M0147

OPERATOR & PARTS MANUAL

MODEL 2100
3 POINT MOUNTED PLANTER

This manual is applicable to:

Model: MT2100 3 Point Mounted Planters
Serial Number: 16067 and on

Model: 2100 3 Point Mounted Planters
Serial Number: 602500 and on

Record the model number and serial number of your planter with date purchased:

Model Number _____

Serial Number _____

Date Purchased _____

8/90

Tear Along Perforation

PREDELIVERY/DELIVERY CHECK LIST

TO THE DEALER

Predelivery service includes assembly, lubrication, adjustment and test. This service helps to assure that the planter will be delivered to the customer ready for field use.

PREDELIVERY CHECK LIST

After the planter has been completely assembled, use the following check list and inspect the planter. Check off each item as it is found satisfactory or after proper adjustment is made.

❑ Recheck to be sure row units and optional attachments are properly spaced and assembled.

❑ Be sure all grease fittings are in place and lubricated.

❑ Check planter and make sure all working parts are moving freely, bolts are tight and cotter pins are spread.

❑ Check all drive chains for proper tension and alignment.

❑ Check for oil leaks, proper hydraulic operation and proper chain alignment.

❑ Inflate tires to specified PSI air pressure. Tighten wheel bolts to specified torque.

❑ Check to be sure all safety decals are correctly located and legible. Replace if damaged.

❑ Check to be sure the red reflectors and amber reflectors are correctly located and visible when the planter is in transport position.

❑ Check to be sure SMV sign is in place.

❑ Check to be sure flashing warning lights are installed correctly and working properly.

❑ Paint all parts scratched in shipment or assembly.

❑ Be sure all safety lockups are on the planter and correctly located.

This planter has been thoroughly checked and to the best of my knowledge is ready for delivery to the customer.

_____

(Signature of Set-up Person/Date)

OWNER REGISTER

Name _____ Date Sold _____

Street Address _____ Model _____

City & State _____ Serial Number _____

8/90

DELIVERY CHECK LIST

At the time the planter is delivered, the following check list is a reminder of very important information which should be conveyed to the customer. Check off each item as it is fully explained to the customer.

❑ Advise the customer that the life expectancy of this or any other machine is dependent on regular lubrication as directed in the operator's manual.

❑ Tell the customer about all the safety precautions.

❑ Along with the customer, check to be sure the red and amber reflectors and SMV sign are clearly visible with the planter in transport position and attached to the tractor. Check to be sure flashing warning lights are in working condition. Tell the customer to check federal, state and local regulations before towing or transporting on a road or highway.

❑ Give the operator's manual to the customer and explain all operating adjustments.

❑ Read warranty to customer.

❑ Complete Warranty And Delivery Report Form.

To the best of my knowledge this machine has been delivered ready for field use and customer has been fully informed as to proper care and operation.

_____

(Signature of Delivery Person/Date)

AFTER DELIVERY CHECK LIST

The following is a list of items we suggest to check during the first season of use of the equipment.

❑ Check with the customer as to the performance of the planter.

❑ Review with the customer the importance of proper maintenance and safety precautions.

❑ Check for parts that may need to be adjusted or replaced.

❑ Check to be sure all safety decals, SMV sign and reflectors are correctly located and legible. Replace if damaged or missing.

❑ Check to be sure safety warning lights are working properly.

_____

(Signature of Follow-up Person/Date)

RETURN THIS COMPLETED FORM TO KINZE® IMMEDIATELY, along with Warranty And Delivery Report. Retain photocopy of this form at dealership for After Delivery Check.

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TO THE OWNER

Kinze Manufacturing, Inc. would like to thank you for your patronage. We appreciate your confidence in KINZE® farm machinery. Your KINZE® planter has been carefully designed and sturdily built to provide dependable operation in return for your investment.

This manual has been prepared to aid you in the operation and maintenance of the planter and should be considered a permanent part of the machine and should remain with the machine when you sell it.

It is the responsibility of the user to read and understand the Operator's Manual in regards to safety, operation, lubrication and maintenance before operation of this equipment. It is the user's responsibility to inspect and service the machine routinely as directed in the Operator's Manual. We have attempted to cover all areas of safety, operation, lubrication and maintenance; however, there may be times when special care must be taken to fit your conditions.

