaft. Planting distances, seed population per acre, and planting rates are given in the Seed Chart Section, beginning on page 9 of this manual.

Corn plates are designed to handle one seed per cell. For best results, select a plate with a cell that best matches the size and shape of one of the larger kernels in the seed to be planted. As operating speeds are increased, it is necessary to allow greater clearance on the length dimension of the cell. Proper selection of seed plates cannot be over-emphasized in obtaining the best results from the planter.

Normally, the smooth side of the base plate should be next to the seed plate. When the base is positioned with the grooved side next to the seed plate, the effective depth of the cell is increased. The grooved side should be used only when necessary, to obtain the desired accuracy.

Cotton Plates

The cotton base is equipped with two packing springs to press cotton seed into the cotton plate cells. The cotton plates are equipped with agitators. The bottom of the cotton plate dome has a cup which rides over the pilot on the hopper support centering the plate. The large 32-cell plate, 109791, is used for gin run seed and heavy plantings of mechanically delinted seed. The small 32-cell plate, 109789, is used for lighter planting rates of mechanically delinted cotton seed. A bunch drop plate, 109790, has 8 large cells for bunch drop planting of gin run or mechanically delinted cotton seed. At 3 to 4 miles per hour, a favorable bunch drop pattern is obtained; however, as planting speeds increase, seeds will be scattered.

Peanut Plates

For best results, select a peanut plate with a cell that best matches the largest seed in the sample. Seeds too large to pass through a plate will collect under the baffle, thereby reducing the output. Clean the peanuts from under the baffle at least once a day. The hopper will tend to retain the big seeds under the baffle. Keep these seeds separate and plant them last with a larger plate.

OPERATION

Other Plates

Planting rates for seed other than corn, cotton, or peanuts will normally be governed by the proper selection of sprocket ratios as shown in the planting charts. Select a seed plate that has a cell similar in size and shape to the seed to be planted.

The chart on page 9 identifies the various seed plates available with a brief description of each.

Seeding Rates

The following charts are designed to aid in the selection of seed plates and to provide a method of determining the correct sprockets to use for a desired planting rate. Rates given in these charts were obtained with a planter operating at normal planting speed and using typical seed. Because of the variations that are possible due to slippage, speed, and differences in seed, the data is approximate and should only be used as a guide. It should be confirmed by checks made during the planting operation.

The drill planting charts are calculated for 40" row spacings. The pounds of seed per acre for rows spaced other than 40" may be obtained by multiplying the amount of seed in the chart by the factor listed below:

<u>Row Spacing</u>	<u>Factor</u>
42 in.	.95
40 in.	Use Chart
38 in.	1.05
36 in.	1.11
34 in.	1.18
32 in.	1.25
30 in.	1.33
28 in.	1.43

Example: To determine the approximate pounds per acre for 38" row spacing of sorghum using 13 to 6 gear ratio and the 108951 plate, multiply 21.3 by 1.05. This results in 22.4 pounds of sorghum seed being drilled on one acre.

LUBRICATION

The planter should be lubricated at the time of assembly and at the end of each day of operation.

There are nine lubrication fittings on each basic planter unit. Six hopper drive fittings are located around the two ring gear supports, as shown in Figure 5. The other three fittings, also indicated in Figure 5, are the seed shaft center bearing and the axle bearings. A good grade of pressure gun grease should be used on all of these fittings.

NOTE: Do not over lubricate seed hopper bases. Excess grease will cause a build-up of dust and dirt and may interfere with hopper operation.

Do not lubricate seed hopper cut-off and knocker assembly or seed plate.

STORING THE PLANTER

When storing the planter, the following procedure is recommended.

1. Secure the markers in the transport position.
2. Remove the fertilizer from the hoppers and clean the metering wheels, spouts, and openers, as shown in Figure 19.
3. Remove the extra seed from the hopper.
4. Clean the bearings by lubricating.
5. Cover the ground-engaging parts with heavy oil or grease.

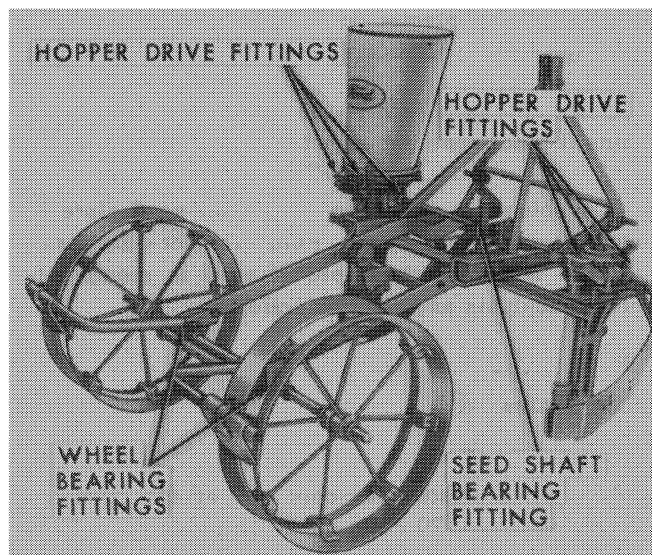


Figure 5
Lubrication Fittings on Basic Unit

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Plate Number	Description	Cells	Lighter	Normal	Heavier			
108954	Corn—Small flat.....	20		108954	108955			
108955	Corn—Small flat (long).....	20	108954	108955	109786A2			
109785	Corn—Medium flat (short).....	20	108954	109785	109786A2			
109786A2	Corn—Medium & large flat (average).....	20	109785	109786A2	109788			
109787A2	Corn—Medium & large flat (long).....	20	109786A2	109787A2	109788			
109788	Corn—Medium & large flat (thick).....	20	109786A2	109788	126785			
126785	Corn—Large flat.....	20	109788	126785				
108956	Corn—Small round.....	20		108956	108957			
108957	Corn—Medium round.....	20	108956	108957	108952			
108952	Corn—Large round.....	20	108957	108952				
108953	Soybean—Light rate	} Also beans — snap, yellow eye, and cranberry 24	24					
121299A2	Soybean—Heavy rate							
108958	Navy Beans—Peas.....	42	Try middle column first. If plate plants light try plate on right. If plate plants heavy try plate on left. If plate plants slightly light place the groove in the base plate next to the seed plate.					
108959	Blank (5/16" thick)—for making special plates.....							
*129912A2	Sorghum and small seeds—Extra light rate.....	20						
*108950	Sorghum and small seeds—light rate.....	40						
*108951	Sorghum and small seeds—heavy rate.....	40						
*129914A2	Popcorn—small.....	20						
*127206A2	Popcorn—large.....	20						
*108949	Blank (1/8" thick)—for making special plates.....							
**109789	Cotton—Mechanically delinted light rates.....	32				NOTE: Any plate number with the suffix A2 designates acetal resin rather than cast iron. However, both plates are identical in size and shape, hence perform the same function.		
**109791	Cotton-Gin run & mechanically delinted (Standard with Corn & Cotton Hoppers 12-185 & 12-186).....	32						
**109790	Cotton-Bunch Drop-Gin run and mechanically delinted..	8						
**126652	Peanuts—Small (spanish).....	24						
**126653	Peanuts—Medium (dixie runner).....	24						
**126654	Peanuts—Large (virginia runner).....	20						
**222127	Peanuts—Large (NC-2).....	15						
**126651	Peanuts—blank plate							

*Use with bottom filler plate, Part No. 108962

**For use only with corn and cotton hoppers, Models 12-185 and 12-186.

OPERATION

FORD SEED PLATE DIMENSIONS

<u>PLATE NO.</u>	<u>CELL LENGTH</u>	<u>CELL WIDTH</u>	<u>CELL THICKNESS</u>	<u>NO. OF CELLS</u>
<u>Corn Flats</u>				
108954	34	12	20	20
108955	37	12	20	20
109785	34	12.5	20	20
109786	37	12.5	20	20
109787	40	13	20	20
109788	37	14	20	20
126785	40	15	21	20
<u>Corn Rounds</u>				
129914	24	12	11	20
127206	24	15	13	20
108956	35	17	20	20
108957	38	19	20	20
108952	42	21	20	20
<u>Bean Plates</u>				
108958	28	15	14	42
108953	42	21	19	24
121299	46	21	24	24
<u>Sorghum Plates</u>				
129912	19	9	7-5	20
108950	19	9	7-5	40
108951	19	15	8-5	40
<u>Cotton Plates</u>				
109789	21	29	18	32
109791	28	33	18	32
109790	53	33	18	8
<u>Peanut Plates</u>				
126652	36	26	19	24
126653	43	26	19	24
126654	53	31	19	20
222127	72	32	26	15
<u>Blank Plates</u>				
108949	---	---	8	---
108959	---	---	20	---
126651	---	---	19	---

NOTE: Dimensions are in 1/64 inches.

OPERATION

APPROXIMATE DRILL PLANTING RATES

Optimum Recommended Planting Speed (mph)	Teeth on Axle Drive Sprocket	Teeth on Seed Shaft Sprocket	Planter Travel Per Seed Plate Revolution (Inches)	CORN		SORGHUM				SOYBEANS		NAVY BEANS			
				Plate as Required (20 Cells)	Drilling Distance (Inches)	Plate 108950 (40 Cells)	Plate 108951 (40 Cells)	Plate 129912 (20 Cells)	Plate 108953 (24 Cells)	Plate 121299 (24 Cells)	Plate 108958 (42 Cells)	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre
2.5	13	6	87		4.4	11.5	21.3	5.0	54	111	36				
3.5	13	9	130		6.5	7.7	14.2	3.4	37	77	24				
4.0	8	6	141		7.1	7.1	13.1	3.1	34	72	22				
4.5	7	6	162	Amount of Seed Per Acre	8.1	6.2	11.4	2.7	30	63	19				
5.0	13	12	174	Will Vary With Seed Size.	8.7	5.8	10.6	2.5	28	59	18				
6.0	8	9	212	See Seed Supplier.	10.6	4.8	8.7	2.0	23	49	15				
7.0	7	9	242		12.1	4.2	7.6	1.8	20	43	13				
7.0	8	12	282		14.2	3.6	6.8	1.5	17	37	11				
7.0	7	12	324		16.2	3.1	5.7	1.4	15	33	10				

* Multiply pounds per acre for 40-inch rows by factor listed on page 8 and enter the pounds required per acre for your row spacing.

OPERATION

APPROXIMATE DRILL PLANTING RATES

Optimum Recommended Planting Speed (mph)	Teeth on Axle Drive Sprocket	Teeth on Seed Shaft Sprocket	Planter Travel Per Seed Plate Revolution (Inches)	VIRGINIA RUNNER PEANUTS			DIXIE RUNNER PEANUTS			SPANISH PEANUTS			NC-2 PEANUTS			MACHINE DELINTED COTTON							
				Plate 126654 (20 Cell) Baffle Setting 2 1/2"		Plate 126653 (20 Cell) Baffle Setting 2"		Plate 126652 (20 Cell) Baffle Setting 1 3/4"		Plate 222127 (15 Cell) Baffle Setting 2 1/4"		Plate 109789 (32 Cell)		Plate 109790 (8 Cell—Bunchdrop)		Plate 109791 (32 Cell)		Pounds Per Acre		Pounds Per Acre		Pounds Per Acre	
				*	40" Rows	*	40" Rows	*	40" Rows	*	40" Rows	*	40" Rows	*	40" Rows	*	40" Rows	*	40" Rows	*	40" Rows	*	40" Rows
2.5	13	6	87	65	60	40	96	40	40	40	51	38	51	38	86								
3.5	13	9	130	44	41	27	67	27	27	36	26	66	36	26									
4.0	8	6	141	40	37	25	62	25	25	33	24	62	33	24									
4.5	7	6	162	35	32	22	55	22	22	29	21	54	29	21									
5.0	13	12	174	33	30	20	51	20	20	27	19	53	27	19									
6.0	8	9	212	27	25	17	42	17	17	22	16	44	22	16									
7.0	7	9	242	23	22	14	37	14	14	19	14	39	19	14									
7.0	8	12	282	20	18	12	32	12	12	16	12	34	16	12									
7.0	7	12	324	18	16	10	28	10	10	14	10	30	14	10									

* Multiply pounds per acre for 40-inch rows by factor listed on page 8 and enter the pounds required per acre for your row spacing.

