

F670A, F670AH, F680A, AND F680AH DRAWN MOLDBOARD PLOW



JOHN DEERE

OPERATORS MANUAL F670A, F670AH, F680A, AND F680AH DRAWN MOLDBOARD PLOW

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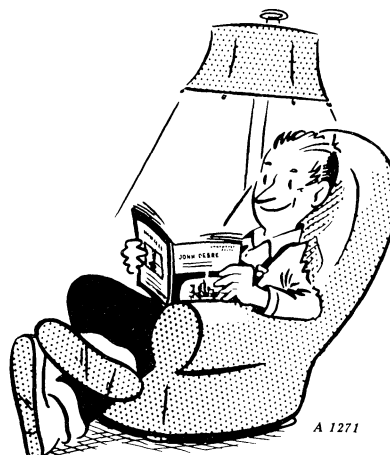
YOUR NEW PLOW

Behind your new plow is an organization that has specialized in designing and building plows for over 125 years. This plow was built in the world's largest plow factory by experienced men, many who have worked in this large plant for from 10 to 45 years. Their experience assures the utmost in good design, high-grade workmanship and thorough inspection, so essential to the production of good plows.

High quality materials, precision production methods, and accurately controlled heat-treating assure maximum strength and long life for every part.

This manual has been carefully prepared and illustrated, so that you may make the necessary adjustments for adapting your plow to work properly in practically all types of soil and field conditions. These adjustments, such as proper hitching and adjusting for width and depth of cut, are fully covered in this manual.

Study this manual carefully. Keep it handy, in a safe place, for future reference.



Occasionally your plow may need new parts, or require service not covered in this manual. If so, we suggest that you take advantage of the facilities offered by your John Deere dealer, which assure you of genuine JOHN DEERE Parts and prompt "know-how" service in the field or shop.

If you will furnish your dealer with the information which should be recorded at the bottom of this page, when the plow is delivered, he can give you prompt and efficient service.

John Deere	☐ F670A	☐ F670AH
	☐ F680A	☐ F680AH

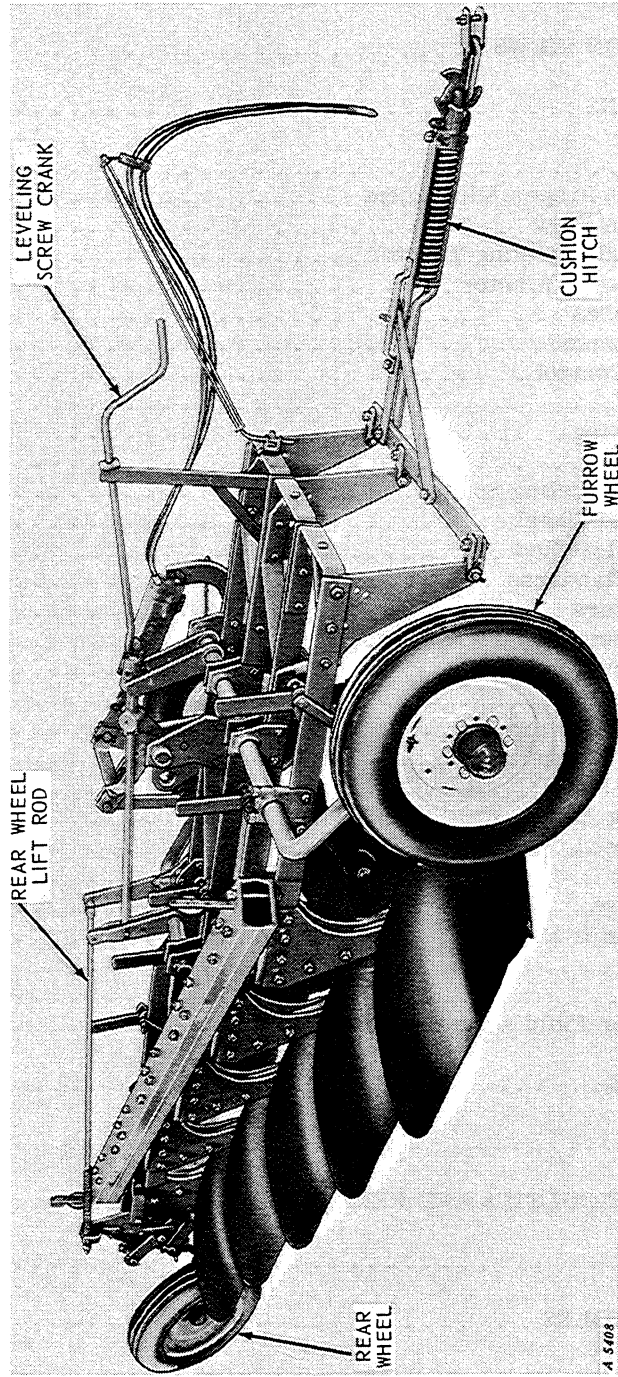
4-, 5-, and 6-Bottom Moldboard Plows

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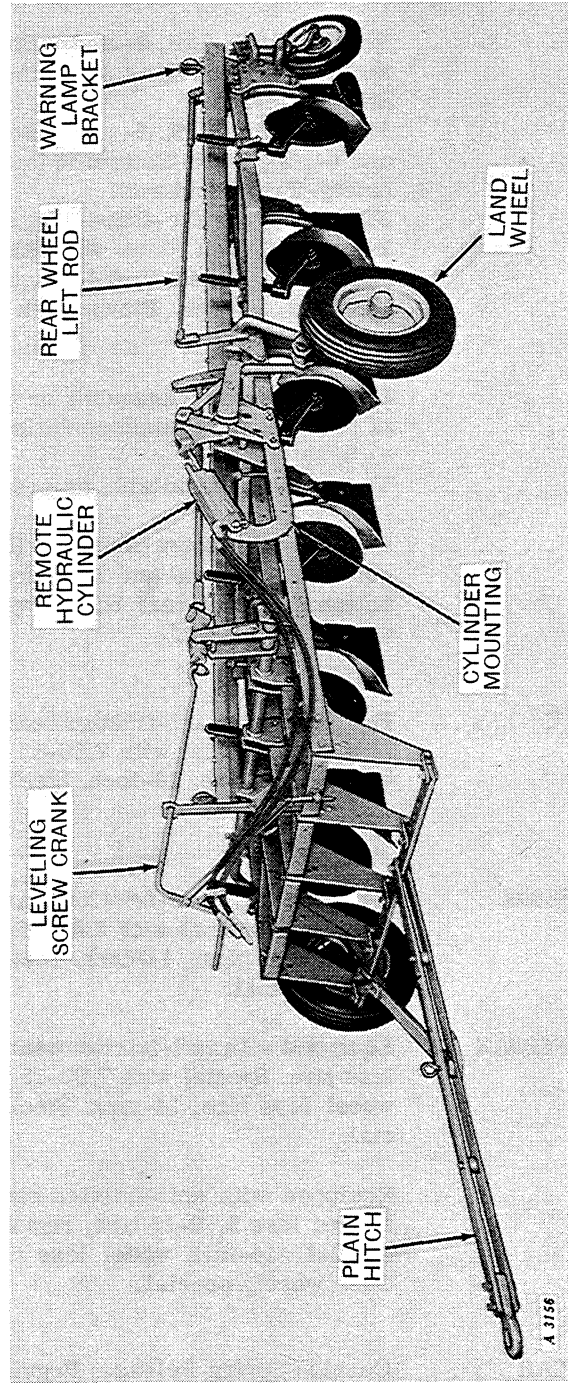
CONTENTS

	<i>Page</i>
IDENTIFICATION VIEWS	2-3
SPECIFICATIONS	4-5
OPERATION	6-30
Importance of Proper Adjustment	6
Preparing the Plow	6
Preparing and Adjusting Tractor	7
Hitching Plow to Tractor	8-12
Types of Hitches	13
Hydraulic Control	14-15
Mechanical Control	15
Leveling	15-16
Depth of Plowing	16
Lifting Springs	17
Trip Lever Adjusting Spring	17
Rear Axle and Wheel	18-19
Rear Wheel Lift Rod	19
Safety-Trip Standards	20-21
Rolling Coulters	22-24
Special Equipment	25-29
Landing Lever	25
Gauge Wheel	25
Independent Jointers	26
Moldboard Extension	27
Moldboard Pad	27
Share-Frog Brace	27
Root Cutter	27
Weed Hook	28
Trash Board	28
Tractor Guide Rod	29
Transporting	29
Safety Rules	29
Procedure for Field Adjusting Plow	30
MAINTENANCE	31-34
LUBRICATION	35-36
PLOWING DIFFICULTIES AND REMEDIES	37-40
ASSEMBLY	41-63
SHIPPING BUNDLES	41-48



John Deere F670AH 5-Bottom Moldboard Plow

A 5408



John Deere F680AH 6-Bottom Moldboard Plow

SPECIFICATIONS

YPES	F670A Clutch-Lift, 4- and 5-Bottom 14-Inch and 4-, 5-, and 6-Bottom 16-Inch Plows with Stiff Standards. F680A Clutch-Lift, 4- and 5-Bottom 14-Inch and 4-, 5-, and 6-Bottom 16-Inch Plows with Safety-Trip Standards. F670AH Hydraulic-Lift 4-, 5-, and 6-Bottom 14- and 16-Inch Plows with Stiff Standards. F680AH Hydraulic-Lift 4-, 5-, and 6-Bottom 14- and 16-Inch Plows with Safety-Trip Standards.
EPTH RANGE	Up to 14 inches, depending on type and size of bottoms and ground conditions.
OTTOMS	Various types available as ordered.
ANDSIDES	Bottoms with short landsides (No. 4 for conventional bottoms and No. 9 for high-speed bottoms, except rear bottom which requires a No. 10 landside).
HEELS:	
FURROW	Equipped with anti-friction bearing. Regular less tire. Special with 7.60-15 tire. Special wheel less tire, 14-inch. Steel wheel, special.
LAND:	
F670A and F680A . . .	Equipped with anti-friction bearing. Regular less tire. Special with 7.60-15 tire. Special wheel less tire, 14-inch. Steel wheel with lugs, special.
F670AH and F680AH . .	Equipped with anti-friction bearing. Regular less tire. Special with 7.60-15 tire. Special wheel less tire, 14-inch. Steel wheel, special.
REAR	Equipped with anti-friction bearing. Wheel for but less 5.90-15 tire, regular; with tire, special. 14-inch wheel less tire, special. Cast wheel, special.
ITCH:	
F670A and F670AH . . .	Cushion Spring Release, Regular.
F680A and F680AH . . .	Plain, Regular.

LIFT	Reduction Gear Lift Clutch for the F670A and F680A. Remote Hydraulic Cylinder for the F670AH and F680AH.
LEVELING	Easy to adjust screw crank.
COULTERS	17-inch plain, regular. 17-inch rippled-edge, optional. 17-inch cushion coulters, plain or rippled edge, chilled-cone bearing, for round shank; optional. 18-inch plain, optional. 20-inch plain or rippled-edge, optional. Flat shank regular. Round shank optional. Chilled-cone bearing, regular. Anti-friction bearing, optional.
JOINTERS	Independent cast or steel available as Special Equipment.
LANDING LEVER	Special Equipment.
WEED HOOKS	Special Equipment.
ROOT CUTTERS	Special Equipment.
MOLDBOARD EXTENSIONS	Special equipment. Two types - For conventional bottoms or HS400 Series High-Speed Bottoms.
MOLDBOARD PADS	Special Equipment for HS400 Series High-Speed Bottoms Only.
TRASH BOARDS	Special Equipment for high-speed bottoms, high-speed slat bottoms, and SDT546FC Semi-Deep Tillage Bottoms.
SHARE-FROG BRACE	Special equipment. To attach 16-inch high-speed shares to 14-inch high-speed bottoms.
GAUGE WHEEL	Available as Special Equipment either less tire or with 5.90-15 tire. 14-inch wheel less tire available as special equipment.

(Specifications and design subject to change without notice.)

NOTE: When the term "right" or "left" is used, it means from a position behind the plow and facing the front.

OPERATION

IMPORTANCE OF PROPER ADJUSTMENT

Your new plow is fully adjustable and, when properly adjusted to operate in the type of soil and field conditions on your farm, it will do a good job of plowing at a minimum of expense. A well-adjusted plow pulls better; its furrow slices are uniform in width and depth; it covers trash; leaves the soil in proper condition to be worked down into the best type of seedbed.

Improper adjustment results in rapid wear and possible breakage of parts, and inefficient operation.

PREPARING THE PLOW

LOW BOTTOMS

The polished surfaces of the plow bottoms have been painted with protective black paint.

In most cases it is not necessary to remove the black paint because it will wear off quickly upon contact with the soil. In those soils where the black paint will not wear off, remove it with gasoline, kerosene, or diesel fuel.

Be careful when using any of these fuels so they do not ignite. Plow should be in a well-ventilated area and away from any sparks or flames.

If the plow is not to be used immediately, protect the polished surfaces by applying a coat of cup or gun grease. If plow is to be put in storage for a considerable length of time, see pages 31 through 34.

BOLTS AND SET SCREWS

Before starting to work with a new plow or one which has been stored, check to see that all bolts and set screws are tight and all cotter pins spread to keep them from falling out. Check the bolts that hold the plow bottoms to see that they are drawn up very tight.

TIRE INFLATION

Check plow tires to be sure they are inflated properly as shown below:

<i>Recommended Implement Tires</i>	<i>Inflation Pressures</i>
5.90-15 — 4-Ply	28 psi
7.60-15 — 4-Ply	24 psi

LUBRICATION

Be sure plow has been properly lubricated. See Lubrication Chart on pages 35 and 36.

PREPARING AND ADJUSTING THE TRACTOR

For complete tractor operating instructions, refer to your tractor operator's manual.

TIRE INFLATION

Inflate the tractor tires as recommended in the tractor operator's manual. For plowing, best results are generally obtained by taking one weight from the furrow wheel and adding it to the land wheel. Tilting of the tractor places more weight than normal on the furrow wheel. Addition of weight to the land wheel provides more uniform weight distribution over the rear wheels.

ROCKSHAFT SELECTOR LEVER

On John Deere Tractors equipped with a 3-Point Hitch and Load-and-Depth Control, set the selector lever in the "D" position. Keep the selector lever in this position while operating.

TRACTOR DRAWBAR

On wheel-type tractors set the tractor drawbar in the **short high position** and, except where off-hitching is required, bolt it exactly in the center of the tractor, midway between rear wheels.

On crawler tractors that work with both tracks on the land the tractor drawbar should ordinarily be free to swing.

REAR WHEEL SETTING

Tractor rear wheel settings are determined by the location of the center line of draft in the plow. Therefore, it is necessary to first read "Hitching Plow to Tractor" on the following pages. Then adjust the wheels as explained on page 9.

FRONT WHEEL SETTINGS

On wide-front-end tractors set front wheels to conform to rear wheel setting, center-to-center of tread.

REAR WHEEL WEIGHTING

Rear wheel weights may be necessary to eliminate excessive wheel slippage or for stability in rough or hillside fields. However, weights should not be added to the point where all slippage is eliminated. To do so would hinder maximum performance of the tractor.

The ideal amount of added weight can be determined by observing the tracks of the rear wheels. When the tractor is pulling its rated load, the soil between the tire lugs should be broken or shifted. If too much weight has been added, the tread marks will be clear and distinct. If too little weight has been added, the tread marks will be entirely obliterated.

Liquid Weights

Water and calcium chloride solution is an economical means of adding weight to rear wheels. Calcium chloride is recommended rather than water as it will not freeze. See your tractor operator's manual or your John Deere dealer.

Cast-Iron Weights

Where weight in addition to or in place of liquid weight is required, cast-iron weights can be bolted to the rear wheels. This type of weight can be secured from your John Deere dealer.

For maximum ballast, refer to your tractor operator's manual.

HITCHING PLOW TO TRACTOR

The ideal hitch is a straight line from the center point of pull on the tractor to the center point of resistance on the plow, both horizontally and vertically.

The center point of pull on the tractor is located approximately 3 inches ahead of the rear axle housing and midway between the rear wheels.

To find the center point of resistance on the plow, first find the center line of draft as explained below.

CENTER LINE OF DRAFT

The center line of draft is simply an imaginary line drawn from the point of pull on the tractor to the point of resistance on the plow.

The center line of draft of the plow can be located by using the following rule:

Rule: The center line of draft of a moldboard plow is located at a point one-fourth of the cutting width of one bottom measured to the left of the center of total cut of the plow. (This rule applies to all plows whether 4-, 5-, or 6-bottom.)

Example: Finding center line of draft of a 5-bottom 14-inch plow.

Total cut of plow = 70 inches.

Center of cut or one-half of 70 inches = 35 inches.

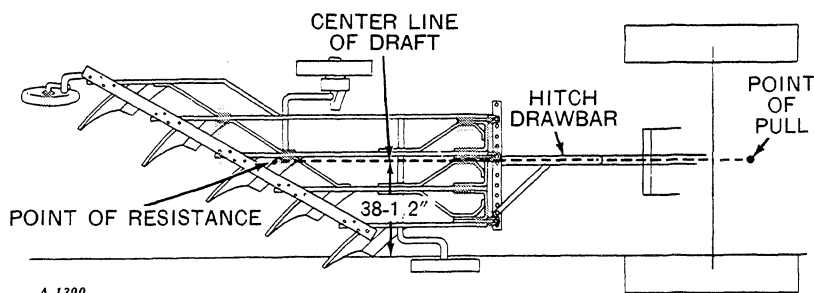
One-fourth the cutting width of one-bottom = $3\frac{1}{2}$ inches.

$3\frac{1}{2}$ inches added to center of cut, which is 35 inches = $38\frac{1}{2}$ inches.

Therefore, the center line of draft of a 5 bottom 14-inch plow is $38\frac{1}{2}$ inches measured to the left and at right angles from the furrow wall. See illustration below.

CENTER POINT OF RESISTANCE

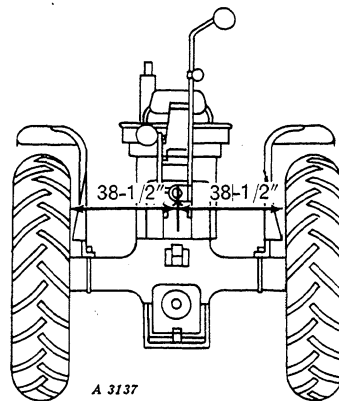
The center point of resistance on a plow is located on the bottom intersected by the line of draft, at a point approximately one-half of the plowing depth from the bottom of the furrow. When plowing 6 inches deep, the point of resistance will be 3 inches up from the furrow bottom, or approximately at the junction of the share and moldboard. If plowing deeper than 6 inches, this point will be located farther up on the moldboard. If plowing shallower than 6 inches, the point of resistance will be farther down on the share.



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Horizontal Hitch Adjustments on 5-Bottom, 14-Inch Plow

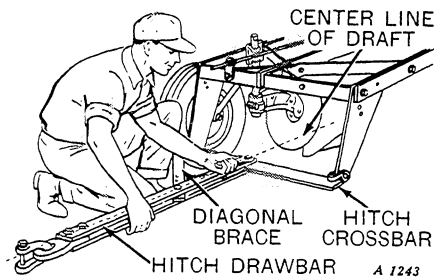
ADJUSTING TRACTOR WHEEL TREAD



After the center line of draft and point of resistance of the plow have been located, set the tractor wheels (on adjustable tread tractors) to the proper position so the pulling force will be on a straight line from the point of pull on the tractor back through to the point of resistance on the plow. Since, in the example on page 8, the point of resistance is 38-1/2 inches from the furrow wall, set the tractor wheels so the center of the drawbar is 38-1/2 inches from the inside of each tire.