Throughout this manual the symbol ⚠ and the words, NOTE, CAUTION, WARNING and DANGER are used to call your attention to important safety information. The definition of each of these terms used follows:

NOTE: Indicates a special point of information.

CAUTION: Indicates that a failure to observe can cause damage to the machine or equipment.

⚠ **WARNING: Indicates that a failure to observe can cause damage to the machine or equipment and/or personal injury.**

⚠ **DANGER: Indicates that a failure to observe can cause most serious damage to the machine or equipment and/or most serious personal injury.**

⚠ **WARNING: Some photos in this manual may show safety covers, shields or lockups removed for visual clarity. NEVER OPERATE the machine without all safety covers, shields and lockups in place.**

NOTE: Some photos in this manual may have been taken of prototype machines. Production machines may vary in appearance.

NOTE: Some photos and illustrations in this manual show optional attachments installed. Contact your KINZE Dealer for purchase of optional attachments.

WARRANTY

The KINZE Limited Warranty for your new machine is stated on the back of the retail purchaser's copy of the Warranty And Delivery Report form.

Warranty, within the warranty period, is provided as part of KINZE's support program for registered KINZE products which have been operated and maintained as described in this manual. Evidence of equipment abuse or modification beyond original factory specifications will void the warranty. Normal maintenance, service and repair is not covered by KINZE warranty.

To register your KINZE product for warranty, a Warranty And Delivery Report form must be completed by the KINZE Dealer and signed by the retail purchaser, with copies to the Dealer, to the retail purchaser and to KINZE. Registration must be completed and sent to KINZE within 30 days of delivery of the KINZE product to the retail purchaser. KINZE reserves the right to refuse warranty on serial numbered products which have not been properly registered.

Additional copies of the Limited Warranty can be obtained through your KINZE Dealer.

If service or replacement of failed parts which are covered by the Limited Warranty are required, it is the user's responsibility to deliver the machine along with the retail purchaser's copy of the Warranty And Delivery Report to the KINZE Dealer for service. KINZE warranty does not include cost of travel time, mileage, hauling or labor. Any prior arrangement made between the Dealer and the retail purchaser in which the Dealer agrees to absorb all or part of this expense should be considered a courtesy to the retail purchaser.

KINZE warranty does not include cost of travel time, mileage, hauling or labor.

INTRODUCTION

The Model 2100 3 Point Mounted planter is available in various configurations and row spacings and permits installation of various row unit attachments.

GENERAL INFORMATION

The information used in this manual was current at the time of printing. However, due to KINZE's continual attempt to improve its product, production changes may cause your machine to appear slightly different in detail. Kinze Manufacturing, Inc. reserves the right to change specifications or design without notice and without incurring obligation to install the same on machines previously manufactured.

Right hand and left hand as used throughout this manual is determined by facing in the direction the machine will travel when in use unless otherwise stated.

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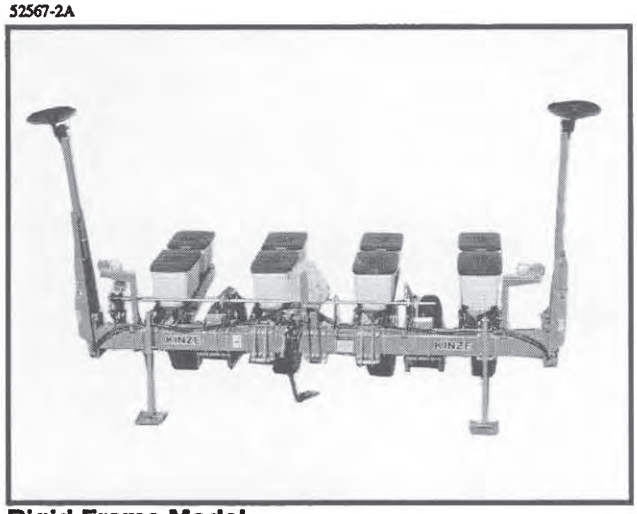
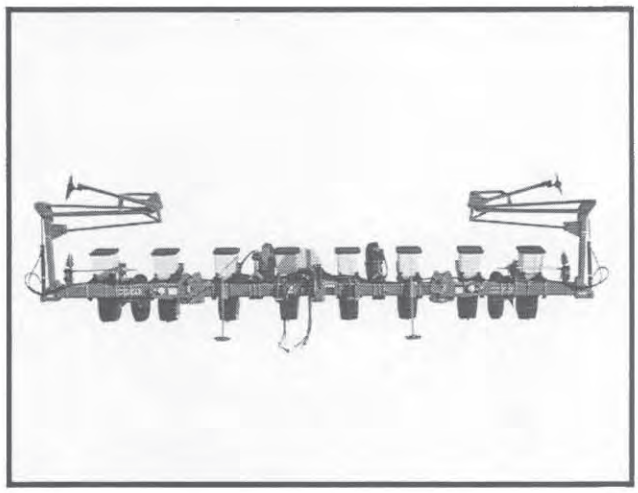