OPERATION

APPROXIMATE DRILL PLANTING RATES

Optimum Recommended Planting Speed (mph)	Teeth on Axle Drive Sprocket	Teeth on Seed Shaft Sprocket	Planter Travel Per Seed Plate Revolution (Inches)	GIN RUN COTTON		ACID DELINTED COTTON											
				Plate 109790 (8 Cell- Bunchdrop)	Plate 109791 (32 Cell)	Plate 108952 (20 Cell)	Plate 108953 (24 Cell)	Plate 108956 (20 Cell)	Plate 108957 (20 Cell)	Plate 108958 (42 Cell)	Plate 109788 (20 Cell)	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre
				Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre	Pounds Per Acre
2.5	13	6	87	17	48	37	59	21	26	31	21	26	31	21	26	31	28
3.5	13	9	130	11	31	26	41	15	19	15	15	19	25	20	25	20	20
4.0	8	6	141	11	28	24	38	14	17	14	14	17	24	18	24	18	18
4.5	7	6	162	9	24	21	33	12	15	12	12	15	22	16	22	16	16
5.0	13	12	174	9	22	20	31	11	14	11	11	14	20	15	20	15	15
6.0	8	9	212	7	18	17	25	9	12	9	9	12	17	13	17	13	13
7.0	7	9	242	6	16	15	22	8	10	8	8	10	15	11	15	11	11
7.0	8	12	282	5	14	13	19	7	9	7	7	9	13	10	13	10	10
7.0	7	12	324	5	12	11	17	6	8	6	6	8	11	9	11	9	9

* Multiply pounds per acre for 40-inch rows by factor listed on page 8 and enter the pounds required per acre for your row spacing.

OPERATION

APPROXIMATE POPULATIONS PER ACRE WITH ONE SEED PER DROP

(For Hilldrop Planting Multiply by Number of Seeds Per Hill)

Seed Spacing in the row	Width Between Rows							
	28"	30"	32"	34"	36"	38"	40"	42"
40"	5,600	5,200	4,900	4,600	4,400	4,100	3,900	3,700
38"	5,900	5,500	5,200	4,900	4,600	4,300	4,100	3,900
36"	6,200	5,800	5,400	5,100	4,800	4,600	4,400	4,100
34"	6,600	6,100	5,800	5,400	5,100	4,900	4,600	4,400
32"	7,000	6,500	6,100	5,800	5,400	5,200	4,900	4,700
30"	7,500	7,000	6,500	6,100	5,800	5,500	5,200	5,000
28"	8,000	7,500	7,000	6,600	6,200	5,900	5,600	5,300
26"	8,600	8,000	7,500	7,100	6,700	6,300	6,000	5,700
24"	9,300	8,700	8,200	7,700	7,300	6,900	6,500	6,200
22"	10,200	9,500	8,900	8,400	7,900	7,500	7,100	6,800
20"	11,200	10,500	9,800	9,200	8,700	8,300	7,800	7,500
19"	11,800	11,000	10,300	9,700	9,200	8,700	8,200	7,900
18"	12,400	11,600	10,900	10,200	9,700	9,200	8,700	8,300
17"	13,200	12,300	11,500	10,800	10,300	9,700	9,200	8,800
16"	14,000	13,100	12,300	11,500	10,900	10,300	9,800	9,300
15"	14,900	13,900	13,000	12,300	11,600	11,000	10,400	10,000
14"	16,000	14,900	14,000	13,200	12,400	11,800	11,200	10,700
13"	17,200	16,100	15,100	14,200	13,400	12,700	12,000	11,500
12"	18,700	17,400	16,300	15,400	14,500	13,800	13,100	12,400
11"	20,400	19,000	17,800	16,800	15,800	15,000	14,200	13,600
10"	22,400	20,900	19,600	18,400	17,400	16,500	15,700	14,900
9"	24,900	23,200	21,800	20,500	19,400	18,300	17,400	16,600
8"	28,000	26,200	24,500	23,100	21,800	20,600	19,600	18,700
7"	32,000	29,900	28,000	26,400	24,900	23,600	22,400	21,400
6"	37,300	35,000	32,700	30,700	29,000	27,500	26,100	24,900
5"	44,800	41,900	39,200	36,900	34,800	33,000	31,400	29,900
4"	56,000	52,200	49,000	46,100	43,600	41,300	39,200	37,300
3"	75,000	69,600	65,400	61,500	58,100	55,000	52,200	49,800
2"	112,000	104,500	98,000	92,200	87,100	82,500	78,400	74,700
1"	224,000	209,100	196,000	184,500	174,200	165,100	156,800	149,300

NOTE: This chart does not allow for planting, germination, or cultivating losses.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION	
Inconsistent Drop	1. Ground speed <ul style="list-style-type: none"> . Too fast . Too slow 	Adjust speed as necessary.	
	2. Ground conditions <ul style="list-style-type: none"> . Excessive surface trash . Poorly prepared seed bed 	Cut up trash more completely. Prepare deeper seed bed.	
	3. Openers <ul style="list-style-type: none"> . Opener heel plugged . Runner openers worn 	Soil too wet – or planter backed up with openers in the ground. Replace runners.	
	4. Seed <ul style="list-style-type: none"> . Incorrect seed plate . Seed corn poorly sized 	Try larger or smaller plate as required.	
	5. Seed Hopper <ul style="list-style-type: none"> . Reversible base plates not installed the same in all hoppers . Cutoff and knocker binding . Seeds lodged in cutoff and knocker cap when hopper was turned to change plates . Cutoff and knocker spring broken . Cutoff or knocker worn 	Check installation. Disassemble and remove cause of binding. Remove seeds. Replace spring. Replace cutoff and knocker.	
	Planting More or Less Seed in Some Rows Than Others	1. Incorrect sprocket combination	Check proper assembly.
		2. Seed <ul style="list-style-type: none"> . Foreign material in seed . Wrong seed plate in one or more hoppers 	Check and remove as necessary. Check and correct.
		3. Seed Hopper <ul style="list-style-type: none"> . Reversible base plates not installed the same in all hoppers . Cutoff or knocker binding 	Check installation. Disassemble and remove cause of binding.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
Planting More or Less Seed in Some Rows Than Others (Cont.)	. Seeds lodged in cutoff and knocker cap when hopper was turned to change plates	Remove seed.
	. Cutoff and knocker spring broken	Replace spring.
	. Cutoff and knocker worn	Replace cutoff and knocker.
Seed Cracking	1. Seed	
	. Incorrect plate	Try larger or smaller plate, as required.
	. Poorly sized seed	
	2. Seed Hopper	
	. Groove of reversible base plate being used when not necessary	Use smooth side of base plate.
	. Cutoff binding in cap	Remove cause of binding.
. Warped reversible base plate	Replace base plate.	
Planting Depth Not Uniform	1. Depth adjustment	Tractor hydraulic system should be in Constant Draft Control position.
	2. Seed bed preparation	
	. Disc fertilizer opener set deeper than depth of seed bed preparation	Raise disc opener or prepare deeper seed bed.
	. Seed bed too shallow	Prepare deeper seed bed.
	. Surface trash interfering	Cut up trash more completely.
	3. Openers	
	. Runner openers worn	Replace runners.

ASSEMBLY

ASSEMBLY PROCEDURE

The basic planter is available with either double disc openers (12-254) or runner openers (12-253) and is shipped in three bundles, as shown in Figure 6.

NOTE: *It is the responsibility of the Ford Tractor—Equipment Dealer to deliver this implement completely assembled as outlined in the following instructions.*

Two-Row Planter

1. Unpack the parts and check with Figure 6 to be sure none are missing.

NOTE: *If the planter is to be equipped with a fertilizer attachment, install the drive sprocket at this time. For installation procedures, refer to page 21 of this manual.*

2. Scrape off the excess paint from the ends of the axle shaft and slide the wheels into place.

3. Secure each of the wheels to the axle shaft with the pins provided.

4. Install the hitch as follows:

- a. Remove the bolts (4), Figure 7, that secure the rear diagonal braces to the hitch braces.

- b. Position the hitch on the runner frame as shown in Figure 7, and secure the rear braces to the hitch braces with the bolts (4).

- c. Secure the hitch braces to the runner frame at (2) and (3) with the bolts provided.

5. Secure the forward ends of the planter wheel frame to the hitch assembly at (1), Figure 7, with the bolts and spacers provided.

6. Install the seed tubes on the rear of each planter boot as shown in Figure 23.

7. Install the drive wheel pressure spring assemblies (6), Figure 8, with each bolt placed up through the hitch brace and the stop on the wheel frame

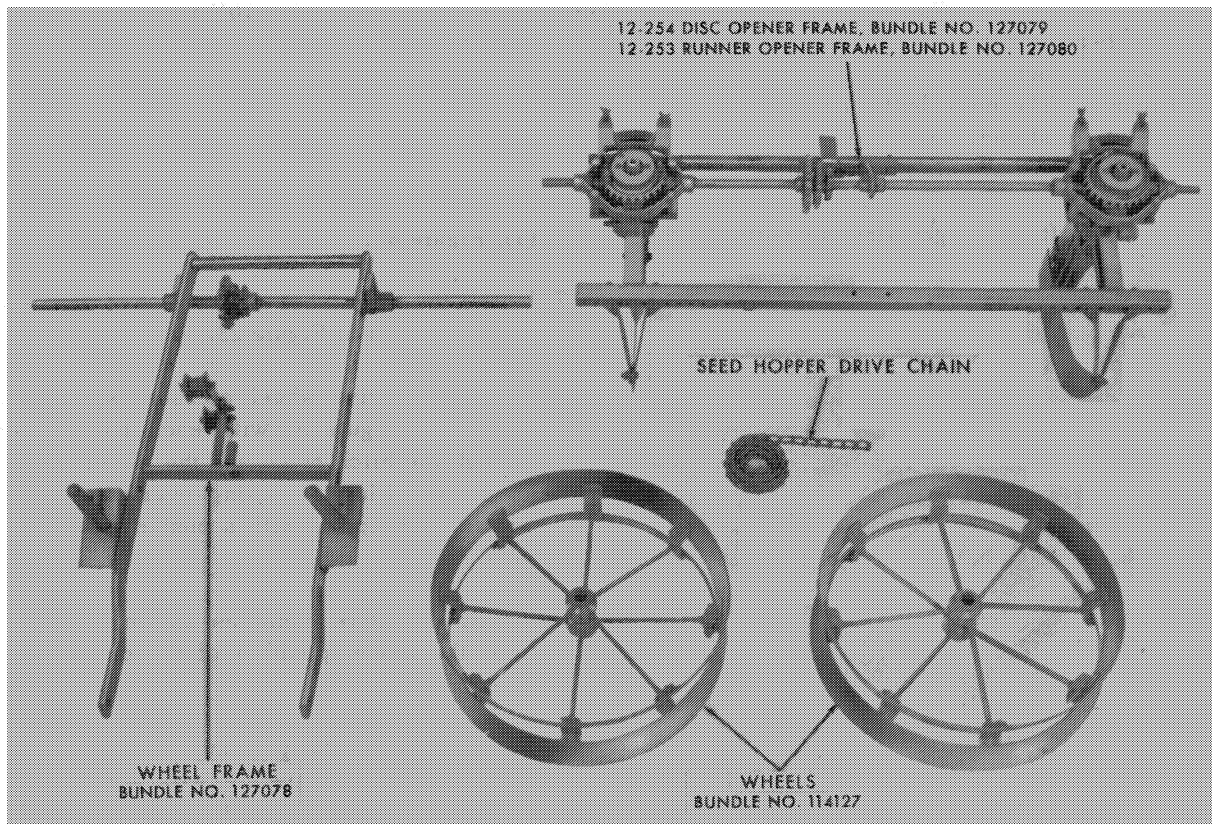


Figure 6
Two-Row Unit—As Shipped

ASSEMBLY

as shown. Place a spring over each bolt and secure each spring with a bushing and two lock nuts.

8. Install the drive chain as shown in Figure 9. Note the proper position of the chain skid and idler.

Four-Row Planter

NOTE: Two complete units, as shown in Figure 6, are required for the four-row planter. If the planter is to be equipped with fertilizer attachments, install the drive sprockets at this time. For installation procedures, refer to page 21 of this manual.