When plowing on steep hillsides, it is sometimes necessary, with adjustable tread tractors, to use a wider wheel spacing than recommended for stability reasons. Where a wider wheel spacing is necessary, always set the left rear tractor wheel at the recommended position and **move the right rear wheel out**. This will result in more nearly equalizing the weight on the two rear wheels of the tractor when plowing. Then center the tractor drawbar between the rear wheels.

HORIZONTAL HITCH ADJUSTMENTS



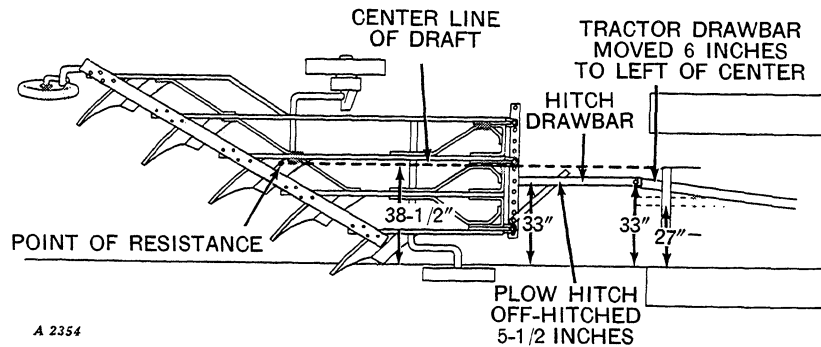
Adjust the plow hitch so it will be on the exact line of draft from the center point of pull on the tractor to the center point of resistance on the plow. A series of holes in the hitch crossbar allow the hitch to be bolted on the center line of draft. See illustration above and on page 8.

Adjust the diagonal brace on the hitch so the plow hitch is parallel to the furrow wall. After the plow is in the field, further adjustment of the diagonal brace may be necessary to get the correct cut on the front bottom.

After the tractor wheels and plow hitch have been set correctly, attach the plow hitch to the tractor drawbar.

Off-Hitching

In some cases, such as with fixed-tread tractors, it is impossible to set the tractor wheels so the drawbar will fall on the center line of draft. In such cases, it is necessary to off-hitch the plow and to move the drawbar of the tractor away from the center point of pull to permit the plow hitch to be parallel to the furrow wall.



Horizontal Off-Hitching Adjustments on Plow and Fixed Tread Tractor

Off-Hitching—Continued

For example, when using a 5-bottom 14-inch plow with a standard tractor with a wheel spacing of 54 inches inside to inside of tires, the plow must be off-hitched 11-1/2 inches. The center line of draft of the plow is 38-1/2 inches from the furrow wall while the distance from the inside of the tire to the center of the tractor drawbar is only 27 inches. The 11-1/2 inches difference should be taken about one-half on the plow and one-half on the tractor. Therefore, move the plow hitch drawbar 5-1/2 inches to the right of the line of draft and the tractor drawbar 6 inches to the left of the center of the tractor. Both the tractor drawbar and the plow hitch will then be 33 inches from the furrow wall. The plow hitch will now run straight and be parallel to the furrow wall.

Hitching Crawler Tractors

When using a crawler tractor with these plows, run both tracks on the land and allow the tractor drawbar to swing free.

The plow hitch must be adjusted to conform to the position of the center of the tractor drawbar. To find this position, measure the distance from the outside of the right-hand track to the center of the tractor and add 3 or 4 inches to permit driving far enough from the furrow wall to prevent breaking it down. Then set the plow hitch on the hitch crossbar the same distance in from the furrow wall.

Hitching Chart

On the next page are examples of correct measurements for hitching a plow and tractor combination. We suggest that you work out the measurements listed for any plow and tractor combination, using the instructions on pages 8-10, and then apply these same instructions to your plow and tractor combination.

Plow Hitching Chart

Number of Bottoms	Size of Bottoms	Tractor Wheel Setting Inside to Inside of Tires	Line of Draft from Furrow Wall	Tractor Drawbar Position	Plow Hitch to Furrow Wall
3	14''	49''	24-1/2''	Center	24-1/2''
3	16''	56''	28''	Center	28''
4	14''	63''	31-1/2''	Center	31-1/2''
4	16''	*72''	36''	Center	36''
5	14''	*77''	38-1/2''	Center	38-1/2''
5	16''	*88''	44''	Center	44''

**Some tractor models do not have sufficient wheel tread adjustment to permit perfect line-of-draft hitching, especially standard tread tractors. See section on "Off-Hitching." Dividing the off-hitching between the tractor and the plow obtains the best performance of each.*

To prevent side-draft on tricycle-type tractors, off-hitching on the tractor should be kept to a minimum, taking most on the plow.

Hitching Wheel-Type Tractors to 6-Bottom Plow

explained on pages 8 through 10.

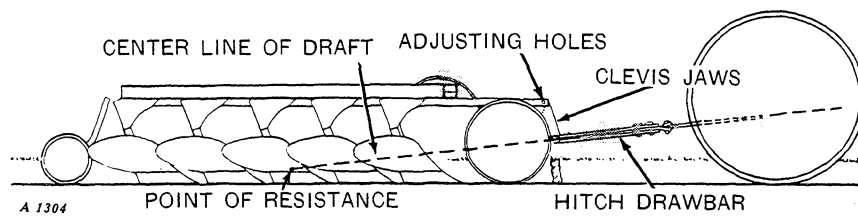
When using a wheel-type tractor with the 6-bottom plow run all four wheels on the land and allow the drawbar to swing free.

Set the plow hitch on the center line of draft in the same manner as

Attach the tractor drawbar to the plow hitch. Drive the tractor where necessary to maintain a uniform and correct cut on the front bottom. The edge of the right-hand rear tractor tire will be approximately 6 to 8 inches from the furrow wall.

12 Operation

VERTICAL HITCH ADJUSTMENTS



Vertical Hitch Adjustments

Adjust the clevis jaws on the plow so the plow hitch will fall on a straight line from the tractor drawbar to center point of resistance on the plow. Four holes are provided in each clevis jaw for this adjustment.

If the clevis jaws are adjusted too high for the depth of plowing, the tractor will pull down on the front end of the plow. The bottoms will bounce along on the points of the share, resulting in heavy draft, uneven penetration, excessive wear

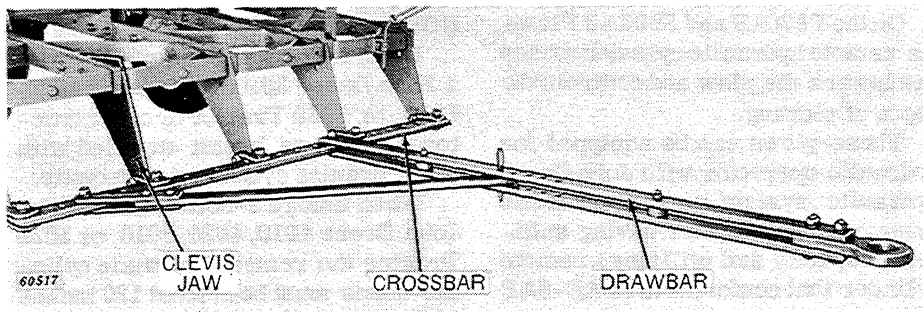
on shares and wheel boxes in land and furrow wheels, and a poor job of plowing. If the rear wheel attempts to run up the furrow wall, it is a good indication the clevis jaws are set too high and you are pulling down on the front end of the plow.

If the clevis jaws are adjusted too low for the depth of plowing, the tractor will pull up on the front end of the plow. the bottoms will penetrate very slowly, resulting in excessive weight on rear wheel of the plow.

Be Careful

THE LIFE YOU SAVE MAY BE YOUR OWN...

TYPES OF HITCHES



Plain Hitch for F680A and F680AH 6-Bottom Plow Used with a Crawler Tractor

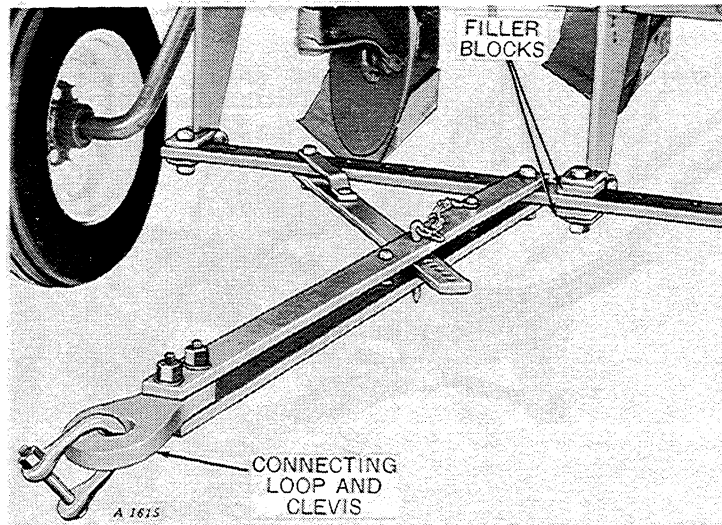
The F670A and F670AH Plows are furnished with cushion spring release hitches only. The F680A and F680AH Plows are furnished with plain hitches only, because safety-trip standards eliminate the need for release-type hitches.

A hitch for use with crawler tractors used with the 6-bottom plow is furnished as regular equipment. A connecting loop with clevis is available as regular equipment for use with wheel-type tractors. For tractors with a straight drawbar use the clevis in the connecting loop as shown below. For tractors with a

forked drawbar, remove the clevis and use the connecting loop only to attach the plow to the tractor.

The hitch illustrated above has an extra clevis jaw which must be attached as shown when the F680A and F680AH Plows are pulled by a crawler tractor.

The hitch supplied for the 5-bottom plow to be used with a wheel-type tractor has two filler blocks which may be positioned between the crossbar and the hitch clevis on the clevis jaw, as shown below, when the hitch drawbar is off-hitched.



Plain Hitch for F680A and F680AH Plows with Connecting Loop and Clevis for Wheel-Type Tractor

HYDRAULIC CONTROL

On the F670AH and F680AH Plows, the remote hydraulic cylinder raises and lowers the plow and controls the depth of plowing.

These plows can be equipped for hydraulic operation with John Deere hydraulic system or the hydraulic system of any tractor having sufficient capacity and utilizing a remote cylinder that conforms to ASAE-SAE standards.

Your John Deere remote hydraulic cylinder is equipped with an adjustable piston stop, so the working stroke may be adjusted to control the working depth of the plow. The stroke may be varied from 8-inch maximum to 0-inch minimum. **For complete operating and adjusting instructions for remote cylinder, refer to your tractor operator's manual.**

When transporting, raise the plow bottoms to highest position by use of the remote cylinder and insert hold-up pin in transport position, as shown below.

HOSE LENGTH

When using a 4-bottom plow with a John Deere 3010, 3020, 4010, 4020, 5010, or 5020 Tractor or other tractors, the hose length supplied with the hydraulic cylinder is adequate.

When using a 5-bottom plow with a John Deere 4010, 4020, 5010, or 5020 Tractor the remote hydraulic cylinder hoses must be at least 120 inches long.

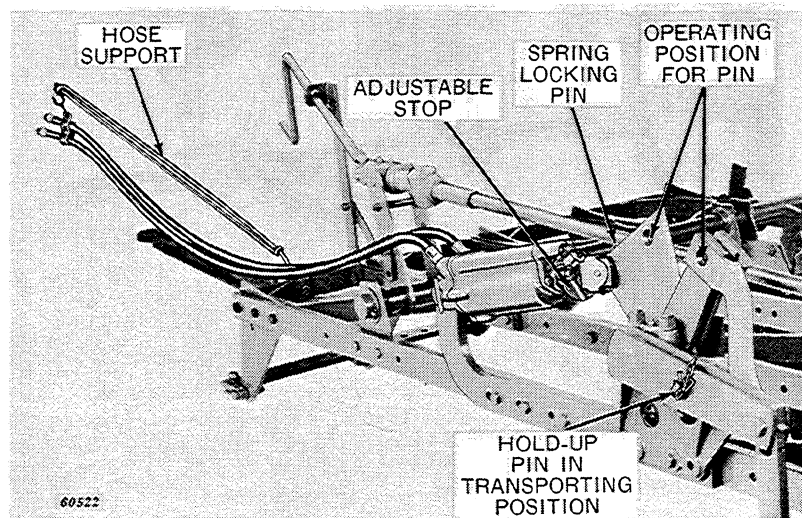
When using a 6-bottom plow with a John Deere 4010, 4020, 5010, or 5020 Tractor the hydraulic cylinder hoses must be at least 180 inches long.

When using other tractors, the hose length may be determined as follows:

The 5-bottom plow requires hoses for an 84-inch minimum spherical radius from the tractor drawbar to the hose end of the cylinder.

The 6-bottom plow requires hoses for a 144-inch minimum spherical radius from the tractor drawbar to the hose end of the cylinder.

The spherical radius is the distance from the tractor drawbar hitch point to the hose end of the cylinder.



To determine the additional hose required, attach the remote cylinder hoses to the tractor breakaway coupler. Lay the cylinder on the ground directly behind the drawbar with hoses stretched out full length. Pull hoses down to the tractor drawbar. Measure the distance from the end of the drawbar to the hose end of the cylinder. The difference between this measurement and the spherical radius shown on page 14 is the amount of the additional hose required.

CONNECTING HOSES AND INSTALLING CYLINDER

Before connecting hoses to tractor, relieve pressure in the tractor hydraulic system. To relieve pressure, stop tractor engine and move remote cylinder operating lever back and forth several times.

Wipe hose ends to remove any dirt before inserting them in breakaway couplers.

If the cylinder has not been used before, it may be necessary to bleed the cylinder as explained in the tractor operator's manual.

The hoses may be attached to either side of the coupler to suit the operator. *Be sure to relock coupler.*

With all trapped air removed from cylinder and with hold-up pin in transport position, install cylinder on plow. Then move pin to operating position.

Attach hose to hose support using S-hook and clamps provided.

Adjust the set screw collar on the hose support so the rod will not interfere with either the plow or tractor when turning.

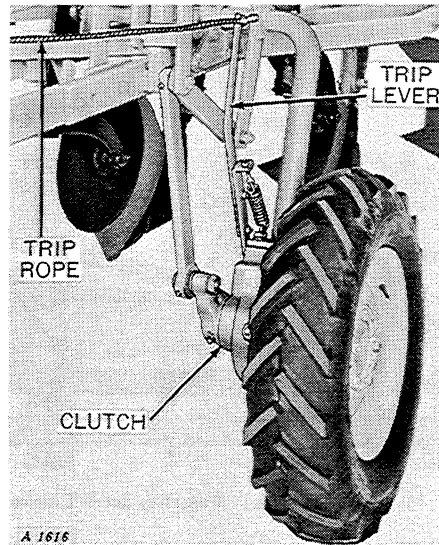
REMOVING CYLINDER

Place the plow in the lifted or transport position. Remove hold-up pin from operating position and place in transport position. Release load on the cylinder and remove

spring locking pins. The plow will be held in the lifted position and can be transported without replacing the cylinder.

NOTE: It is not necessary to remove cylinder when transporting. However, always place hold-up pin in transporting position to take the load off the hydraulic system.

MECHANICAL CONTROL

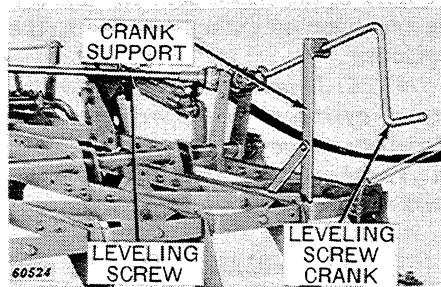


The F670A and F680A Plows are raised and lowered by the enclosed clutch. A rope attached to the clutch trip lever controls the clutch.

To lift the plow bottoms out of the ground for turning at the end of a row or for transporting, simply give the trip rope a quick positive pull. To lower the plow, pull the rope in the same manner. *NOTE: Do not use a slow steady pull since it will cause the clutch to continue tripping.*

The enclosed clutch on these plows provides constant lift so plow will raise completely to give full transport and trash clearance regardless of depth setting. Cushioned drop protects the plow bottom parts as the plow is lowered to its work.

LEVELING

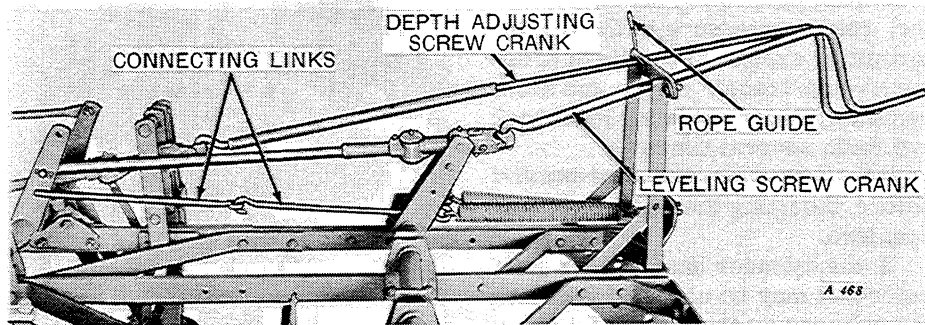


Leveling Screw Crank
on F670AH and F680AH Plows

The leveling screw on these plows is used for leveling the plow bottoms when in working position. The screw regulates the depth of the front bottom in relation to the rear.

Once the plow is leveled, plowing depth may be changed without affecting leveling except in cases where extreme changes in the depth of plowing are made. Then a slight adjustment in leveling may be necessary.

DEPTH OF PLOWING



Adjusting Screw Cranks on F670A and F680A Plows

Depth can be set from approximately 6 to 14 inches. There will be some variation in these figures depending on type of bottoms and soil conditions.

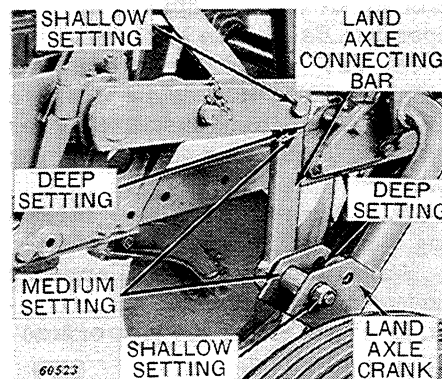
CLUTCH-LIFT PLOWS

On these plows, the depth adjusting screw crank controls the working depth of the bottoms.

For deeper plowing, turn crank clockwise. For shallower plowing, turn crank counterclockwise.

HYDRAULIC-LIFT PLOWS

The depth of plowing is controlled by the remote hydraulic cylinder and by the setting of the land axle connecting bar.