Rigid Frame Model

55702-17A



Folding Frame Model

SERIAL NUMBER

The serial number plate is located on the planter frame to be readily available. It is suggested that the serial number and purchase date also be recorded on the first page of this manual.

The serial number provides important information about your planter and may be required to obtain the correct replacement part. Always provide the serial number and model number to your KINZE Dealer when ordering parts or anytime correspondence is made with Kinze Manufacturing, Inc.

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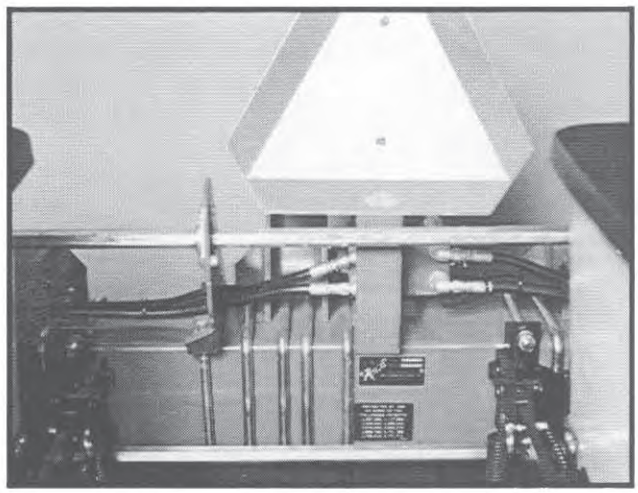

SPECIFICATIONS

TYPE - 3 Point Mounted (Rigid and Folding)

PLANTING UNIT TYPE - Pull Type Row Units

ROW SPACING -
2 Row (120" Bar - Rigid Frame)
2 Row (240" Bar - Rigid Frame)
4 Row Narrow - 30" rows (Rigid Frame)
4 Row Wide - 36", 38" and 40" rows (Rigid Frame)
6 Row Narrow - 30" rows (Rigid Frame)
6 Row Wide - 36", 38" and 40" rows (Rigid Frame)
8 Row Narrow - 30" rows (Rigid Frame)
8 Row Wide - 40" rows (Rigid Frame)
10 Row Narrow - 30" rows (Rigid Frame)
8 Row Wide - 36" and 38" rows (Hydraulic Fold Frame)
8 Row Wide - 40" rows (Hydraulic Fold Frame)
12 Row Narrow - 30" rows (Hydraulic Fold Frame)

DRIVE SYSTEM
Ground drive
7.60" x 15", 4 ply tires
Two drive/gauge wheels on rigid models and 8 row folding model
Four drive/gauge wheels used on 12 row folding model
No. 2050 roller chain with spring/ratchet idlers

TRANSMISSION
End mounted, quick adjusting sprockets
No. 40 chain with spring/ratchet idlers
One on rigid. Two on folding models

HYDRAULICS
Rigid Models Marker Hydraulics - Dual remote standard. Single remote with sequencing valve optional.
Vertical Fold Models Marker Hydraulics - Single remote with sequencing valve.
Vertical Fold Models Wing Lift - Single remote.

Additional remote required for dual lift assist wheel option.

HITCH - Category 2, 3, 3N. Modular. Bolt-on.

MARKERS
2 Row - Not Applicable
4 Row 30/Wide and 6 Row 30 - Heavy duty conventional design
6 Row Wide, 8 Row 30/Wide and 10 Row 30 (Rigid Toolbar) - Low profile two-fold
8 Row Wide and 12 Row 30 (Hydraulic Fold Toolbar) - Low profile triple-fold
(8 row wide and larger utilize depth band on marker discs.)