1. Unpack the parts and check with Figure 6 to be sure none are missing.
2. Scrape off the excess paint from the ends of the axle shafts and slide the wheels into place.
3. Secure each of the wheels to the axle shafts with the pins provided.
4. Bolt the two hitch braces to the front and rear tool bars of each unit, at the points shown at (5), Figure 8. The nuts, bolts, and lock washers to be used are already positioned in the front and rear tool bars of the basic planter units.
5. Attach the left and right link supports to the

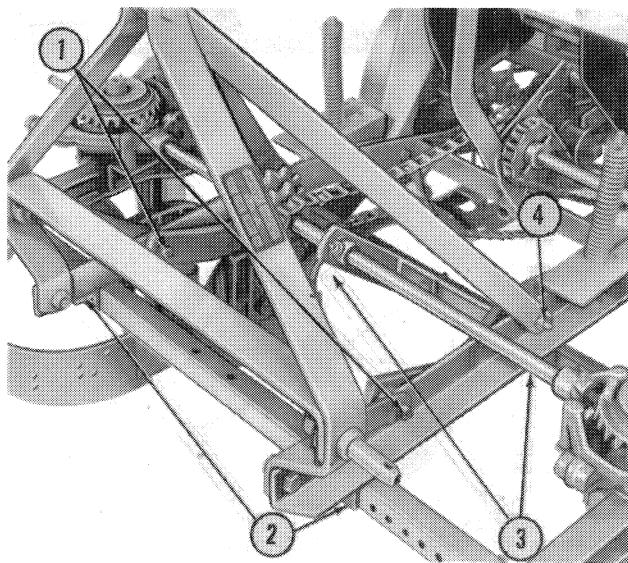


Figure 7
Two-Row Hitch Installed

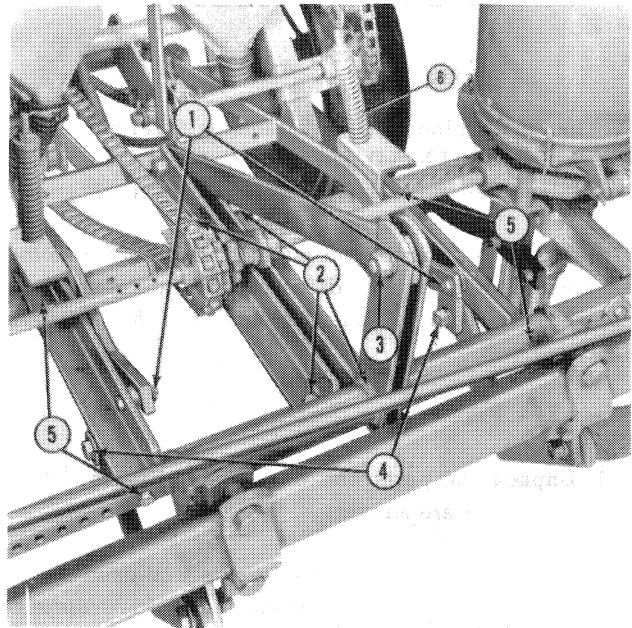


Figure 8
Detail of 12-226 Flexo-Hitch

- front and rear tool bars at the four points (2), Figure 8. The bolts used are 7/16" x 1-3/4" at the rear tool bar and 7/16" x 2-1/2" at the front tool bar.
6. Attach the front ends of the wheel frame assembly to the hitch braces, using the four 7/16" x 2-1/2" bolts and spacers provided with the hitch assembly. Two of these bolts are shown in place at (1), Figure 8.
7. Install the seed tubes on the rear of each planter boot as shown in Figure 23.
8. Install the drive wheel pressure spring assemblies (6), Figure 8, with each bolt placed up through the hitch brace and the wheel frame stop as shown. Place a spring over each bolt and secure each spring with a bushing and two lock nuts.
9. Install the drive chain as shown in Figure 9. Note the proper position of the chain skid and idler.
10. Position the two basic planter units side by side at the desired row spacing. Attach the spacer bar to the rear tool bar of each unit using the 3/8" x 1-3/4" bolts provided with the spacer bar. The bolts (2), Figure 3, provide a means of adjusting the spacer bar for various row widths.

ATTACHMENTS

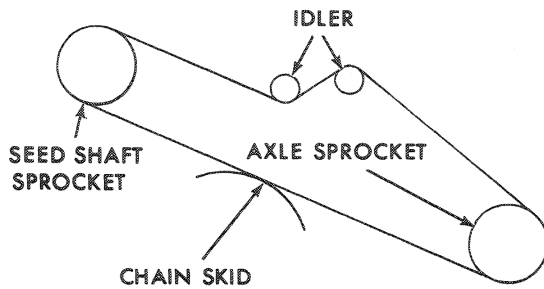


Figure 9
Chain Installation

11. Move the four-row tool bar into position. Attach the "L" shaped rear pick-up links to the link supports on the four-row hitch braces using the 5/8" x 2" bolts as shown at (4), Figure 8.

NOTE: *It may be necessary to loosen the clamps (1), Figure 3, and reposition the floating hitch assembly when performing the above operation.*

12. Lift the tool bar into position and attach the brace bars in position using the 5/8" x 1-1/2" bolts and spacers as shown at (3), Figure 8.

Assembly of the four-row planter is now complete. For information on installing the various attachments, consult the "ATTACHMENTS" section of this manual.

Six-Row Planter

NOTE: *Three complete units, Figure 6, are required for the six-row planter. If the planter is to be equipped with fertilizer attachments, install the drive sprockets at this time. For installation procedures, refer to page 21 of this manual.*

1. Unpack the parts and check with Figure 6 to be sure none are missing.
2. Assemble each planter unit completely, as outlined in steps 1 through 12 under "Assembly of the Four-Row Planter."
3. Position the three planter units side by side at the desired row spacing. Attach a spacer bar between the units with the four 3/8" x 1-3/4" bolts provided with the spacer bars. Bolts (2), Figure 3, provide a means of adjusting the spacer bar for various row widths.

4. Attach the six-row tool bar to the tractor three-point hitch and position the tractor and tool bar in front of the units.

5. Attach the "L" shaped pick-up links to the link supports using the 5/8" x 2" bolts as shown at (4), Figure 8.

NOTE: *It may be necessary to loosen the clamps (1), Figure 3, and reposition the hitch brackets.*

6. Attach the rear pickup links using the 5/8" x 1-1/2" bolts and spacers as shown at (3), Figure 8.

ATTACHMENTS

The following attachments for the Series 309 Planter are sold separately by your Ford Tractor-Equipment Dealer.

12-225 Hitch Assembly for Two-Row Planter

Shipping Information: The 12-225 Hitch Assembly (one required) is shipped as shown in Figure 10 (Bundle No. 12-225).

When attached to the basic planter unit, this attachment provides a means of fastening the planter to the tractor three-point hitch.

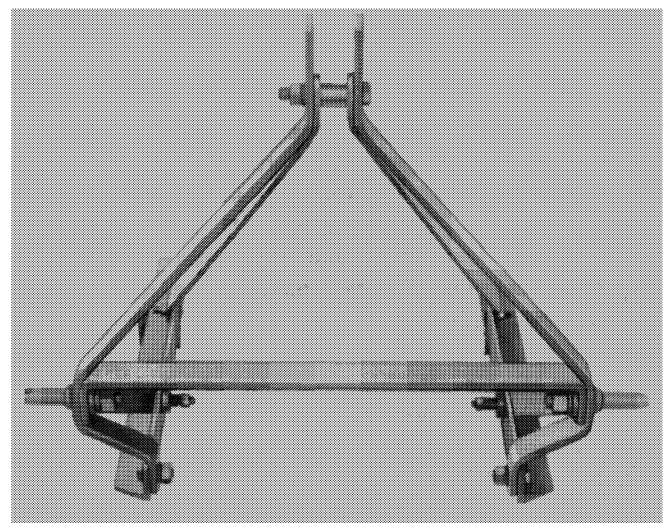


Figure 10
12-225 Two-Row Hitch Assembly

ATTACHMENTS

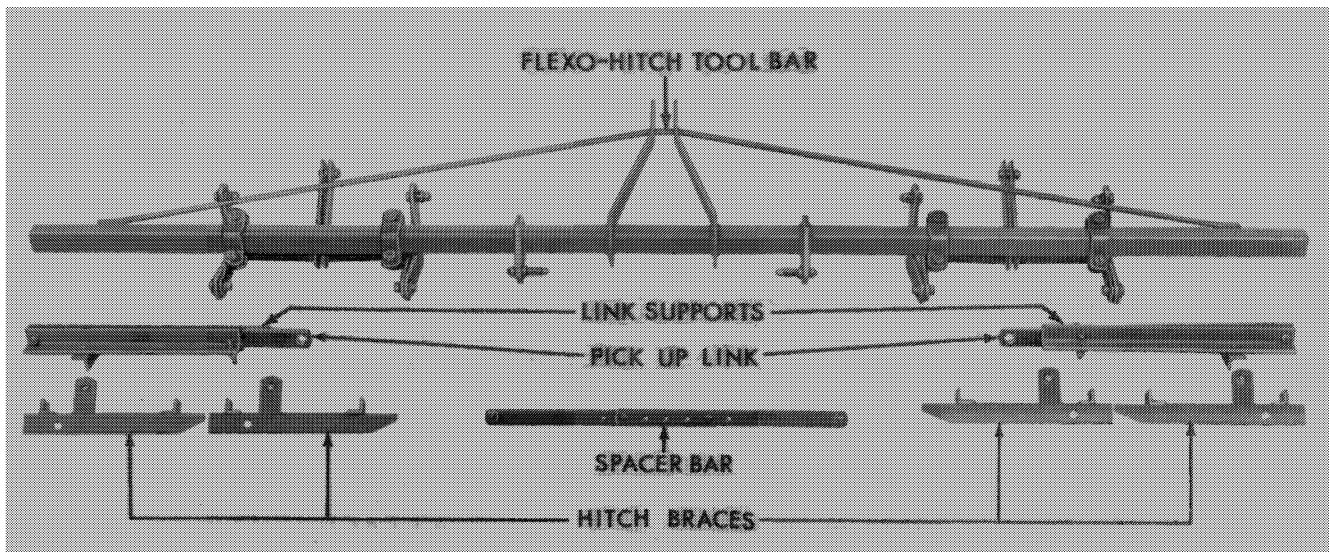


Figure 11
12-226 Flexo-Hitch Assembly

Attaching: The Two-Row Hitch Assembly is bolted to the planter at the six points shown at (1), (2), and (3), Figure 7. The bolts used at (1) and (2) are 7/16" x 2-1/2" and the bolts at (3) are 7/16" x 1-3/4". Two spacers are provided for use between the frame and the hitch at (1).

12-226 Flexo-Hitch Assembly for Four-Row Planters

Shipping Information: The 12-226 Hitch Assembly (one required) is shipped in two bundles as shown in Figure 11. Bundle No. 114046 contains the tool bar and attached assemblies. Bundle No. 126775 contains the support and brace assemblies.

This unit provides the means for assembling two basic planter units together and attaching them to the tractor as a four-row planter. The planter units are attached to the tool bar using four "L" shaped lower links and two upper link and brace assemblies. A spacer bar between the two basic units maintains accurate row widths.

Attaching: Begin attaching the hitch by bolting the four hitch braces, shown in Figure 11, to the front and rear tool bars as shown at (5), Figure 12. The nuts, bolts, and lock washers to be used are already positioned in the front and rear tool bars of the basic planter units. Use the four 7/16" x 2-1/2" bolts and spacer, provided with the Flexo-Hitch Assembly, to

attach the front ends of the wheel frame to the Flexo-Hitch braces. Two of these bolts are shown in place at (1), Figure 12. Attach the left and right link supports, shown in Figure 11, to the front and rear tool bars at the points shown at (2), Figure 12. The bolts used are 7/16" x 2-1/2" at the front tool bar and 7/16" x 1-3/4" at the rear tool bar. Position the two basic planter units side by side and attach the spacer bar to the rear tool bar of each unit. Secure with the 3/8" x 1-3/4" bolts, lock nuts, and flat washers provided with the spacer bar as shown in the Insert, Figure 13. Move the four-row tool bar in front of the planter units. Attach the "L" shaped pull links to the outside of the link supports on the four hitch braces, using the 5/8" x 2" bolts, spacers, lock washers, and nuts as shown at (4), Figure 12.

NOTE: It may be necessary to loosen the clamps (1), Figure 13, remove the bolts (2), and reposition the floating hitch assembly when performing the above operation. It is also necessary to loosen the clamps (1) and remove the bolts (2) whenever the spacing between the two basic planter units is changed.

When the four front pull links are attached, lift the tool bar into position and attach the rear pickup links using the 5/8" x 1-1/2" bolts, spacers, lock washers, and nuts as shown at (3), Figure 12.

ATTACHMENTS

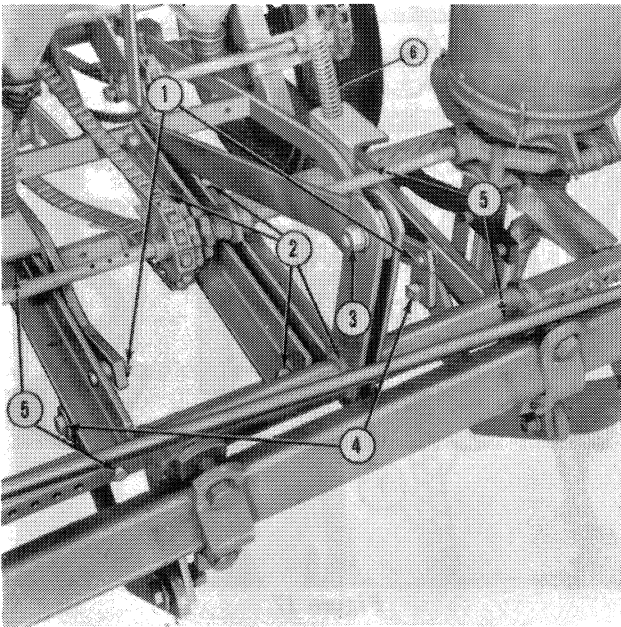


Figure 12
Detail of 12-226 Flexo-Hitch

12-227 Flexo-Hitch Assembly for Six-Row Planters

Front wheel weights, weight boxes, liquid ballast, and Hydraulic Cylinder Booster Kit, 12-199, are required when using the six-row planter (less fertilizer attachments) on Ford Tractors. Liquid ballast and front wheel weights are required on the Fordson Tractors.