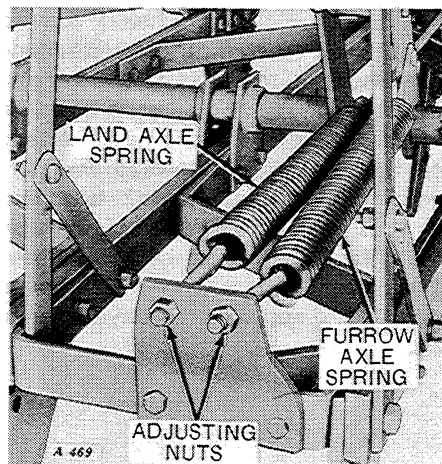


The two holes in the land axle connecting bar and the two holes in the land axle crank provide ad-

justment for shallow and deep plowing. There are three variations of depth which can be obtained. For shallow plowing attach connecting bar as shown in illustration on page 16. For slightly deeper plowing move bolt in connecting bar to the lower hole but leave connecting bar attached to the land axle crank as shown. For deepest possible setting move bolt in connecting bar to the lower hole and attach connecting bar to the land axle crank in hole closest to the axle.

After the land axle connecting bar has been set, the remote hydraulic cylinder controls the depth of plowing within the range of the shallow, medium, or deep setting. See your tractor operator's manual for operation of the remote hydraulic cylinder.

LIFTING SPRINGS

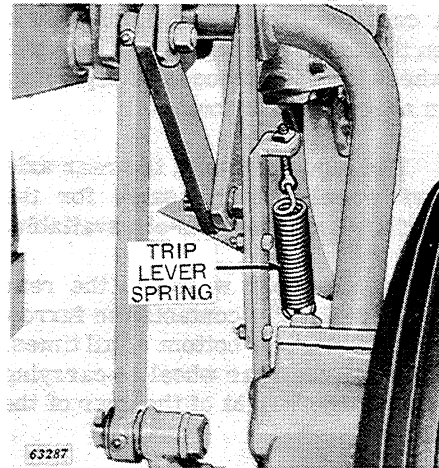


On the F670A and F680A Plows the lifting springs assist the reduction gear lift clutch in lifting the plow. These springs must be adjusted carefully.

On the land axle spring, draw up nut about halfway on threaded rod. Too much tension on the spring will prevent plow from penetrating quickly when the clutch is tripped. Not enough tension on the spring may cause the land wheel to slide before the clutch lifts the plow.

On the furrow axle spring, draw nut all the way up on threaded rod.

TRIP LEVER ADJUSTING SPRING



On the F670A and F680A Plows the reduction gear lift clutch trip lever spring aids the lever in returning to its original position, preparing the clutch for its next operation.

Tighten the nut on the spring adjusting eyebolt if greater tension is desired.

REAR AXLE AND WHEEL

These plows are regularly equipped with a rear axle with an anti-friction bearing and a 15-inch wheel less tire. A wheel with a 15-inch tire is available as special equipment. A 14-inch wheel less tire also is available as special equipment.

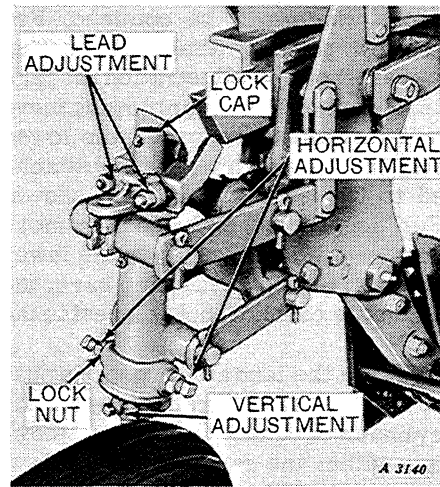
A wrap-around axle with anti-friction bearing is available as special equipment. This axle requires a cast-iron wheel. See illustration on the following page. This axle and wheel is recommended when plowing in adverse conditions.

The adjustments of the rear axle and wheel are the same for the various axles and wheels available.

Set the rear wheel so the rear landside lightly contacts the furrow wall and furrow bottom at all times. Be sure the rear wheel is carrying part of the weight of the rear of the plow.

To move rear wheel up or down, loosen set screws and lock nuts and bolts in rear axle lock cap. Then loosen clamp collar and adjust to desired setting. Tighten lock nuts, bolts, and set screws after adjustment is made.

To adjust wheel away from the furrow wall, loosen lock nuts and right-hand set screw and tighten left-hand set screw. Then tighten lock nuts. To adjust wheel toward



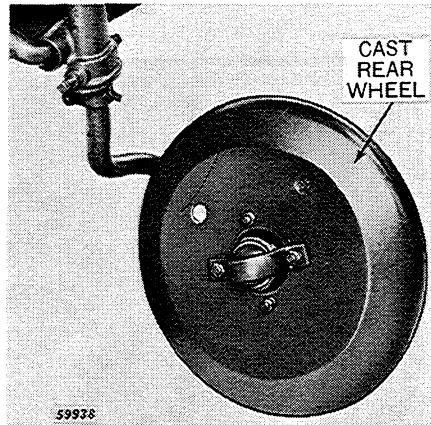
the furrow wall, loosen nuts and left-hand set screw and tighten right-hand set screw. Then tighten lock nuts.

The rear wheel should have a slight lead toward the plowed ground to assist in absorbing the furrow slice pressure and to keep the plow running straight. To adjust the lead of the rear wheel toward the furrow wall, loosen the left-hand nut in lock cap, and tighten right-hand nut. To adjust lead of rear wheel away from the furrow wall, loosen right-hand nut, and tighten left-hand nut.

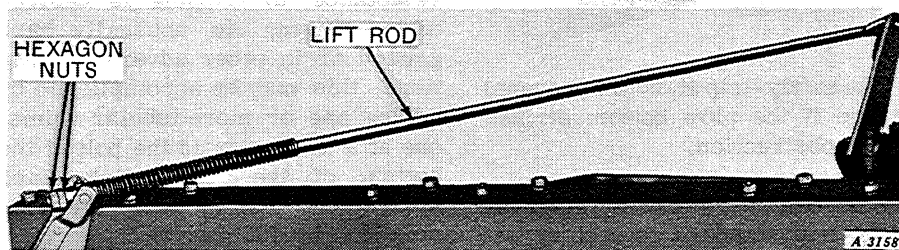
The rear wheel should **never** lead toward the unplowed ground.

The rear wheel may be locked with a bolt or pin in lock cap so it will not pivot when transporting or backing the plow. **CAUTION:** The pin must be removed before dropping the plow to working position.

NOTE: Keep the rear tire inflated to recommended air pressure shown on page 6.

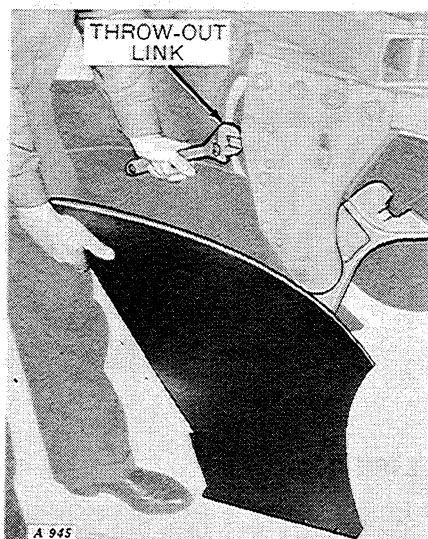


REAR WHEEL LIFT ROD



The rear wheel lift rod raises and lowers the rear axle and wheel. To get more transport clearance at the

rear of the plow, draw up the two hexagon nuts on the rear of the lift rod.

SAFETY-TRIP STANDARDS

The safety-trip standard prevents damage if the plow bottom strikes a solid obstruction.

The release mechanism of the safety-trip standard is factory set for proper tension.

To reset the safety-trip standard after a bottom has tripped, back the tractor without raising the plow until the standard snaps into locked position.

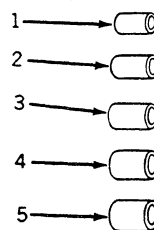
The release mechanism may be tripped to facilitate changing shares. To trip, first raise the plow and then hold down the throw-out link with an ordinary wrench, as shown in the illustration above, for standards other than the rear. On the rear standard there is not enough room to release standard with a wrench so a screwdriver must be used.

ADJUSTING TRIPPING RESISTANCE

The safety-trip standard trips when pressure or a shock load on the plow bottom causes enough deflection of the spring link to allow the throw-out arms to strike the stop pin which forces the throw-out roller out of the slot at the top of the standard.

The resistance to tripping is pre-set at the factory for uniform tripping pressure and normally will not require change. However, if greater resistance to tripping is desired when plowing in unusually hard ground or in other adverse conditions, this may be accomplished by adding one or more tubular shims, one at a time, around the bolt at the bottom of the spring link. Each shim added will increase the tripping load by 600 pounds.

If you wish to reduce the tripping load, shims may be removed. Each shim removed will reduce the tripping load by 600 pounds.



55821

Tubular Shims

NOTE: To work properly, the larger shims must be assembled over the smaller shims in the order shown in the illustration above.

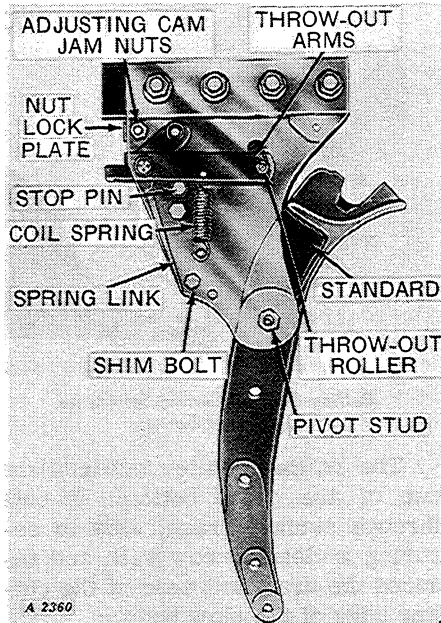
There are five different telescoping tubular shims available, each .060-inch thick. They are:

Key	Part No.	Specifications
1	31785A	.505" x .060" x 1-7/16"
2	31786A	.660" x .060" x 1-7/16"
3	31787A	.820" x .060" x 1-7/16"
4	31788A	1.005" x .060" x 1-7/16"
5	31789A	1.190" x .060" x 1-7/16"

One or more of these shims may be installed or removed easily by following these steps:

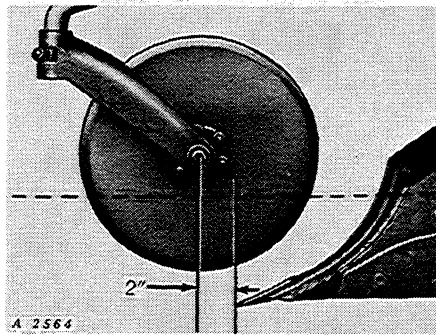
1. Trip standard by hand.
2. Loosen adjusting cam jam nuts.
3. Rotate adjusting cam counter-clockwise with a screwdriver (when facing left side of plow) so spring link is free to pivot.
4. Remove shim bolt at lower end of spring link.
5. Add or remove shim or shims as required and replace bolt.
6. Reset adjusting cam by rotating it clockwise until it rests firmly against the top of the spring and tighten the jam nuts. Turn corners of lock plate up on flat of the nut after jam nuts are tightened.

NOTE: If it becomes necessary to replace the standard in the safety-trip standard assembly, remove all shims and add only as needed to attain proper tripping load.



The coil spring has no effect on the tripping action of the standard. The adjusting cam serves only to hold the spring link firmly against shim bolt and to prevent backlash during tripping. The coil spring is used to insure proper seating of the throw-out roller in the slot on the top of the standard.

After any adjustment on a trip standard be sure it is properly lubricated. See lubrication instructions, page 35.

ROLLING COULTERS

*Rolling Couler—Correct Setting for
High-Speed Bottoms*

The rolling couler outlines the cut of the plow bottom. It cuts through surface trash, aids in securing a clean furrow wall, and reduces the draft and wear of the cutting edge of the plow bottom.

Always adjust the rear couler first. Then set the other coulers exactly the same. Final adjustments must be made in the field to meet soil conditions and depth of plowing.

FORE-AND-AFT AND DEPTH ADJUSTMENTS

For average conditions, adjust couler with center of the couler hub approximately over the point of the share on conventional bottoms and approximately 2 inches ahead of point of share on high-speed bottoms, as shown in illustration above.

Adjust the couler only deep enough to cut the trash, about 3 inches in ordinary conditions. See illustration above. Do not run the couler too deep.

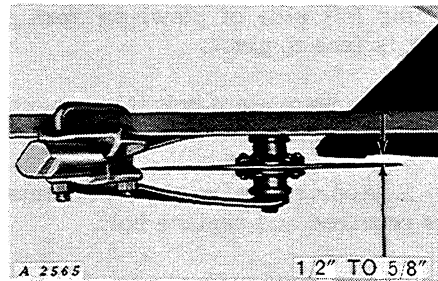
For hard ground conditions, move the couler toward the rear of the plow to reduce its tendency to ride the plow out of the ground. It may be necessary also to raise the couler.

For lighter soils, especially where there is heavy or tough trash, move the couler toward the front. Set the couler just deep enough to cut the trash. If set too deep, the couler pushes the trash instead of cutting it.

For tough scouring conditions, move the couler toward the rear of the plow and raise the couler.

When plowing sod, set the couler deep enough to cut the roots below the surface, usually about 1 inch shallower than the share is cutting.

To adjust coulers, loosen U-bolts and slide the shank and clamp either forward or backward or up and down.

HORIZONTAL ADJUSTMENT

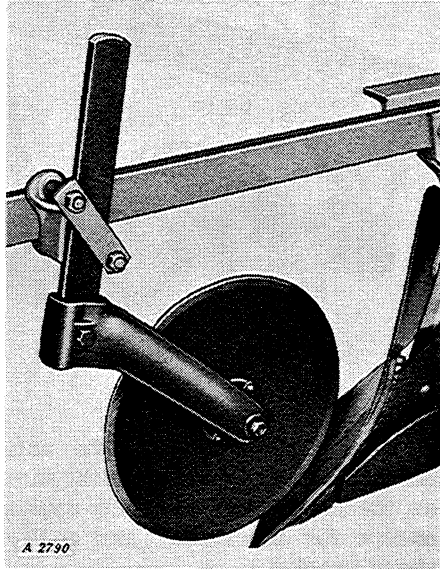
The rolling couler must be set only far enough to the left of the landside to leave a good straight furrow wall. For average conditions, set the couler 1/2 to 5/8 inch to the left of the landside, as shown in illustration above.

Loose ground conditions will sometimes require the couler to be set wider than 5/8 inch.

Measure the distance between coulers so you get exactly the correct cut on each bottom.

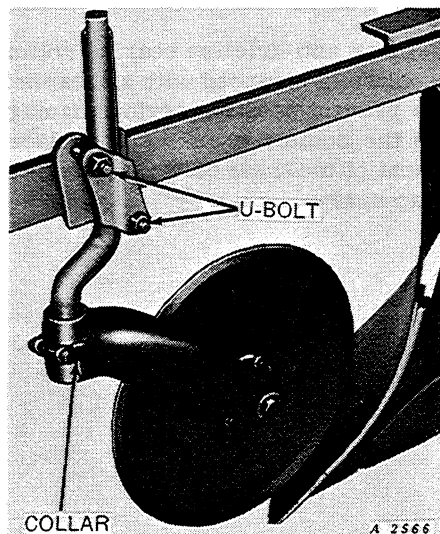
CHILLED-CONE BEARING COULTERS

Flat Shank



To adjust the flat shank coulter toward the furrow wall, loosen lower nut and tighten upper nut. To move the coulter toward the plow bottom, loosen upper nut and tighten lower nut.

Round Shank

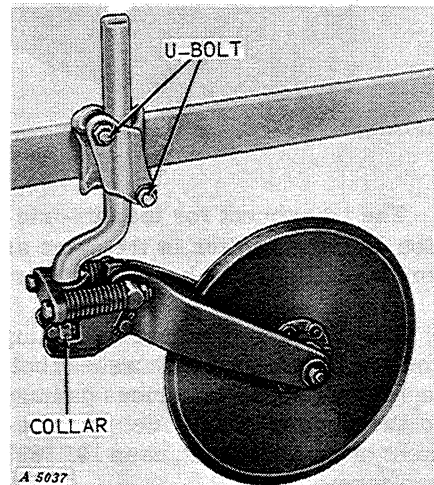


To adjust the coulter, loosen the clamp U-bolt nuts and rotate the coulter shank until coulter blade is at proper position.

When a major adjustment of a round shank coulter is made, it may be necessary to adjust the coulter shank collar so coulter is free to swing in the coulter yoke an equal distance on either side of the "straight ahead" position.

To adjust, loosen bolt in collar and rotate collar until open end of collar faces front of plow. **Be careful so coulter yoke and blade do not slip off shank.**

Cushion Coulter (Round Shank)



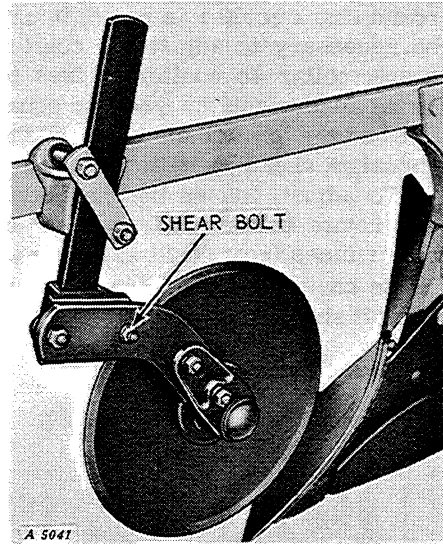
The cushion coulter protects the yoke, blade, and shank by means of two rows of cupped washers. There are 26 washers (13 sets) on each side. Each set of washers is mounted with their concave sides facing each other. The cupped washers hold the coulter in working position until striking an obstruction. Striking an obstruction deflects the washers, allowing the coulter blade to raise up approximately 4 inches to pass over the obstruction.

There is no pressure adjustment required.

24 Operation

ANTI-FRICTION BEARING COULTERS

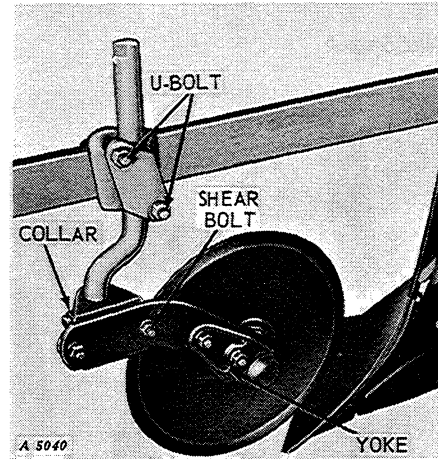
Flat Shank



The adjustment for the anti-friction bearing coulters is the same as for the chilled-cone bearing coulters.

The anti-friction bearing rolling coulters is equipped with a shear bolt to prevent possible serious damage to the coulters shank. For replacement of the shear bolt, use a 19H1899 cap screw.

Round Shank



The adjustments for the anti-friction bearing coulters are the same as the chilled-cone bearing coulters except for the collar and coulters shank bracket.

To adjust collar so coulters is free to swing an equal distance between the straight ahead position, loosen bolt in collar and rotate collar until open end of collar faces the right.

Be careful so coulters blade and yoke do not slip off shank.