SPECIFICATIONS

DIMENSIONS & WEIGHTS

PLANTER SIZE	TRANSPORT WIDTH	OPERATING & TRANSPORT LENGTH	WEIGHT***
2 Row (120" Bar)	10' 0"	5' 7"	1374 lbs.
2 Row (240" Bar)	20' 0"	5' 7"	1669 lbs.
4 Row Narrow	12' 8"*	5' 7"	1818 lbs.
4 Row Wide	15' 2"*	5' 7"	1868 lbs.
6 Row Narrow	17' 8"*	5' 7"	2420 lbs.
6 Row Wide	21' 0"*	5' 7"	2495 lbs.
8 Row Narrow	21' 10"*	5' 7"	3001 lbs.
8 Row 36 - 38	18' 6"	9' 5" **	3906 lbs.
8 Row 40 (Rigid Frame)	27' 8"*	5' 7"	3409 lbs.
8 Row 40 (Hydraulic Fold)	19' 0"	9' 5" **	3950 lbs.
10 Row Narrow	26' 10"*	5' 7"	3811 lbs.
12 Row Narrow	21' 8"	9' 5" **	5496 lbs.

* Transport width includes optional row markers.

** Length includes optional dual lift assist wheels.

*** Base machine weight includes toolbar and 3 point hitch, wheel modules with tires and wheels, seed transmission(s) with drive components, parking stands, optional row markers with hydraulic cylinders and hoses (where applicable) and KINZE plateless row units with seed hopper and lid, quick adjustable dual down force springs.

SAFETY PRECAUTIONS ⚠

Safe and careful operation of the tractor and planter at all times will contribute significantly to the prevention of accidents.

Since a large portion of farm accidents occur as a result of fatigue or carelessness, safety practices should be of utmost concern. Read and understand the instructions provided in this manual. Listed below are a few other safety suggestions that should become common practice.

⚠ **Never permit any persons other than the operator to ride on the tractor.**

⚠ **Never ride on the planter or allow others to do so.**

⚠ **Limit transport speed to 15 MPH. Transport only with farm tractor of sufficient size and horse power. (See Machine Operation Section)**

⚠ **Never allow the planter to be operated by anyone who is unfamiliar with the operation of all functions of the unit. All operators should read and thoroughly understand the instructions given in this manual prior to moving the unit.**

⚠ **Always make sure flashing safety lights, SMV sign and reflectors are in place and visible prior to transporting the machine on public roads. In this regard, check federal, state and local regulations.**

⚠ **Never work under the planter while in raised position.**

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

⚠ **Watch for obstructions such as wires, tree limbs, etc., when folding markers.**

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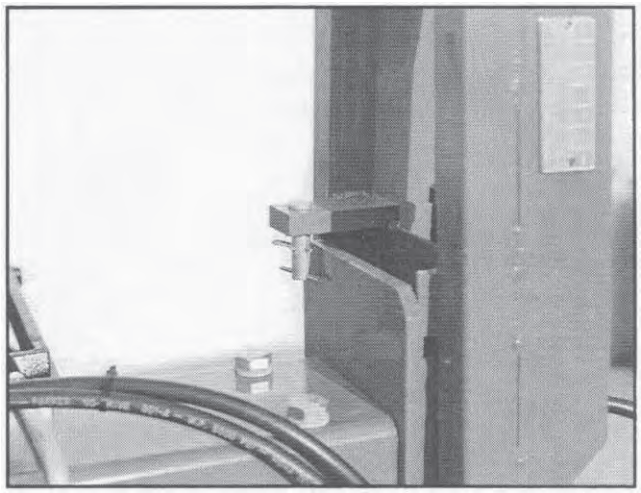


⚠ **Install lockups on markers, as provided, prior to transporting the planter or working around the unit.**

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

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

⚠ **This planter is designed to be DRIVEN BY GROUND TIRES ONLY. The use of hydraulic, electric or PTO drives may create serious safety hazards to you and the people near by. If you install such drives you must follow all appropriate safety standards and practices to protect you and others near this planter from injury.**