Shipping Information: The 12-227 Hitch Assembly is shipped in two bundles. Bundle No. B127083 contains the tool bar and hitch assemblies. Bundle No. B127084 contains the support and brace assemblies.

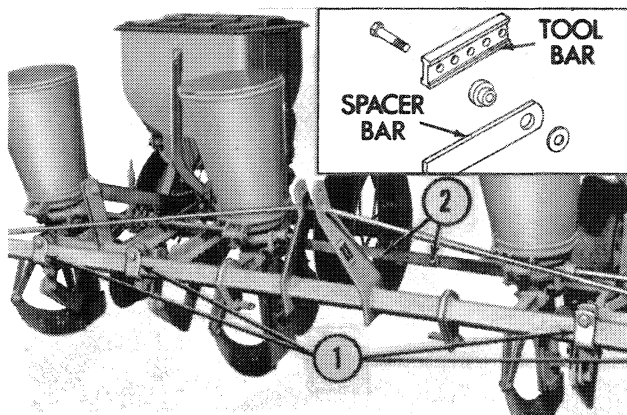


Figure 13
Flexo-Hitch Tool Bar on Four-Row Planter

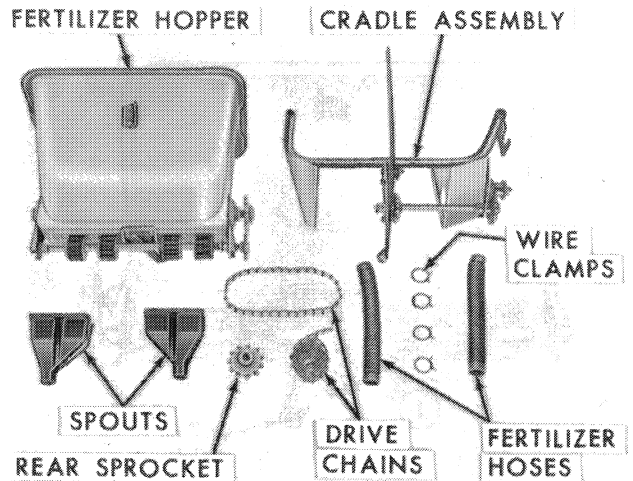


Figure 14
12-202 Fertilizer Attachment as Shipped

This unit provides the means for assembling three planter units together and attaching them to the tractor as a six-row planter. The planter units are attached to the tool bar in the same manner as on the four-row hitch, using six "L" shaped lower links and three upper link and brace assemblies. A spacer bar between each two-row unit maintains accurate row widths.

12-202 Fertilizer Attachment

Shipping Information: The 12-202 Fertilizer Attachment is shipped in two bundles as shown in Figure 14. Bundle No. 126738 contains only the fertilizer hopper. Bundle No. 126562 contains the cradle assembly, drive shaft, spouts, chains, hoses, clamps, pin, and sprocket.

The fertilizer hopper capacity is approximately 240 lbs. per hopper, and one fertilizer attachment is required for each two-row unit. The rate of application can be varied from 10 lbs. to 600 lbs. or more per acre. The rate of flow will vary with the type and condition of the fertilizer. Consequently, the adjusting lever (2), Figure 15, is not calibrated in pounds but is calibrated with reference marks only. The largest reference mark indicates the largest shutter opening and the greatest fertilizer application. The rate of fertilizer applied must be determined under your specific conditions.

Attaching: Block up the rear end of the planter unit and drive out the pin (2), Figure 16, holding the left

ATTACHMENTS

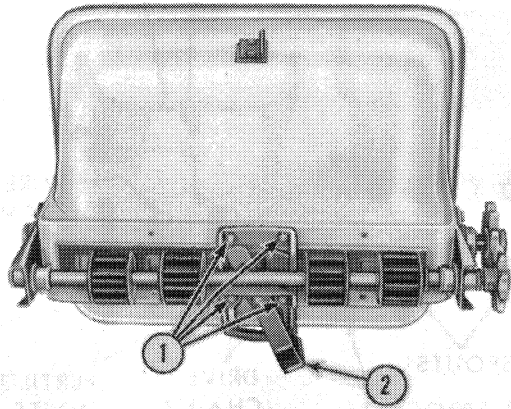


Figure 15
Bottom of Fertilizer Hopper

rear wheel to the axle. Loosen the wheel scraper nut (1), and swing the scraper clear of the wheel. Remove the bolt (3), holding the wheel bearing to the planter frame. Slide the left rear wheel, wheel bearing, and washer off of the axle and drive out the roll pin (4). Position the fertilizer drive sprocket (7), Figure 17, in the center of the rear axle and secure it with a cotter pin. Replace the roll pin, and slide the washer and wheel bearing back over the axle. Bolt the axle bearing to the frame and replace the left rear wheel. Replace the pin (2), Figure 16, and tighten the nuts holding the wheel scraper in place.

Position the cradle assembly (1), Figure 17, on the planter frame and bolt it at the four points shown at

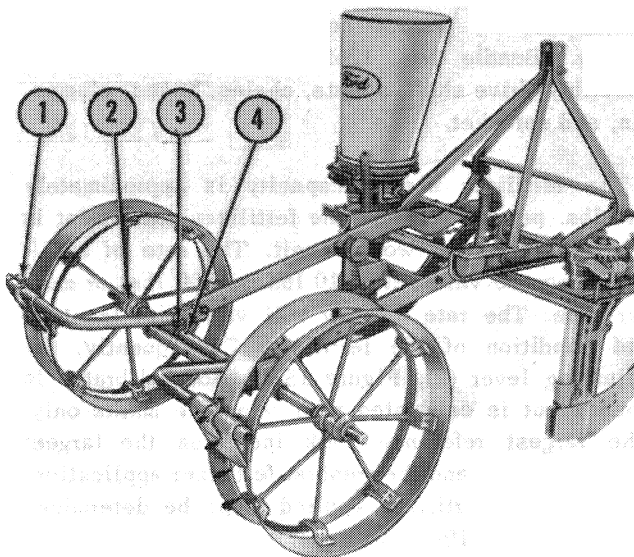


Figure 16
Basic Unit Prior to Attaching Fertilizer Hopper

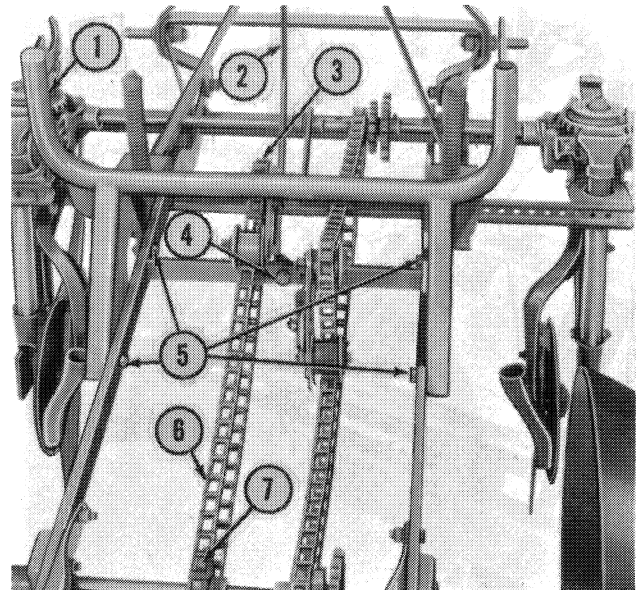


Figure 17
*Basic Unit with Fertilizer Hopper Support
and Drive Sprocket Installed*

(5), with $7/16'' \times 1-1/4''$ bolts, lock washers, and nuts. Loop the fertilizer drive chain (6) over the two sprockets shown at (3) and (7), and position the ends together. Adjust the fertilizer drive chain idler for proper chain tension.

Using a $7/16'' \times 1''$ carriage bolt, secure the hopper strut to the cradle with a $7/16''$ flat washer between the hopper strut and the cradle strut as shown in the Insert, Figure 18. Attach the lower end of the hopper

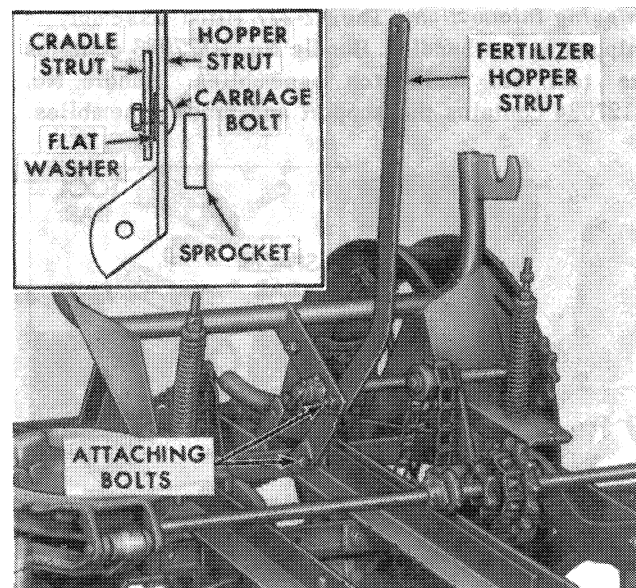


Figure 18
Fertilizer Hopper Strut Installed

ATTACHMENTS

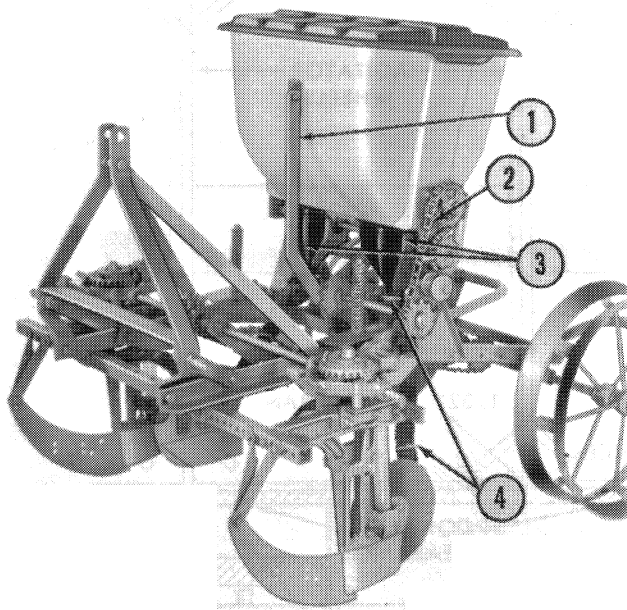


Figure 19
Planter with Fertilizer Unit Attached

strut to the planter frame with a $7/16'' \times 1-1/4''$ bolt. Figure 18 shows the fertilizer hopper strut installed. Position the fertilizer spouts (3), Figure 19, with the offset in the out position and attach to the hoppers with $5/16'' \times 1''$ carriage bolts, lock washers, and nuts. Lift the fertilizer hopper into place on the cradle and bolt it to the strut (1), Figure 19, with a $7/16'' \times 1''$ bolt, lock washer, and nut. Place the chain on the sprockets and idler pulley as shown at (2), Figure 19. Slide the rubber hoses over the fertilizer spouts and the disc opener boots and clamp them in place with the wire hose clamps (4).

NOTE: When operating the planter in the wider row settings, it is recommended that the fertilizer hoses be routed through the holes in the cradle assembly.

Adjustment: Most operators will adjust the fertilizer rate by estimating the application rate based on the amount of rows planted. It is also possible to calculate the fertilizer rate before entering the field by raising the planter and rotating a drive wheel through 21 revolutions. Weigh the fertilizer delivered through one spout and multiply by 100 to determine the pounds per acre for 40'' rows. To determine the fertilizer application for other row spacings, multiply this rate by the appropriate factor listed on page 8.

The fiberglass hopper is non-corrosive and may be

easily rotated to a horizontal position for cleaning as shown in Figure 20. To do this, release the lower end of the fertilizer hoses, remove the chain (2), Figure 19, and remove the bolt that secures the hopper to the strut (1). The hopper can now be rotated into the position shown in Figure 20.

Fertilizer hoppers are calibrated to zero and the agitator-to-hopper clearances are factory-set adjustments. If it is necessary to dismantle or readjust a hopper, the following procedures should be used to reset these adjustments.

To set the adjusting lever (2), Figure 15, so it is at zero when the shutter is closed, loosen the four bolts (1) that hold the gauge bracket to the hopper bottom. Set the shutter control handle at the zero mark on the gauge bracket and slide the gauge bracket and shutter assembly to the right or left until the hopper openings are just closed. Tighten the four bolts (1), securely.