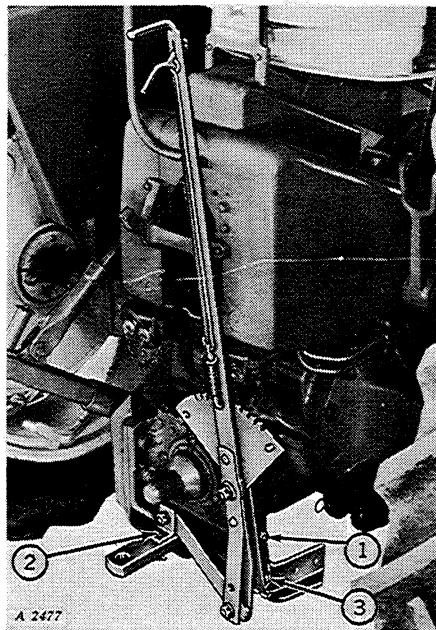
The anti-friction bearing rolling coulters is equipped with a shear bolt to prevent possible serious damage to the coulters shank. For replacement of the shear bolt, use a 19H1899 cap screw.

SPECIAL EQUIPMENT

LANDING LEVER FOR 3010, 3020, 4010, AND 4020 TRACTORS

The landing lever attachment controls the width of cut of the front bottom when working contour or hillsides.

These tractors must be equipped with dual remote cylinder outlets so the remote cylinder hoses may be connected to the left-hand breakaway couplers. This will prevent possible interference with the landing lever.



NOTE: Before attaching landing lever to tractor, the center link and right-hand draft link, lift link, and sway block must be removed from tractors equipped with a 3-point hitch.

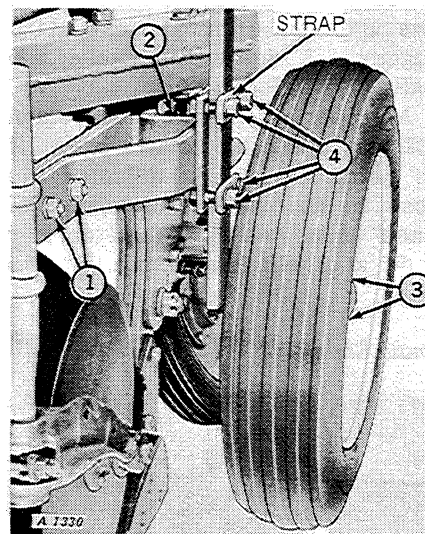
1. Attach ratchet support angle to sway block support using the 1/2- x 1-3/4-inch cap screw in the bottom hole.

2. Attach drawbar clip to the top side of the drawbar with the vertical

leg of the clip to the front. The drawbar must be in the short high position.

3. The lower end of the ratchet support angle can be trimmed off flush with the lower edge of the sway block support to overcome the possibility of collecting trash.

GAUGE WHEEL



The gauge wheel assists the plow in maintaining a constant depth while operating in sandy or loose-type soils.

The working depth of the gauge wheel may be adjusted by loosening the bolts in the bracket and straps and pushing the wheel up or down to the desired depth.

1. Attach bracket assembly to frame bar and brace.

2. Attach bracket assembly to rear standard and frame bar.

3. Attach wheel to hub.

4. Position wheel and axle assembly and secure in place by attaching straps.

26 Operation

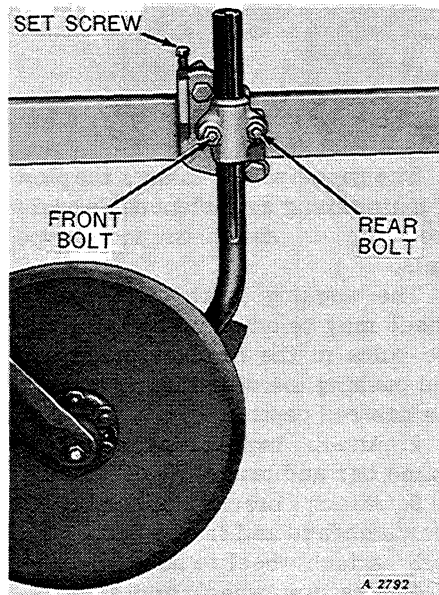
INDEPENDENT JOINTERS

Jointers assist the plow bottom in turning under and covering trash. By cutting and turning a small corner of the furrow slice next to the coulter and depositing it in the bottom of the furrow, the jointer eliminates any trash or stalk ends from the furrows.

In average conditions, a jointer set to work about 2-1/2 inches deep will effectively turn the corner of the furrow slice enough to insure good coverage and eliminate excessive clogging. A jointer adjusted too shallow will clog easily.

A properly adjusted jointer blade will just clear the coulter blade. If the jointer blade is adjusted too close to the coulter blade, it will cause undue wear on the coulter blade and will have a tendency to clog.

Round Shank

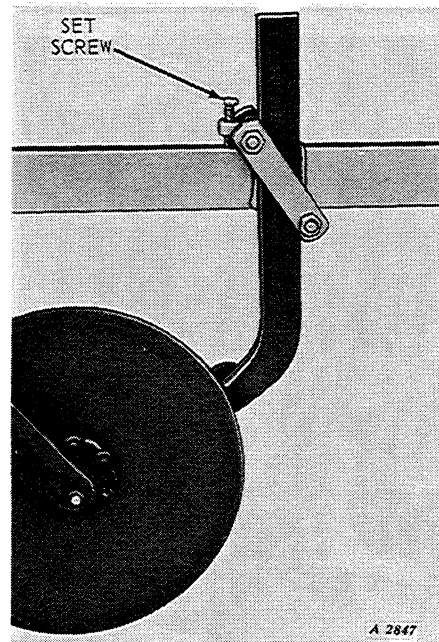


The independent jointer may be adjusted up or down by loosening

clamp and raising or lowering to desired depth.

To move jointer forward, turn set screw down in the jointer clamp; reverse operation to move it to the rear. To move the jointer toward the coulter, loosen front clamp bolt and tighten rear clamp bolt. To move the jointer blade away from the coulter blade, reverse the process.

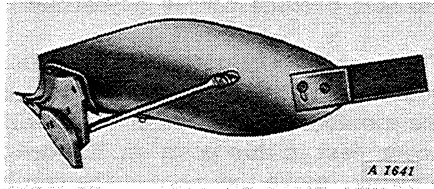
Flat Shank



The independent jointer may be adjusted up or down by loosening clamp and raising or lowering to desired depth.

To move the jointer forward, turn set screw down in the jointer clamp; reverse operation to move it to the rear. To move the jointer toward the coulter, loosen bottom clamp bolt and tighten top clamp bolt. To move the jointer away from the coulter blade, reverse the process.

MOLDBOARD EXTENSION

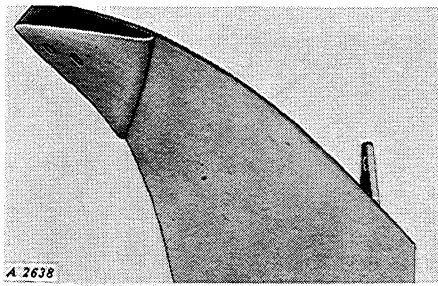


Moldboard extensions for both high-speed (HS400 Series) and conventional-type bottoms are available.

The moldboard extension applies pressure to the furrow slice and prevents the furrow slice from rolling back into the furrow when plowing on hillsides.

The slot in the moldboard extension provides ample adjustment. For more pressure on the furrow slice, move the extension down. For less pressure on the furrow slice, move the extension up.

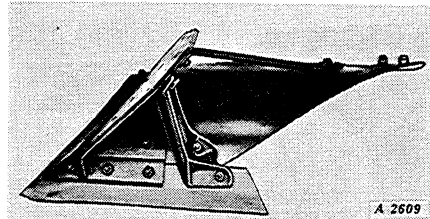
MOLDBOARD PAD



A moldboard pad, available as special equipment for HS400 Series high-speed plow bottoms, turns the furrow slice more abruptly when plowing on hillsides or at reduced speeds.

The pad should be used only where the soil scours easily. It is **not** recommended in difficult scouring conditions.

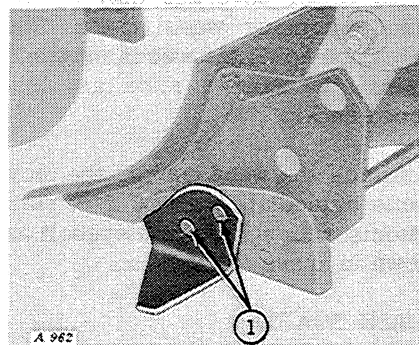
SHARE-FROG BRACE



In some tough scouring conditions, the use of 14-inch high-speed bottoms on 16-inch plowframes improves scouring due to the reduced moldboard area. The share-frog brace shown above permits the use of 16-inch shares on 14-inch high-speed bottoms.

Attach the share-frog brace as shown in the illustration above.

ROOT CUTTER

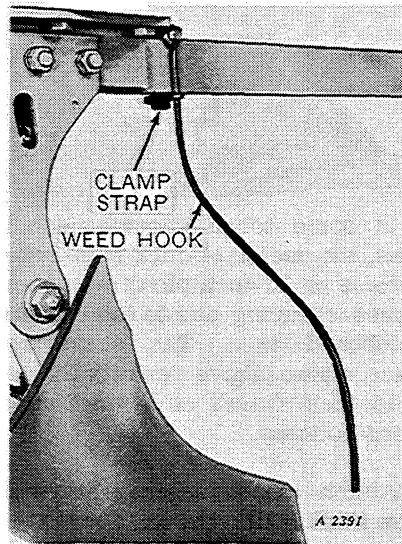


This cutter is available for attaching to the bottom for cutting alfalfa or similar roots.

1. Attach root cutter to bottom with same bolts that attach landside and frog to plow bottom standard. If root cutter is used with No. 9 cast landside or No. 10 cast landside, it will be necessary to use 1/2-inch longer bolts.

28 Operation

WEED HOOK



When plowing in tall weeds and trash, better coverage may be obtained by using weed hooks. The weed hook holds the weeds and trash against the furrow slice as it is turned under.

Attach the weed hook to the plow frame immediately ahead of the plow bottoms with a strap and eyebolt as shown in above illustration.

TRASH BOARD

Trash boards, for high-speed bottoms, high-speed slat bottoms, or the SDT546FC Semi-Deep Tillage Bottoms, improve coverage of heavy straw, stubble, and stalks.

The trash board catches the trash being carried on the top of the furrow slice and turns it down into the furrow bottom to be covered completely by the furrow slice.

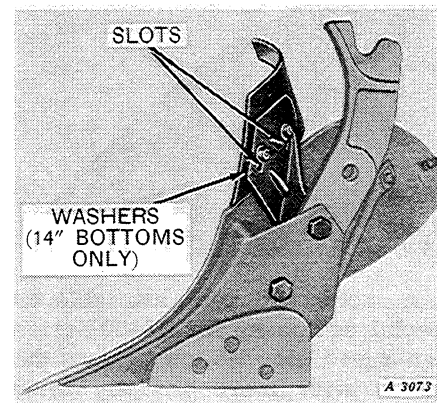
Slots in the trash board support bracket provide ample adjustment.

For average conditions, set the trash board so it is flush with the top of the moldboard. The trash board will scour best in this position. For deep plowing, move the rear of the trash board up, making sure front point remains flush with moldboard.

Be sure point of trash board is down tight against the moldboard shin.

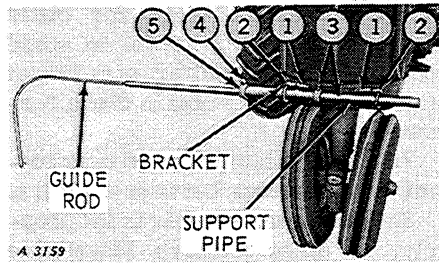
In this position, the trash board will turn trash quicker and will give lighter draft.

Flat washers are provided on front bolt for proper fit of trash board when used on 14-inch bottoms. Use the washers as needed on front bolt and place **between** trash board and trash board support bracket.



Attach the trash board as shown in the above illustration.

TRACTOR GUIDE ROD



A guide rod is available to aid in maintaining proper width of cut on front bottom. To attach:

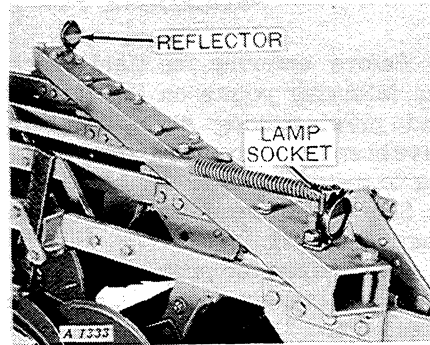
1. Bolt brackets to tractor.
2. Attach U-bolts to brackets. Leave nuts loose.
3. Insert support pipe through right-hand U-bolt. Slide set screw collar onto support pipe and insert pipe through left-hand U-bolt.
4. Slide remaining set screw collar onto end of support pipe.

NOTE: Set screws must be aligned with holes in support pipe so clamping may be accomplished.

5. Insert guide rod into support pipe and tighten nuts on U-bolts and set screws.

TRANSPORTING

To transport, raise the plow and lock in transport position by inserting hold-up pin through hole in bell crank and bell crank bearing. See page 14. Then lock the rear wheel in transport position as explained on pages 18 and 19. **Be sure to remove both pins before plowing.**



When transporting the plow on a road or highway at night or during the day, use accessory lights and devices for adequate warning to operators of other vehicles. In this regard, check local governmental regulations for proper use. Various safety lights and devices are available from your John Deere dealer.

SAFETY RULES

To avoid injury, always be careful while operating a tractor and plow.

Do not grease, oil, or adjust the plow while it is in motion.

Never ride, or permit others to ride, on the drawbar of the tractor or on the plow.

When transporting the plow on a public road, follow safety instructions outlined under "Transporting."

Remember, an accident is usually caused by someone's carelessness, neglect, or oversight.

PROCEDURE FOR FIELD ADJUSTING PLOW

Before entering the field check the following points on the tractor and plow, making sure that both have been properly prepared according to instructions in this manual.

Set wheel tread as outlined on pages 9 and 11.

Check tires for proper air pressure and weighting as outlined on pages 6 and 7.

Set tractor drawbar in proper position as outlined on page 7.

Set rockshaft selector lever in "D" position.

Set plow hitch correctly as outlined on pages 8-12.

Set clevis jaws in lowest setting (top hole in clevis jaws). See page 12.

Set rolling coulters as outlined on pages 22-24.

Measure or step off field so opening and finishing furrows will be in proper order.

After plow has entered the field, follow these steps to set the plow correctly.

1. Drop plow in ground, drive forward several feet, and stop.

2. Set the master lever or adjustable depth stop on remote hydraulic cylinder for desired plowing depth.

3. Set leveling lever so front bottom cuts the desired depth. Front bottom should be shallower than rear bottom to prevent having too high a ridge on opening round.

4. If necessary, adjust rear coulter to get a furrow wall.

5. After first round has been completed start second round. Level plow laterally with leveling lever and, if necessary, adjust master lever or depth stop on hydraulic cylinder for desired plowing depth.

6. Set rear coulter for clean furrow and proper depth. In some conditions rear coulter may be set slightly deeper to obtain clean furrow.

7. Check width of cut on rear bottom by measuring between coulters.

8. After rear coulter is set properly, set other coulters. Make sure distance between the coulters is exactly the same as size of plow frame.

9. Set diagonal hitch brace to get proper width of cut on front bottom. Shorten brace setting to increase width of cut of front bottom or lengthen to decrease cut.

10. Check rear wheel setting for proper height, lead, and lateral setting. See pages 18 and 19.

11. If jointers or trash boards are used, set according to instructions on pages 26 and 28, after plow has been set.

12. If the tractor guide rod (special equipment) is used, set rod on tractor to maintain proper width of cut on front bottom. Width of cut on front bottom is dependent on the operator maintaining proper distance from furrow wall with the tractor. See page 29.

13. On third round plow should be in adjustment. As a final check, observe plow and make sure all of the foregoing adjustments are correct.

MAINTENANCE

PLOW BOTTOMS

Protect the face of the moldboard and share from rust whenever the plow is not in use (even overnight) by applying a light coating of oil or grease. When storing the plow for the season, apply a good rust preventive such as John Deere Plow Bottom Black Paint or a heavy coating of cup or gun grease. The paint is available from your John Deere dealer in brush-type (PT64) or a 12-ounce spray can (PT65).

SHARES

It is important to keep the plow shares in good cutting condition at all times. Sharp, correctly set shares add to the efficiency and good work of the plow bottoms. Dull shares cause poor penetration and may greatly increase the draft of the plow.

Soil-Flow Shares for High-Speed Bottoms are the "throwaway" type. When they become worn, it is most economical to discard and replace them with new low-cost Genuine John Deere Soil-Flow Shares.

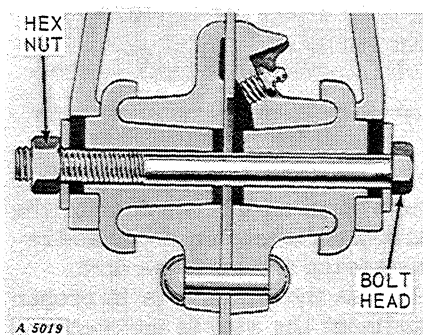
Shares for conventional plow bottoms can be resharpened and reshaped. See your local blacksmith.

ROLLING COULTERS

It is important to keep the rolling coulters sharp and properly lubricated at all times.

ADJUSTING END PLAY IN COULTER HUBS

Coulters with Chilled-Cone Bearings

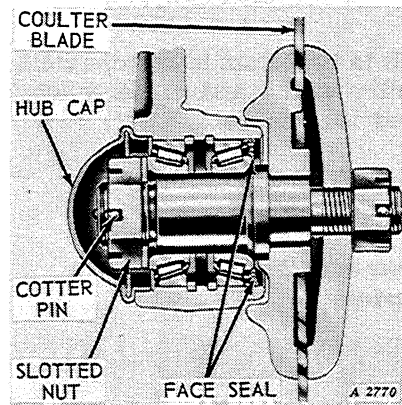


Cross-Section View of Coulters Bearing

The rolling coulter have adjustable bearings which provide means for taking up wear.

To remove excessive end play in rolling coulters hubs, loosen nut and turn bolt head to right until end play is removed. Adjust so coulters blade will turn freely. Then tighten nut.

Coulters with Anti-Friction Bearings



Cross-Section View of Anti-Friction Bearing Rolling Couler

The anti-friction bearing has a face-type seal. The contact of the seal against a machined surface retains grease and excludes dirt.

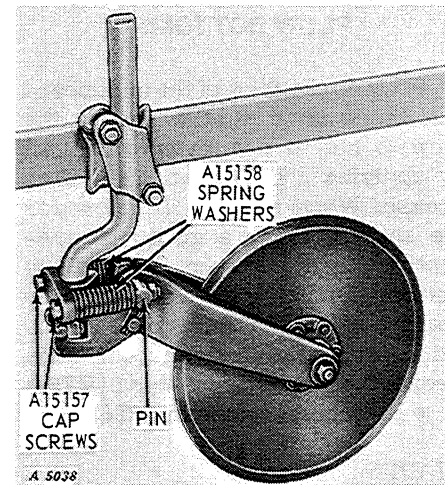
Unless the bearing is in proper adjustment the seal is ineffective.

If there is any looseness in the bearing, disassemble, clean and repack with SAE multipurpose-type grease. Tighten nut until there is drag on the bearing. **Do not back off nut after drag is encountered on the bearing.** This drag assures positive sealing. Be sure to replace the cotter pin in the slotted nut to lock the nut in position.