⚠ **This machine has been designed and built with your safety in mind. Any alteration to the design or construction may create safety hazards. Do not make any alterations or changes to the equipment, but if any alterations or changes are made you must follow all appropriate safety standards and practices to protect you and others near this machine from injury.**

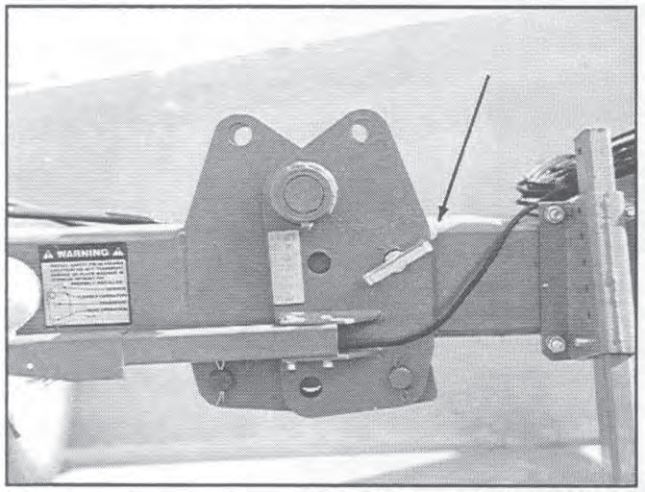
SAFETY PRECAUTIONS ⚠

⚠ **Always empty or remove all hoppers before folding planter wings. (If applicable)**

⚠ **Due to the height of the folding model's wings in transport, watch for obstructions such as wires, tree limbs, etc.**

⚠ **Never transport folding models with lift assist wheels without the floating link in place. If not in place a sudden stop could allow the toolbar to rotate forward causing personal injury or damage to the equipment.**

55702-20



⚠ **Install wing safety-lock pins in transport position before transporting the planter or working around the unit. Install wing safety-lock pins in service position when servicing wing fold cylinders and/or wing fold linkage. (If applicable)**

⚠ **Always make sure there are no persons near the planter when planter wings are being lowered from transport position. (If applicable)**

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

⚠ **Wings must be unfolded before detaching machine from tractor. (If applicable)**

⚠ **Check to be sure all safety warning lights are working before transporting the machine on public roads.**

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

⚠ **Agricultural chemicals used with this unit can be dangerous. Improper selection or use can seriously injure persons, animals, plants, soil and other property. BE SAFE: Select the right chemical for the job. Handle it with care. Follow the instructions of the chemical manufacturer.**

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

SAFETY WARNING SIGNS ⚠

The "WARNING" signs illustrated on this page are placed on the machine to warn of hazards. The warnings found on these signs are for your personal safety and those around you. OBSERVE THESE WARNINGS!

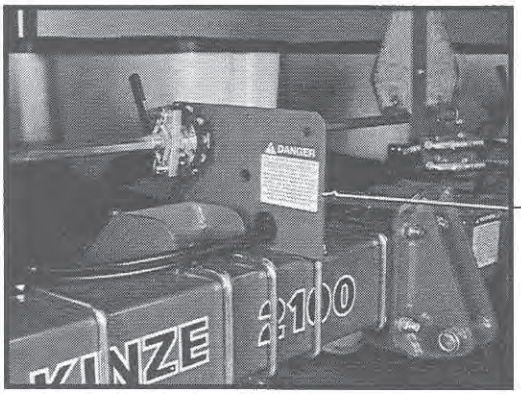
•Keep these signs clean so they can be readily observed. Wash with soap and water or cleaning solution as required.

•Replace "WARNING" signs should they become damaged, painted over or if they are missing.

•Check SMV sign periodically. Replace if it shows loss of any of its reflective property.

•When replacing decals, clean the machine surface thoroughly using soap and water or cleaning solution to remove all dirt and grease.