The rotary valves, Figure 21, should center on the hopper openings and should contact the bottom of the hopper to seal the opening when the attachment is not operating. The rotary valve shaft, however, must be free enough to be rotated by hand. The rotary valve shaft bearing bracket mounting holes are slotted, and permit the rotary valves to be adjusted ver-

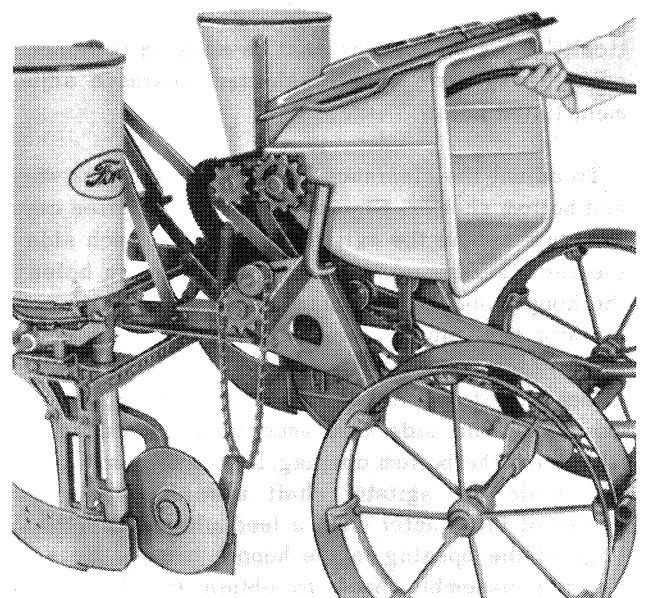


Figure 20
Cleaning Out the Hopper

ATTACHMENTS

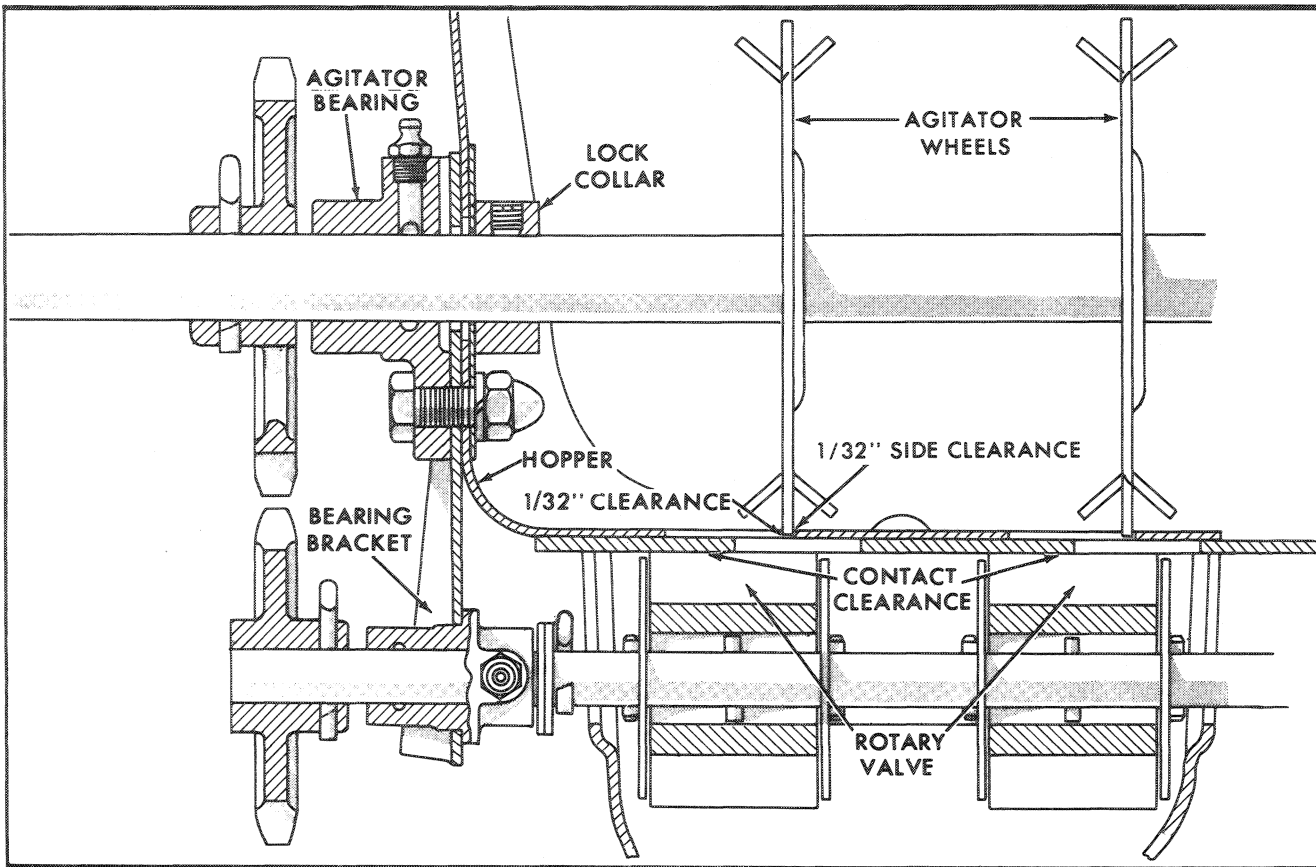


Figure 21
 (Rear View of Right-Hand Hopper)
 Fertilizer Hopper Adjustment Clearances

tically. This adjustment must be made in conjunction with the agitator wheel-to-shutter clearance adjustment listed below.

To adjust the clearance between the agitator wheel and bottom shutter, Figure 21, loosen the three crown nuts that secure the agitator bearings at each side of the fertilizer hopper. The bearing mounting holes in the hopper and bearing bracket are slotted. Move the agitator shaft up or down as necessary to obtain the 1/32" clearance and secure the nuts when both the rotary valves and the agitator wheels have been set. To adjust the side clearance between the agitator wheel and the bottom opening, loosen the lock collars and slide the agitator shaft assembly toward the center of the planter until a feed wheel contacts the edge of the opening in the hopper bottom. Move the agitator assembly back to obtain the 1/32" side clearance and lock the shaft assembly in this position with the lock collars at each end of the shaft. The shaft must be free enough to be rotated by hand.

12-176 Flatland Disc Fertilizer Opener

Shipping Information: The 12-176 Flatland Disc Openers (one required per two-row unit) are shipped as shown in Figure 22. The pair of openers make up Bundle No. 12-176. These disc openers are designed for use with the 12-202 Fertilizer Attachment. One disc is attached to each side of the basic two-row planter. Fertilizer is placed two inches or more to the side, and from 1/2" to 2" below the seed, as desired. Openers are adjusted for depth by loosening the bolts (1), Figure 22, and raising or lowering the disc assembly as desired. Distance from the seed is adjusted by adding or removing the 1/4" spacers between the runner support and the disc opener support.

The discs rotate on sealed ball bearings and require no lubrication.

ATTACHMENTS

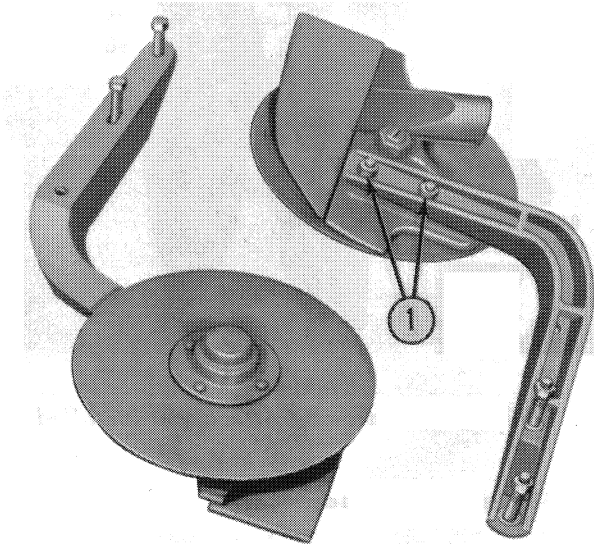


Figure 22
12-176 Disc Openers as Shipped

Attaching: The 12-176 Flatland Disc Openers are attached to the opener support using the 7/16" x 2-3/4" bolts supplied with the openers. It is recommended that the forward set of attaching holes be used for maximum clearance between seed openers

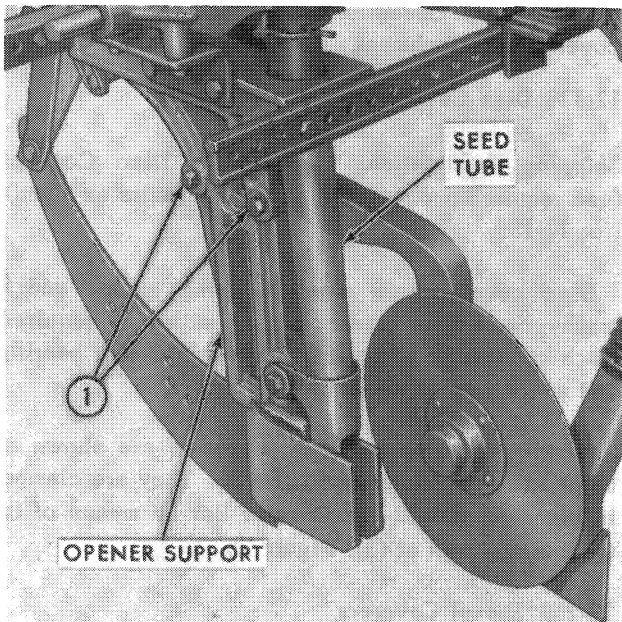


Figure 23
Disc Openers Attached

and fertilizer openers. Use the rear set of holes when coverer bar or seed press wheel attachments are used. Figure 23 shows one of the discs in position with the bolts in place at (1).

12-178 Loose Ground Lister

Shipping Information: The 12-178 Loose Ground Lister (one required per row) is shipped as shown in Figure 24, as Bundle No. 12-178. This unit is designed for use in areas where furrow planting in prepared land is practiced. The discs can be raised or lowered to control planting depth. The point at which the discs converge can also be adjusted by rotating the disc support bracket. Index markings for height and angle make it easy to place all discs at the same setting. The discs rotate on sealed ball bearings and require no lubrication.

Attaching: Separate the two discs by removing the 1/2" bolt shown at (1), Figure 24. Position the two halves on the opener support, as shown in Figure 25, and replace the 1/2" bolt, lock washer, and nut.

Adjustment: The entire loose ground lister assembly can be raised or lowered on the opener support by loosening the nut (4), Figure 25, and lifting or lowering the discs. The notches (1) are provided on the opener support to give reference points for use when adjusting the lister. The angle at which the discs

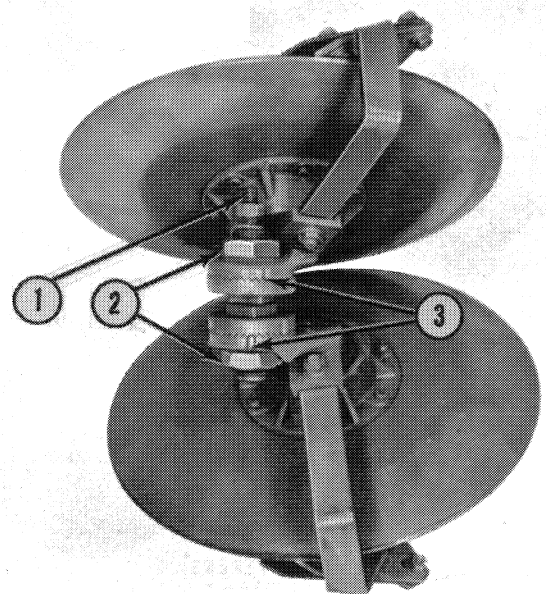


Figure 24
12-178 Loose Ground Lister

ATTACHMENTS

operate can be adjusted by loosening the 1-1/8" jam nuts (2), Figure 24, and rotating the discs in the direction desired. When adjustment is complete, the jam nuts must be tightened securely. The lugs shown at (3), Figure 24, are provided to facilitate disc angle adjustment. When one disc is set at the desired angle, the opposite disc can be adjusted for exactly the same angle by counting the number of teeth between the lugs on the adjusted disc and then matching that number on the opposite disc.

222097 Disc Furrowing Attachment

Shipping Information: The Disc Furrowing Attachment (one required per two-row unit) is used with runner openers and is shipped as Bundle No. 222097, and contains the following:

- 4 Bracket and Disc Assemblies
- Miscellaneous Hardware

Attaching: Position a bracket and disc assembly against the slot on each side of the opener support, Figure 26. Secure both bracket and disc assemblies to the opener support with the 7/16" - 14 x 2-1/2" bolt, washer, and nut shown at (1). The disc assemblies can be adjusted on the opener support by loosening the mounting bolt (1), and raising or lowering the assemblies to the desired depth.