The anti-friction bearing rolling coulters are packed with grease at the factory. Every 100 hours, inspect the bearing and adjust it if necessary. Every 200 hours, or before each plowing season, whichever comes first, disassemble the bearing, clean, and repack it as outlined above. **Do not use chassis lubricant in anti-friction bearings.**

NOTE: The nut on the blade side should be checked for looseness and should be kept tight at all times.

CUSHION COULTER



If the cushion rolling couler is disassembled for any reason, the couler must be reassembled correctly.

The A15158 spring washers (26 washers on each cap screw) are cupped and should be assembled in pairs so the cups face each other.

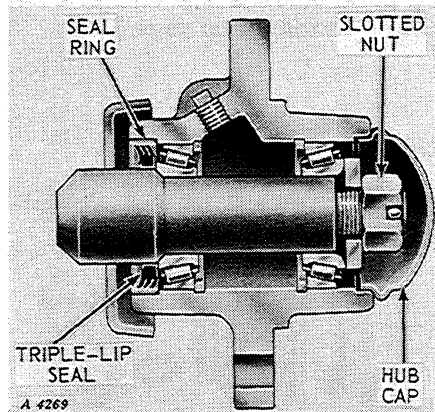
The A15157 cap screws are a special type and thread length, and only these cap screws should be used for replacement. Before assembly, these cap screws should be coated with SAE multipurpose-type grease. Thread these cap screws into the pin until the thread bottoms out and tighten to 70-90 ft-lbs of torque. Lock securely in place with the jam nut.

There is no pressure adjustment on the cushion rolling couler.

WHEEL BEARINGS

ANTI-FRICTION BEARING

Rear Axle for 14- or 15-inch Wheels



Cross-Section View of Rear Wheel Anti-Friction Bearing with Triple-lip Seal

The rear axle for 14- or 15-inch rear wheels, regularly furnished with these plows, is equipped with a triple-lip seal anti-friction bearing.

Inspect wheel bearings before each plowing season and repack with wheel bearing grease. Clean lips of the seal thoroughly and fill with grease.

Assemble the bearing seal so the wide metal ring faces toward the bearing and rests tightly against the cone face. Press the cone and the seal on the spindle at the same time to assure proper location of the seal.

Install the plastic seal ring with the chamfered edge toward the bearing. This ring must be in the hub before the hub is positioned over the bearing and seal.

Tighten the spindle nut until the wheel turns firmly but freely with from 5 to 15 in-lbs drag. While tightening the spindle nut, rotate the wheel so the rollers can assume their working position in the cups. Most of the drag will be generated by the seal. No grinding effect should be evident when properly tightened. Lock the nut with a cotter pin at the next nearest matching hole.

Fill the hub cap approximately one-fourth full with clean wheel bearing grease and attach cap to hub.

Hydraulic Land Axle, Gauge Wheel Axle, Furrow Axle, and "Wrap-Around" Rear Axle (for Cast Wheel)

Inspect wheel bearings before the plowing season and repack with wheel bearing grease. Tighten the adjusting nut with a 12-inch wrench. At the same time turn wheel in both directions until there is a slight drag to be sure all bearing surfaces are in contact. Then back off the adjusting nut to first locking position.

SERVICE AT THE BEGINNING OF THE SEASON

Clean off any dirt or grease that may have accumulated on moving parts. This will prevent abrasive action that could cause excessive wear.

Thoroughly inspect the plow for loose parts and adjust as necessary.

Lubricate as shown on pages 35 and 36.

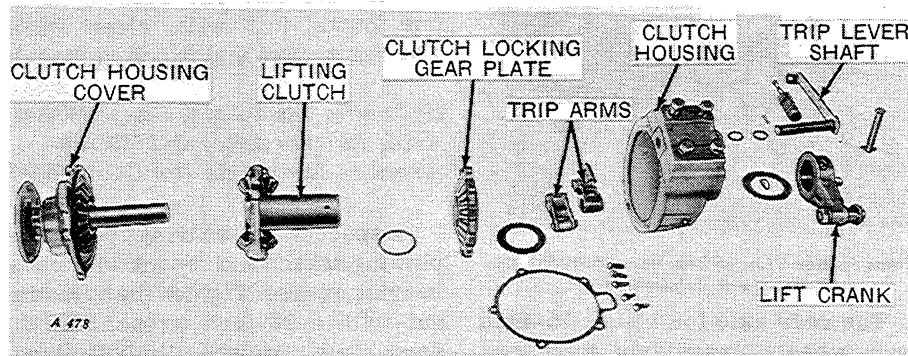
SERVICE AT THE END OF THE SEASON

The plow's chief enemies, rust and corrosion, are busy the year-around. A little time and effort spent protecting the plow from destructive moisture will repay you in longer service, easier operation, and higher resale value.

Clean plow thoroughly to remove dirt and trash which would hold moisture and cause rusting.

Apply a good rust preventive to all land polished surfaces such as the plow bottoms and coulters. See "Plow Bottoms" on page 31.

REDUCTION GEAR LIFT CLUTCH



The mechanism of the reduction gear lift clutch is completely enclosed and operates in a bath of SAE 90 oil.

CAUTION: This clutch does NOT contain oil when shipped from the factory. Before operating plow add one quart of SAE 90 oil. Drain and refill every 100 hours of operation or once a year.

To replace worn or damaged clutch parts, disassemble clutch as follows:

Remove drilled pin from lift crank.

Remove lift crank from shaft.

Unscrew five bolts from clutch housing and pull out the clutch housing cover, lifting clutch, clutch locking gear plate, and gaskets.

Remove trip lever shaft from clutch housing.

Remove trip arms and tension spring from inside of clutch housing.

Check for loose, worn, or broken parts and replace them if necessary.

To reassemble clutch, simply reverse the above procedure.

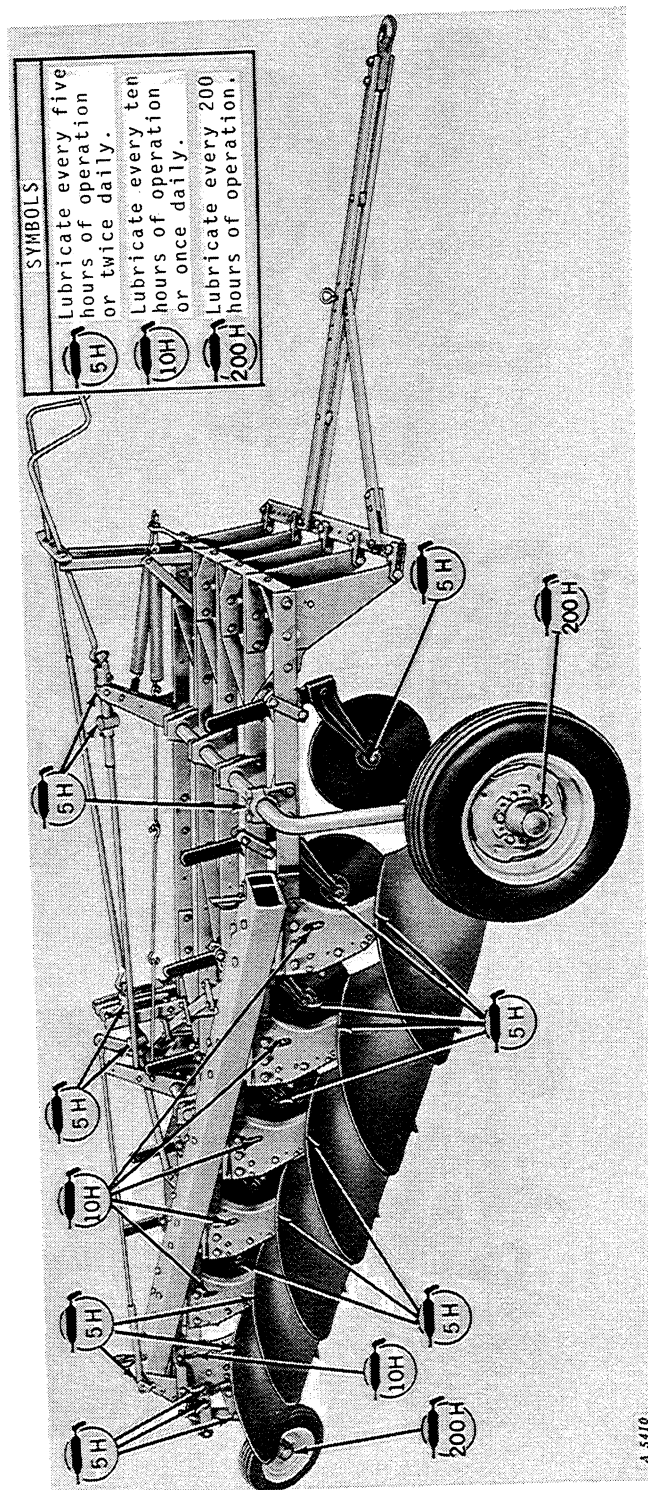
Upon reassembling the clutch, be sure to fill it with one quart of SAE 90 oil.

LUBRICATION

Grease fittings are provided at all points indicated in the lubrication chart. All parts provided with grease fittings should be lubricated as indicated with SAE multipurpose-type grease. If any grease fittings are missing, replace them immediately. **Clean the fittings thoroughly before using grease gun.** All other moving

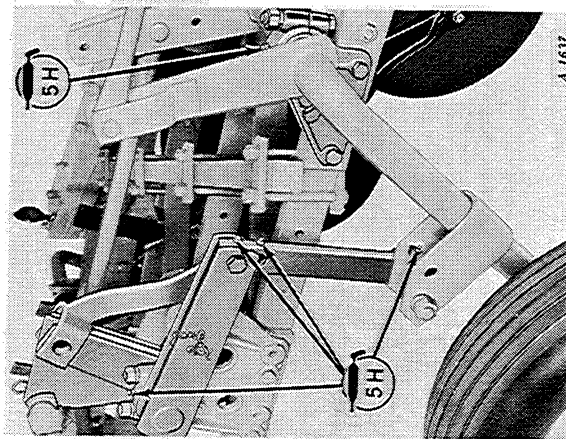
parts on the plow should be oiled twice daily with SAE 30 lubricating oil. The period recommended is based on normal conditions; severe or unusual conditions may require more frequent lubrication.

NOTE: Throw-out roller on safety-trip standards must be free and well lubricated at all times.

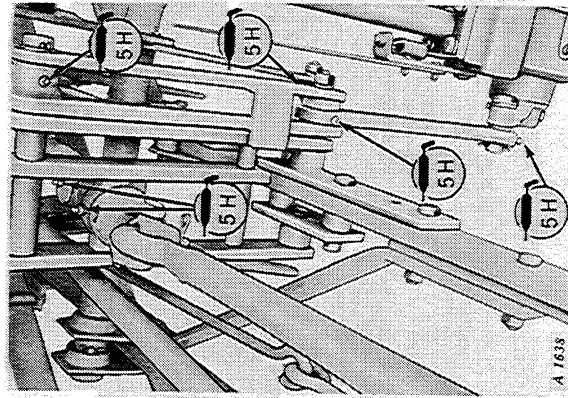


Lubrication Chart

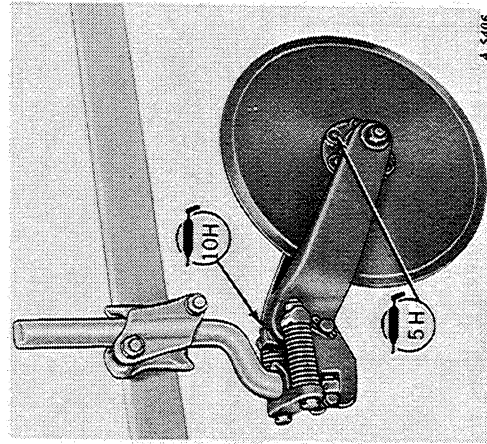
LUBRICATION—Continued



Hydraulic-Lift Plow
(F670AH and F680AH Plows)



Clutch-Lift Plow
(F670A and F680A Plows)



Cushion Coulter

NOTE: The reduction gear lift clutch on the F670A plow, always be sure clutch contains oil. Drain and and F680A Plows operates in a bath of SAE 90 oil. replace oil once a year or approximately once every The clutch requires one quart of oil. Before operating 100 hours of operation.

PLOWING DIFFICULTIES AND REMEDIES

Improper adjustments account for most plowing difficulties. If, after following the operating and adjusting instructions in this manual and checking the plow for proper assembly, difficulties still persist, use the following chart. If you are unable to remedy the trouble, have your John Deere dealer check for worn or damaged parts.

SLOW GROUND ENTRY

<i>Possible Cause</i>	<i>Possible Remedy</i>
Worn shares.	Sharpen or replace.
Improper coulter adjustment.	Coulters should run only about 3 or 3-1/2 inches deep.
Dull coulters.	Sharpen or replace.
Improper rear wheel adjustment.	Set rear wheel so rear landside lightly contacts the bottom of the furrow.
Insufficient plow bottom suck.	Loosen bottom attaching bolts and force share points down—retighten bolts.
Tractor hitch too high.	Set tractor drawbar 15 to 17 inches above ground when tractor is on level ground.
Clevis jaws too low.	Raise clevis jaws slightly. Clevis jaws set too high will cause plow to run on nose, resulting in unfavorable performance.
Lift springs too tight.	Slack off spring tension.

PLOW RUNNING CROOKED

Improper tractor wheel tread.	Check operator's manual.
Improper hitch adjustment.	Check operator's manual.
Improper leveling.	Set front bottom to cut proper depth.

PLOW RUNNING CROOKED—Continued

<i>Possible Cause</i>	<i>Possible Remedy</i>
Improper rear wheel adjustment.	Set wheel to have slight lead toward plowed ground and so rear land-side lightly contacts the side of the furrow wall.
Improper coulter adjustment.	Be sure coulters are free to swing and run straight.
Improper jointer adjustment.	Set jointers to run only about 2 inches deep and be sure they do not prevent coulters from running straight.

RIDGING

Front bottom too deep.	Level plow.
Front bottom too shallow.	Level plow.
Front bottom cutting wrong width.	Check tractor wheel tread and plow hitching.
Improper coulter adjustment.	Distance between coulter blades must measure same as plow frame size.
Improper jointer adjustment.	Set all jointers the same depth.

POOR TRASH COVERAGE

Bottoms not scouring.	Clean bottoms frequently until land polish is obtained.
Improper coulter adjustment.	Set coulters deep enough to cut trash. Keep coulter sharp.
Improper jointer adjustment.	Set jointers to run about 2 inches deep and close to but not rubbing against the coulter blade.
Plow running crooked.	See "Plow Running Crooked," on pages 37 and 38.
Weed hooks may be necessary.	Add weed hooks.
Trash boards may be necessary.	Add trash boards.
Trash boards not set properly.	When plowing deeper than 7 inches, raise rear of trash board slightly. Be sure point of trash board is down tight against the moldboard shin.

BOTTOMS DON'T SCOUR

<i>Possible Cause</i>	<i>Possible Remedy</i>
New bottoms.	Clean surface with gasoline, kerosene or diesel fuel.
Plow running on nose.	Lower clevis jaws or raise tractor drawbar.
Plow running crooked.	See "Plow Running Crooked," pages 37 and 38.
Coulters not set properly.	Set coulters shallower and back.

RAGGED FURROW WALL

Improper rear coultter adjustment.	Set coulters to run about 3 or 3-1/2 inches deep and far enough to the left of landside to leave clean furrow wall.
Wrong rear coultter angle.	Be sure coultter collar does not keep coultter from running straight.
Jointer interference.	Be sure jointer is not keeping coultter from running straight.
Rear wheel not set properly.	Set rear wheel to allow landside to lightly contact furrow wall. Rear wheel should have slight lead toward plowed ground.

PLOW PULLS HEAVY

Excessive tractor wheel slippage.	Raise tractor drawbar.
Plow running on nose.	Lower clevis jaws.
Rear wheel not set properly.	Lower rear wheel until rear landside lightly contacts the furrow bottom and rear wheel carries part of the weight of the rear of the plow.
Bottoms not scouring.	Clean frequently until land polish is obtained.

CLUTCH NOT WORKING PROPERLY

<i>Possible Cause</i>	<i>Possible Remedy</i>
Land wheel slides when lifting.	Tighten lift springs. Check tire pressure.
Land wheel slides or chatters when dropping plow.	Loosen lift springs. Sharpen or replace shares.
Clutch will not operate up or down.	Disassemble, wash out old grease, check for worn or broken parts, reassemble, and lubricate.
Land wheel slips when lifting.	Hitch clevis jaws may be too low—raise one hole.

SAFETY-TRIP STANDARDS

Standard Trips too Easily

Tripping load not great enough.	Add tubular shim.
Slot in standard rounded.	Replace with new standard.
Throw-out roller damaged.	Replace with new throw-out assembly.
Excessive wear on pivot stud.	Replace pivot stud.
Coil spring broken.	Replace coil spring.
Dirt packed under throw-out roller.	Clean.
Plow running on nose.	Level plow fore and aft.

Standard Trips too Hard

Tripping load too great.	Remove enough tubular shims to obtain desired tripping load.
Not properly lubricated.	Lubricate all moving parts.
Standard binding at pivot stud.	Loosen lock nut slightly. Grease pivot stud.
Standard seldom tripped.	Trip standard periodically by hand.

Excessive Vertical Play at Share Point

Adjusting cam not tight.	Rotate cam clockwise until cam is tight against spring link.
Pivot stud worn or broken.	Replace and grease pivot stud.
Throw-out roller damaged.	Replace with new throw-out assembly and oil.

Excessive Lateral Looseness of Standard

Standard pivot stud loose.	Tighten nut until standard is free to move without binding.
Pivot stud worn or broken.	Replace and grease pivot stud.

ASSEMBLY

1. Read all assembly instructions and carefully observe illustrations.
2. Cut all bundling wires and conveniently arrange parts.
3. Lubricate all bearings and moving parts as you proceed so they move freely.