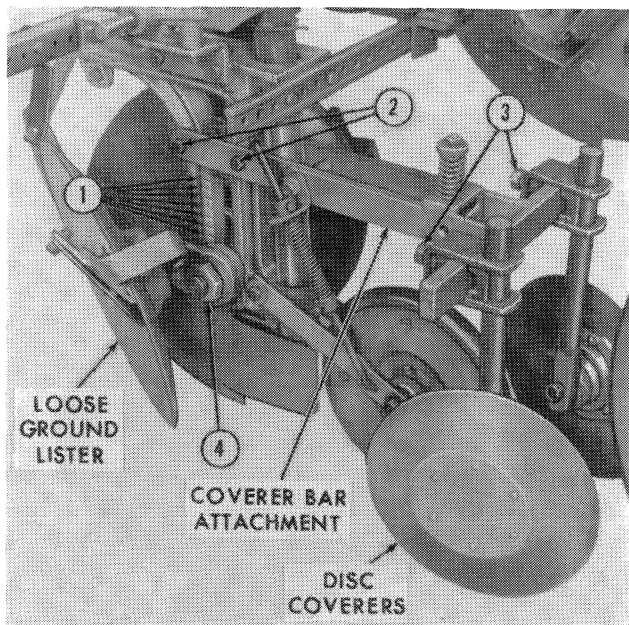


Figure 25

Planter with 12-178 Loose Ground Lister and 12-179 Coverer Bar Attachment Installed

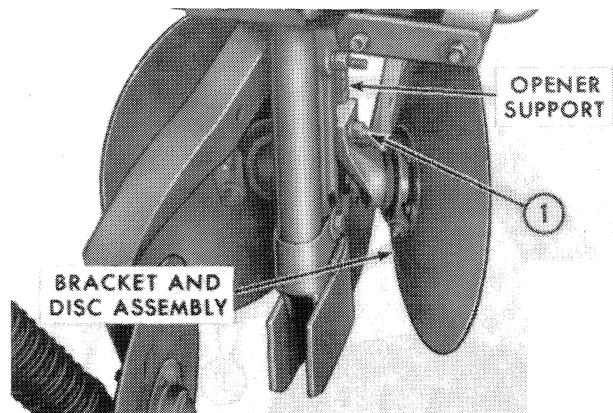


Figure 26

222097 Disc Furrowing Attachment Installed

12-179 Coverer Bar Attachment

Shipping Information: The 12-179 Coverer Bar Attachment (one required per row) is shown in Figure 25.

This attachment provides a means for mounting 12-139 Disc Coverers, 12-258 Shovel Coverers, or 12-141 Spoon Coverers. The coverer bar is spring loaded so that trash and clods can be easily cleared.

Attaching: One 12-179 Coverer Bar Attachment is attached to each planter opener support using the two 7/16" x 2-3/4" bolts, lock washers, and nuts as shown at (2), Figure 25. In this illustration, the 12-139 Disc Coverers are shown mounted to the coverer bar attachment.

12-139 Disc Coverers

Shipping Information: The 12-139 Disc Coverers (one required per row) are shipped in pairs as Bundle No. 12-139.

Disc coverers are used in loose ground and in trashy conditions where cutting action is required. Each coverer is equipped with a white iron bearing, felt seals, and a lubrication fitting.

Attaching: A pair of disc coverers are shown attached to the planter in Figure 25. They are clamped in place on the 12-179 Coverer Bar by means of the two bolts shown at (3), Figure 25.

12-258 Shovel Coverers

Shipping Information: The 12-258 Shovel Coverers (one required per row) are shipped in pairs, as

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Bundle No. B127179. Shovel coverers are generally used in heavy soils and are equipped with a friction trip mechanism in case a shovel point catches under roots or some other obstruction.

Attaching: The 12-258 Shovel Coverers are attached to the 12-179 Coverer Bar in the same manner as the 12-139 Disc Coverers. See (3), Figure 25.

12-141 Spoon Coverers

Shipping Information: The 12-141 Spoon Coverers (one required per row) are shipped in pairs as Bundle No. 12-141. Spoon Coverers are generally used in loose and cloddy soils. They are also well suited for clearing trash.

Attaching: The 12-141 Spoon Coverers are attached to the coverer bar in the same manner as the 12-139 Disc Coverers. See (3), Figure 25.

12-180 Two-Row Disc Marker

Shipping Information: The 12-180 Disc Marker Attachment (one required per two-row unit) is shipped complete as Bundle No. 12-180.

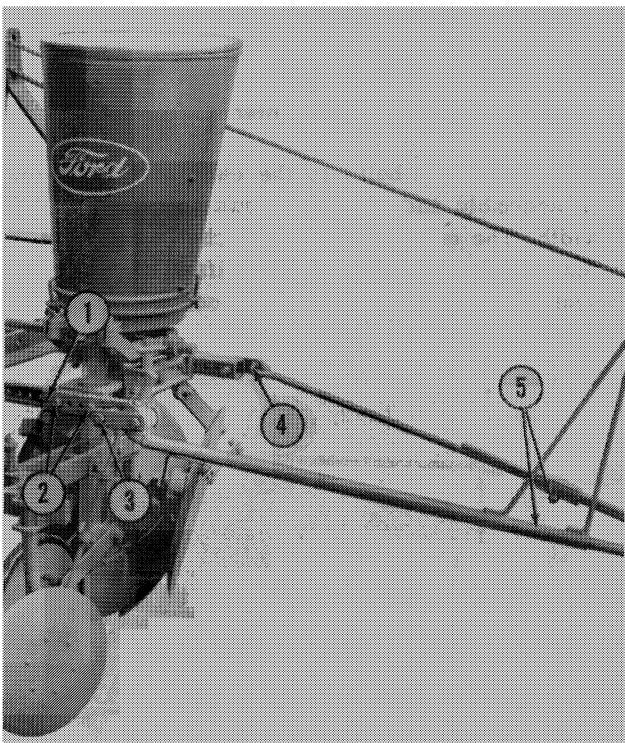


Figure 27
12-180 Two-Row Disc Marker Attached

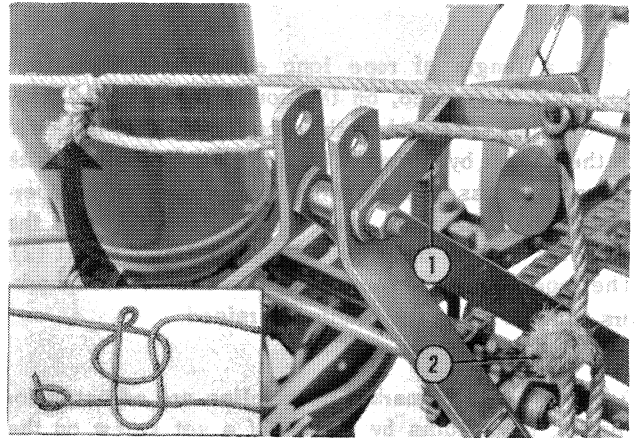


Figure 28
Detail of Control Rope

12-181 Two-Row Hook Marker

Shipping Information: The 12-181 Hook Marker Attachment (one required per two-row unit) is shipped complete as Bundle No. 12-181.

Either the Disc or the Hook Marker Attachment may be adjusted to mark rows from 28" to 44" in width. Operation of the markers is controlled by a rope and pulley arrangement, which enables the operator to lower one marker and raise the opposite one. The weight of the lowering marker balances that of the rising marker and minimizes the effort required for the operation.

Attaching: The disc and hook marker attachments are attached to the rear and front tool bars on each side of the planter in the same manner. The attaching strap (1), Figure 27, is fastened to the rear tool bar with the bolts (2) (which is already in the rear tool bar) and with the 3/8" x 3" bolt (3). The brace rod retainer (4) is attached to the front tool bar with a 3/8" x 2-1/4" bolt, lock washer, and nut.

When the markers are attached on both sides of the planter, the 3/8" control rope can be attached. Tie an end of the rope to one of the lift hooks. Raise the opposite marker assembly until it forms an angle of approximately 50° to the ground and tie the other end of the rope to the lift hook on that marker. Cut off the excess rope. Attach the pulley support (1), Figure 28, as shown. Tie a knot at one end of the excess piece of rope and pass it through the loop of a slip knot tied in the center of the cross rope. Pass the other end of the excess rope through the marker pulley. The free end of the control rope can be attached to any safe spot on the tractor which is within convenient reach of the operator.

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Cut a length of rope long enough to reach from point (2), Figure 28, on the control rope to the tractor drawbar. The end of this rope should be attached to the hanger by means of the "S" hook provided with the marker assemblies. When the planter is in operating position with one marker lowered, tie the opposite end of the rope to the control rope at (2). The rope should be taut enough to enable both markers to raise when the planter is raised.

Adjustment: The marker assemblies are adjusted for varying row widths by means of a set screw on the telescoping marker rod and a clamp on the brace rod indicated at (5), Figure 27. To adjust the markers, loosen the set screw on the telescoping member and the nut on the brace rod. The disc can now be moved in or out as desired. To vary the pitch of the disc, loosen only the set screw and rotate the disc until the desired pitch is obtained. To secure the adjustment, tighten the set screw and nut.

NOTE: Adjust the length of the brace rod so that the control rope does not rub against the seed hoppers.

12-160 Disc Marker for Four-Row Planter

Shipping Information: The 12-160 Disc Marker Attachment (one required per four-row unit) is shipped complete as Bundle No. 12-160, as shown in Figure 29.

12-161 Hook Marker for Four-Row Planter

Shipping Information: The 12-161 Hook Marker Attachment (one required per four-row unit) is shipped complete as Bundle No. 12-161.

Either the Disc or the Hook Marker Attachment may be attached to the Flexo-Hitch Tool Bar of the four-row planter and will mark rows from 28" to 42" in width. Marker operation is controlled by means of a rope and pulley arrangement.

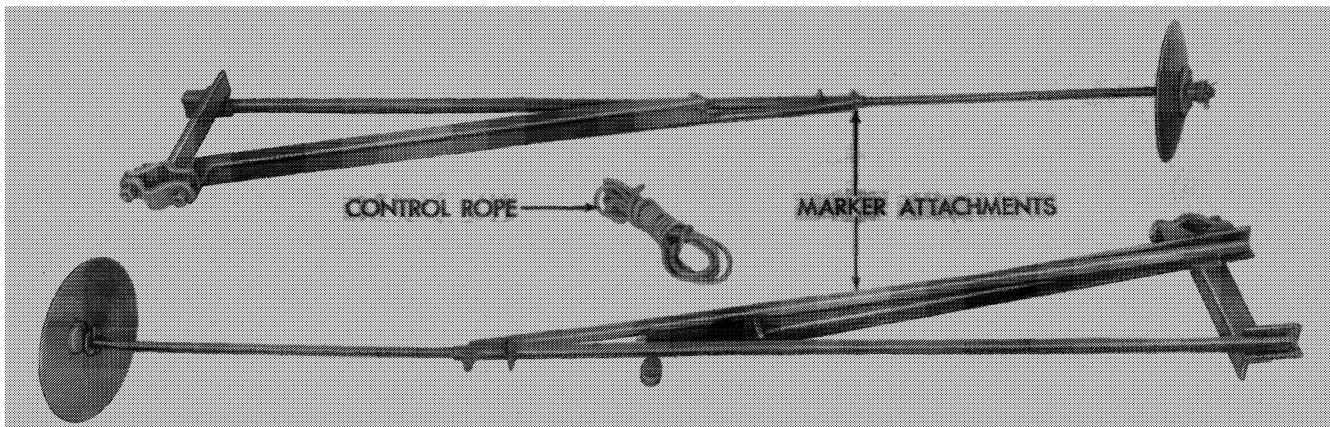
Attaching: The disc and hook marker attachments are held to the tool bar by means of a single large clamp. Figure 30 shows a four-row marker in position on the planter. The two bolts shown at (3), Figure 30, must be tightened equally to obtain good fit between the clamp and the tool bar. Attach the control rope by tying one end to the metal loop on one of the two marker arms as shown at (2).

When the rope is fastened to one of the markers, feed the other end of the rope through the opposite pulley and down to the metal loop on the opposite marker. Prop that marker up to form about a 70° angle with the ground. Take the slack out of the rope and tie it securely to the metal loop.

Adjustment: The marker assemblies are adjusted for varying row widths by means of the set screw and lock nut shown at (1), Figure 30. To adjust the marker, loosen the set screw and move the disc in or out as desired.

12-182 Marker for Six-Row Planter

This attachment bolts to the ends of the six-row hitch assembly and will mark rows from 36" to 42" in width. The marker lifts and latches automatically at row ends when the planter is lifted. Operation is controlled by means of chains and control ropes.



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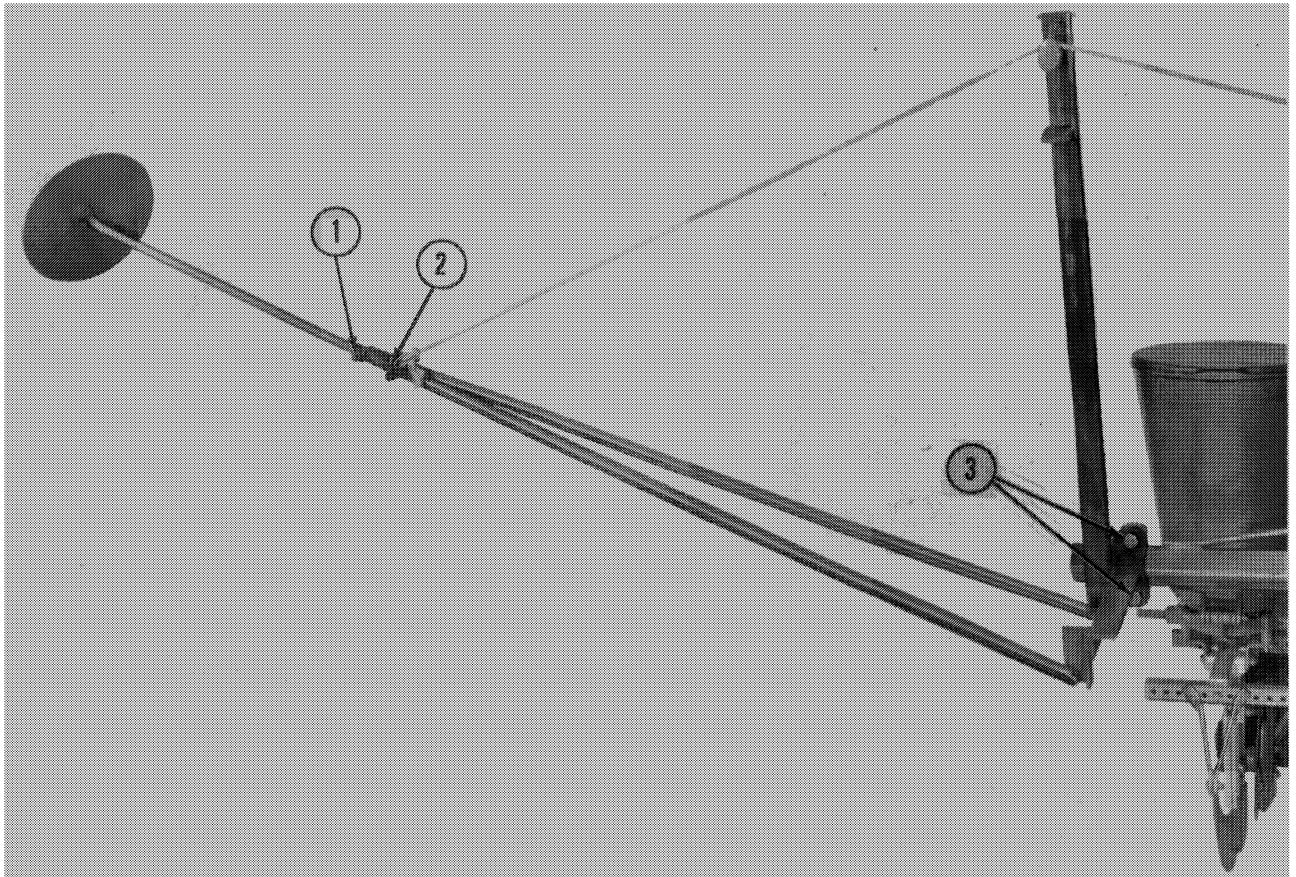


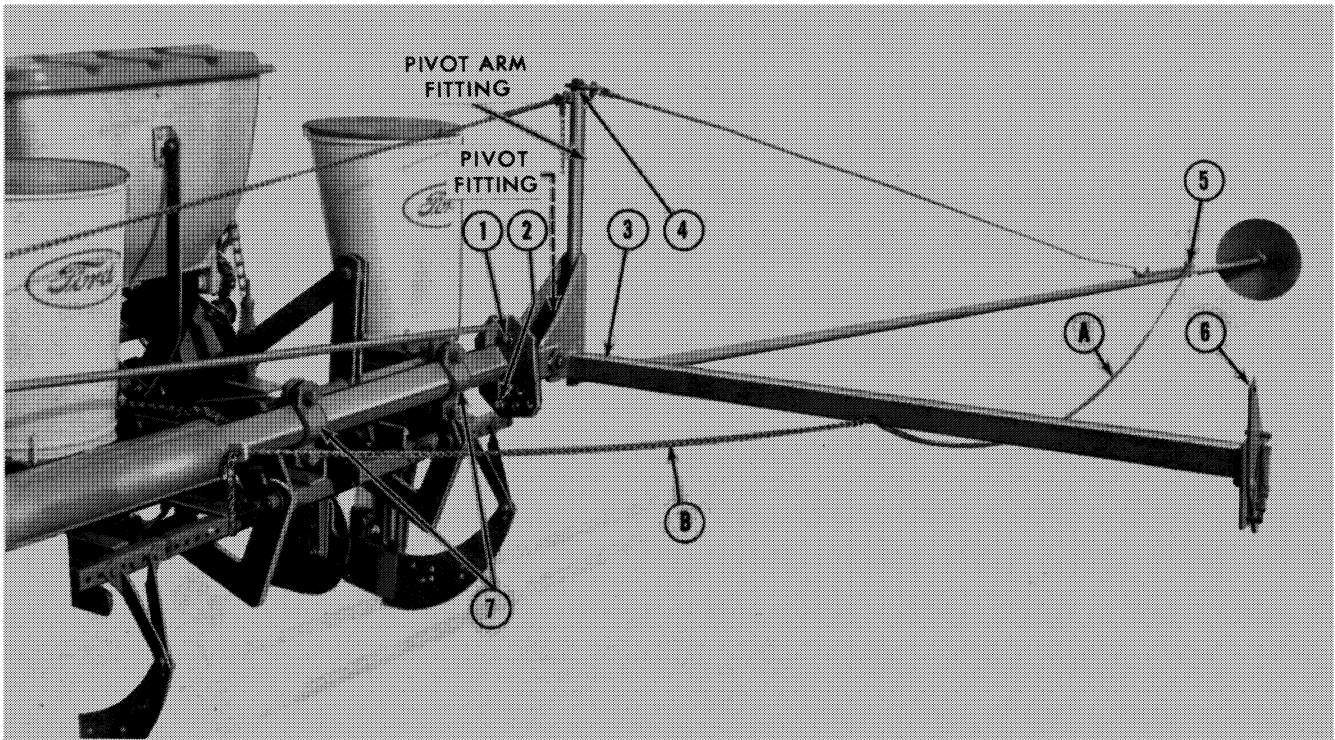
Figure 30
12-160 Four-Row Disc Marker Attached

Shipping Information: The 12-182 Marker Attachment is shipped as Bundle No. 127180.

Attaching: The 12-182 Marker is installed as follows:

1. Attach a marker assembly to each end of the hitch assembly with one 5/8" x 1-3/4" bolt (1), as shown in Figure 31.
2. Attach each truss rod clevis to the truss rod anchor at (4), Figure 31, and attach the two pulleys to the eyes welded on the top of the "A" frame as shown in Figure 32.
3. Attach the planter to the tractor three-point linkage and adjust the top link until the planter units are level when in the operating position.
4. Raise the planter to transport position and adjust the latch arms (3), Figure 31, so that they are *horizontal* to the ground. Secure the latch arms to the hitch with a 5/8" x 1-3/4" bolt, using the appropriate hole at (2). Tighten bolts (1) and (2) securely.
5. Attach the chain anchor to the tractor drawbar with the 5/8" x 2-1/2" bolt (3), Figure 32.
6. Attach one end of each short chain to each vertical marker pivot arm with a cotter pin at (4), Figure 31. Run the other end of the chains through the pulleys and tighten the chains until the vertical arm of the pivot assembly leans toward the center of the planter approximately 5°. Secure the chains to the chain anchor as shown in Figure 32.
7. Lower the planter until it rests on the ground. Attach one end of each long chain to the marker rod at (5), Figure 31, with the cotter pins provided. Run the other end of the chains through the hole in the latch arm and secure them to the brackets on the hitch assembly, as shown in Figure 31, using the cotter pins provided.

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*Figure 31
Six-Row Marker*

8. Adjust the length of chain (A) to permit the marker rod to swing out approximately 80° and secure the chain on each side of the latch arm with a cotter pin. Adjust the length of chain (B) until the chain is tight but not strained.

9. Attach the rope guides to the tractor fender in the set of holes nearest the front of the fender. Tie a trip rope to each latch (6), Figure 31, and to the rope guides.

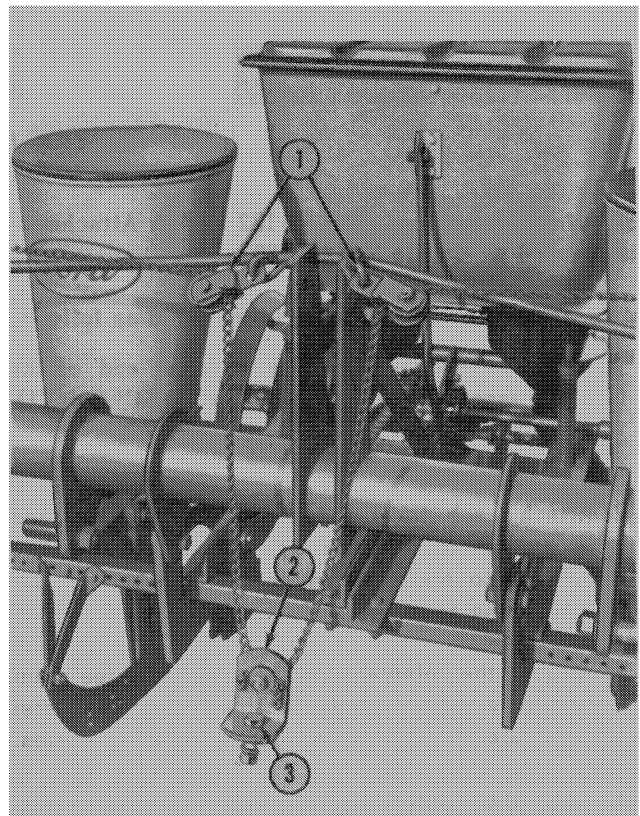
Adjustments: Before operating the marker assemblies, check the latches for free operation. The latches *must* be open to receive the markers when performing the following adjustments. Markers must *not* be permitted to strike a closed latch as damage to the latch and marker rod may result.

If the marker swings too fast, lengthen the pivot arm chains. If the marker swings too slow, shorten the pivot arm chains.



CAUTION: *Stand clear of the marker assembly when checking operation.*

Lubricate the marker pivot assemblies and vertical marker pivot arms at the end of each day's operation. See Figure 31.



*Figure 32
Chains and Chain Anchor*

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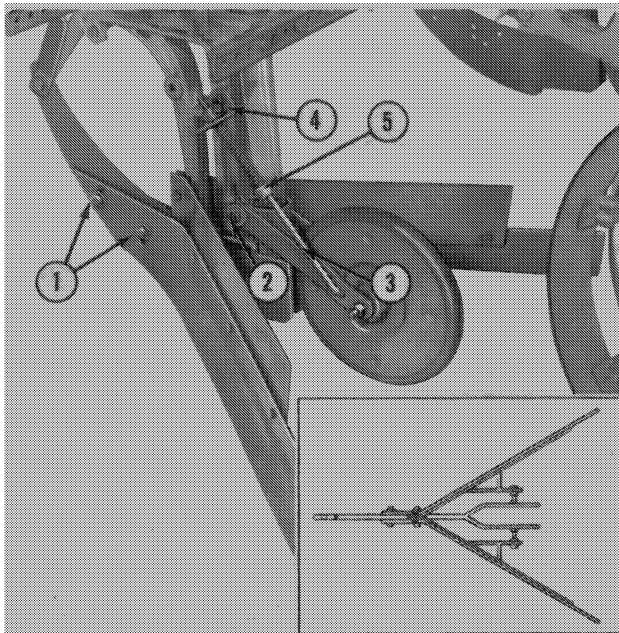


Figure 33
Bed Sweep Attachment

12-228 Bed Sweep Attachment

Shipping Information: The 12-228 Bed Sweep Attachment (one required per row) is shipped complete as Bundle No. 12-228.

The bed sweep is used to sweep the tops from beds or ridges during planting. A dirt shield prevents the soil from passing over the sweep. The sweeps can be raised or lowered to control planting depth.

Attaching: The bed sweep is fastened to the opener as shown at (1), Figure 33. The bolts pass through elongated holes to facilitate adjustment. To raise or lower the sweep, loosen the two bolts and adjust the sweep as desired. If additional adjustment is needed, the sweep can be removed and reinstalled in two of the other holes in the runner. Adjust the stop bolts on the back side of the sweeps to help support and maintain the sweep angle. Securely tighten the jam nuts, following all adjustments.

108790 Seed Press Wheel

Shipping Information: The 108790 Seed Press Wheel (one required per row) is shipped complete as Bundle No. 108790.