F670A AND F670AH PLOWS REGULAR SHIPPING BUNDLES

Bundle No.	Description	F670A			F670AH		
		4- Btm.	5- Btm.	6- Btm.	4- Btm.	5- Btm.	6- Btm.
Frame and Standards							
BA 10869 A	(14-Inch)	1	..	..	1	..	..
BA 10870 A	(16-Inch)	1	..	..	1	..	..
BA 10871 A	(14-Inch)	..	1	..	..	1	..
BA 10872 A	(16-Inch)	..	1	..	..	1	..
BA 10891 A	(14-Inch)	..	..	..	..	..	1
BA 10890 A	(16-Inch)	..	..	1	..	..	1
Axles							
SD 2760 A	Furrow (14-Inch)	1	..	..	1	..	..
SD 2761 A	Furrow (16-Inch)	1	..	..	1	..	..
SD 2762 A	Furrow (14-Inch)	..	1	..	..	1	..
SD 2763 A	Furrow (16-Inch)	..	1	..	..	1	..
SD 2764 A	Furrow (16-Inch)	..	..	1	..	..	1
BA 10309 A	Furrow (14-Inch)	..	..	..	..	..	1
BA 10888 A	Land (14-Inch)	1	1	..	..	..	..
BA 10889 A	Land (16-Inch)	1	1	1	..	..	..
SD 2765 A	Land (14-Inch)	..	..	..	1	1	1
SD 2766 A	Land (16-Inch)	..	..	..	1	1	1
Rear Axle, Bails, Anti-Friction Bearing and Wheel							
BA 14042	Rear Axle, Bails, and Bearing	1	1	1	1	1	1
JD 1384	Rear Wheel, 15-Inch, less Tire	1	1	1	1	1	1
Hitches							
BA 10695 A	Cushion Spring Release	1	1	..	1	1	..
SD 2444 A	Cushion Spring Release	..	..	1	..	..	1
Flat Coulter Shank, Clamp, and Rolling Coulter							
BA 10991 A	Clamp	4	5	6	4	5	6
BA 10907 A	17-Inch with Chilled-Cone Bearing	4	5	6	4	5	6

F670A AND F670AH PLOWS—Continued**REGULAR SHIPPING BUNDLES—Continued**

		F670A			F670AH		
Bundle No.	Description	4- Btm.	5- Btm.	6- Btm.	4- Btm.	5- Btm.	6- Btm.
Miscellaneous Regular Bundles							
BA 10085 A	Adjusting Screws and Cranks	1	..	..	..	..	..
BA 10086 A	Adjusting Screws and Cranks	..	1	..	..	..	..
BA 10087 A	Adjusting Screws and Cranks	..	..	1	..	..	..
SD 1525 A	Leveling Screw, Crank and Support	..	..	..	1	..	..
SD 1526 A	Leveling Screw, Crank and Support	..	..	..	..	1	..
SD 2769 A	Leveling Screw, Crank and Support	..	..	..	..	..	1
BA 10866 A	Reduction Gear Lift Clutch	1	1	1	..	..	..
BA 10116 A	Cylinder Support and Bell Crank	..	..	..	1	1	1
BA 10544 A	Rear Wheel Lift Rod	1	1	1	1	1	1
BA 10778 A	Clutch Rope and Grease Fittings	1	1	1	..	..	..
SD 1355 A	Grease Fittings	..	..	..	1	1	1
SD 2423 A	Wheel less Tire	1	1	1	2	2	2
BA 10229 A	Wheel less Tire (Land)	1	1	1	..	..	..
SD 2331 A	Reflector (2)	1	1	1	1	1	1
SD 2333 A	Light and Reflector Bracket	1	1	1	1	1	1

SPECIAL SHIPPING BUNDLES**Rear Axle, Bails, Anti-Friction Bearing and Wheel**

SD 2747 A	Rear Axle, Bails, and Bearings	1	1	1	1	1	1
SD 2449 A	Wheel (Cast)	1	1	1	1	1	1

Rear Wheel (In lieu of JD1384)

SD 2410 A	Wheel, 15-Inch, with Tire.	1	1	1	1	1	1
JD 1754	Wheel, 14-Inch, less Tire.	1	1	1	1	1	1

Land and Furrow Wheels

SD 2770 A	Furrow with Tire	1	1	1	2	2	2
BA 10879 A	Land with Tire	1	1	1	..	..	..
AA 14898	Land and Furrow (Steel).	2	2	2	2	2	2
SD 1292 A	Wheel Lugs	1	1	1	..	..	..
JD 3011	Furrow, 14-Inch, less Tire.	1	1	1	2	2	2

Gauge Wheel and Axle

BA 10041 A	Axle and Hub	1	1	1	1	1	1
JD 1384	Wheel less Tire	1	1	1	1	1	1
SD 2410 A	Wheel with Tire	1	1	1	1	1	1
JD 1754	Wheel, 14-Inch, less Tire.	1	1	1	1	1	1

SPECIAL SHIPPING BUNDLES—Continued

Bundle No.		Description	F670A			F670AH		
			4- Btm.	5- Btm.	6- Btm.	4- Btm.	5- Btm.	6- Btm.
Independent Jointer and Clamp								
DK	76 FA	Jointer - Cast (Round Shank)	4	5	6	4	5	6
JC	24 A	Clamp (For DK76FA)	4	5	6	4	5	6
SD	467 A	Jointer - Steel (Flat Shank)	4	5	6	4	5	6
JC	21 A	Clamp (For SD467A)	4	5	6	4	5	6
Round Coulter, Clamp, and Rolling Coulters								
BA	10713 A	Shank and Clamp.	4	5	6	4	5	6
BA	10902 A	17-Inch, with Chilled-Cone Bearing	4	5	6	4	5	6
BA	14324	17-Inch, with Anti-Friction Bearing.	4	5	6	4	5	6
BA	10971 A	17-Inch Rippled Edge, with Chilled-Cone Bearing	4	5	6	4	5	6
BA	14325	17-Inch Rippled Edge, with Anti-Friction Bearing	4	5	6	4	5	6
BA	10904 A	18-Inch, with Chilled-Cone Bearing	4	5	6	4	5	6
BA	10905 A	20-Inch Plain, with Chilled-Cone Bearing	4	5	6	4	5	6
BA	14326	20-Inch Plain, with Anti-Friction Bearing	4	5	6	4	5	6
BA	11083 A	20-Inch Rippled Edge, with Chilled-Cone Bearing	4	5	6	4	5	6
BA	14327	20-Inch Rippled Edge, with Anti-Friction Bearing	4	5	6	4	5	6
Cushion Rolling Coulters for Round Shank and Clamp								
BA	14245	17-Inch, with Chilled-Cone Bearing	4	5	6	4	5	6
BA	14246	17-Inch Rippled Edge, with Chilled-Cone Bearing	4	5	6	4	5	6
Flat Coulter Shank and Rolling Coulters								
BA	14328	17-Inch, with Anti-Friction Bearing	4	5	6	4	5	6
BA	10972 A	17-Inch Rippled Edge, with Chilled-Cone Bearing	4	5	6	4	5	6
BA	14329	17-Inch Rippled Edge, with Anti-Friction Bearing	4	5	6	4	5	6
BA	10909 A	18-Inch, with Chilled-Cone Bearing	4	5	6	4	5	6
BA	10910 A	20-Inch, with Chilled-Cone Bearing	4	5	6	4	5	6
BA	14330	20-Inch, with Anti-Friction Bearing	4	5	6	4	5	6
BA	11084 A	20-Inch Rippled Edge, with Chilled-Cone Bearing	4	5	6	4	5	6
BA	14331	20-Inch Rippled Edge, with Anti-Friction Bearing	4	5	6	4	5	6

F670A AND F670AH PLOWS—Continued**SPECIAL SHIPPING BUNDLES—Continued**

		F680A			F680AH		
Bundle No.	Description	4- Btm.	5- Btm.	6- Btm.	4- Btm.	5- Btm.	6- Btm.
Plow Bottom Attachments							
7750 A	Moldboard Extensions (For conventional bottoms)	4	5	6	4	5	6
A 11736 A	Moldboard Extensions (For HS400 Series High-Speed Bottoms)	4	5	6	4	5	6
BA 11128 A	Trashboard (For HS Bottom)	4	5	6	4	5	6
BA 11130 A	Trashboard (For Slat Bottom)	4	5	6	4	5	6
BA 14039	Trashboard (For SDT546FC Semi-Deep Tillage Bottom)	4	5	6	4	5	6
BA 10162 A	Moldboard Pad (14-Inch)	4	5	6	4	5	6
BA 10164 A	Moldboard Pad (16-Inch)	4	5	6	4	5	6
CT 186 A	Root Cutter, R.H.	4	5	6	4	5	6
AA 14903	Share-Frog Brace to attach 16-Inch High-Speed Shares to 14-Inch High-Speed Bottoms	4	5	6	4	5	6
Miscellaneous Special Bundles							
SD 2642 A	Landing Lever	1	1	1	1	1	1
BA 10113 A	Weed Hook	4	5	6	4	5	6
BA 10545 A	Rear Wheel Lift Rod to reduce 4-Bottom to 3-Bottom	1	..	..	1	..	..
SD 1421 A	Leveling Screw	..	1	..	..	1	..
SD 2768 A	Plain Hitch for Crawler Tractors	1	1	..	1	1	..

F680A AND F680AH PLOWS REGULAR SHIPPING BUNDLES

Bundle No.		Description	F680A			F680AH		
			4- Btm.	5- Btm.	6- Btm.	4- Btm.	5- Btm.	6- Btm.
Frame and Standards								
BA 10884	A	(14-Inch)	1	..	..	1	..	..
BA 10885	A	(16-Inch)	1	..	..	1	..	..
BA 10886	A	(14-Inch)	..	1	..	..	1	..
BA 10887	A	(16-Inch)	..	1	..	..	1	..
BA 10893	A	(14-Inch)	..	..	..	..	..	1
BA 10892	A	(16-Inch)	..	..	1	..	..	1
Axles								
SD 2760	A	Furrow (14-Inch)	1	..	..	1	..	..
SD 2761	A	Furrow (16-Inch)	1	..	..	1	..	..
SD 2762	A	Furrow (14-Inch)	..	1	..	..	1	..
SD 2763	A	Furrow (16-Inch)	..	1	..	..	1	..
SD 2764	A	Furrow (16-Inch)	..	..	1	..	..	1
BA 10309	A	Furrow (14-Inch)	..	..	..	..	..	1
BA 10888	A	Land (14-Inch)	1	1	..	..	..	..
BA 10889	A	Land (16-Inch)	1	1	1	..	..	..
SD 2765	A	Land (14-Inch)	..	..	..	1	1	1
SD 2766	A	Land (16-Inch)	..	..	..	1	1	1
Rear Axle, Bails, Anti-Friction Bearing and Wheel								
BA 14042		Rear Axle, Bails and Bearings	1	1	1	1	1	1
JD 1384		Rear Wheel, 15-Inch, less Tire	1	1	1	1	1	1
Flat Coulter Shank, Clamp, and Rolling Coulter								
BA 10991	A	Clamps	4	5	6	4	5	6
BA 10907	A	17-Inch Plain with Chilled-Cone Bearing .	4	5	6	4	5	6
Miscellaneous Regular Bundles								
BA 10516	A	Connecting Loop and Clevis for BA10539A and BA10540A	1	1	..	1	1	..
BA 10539	A	Plain Hitch for Wheel-Type Tractor	1	..	..	1	..	..
BA 10540	A	Plain Hitch for Wheel-Type Tractor	..	1	..	..	1	..
SD 2768	A	Plain Hitch for Crawler Tractors	..	..	1	..	..	1
BA 10085	A	Adjusting Screws and Cranks	1	..	..	..	..	..
BA 10086	A	Adjusting Screws and Cranks	..	1	..	..	..	..
BA 10087	A	Adjusting Screws and Cranks	..	..	1	..	..	..
SD 1525	A	Leveling Screw, Crank, and Support	..	..	..	1	..	..
SD 1526	A	Leveling Screw, Crank, and Support	..	..	..	..	1	..
SD 2769	A	Leveling Screw, Crank, and Support	..	..	..	..	..	1
BA 10544	A	Rear Wheel Lift Rod	1	1	1	1	1	1
BA 10866	A	Reduction Gear Lift Clutch	1	1	1	..	..	..

F680A AND F680AH PLOWS—Continued**REGULAR SHIPPING BUNDLES—Continued**

Bundle No.	Description	F680A			F680AH		
		4- Btm.	5- Btm.	6- Btm.	4- Btm.	5- Btm.	6- Btm.
Miscellaneous Regular Bundles—Continued							
BA 10778 A	Clutch Rope and Grease Fitting	1	1	1	..	..	..
BA 10116 A	Cylinder Support and Bell Crank	..	..	..	1	1	1
SD 1355 A	Grease Fittings	..	..	..	1	1	1
SD 2423 A	Wheel less Tire	1	1	1	2	2	2
BA 10229 A	Wheel less Tire (Land)	1	1	1	..	..	..
SD 2331 A	Reflectors (2).	1	1	1	1	1	1
SD 2333 A	Light and Reflector Bracket	1	1	1	1	1	1

SPECIAL SHIPPING BUNDLES**Rear Axle, Balls, Anti-Friction Bearing and Wheel**

SD 2747 A	Rear Axle, Balls, and Bearings	1	1	1	1	1	1
SD 2449 A	Wheel (Cast)	1	1	1	1	1	1

Rear Wheel (In lieu of JD1384)

SD 2410 A	Wheel, 15-Inch, with Tire	1	1	1	1	1	1
JD 1754	Wheel, 14-Inch, less Tire	1	1	1	1	1	1

Land and Furrow Wheels

SD 2770 A	Furrow with Tire	1	1	1	2	2	2
BA 10879 A	Land with Tire	1	1	1	..	..	..
JD 3011	Wheel less Tire	1	1	1	2	2	2
AA 14898	Land and Furrow (Steel).	2	2	2	2	2	2
SD 1292 A	Wheel Lugs	1	1	1	..	..	..

Gauge Wheel and Axle

BA 10041 A	Axle and Hub	1	1	1	1	1	1
JD 1384	Wheel, 14-Inch, less Tire	1	1	1	1	1	1
SD 2410 A	Wheel, 14-Inch, with Tire	1	1	1	1	1	1
JD 1754	Wheel, 14-Inch, less Tire	1	1	1	1	1	1

Independent Jointer and Clamp

DK 76 FA	Jointer - Cast (Round Shank).	4	5	6	4	5	6
JC 24 A	Clamp (For DK76FA).	4	5	6	4	5	6
SD 467 A	Jointer - Steel (Flat Shank).	4	5	6	4	5	6
JC 21 A	Clamp (For SD467A)	4	5	6	4	5	6

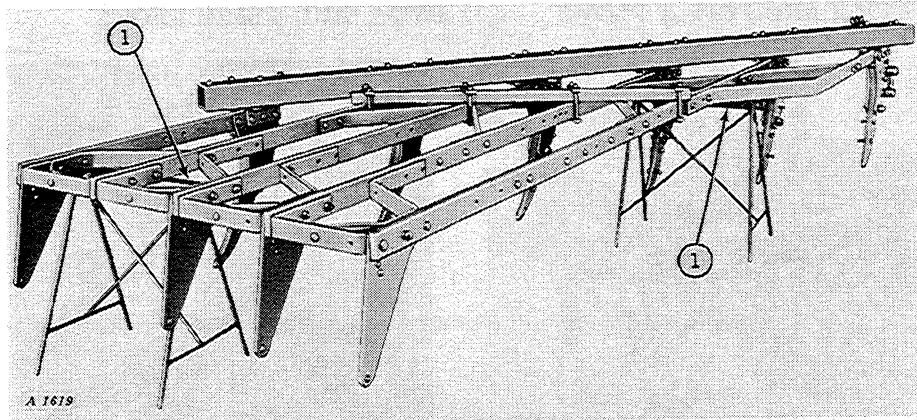
SPECIAL SHIPPING BUNDLES—Continued

Bundle No.	Description	F680A			F680AH		
		4- Btm.	5- Btm.	6- Btm.	4- Btm.	5- Btm.	6- Btm.
Round Coulter Shank, Clamp and Rolling Coulter							
BA 10713 A	Clamp.	4	5	6	4	5	6
BA 10902 A	17-Inch Plain, with Chilled-Cone Bearing .	4	5	6	4	5	6
BA 14324	17-Inch Plain, with Anti-Friction Chilled- Cone Bearing	4	5	6	4	5	6
BA 14325	17-Inch Rippled Edge, with Anti-Friction Bearing	4	5	6	4	5	6
BA 10904 A	18-Inch Plain, with Chilled-Cone Bearing .	4	5	6	4	5	6
BA 10905 A	20-Inch Plain, with Chilled-Cone Bearing .	4	5	6	4	5	6
BA 14326	20-Inch Plain, with Anti-Friction Bearing .	4	5	6	4	5	6
BA 11083 A	20-Inch Rippled Edge, with Chilled-Cone Bearing	4	5	6	4	5	6
BA 14327	20-Inch Rippled Edge, with Anti-Friction Bearing	4	5	6	4	5	6
Cushion Rolling Coulters for Round Shank and Clamp							
BA 14245	17-Inch, with Chilled-Cone Bearing	4	5	6	4	5	6
BA 14246	17-Inch Rippled-Edge, with Chilled-Cone Bearing	4	5	6	4	5	6
Flat Coulter Shank and Rolling Coulter							
BA 14328	17-Inch Plain, with Anti-Friction Bearing .	4	5	6	4	5	6
BA 10972 A	17-Inch Rippled Edge, with Chilled-Cone Bearing	4	5	6	4	5	6
BA 14329	17-Inch Rippled Edge, with Anti-Friction Bearing	4	5	6	4	5	6
BA 10909 A	18-Inch Plain, with Chilled-Cone Bearing .	4	5	6	4	5	6
BA 10910 A	20-Inch Plain, with Chilled-Cone Bearing .	4	5	6	4	5	6
BA 14330	20-Inch Plain, with Anti-Friction Bearing .	4	5	6	4	5	6
BA 11084 A	20-Inch Rippled Edge, with Chilled-Cone Bearing	4	5	6	4	5	6
BA 14331	20-Inch Rippled Edge, with Anti-Friction Bearing	4	5	6	4	5	6

F680A AND F680AH PLOWS—Continued**SPECIAL SHIPPING BUNDLES—Continued**

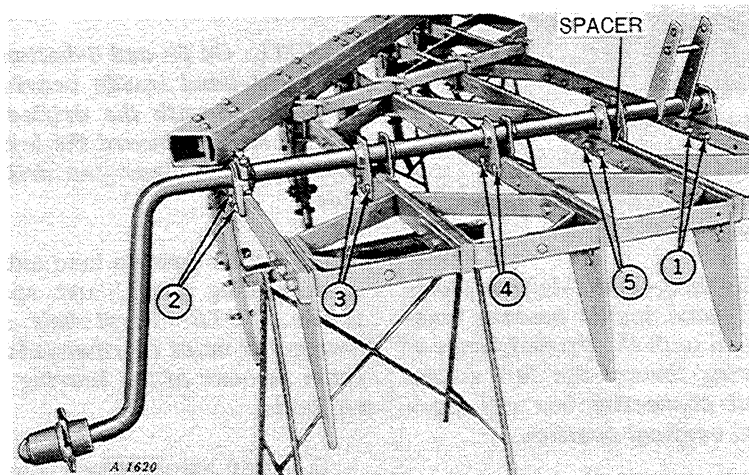
Bundle No.		Description	F670A			F670AH		
			4- Btm.	5- Btm.	6- Btm.	4- Btm.	5- Btm.	6- Btm.
Plow Bottom Attachments								
	7750 A	Moldboard Extensions (For conventional bottoms)	4	5	6	4	5	6
A	11736 A	Moldboard Extensions (For HS400 Series High-Speed Bottoms)	4	5	6	4	5	6
BA	11128 A	Trashboard (For HS Bottom)	4	5	6	4	5	6
BA	11130 A	Trashboard (For Slat Bottom)	4	5	6	4	5	6
BA	14039	Trashboard (For SDT546FC Semi-Deep Tillage Bottom)	4	5	6	4	5	6
BA	10162 A	Moldboard Pad (14-Inch)	4	5	6	4	5	6
BA	10164 A	Moldboard Pad (16-Inch)	4	5	6	4	5	6
CT	186 A	Root Cutter, R.H.	4	5	6	4	5	6
AA	14903	Share-Frog Brace to attach 16-Inch High-Speed Shares to 14-Inch High-Speed Bottoms	4	5	6	4	5	6
Miscellaneous Special Bundles								
SD	2642 A	Landing Lever	1	1	1	1	1	1
BA	10542 A	Cushion Hitch, Pivoted.	1	1	1	1	1	1
SD	2444 A	Cushion Spring Release Hitch for Crawler Tractor	1	1	..	1	1	..
BA	10113 A	Weed Hook.	4	5	6	4	5	6
BA	10545 A	Rear Wheel Lift Rod to reduce 4-Bottom to 3-Bottom	1	..	..	1	..	..
SD	1421 A	Leveling Screw.	..	1	..	..	1	..

FRAME AND STANDARDS



1. Place frame and standards on blocks or stands approximately 30 inches high. Be sure to work on a level surface.

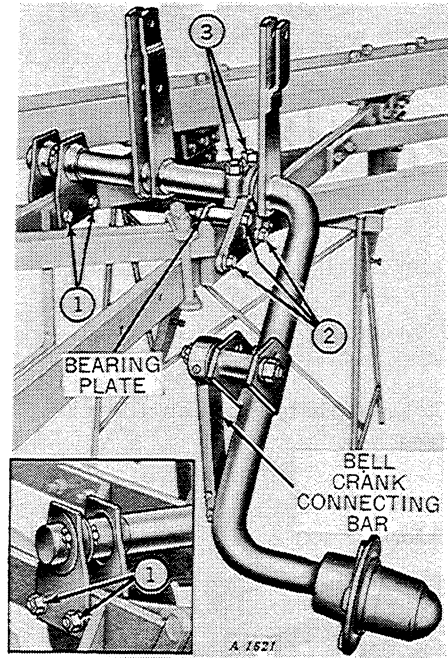
FURROW AXLE



1. Attach outside axle bearing between frame bar and front frame bracket with bolts supplied in frame.
2. Bolt inside axle bearing to first frame bar with bolts supplied in axle.
3. Attach bearings to second frame bar.
4. Bolt bearings to third frame bar on 5- and 6-bottom plows.
5. Attach bearings to fourth frame bar on 6-bottom plow. Be sure spacer is between bearing and fourth frame bar.

LAND AXLE

F670AH AND F680AH PLOWS



Land Axle on 6-Bottom F680AH Plow

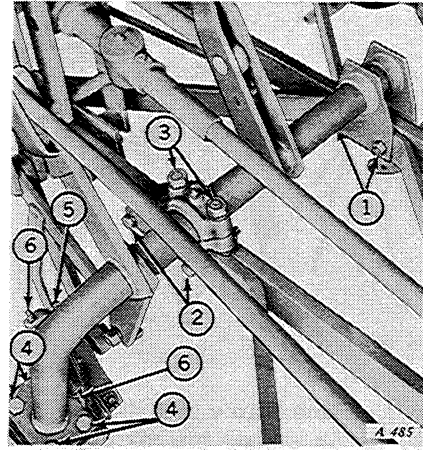
1. Attach land axle bearings to frame bar.

NOTE: On 5- and 6-bottom plows the right-hand inside bearing must be attached with the drifted flange of the bearing toward the left so the bell crank connecting bar will operate in the vertical position.

2. Attach outside land axle bearing and bearing plate to frame. A small pipe spacer must be removed from top bolt on 5- and 6-bottom plows only. See pages 53 and 54 for use of spacer.

3. After axle has been positioned draw up nuts on bolts in bearing cap.

F670A AND F680A PLOWS



Land Axle on F680A Plow

1. Attach land axle bearings to frame bar.

NOTE: On 5- and 6-bottom plows the right-hand inside bearing must be attached with the drifted flange of the bearing toward the left so the bearing will clear the drilled pin hole.

2. Attach outside land axle bearing, bearing plate, and spacer to frame. *NOTE: First bolt in rear frame bar must be removed to make room for one of the bearing attaching bolts.*

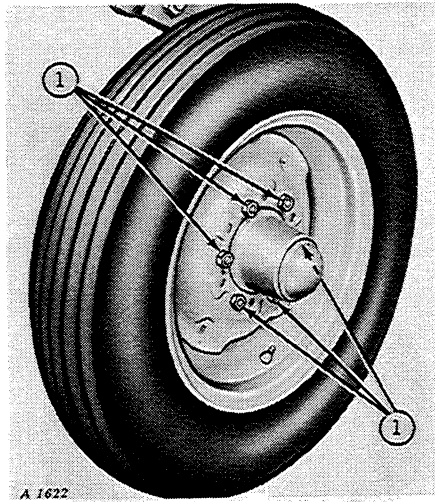
3. After axle has been positioned draw up nuts on bolts in bearing cap.

4. Attach clutch to land axle.

5. Attach clutch trip lever to trip lever shaft.

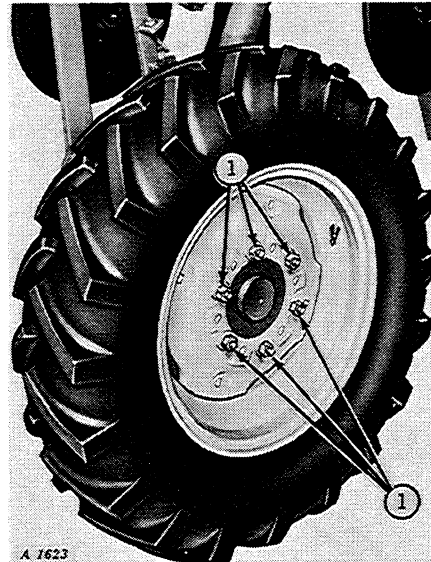
6. Attach tension spring to trip lever shaft and land axle.

**LAND AND FURROW WHEELS
(F670AH and F680AH Plows)**



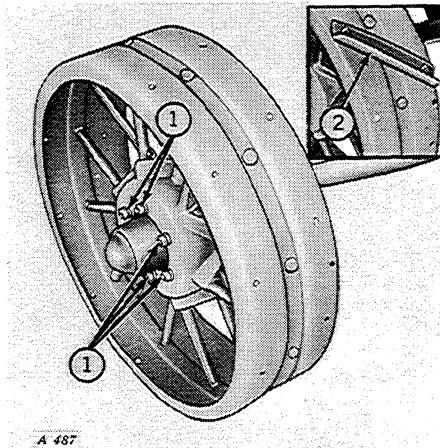
1. Slide wheel on axle and bolt to hub.

**LAND WHEEL
(F670A and F680A Plows)**



1. Attach wheel to stub axle assembly with six bolts supplied.

**STEEL LAND AND FURROW
WHEELS
(All Plows)**

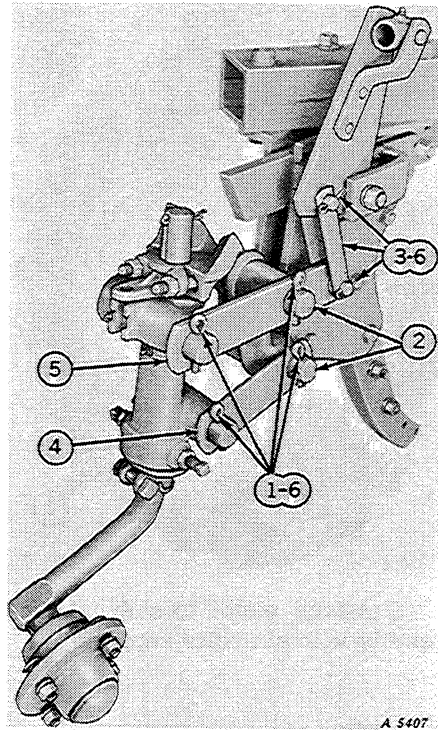


1. Slide wheel on axle and bolt to hub.

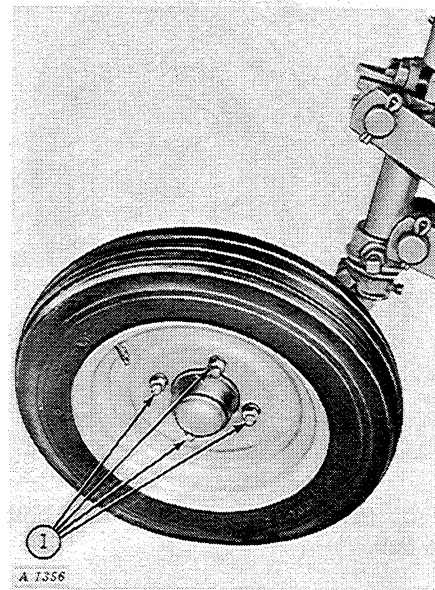
2. On F670A and F680A plows, attach 12 lugs to rim of land wheel.

REAR AXLE AND WHEEL

AXLE



WHEEL



1. Attach rear wheel to hub.

1. Remove four cotter pins and lift bail straps from rear axle assembly.

2. Insert upper and lower lift bails into rear bail bearing.

3. Remove cotter pins and lift crank link from lift crank link assembly.

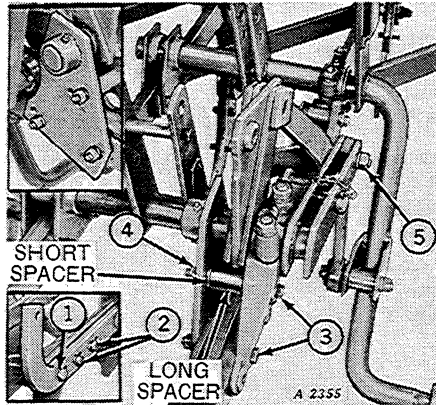
4. Replace lower lift bail strap.

5. Replace upper lift bail strap on upper bail and lift crank assembly.

6. Replace lift crank link and all cotter pins removed in Steps 1 and 3.

CYLINDER SUPPORT AND LAND AXLE CONNECTING BAR

4-BOTTOM PLOW



Cylinder Mounting on 4-Bottom F680AH Plow

1. Remove first bolt in frame and attach cylinder support bar to frame with bolt supplied in cylinder support bar.

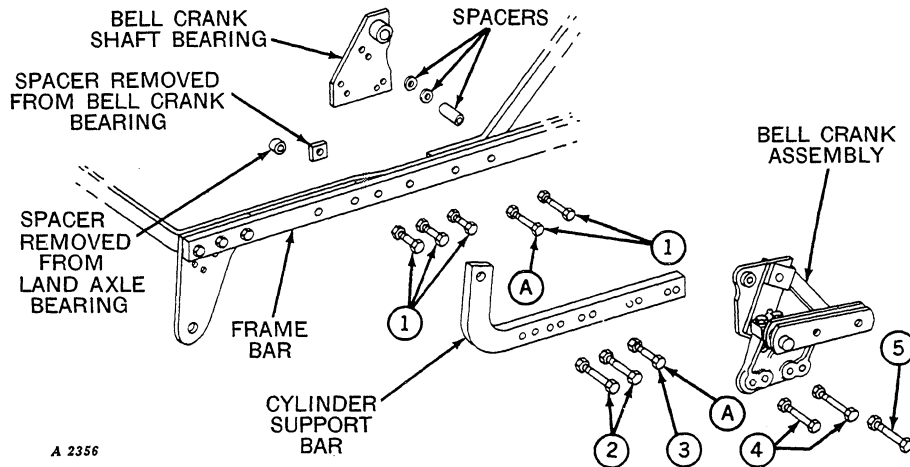
2. Remove second and third frame bolts and attach cylinder support bar to frame with bolts supplied in cylinder support bar.

3. Attach bell crank bearings to frame with bolts supplied. See inset for proper assembly of inside bearing plate.

4. On 4-bottom plow use one long spacer and one short spacer.

5. Attach land axle connecting bar to bell crank assembly with bolt supplied.

5-BOTTOM PLOW



1. Remove bolts from frame. Set aside 5/8 x 3-inch machine bolt "A" for reuse in Step 3.

2. Attach cylinder support bar to frame bar with bolts supplied in cylinder support bar.

NOTE: In order to draw up bolts tight it is necessary to use round spacer removed from land axle bearing and square spacer removed from bell crank bearings.

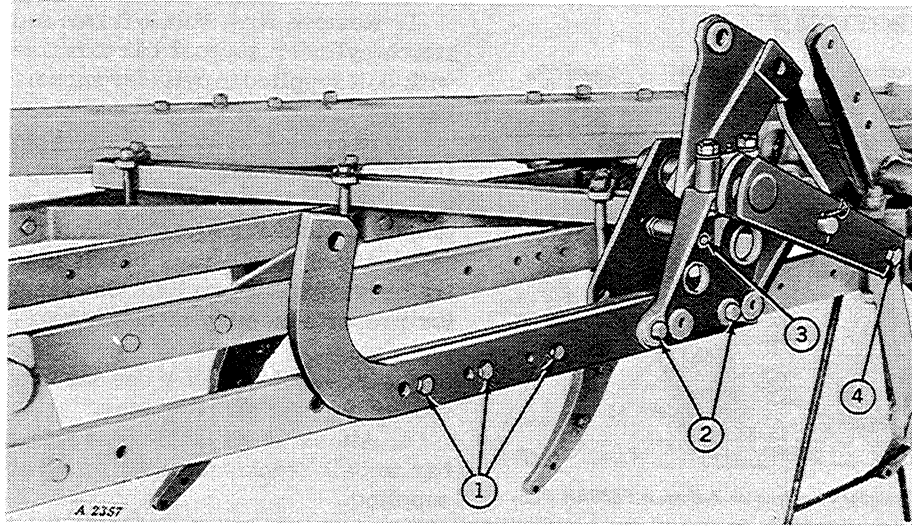
3. Attach cylinder support bar to frame bar with bolt "A" removed in Step 1.

4. Attach cylinder support bar and bell crank bearings to frame bar with bolts supplied in bell crank bearings.

5. Bolt two short spacers and one long spacer to bell crank bearings with bolts supplied.

54 Assembly

6-BOTTOM PLOW



Cylinder Mounting on 6-Bottom F680AH Plow

1. Attach cylinder support bar to frame with bolts supplied after removing original bolts in frame.

2. Attach bell crank bearing, bearing plate, and brace to frame bar with bolts supplied.

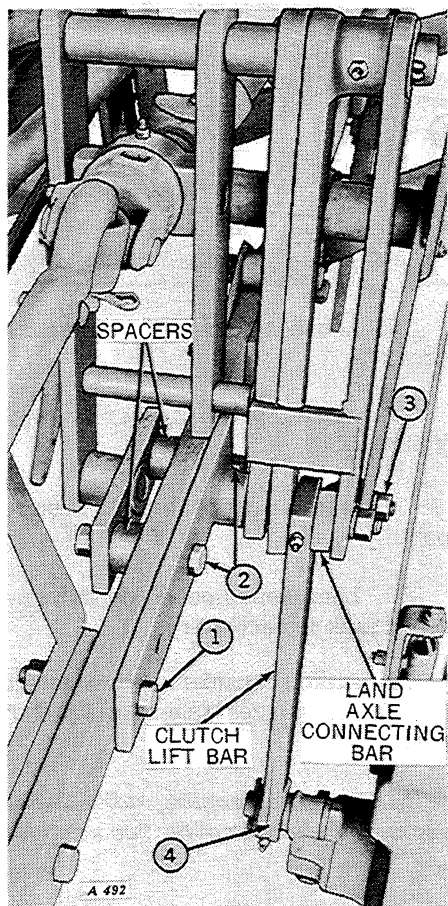
3. Attach bell crank bearing,

bearing plate, and spacers with bolt supplied.

NOTE: On 6-bottom plow use one long spacer and two short spacers.

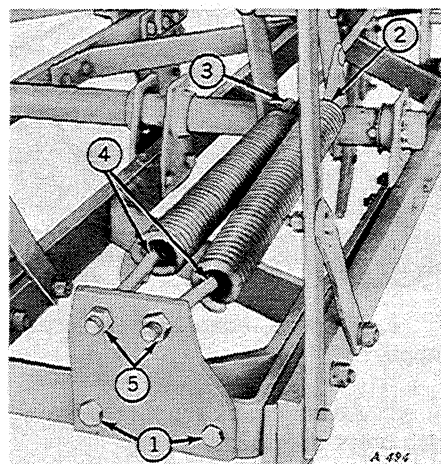
4. Attach land axle connecting bar to bell crank assembly with bolt supplied.

**DEPTH ADJUSTING SCREW
CRANK
(F670A and F680A Plows)**



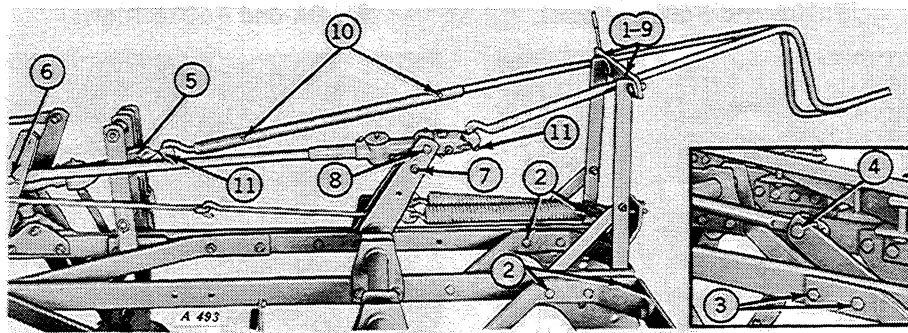
1. Attach pivot link bearing assembly to frame with $5/8 \times 3-1/2$ -inch machine bolt supplied.
2. Attach right-hand pivot link bearing to left-hand bearing with two spacers and two $5/8 \times 3-3/4$ -inch machine bolts, except on 4-bottom plow. On 4-bottom plow, use only one spacer.
3. Bolt land axle connecting bar to land axle.
4. Connect clutch lift bar to stub axle of enclosed clutch.

**LAND AND FURROW AXLE
LIFTING SPRINGS
(F670A and F680A Plows)**



1. Bolt lifting spring post to frame.
2. Connect furrow wheel lifting spring to spring brace on furrow axle.
3. Attach land wheel lifting springs to connecting links.
4. Attach springs to eyebolts.
5. Tighten nuts on eyebolts to desired tension.

DEPTH ADJUSTING AND LEVELING SCREW CRANKS (F670A and F680A Plows)



1. Remove cranks from crank support.

2. Attach crank support to frame with bolts supplied.

3. Bolt depth control screw support to frame.

4. Attach depth control screw to support with drilled pin and cotter pin.

5. Screw universal into pivot link assembly.

6. Fasten leveling screw to land axle with drilled pin and cotter pin.

7. Loosen bolt in furrow axle crank.

8. Insert leveling screw and tighten bolt.

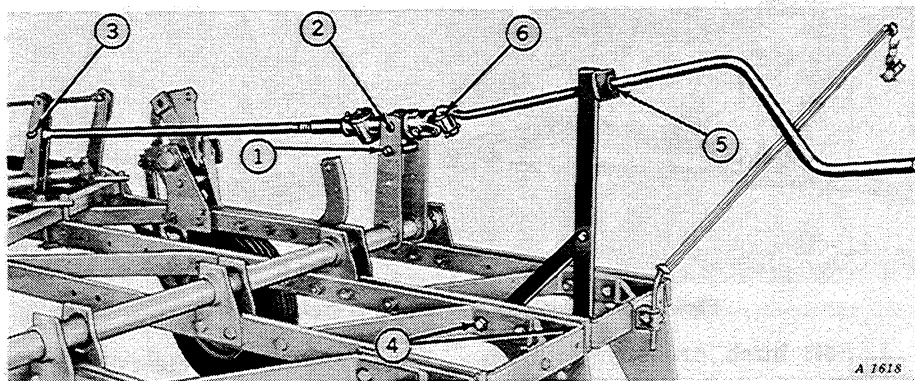
9. Insert cranks into crank support.