This attachment presses the seed into the furrow bottom to give quicker and more uniform germination.

Attaching: The seed press wheel is bolted to the runner support, as shown at (2), Figure 33, with one 7/16" x 3-1/4" bolt, lock washer, flat washer, and nut. The spring tension rod (3) is held to the runner support by means of the angle bracket (4). A 7/16" x 3-1/4" bolt, lock washer, and nut is used to hold this bracket to the runner support. The spring pressure may be adjusted by relocating the collar (5). To increase the pressure, loosen the set screw and move the collar up against the spring until the desired pressure is obtained. Tighten the set screw. When the cover bar attachment (12-179) is used, the spring tension rod can be attached as shown in Figure 25. Adjustment of the spring tension is performed in the same manner as described above.

108791 -- 12" Gauge Shoe

Shipping Information: The 12" Gauge Shoe Attachment, Part No. 108791, is shipped complete as Bundle No. 108791. One attachment is required for each row.

This attachment gives additional flotation in loose soil conditions and a more precise planting depth.

Attaching: Fasten the gauge shoe to the opener runner with the two 3/8" x 1-1/2" carriage bolts shown at (2), Figure 34. The gauge shoe can be adjusted up or down by repositioning the bolts in the different mounting holes indicated at (1).

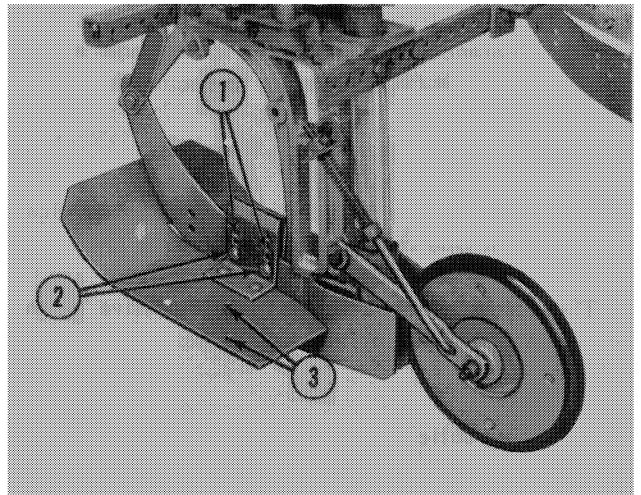


Figure 34
108791 - 12" Gauge Shoe Attached

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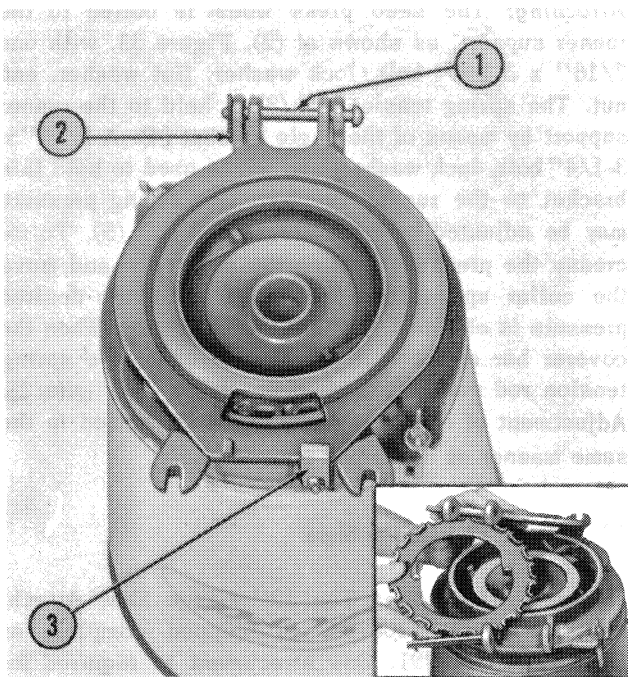


Figure 35
Seed Hopper

12-255 Wheel Scrapers

Shipping Information: The 12-255 Wheel Scrapers (two required per unit) are shipped as Bundle No. B127189. This attachment is used to keep the drive wheels clean in sticky soils.

Attaching: Attach the scraper frames to the wheel frames as shown in Figure 16. Position the scrapers on the scraper frames so that there is approximately 1/8" clearance between the wheel and scraper. Tighten the bolt (1), Figure 16, to secure the scraper.

150004 Semi-Pneumatic Press Wheel Tire

Shipping Information: Each tire is shipped as Bundle No. 150004. One tire is required for each row.

The semi-pneumatic tire is very effective in shedding wet, sticky soil and for reducing press wheel slippage.

12-199 Hydraulic Cylinder Booster Kit

Shipping Information: This attachment is shipped in one bundle, as Bundle No. 12-199. One kit is required for each tractor.

This attachment serves to reduce the load imposed

by the four or six-row planter on the tractor hydraulic system. See your Ford Tractor—Equipment Dealer for ordering and installation information.

129613 Gauge Shoe Sweep

Shipping Information: The 129613 Gauge Shoe Sweep (one required per row) is shipped complete as Bundle No. 129613.

This attachment is used in conjunction with the 108791 Gauge Shoe, to sweep away and flatten the tops of seed beds.

Attaching: Attach the sweeps to the gauge shoes in the holes shown at (3), Figure 34. Use two 3/8" x 1" flat head screws, lock washers, and nuts to attach a sweep on each side of the opener.

Seed Hoppers -- Includes Hopper Base Assembly, Hopper Can and Lid, Less Seed Plates

Shipping Information: The 12-183 and 12-184 Seed Hoppers (one required per row) are shipped as Bundle Nos. 12-183 and 12-184 respectively. The 12-185 and 12-186 Seed Hoppers are shipped in two bundles. Seed Hopper No. 12-185 is contained in Bundle Nos. 12-183 and 114594. Seed Hopper No. 12-186 is contained in Bundle Nos. 12-184 and 114594.

Attaching: Place the pin (1), Figure 35, in the cast lug on the hopper base (1), Figure 36. Lower the hopper into position over the support so that the cast lugs on the hopper coincide with those on the support. Position the hold-down bolts (2), Figure 36, in the

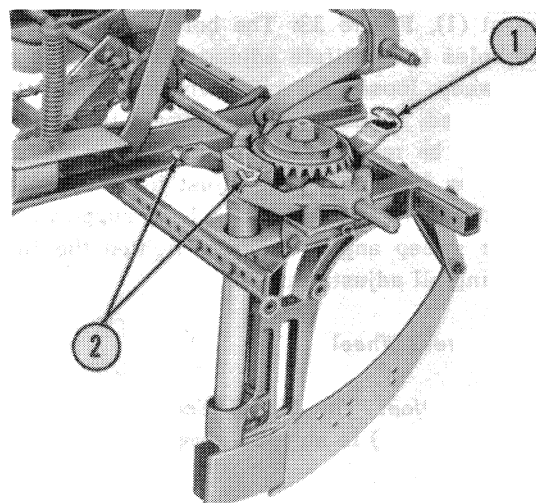
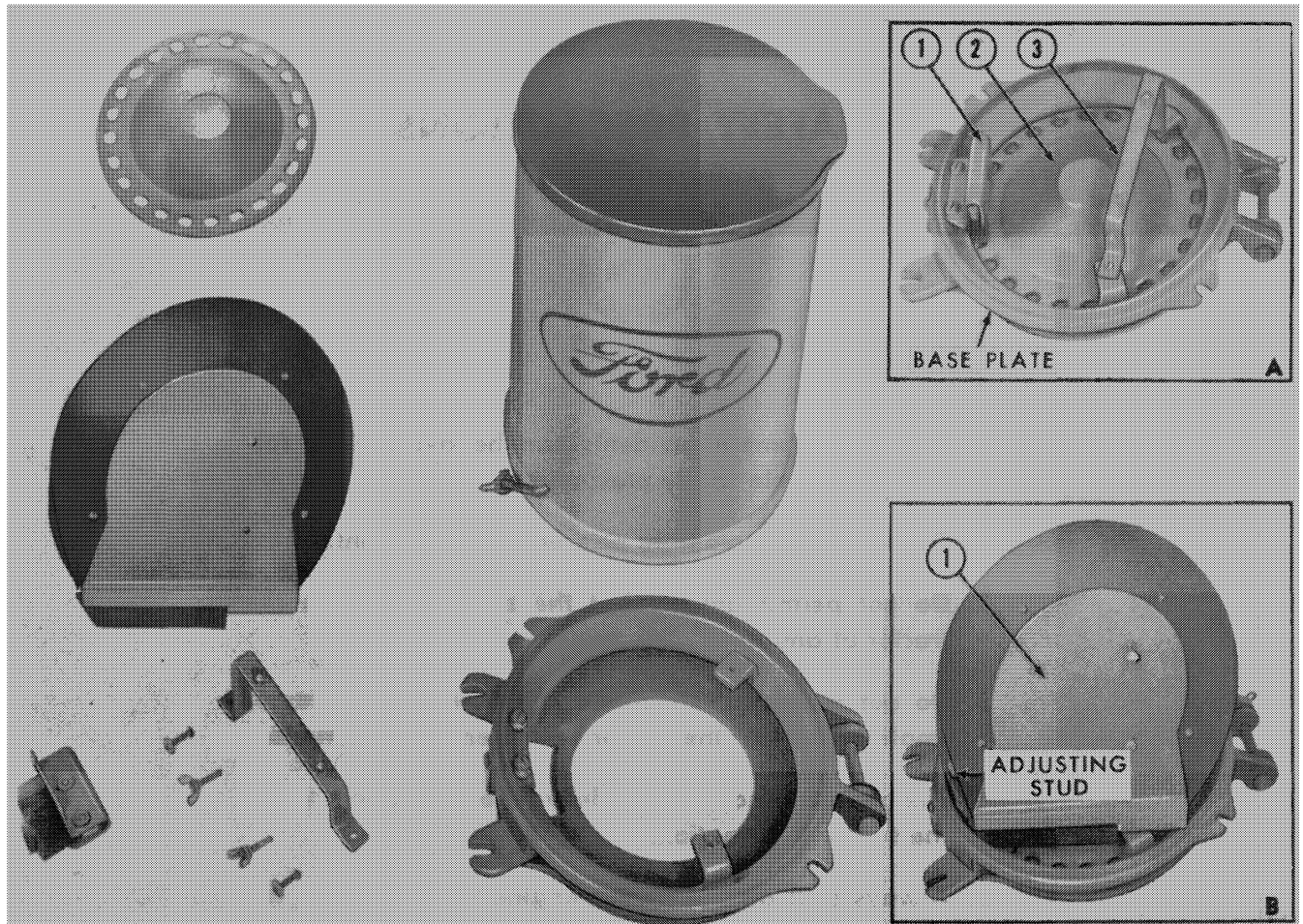


Figure 36
Hopper Base

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12-220 PEANUT HOPPER ATTACHMENT

Figure 37

Peanut Attachment Conversion

slots and tighten the wing nuts. To change seed plates, loosen the wing nuts, tip the hopper forward and remove it. Remove the hairpin (2), Figure 35, and the pin (1). Slide the base plate out from under the clip (3). Change the seed plate and replace the base plate with the groove side up or down, as explained on page 5, under "Hopper Information". Lower the hopper back onto the support and tighten the wing nuts.

12-220 Peanut Hopper Attachment

Shipping Information: The 12-220 Peanut Hopper Attachment is shipped as Bundle No. 12-220.

Attaching: The peanut attachment is installed in the cotton hopper as follows:

1. Remove the hopper assembly from the planter.
2. Separate the hopper can from the hopper bottom

by loosening the two nuts at the base of the hopper.

3. Strip the hopper bottom down to the point shown in Figure 37.
4. Install the bracket (3) and the brush (1) as shown in Insert A, Figure 37.
5. Attach the adjusting stud to the baffle plate (1), with the nuts provided.
6. Adjust the length of the stud supporting the baffle plate to the length given at the top of the appropriate seed chart.
7. Replace the hopper can and secure it with the two nuts previously loosened. Secure the baffle to the bracket as shown in Insert B, Figure 37.
8. Install desired peanut seed plate (2), Insert A.

SAFETY PRECAUTIONS



Most farm equipment accidents can be avoided by following these simple safety precautions:

1. Do not allow anyone to ride on the implement.
2. Do not permit anyone but the operator to ride the tractor at any time.
3. Do not make adjustments or lubricate the tractor or implement when the tractor or implement is in motion.
4. The operator should never leave the tractor seat when the tractor is in motion.
5. Always shut off the tractor engine when leaving the tractor.
6. Keep all nuts, bolts, screws and connections tight.
7. Avoid exceeding recommended implement operating speeds.
8. Keep the tractor engine clean to avoid the possibility of fire.
9. Keep the tractor keys where they are not available to children.
10. Work safely, avoid accidents.

The Tractor and Implement Division of the Ford Motor Company, being a member of the National Safety Council, is privileged to use the Green Cross to denote safety instructions in operators manuals.