10. Lengthen pipe on depth control crank if necessary.

11. Attach cranks to universal joints and replace washers and cotter pins.

NOTE: The leveling adjustment screw is the longer of the two screws.

LEVELING SCREW (F670AH and F680AH Plows)



1. Remove bolt and spacer from furrow axle cranks.

2. Spread cranks and insert pivot from adjusting screw crank into cranks.

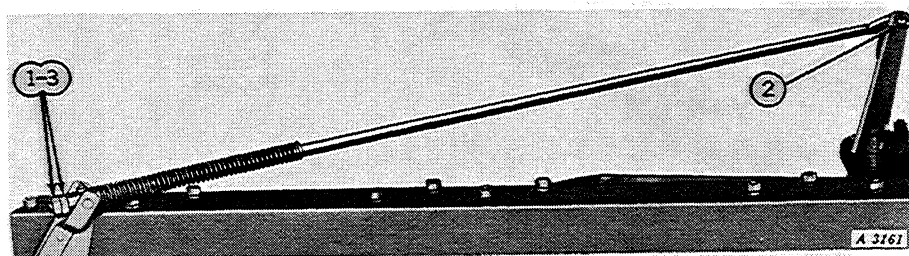
3. Attach leveling screw to land axle cranks with drilled pin and cotter pin.

4. Attach crank support to frame.

5. Insert crank into crank support.

6. Attach crank to universal joint with plain washer and cotter pin.

REAR LIFT ROD

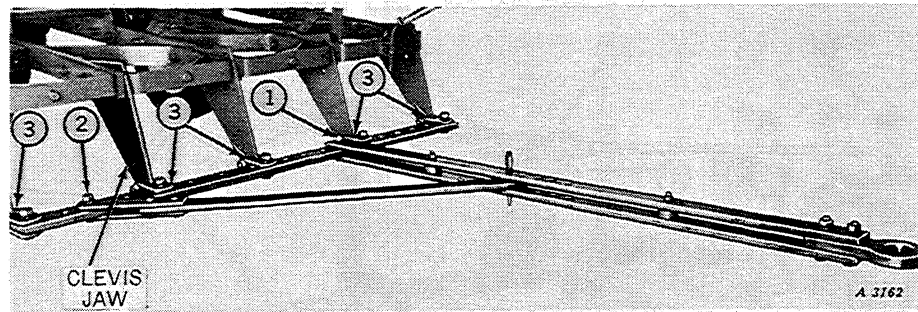


1. Remove the two hexagon nuts and place lift rod through pivot.

2. Attach lift rod to outer land axle crank with bushing and machine bolt.

3. Raise plow and place the two hexagon nuts on lift rod.

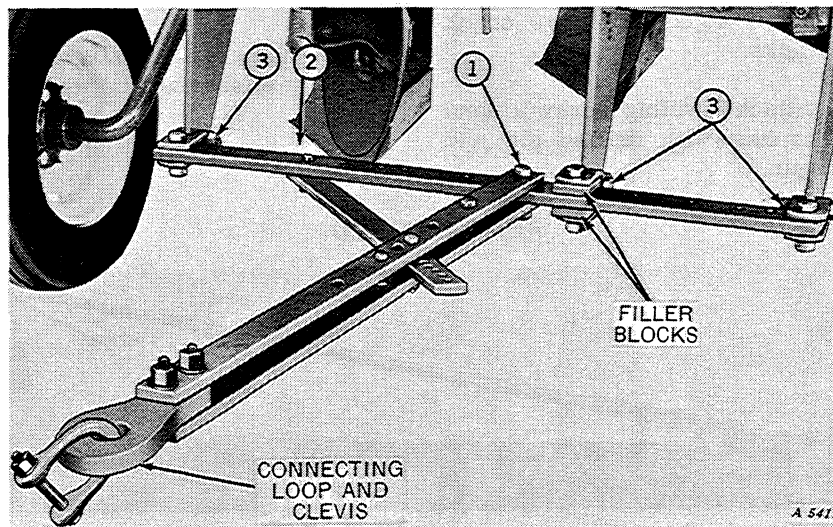
HITCH



Plain Hitch for 6-Bottom Plow Used with Crawler Tractor

1. Bolt hitch crossbar to hitch drawbar.
2. Bolt adjusting brace to hitch crossbar.

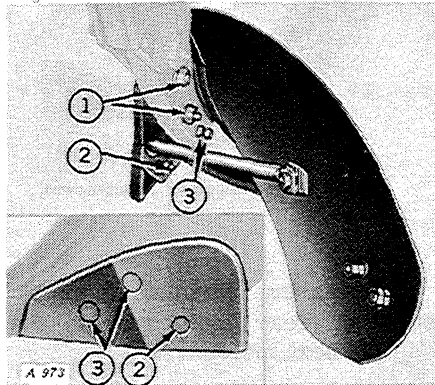
3. Attach hitch to clevis jaws. See pages 8 through 12 for proper adjustment of the hitch. When plow is to be pulled by a crawler tractor, the additional clevis supplied with hitch must be attached to the frame.



Plain Hitch with Connecting Loop and Clevis for 5-Bottom Plow Used with Wheel-Type Tractor

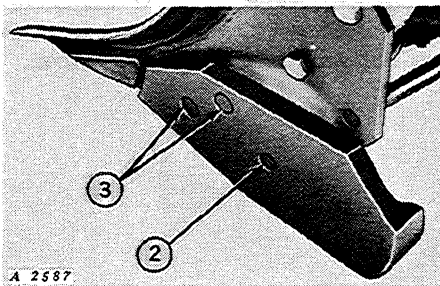
PLOW BOTTOMS

These plows require No. 4 Landsides when using conventional bottoms. When using high-speed bottoms, No. 9 Landsides are required on all bottoms except the rear bottom, which requires a No. 10 Landside. See illustrations below.

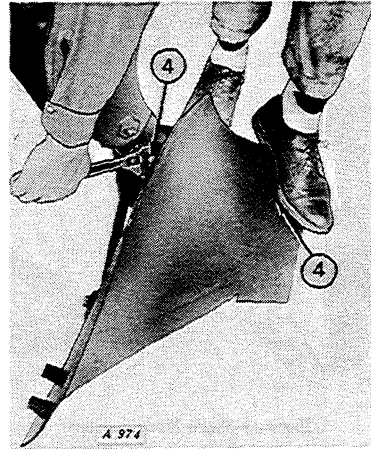


Attaching No. 9 Landside

1. Remove the two machine bolts from each standard. Insert the two machine bolts through frog and standard.
2. Remove the two front plow bolts from the landside and bolt the landside to the plow bottom frog with the one rear bolt.
3. Insert the two front plow bolts through the landside, frog, and standard. *Leave nuts loose.*

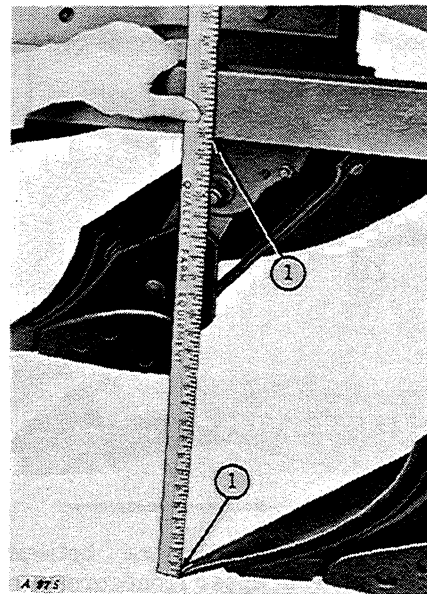


Attaching No. 10 Landside to Rear Bottom

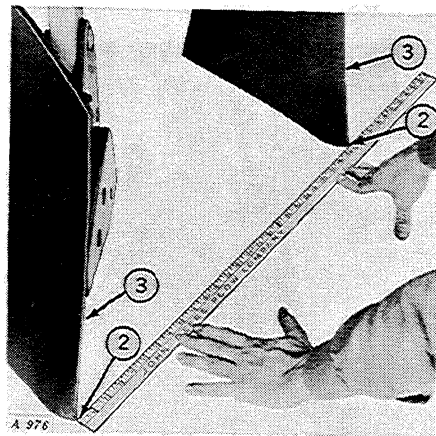


4. Push down on the points of the shares to make sure all slack is taken out of the bolts. Then tighten nuts securely.

LINING UP PLOW BOTTOMS



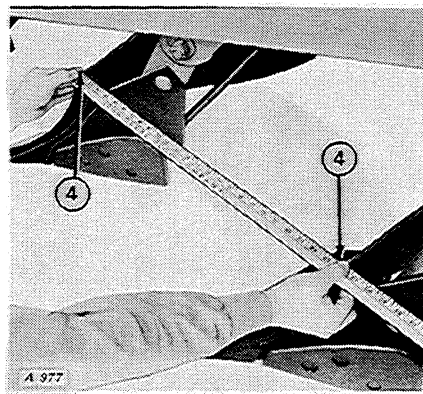
1. Check distance from underside of each frame bar to point of each share. The distance should be reasonably the same for each bottom if the bottoms are attached correctly. If not, loosen frame bolts and adjust.



Share-to-Share Measurement

2. Measure distance between bottoms from point of rear share to point of next share forward.

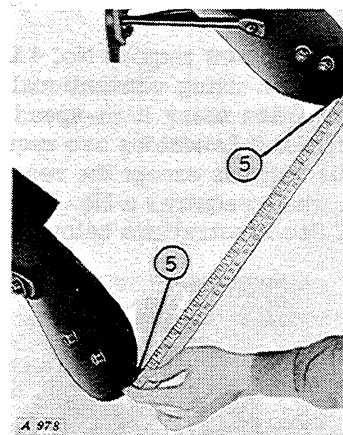
3. Measure distance between bottoms at juncture of share and moldboard on front edge of bottom.



Moldboard-to-Moldboard Measurement

4. Measure distance between bottoms from upper front corners of rear moldboard to upper front corner of next moldboard forward.

NOTE: Measurements for Steps 2, 3, and 4 should be reasonably the same.



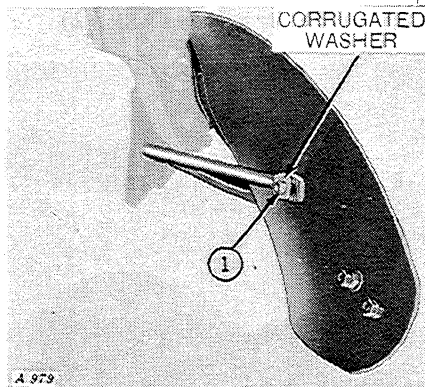
Moldboard-to-Moldboard Measurement

5. Measure distance from back edge of rear moldboard to back edge of next moldboard.

NOTE: This measurement should be reasonably uniform across all bottoms as near measurements in Steps 2, 3, and 4 as possible, if the bottoms are attached correctly. If the distance between the back edges of the moldboards varies greatly from the other measurements, adjust either the rear moldboard brace or the next moldboard brace to push one of the moldboards forward until measurements are identical.

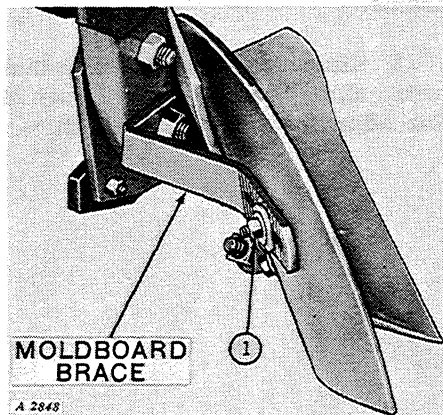
NOTE: Repeat these measurements, Steps 2, 3, 4, and 5 between all bottoms as you work forward.

ADJUSTING MOLDBOARD BRACE



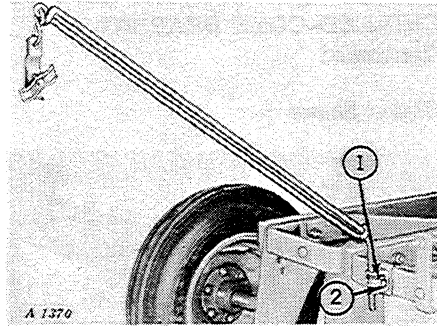
Moldboard Brace on High-Speed Bottom

1. To adjust moldboard brace, loosen nut on moldboard bolt and adjust corrugations in washer and brace. **CAUTION: Never adjust a moldboard brace to pull the moldboard back.**



Moldboard Brace on Conventional Bottom

HOSE SUPPORT



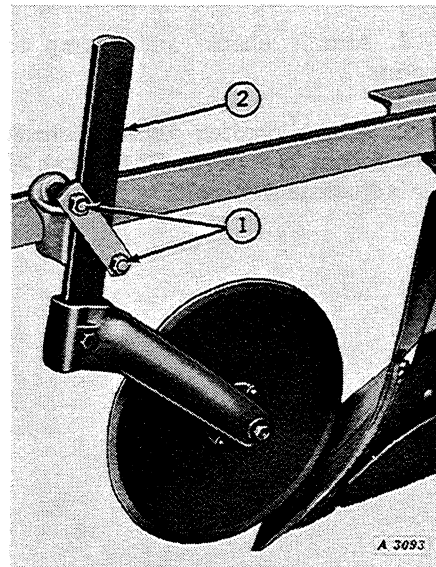
1. Bolt hose support to frame.

2. Adjust set screw collar to restrict the swing of the hose support.

ROLLING COULTERS

CHILLED-CONE BEARING

Flat Shank



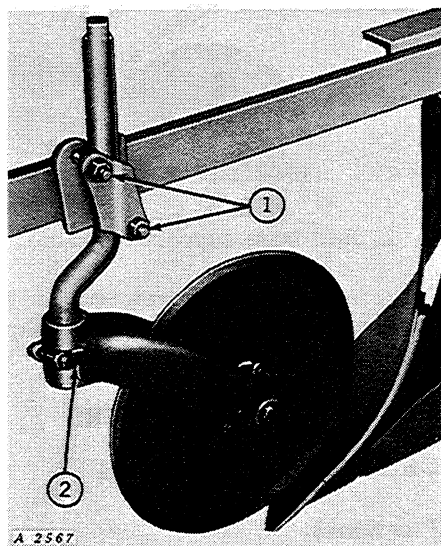
1. Attach clamp to frame.

2. Insert coulter shank into clamp and tighten nuts. See pages 22 through 24 for adjustment of rolling coulters.

ROLLING COULTERS—Continued

CHILLED-CONE BEARING— Continued

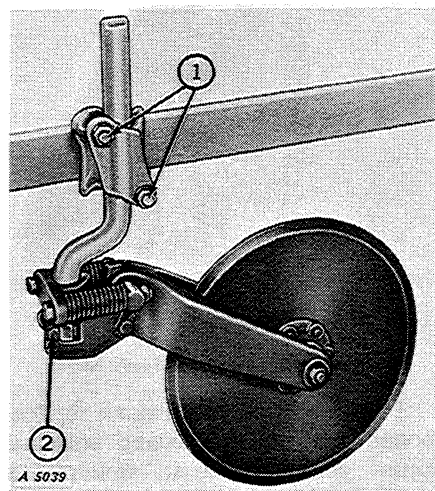
Round Shank



1. Attach shank and clamp to frame.

2. Attach coultter yoke to shank with collar. See pages 22 through 24 for adjustment of rolling coultters.

Cushion Coultter (Round Shank)

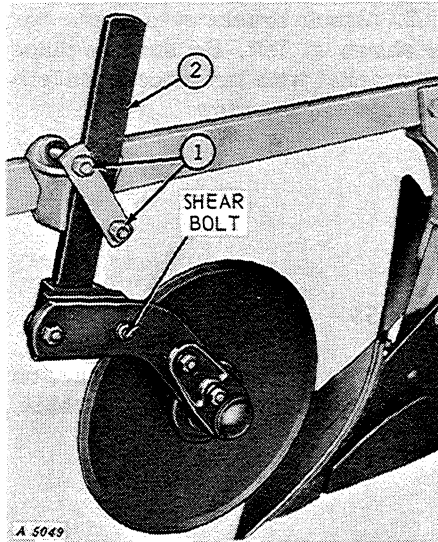


1. Attach shank and clamp to frame.

2. Attach coultter yoke to shank with collar. See pages 22 through 24 for adjustment of rolling coultters.

ANTI-FRICTION BEARING

Flat Shank

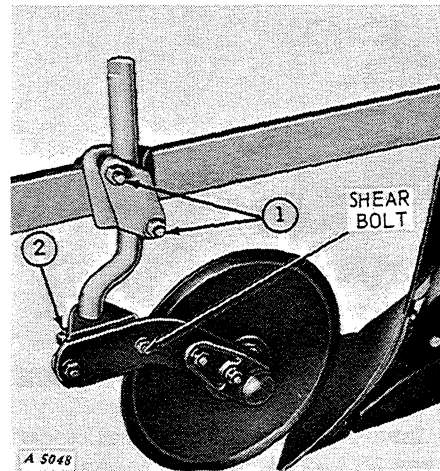


1. Attach clamp to frame.

2. Insert coulter shank into clamp and tighten nuts. See pages 22 through 24 for adjustment of rolling coulters.

The anti-friction bearing rolling coulter is equipped with a shear bolt to prevent possible serious damage to the coulter shank. For replacement of the shear bolt, use a 19H1899 cap screw.

Round Shank

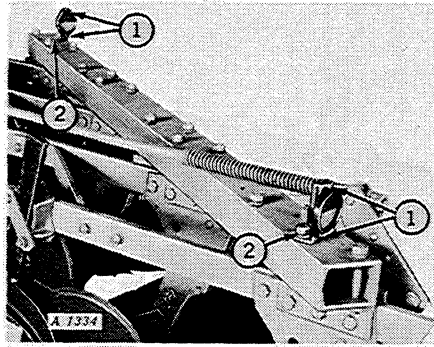


1. Attach chank and clamp to frame.

2. Attach coulter yoke to shank with collar. See pages 22 through 24 for adjustment of rolling coulters.

The anti-friction bearing rolling coulter is equipped with a shear bolt to prevent possible serious damage to the coulter shank. For replacement of the shear bolt, use a 19H1899 cap screw.

WARNING LAMP AND REFLECTOR BRACKETS



1. Bolt reflectors to brackets.
2. Attach brackets to truss box as shown at left. Be sure to place the bracket with lamp socket on left-hand side of the plow.

GREASE FITTINGS

Insert grease fittings in all locations shown in the Lubrication Chart on pages 35 and 36. Apply grease and oil to all points as indicated on the chart.



nobody can fill them like you can!

That's what the owner of this pair of work shoes is finding out—the hard way. Through a careless action, he has become the victim of an accident. It's a mighty tough way to find out that nobody else can wear your shoes or practice safety for you. And a needless, costly lesson to learn that safety is an everyday need.

Put safety into each of your workdays; read the operator's manual thoroughly; know how to operate each machine properly and safely; take the safety precautions specified; think before you act.

Make sure you wear your "shoes" everyday. Outfit yourself with a safety program now.