61048-19

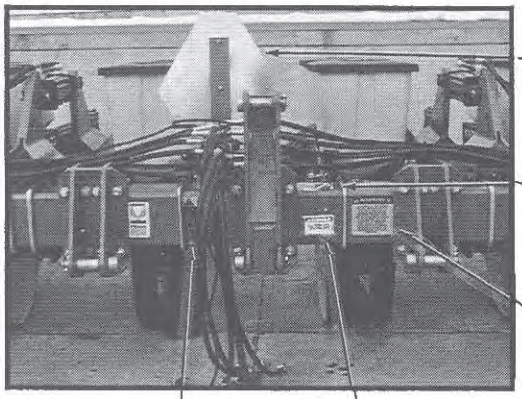


⚠ DANGER

THIS PLANTER IS DESIGNED TO BE DRIVEN BY GROUND TIRES ONLY. THE USE OF HYDRAULIC, ELECTRIC OR PTO DRIVES MAY CREATE SERIOUS SAFETY HAZARDS TO YOU AND THE PEOPLE NEAR BY. IF YOU INSTALL SUCH DRIVES YOU MUST FOLLOW ALL APPROPRIATE SAFETY STANDARDS AND PRACTICES TO PROTECT YOU AND OTHERS NEAR THIS PLANTER FROM INJURY.

Part No. 7100-89

52567-8



Part No. D2199

⚠ DANGER

NEVER TRANSPORT FOLDING MODELS EQUIPPED WITH LIFT ASSIST WHEELS WITHOUT FLOATING CENTER MAST IN PLACE.

Part No. 7100-132
Folding Models Only

⚠ CAUTION

1. Read and understand the Operator's Manual.
2. Stop the tractor engine before leaving the operator's platform.
3. Keep riders off the machine.
4. Make certain everyone is clear of the machine before starting the tractor engine and operating.
5. Keep all shields in place.
6. Never lubricate, adjust, unclog or service the machine with tractor engine running.
7. Wait for all movement to stop before servicing.
8. Keep hands, feet and clothing away from moving parts.
9. Use flashing warning lights when operating on highways except when prohibited by law.

Part No. 7100-46

⚠ WARNING ⚠

WINGS MUST BE UNFOLDED BEFORE DETACHING MACHINE FROM TRACTOR.

7100-140

Part No. 7100-140
Folding Models Only

⚠ WARNING ⚠

THIS MACHINE HAS BEEN DESIGNED AND BUILT WITH YOUR SAFETY IN MIND. ANY ALTERATION TO THE DESIGN OR CONSTRUCTION MAY CREATE SAFETY HAZARDS. DO NOT MAKE ANY ALTERATIONS OR CHANGES TO THE EQUIPMENT, BUT IF ANY ALTERATIONS OR CHANGES ARE MADE YOU MUST FOLLOW ALL APPROPRIATE SAFETY STANDARDS AND PRACTICES TO PROTECT YOU AND OTHERS NEAR THIS MACHINE FROM INJURY.

7100-90

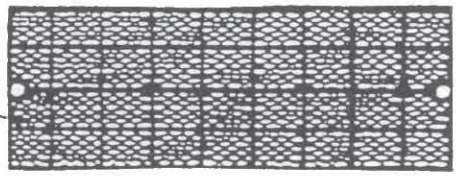
Part No. 7100-90

SAFETY WARNING SIGNS ⚠

52567-2A

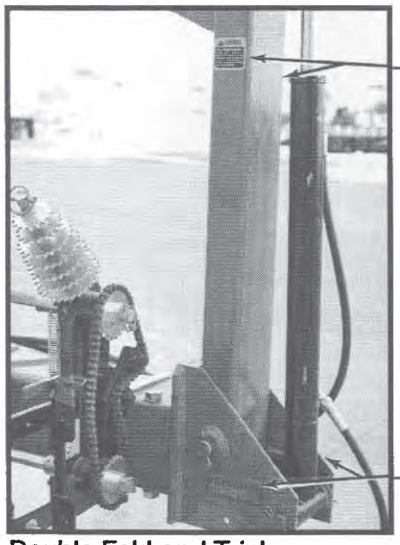
Conventional Marker

Part No. 7100-42



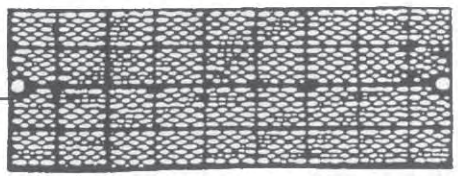
Part No. 7200-03
Red Reflector (Rear of Machine)
Part No. 7200-04
Amber Reflector (Front of Machine)

52567-1



Double Fold and Triple
Fold (Shown) Markers

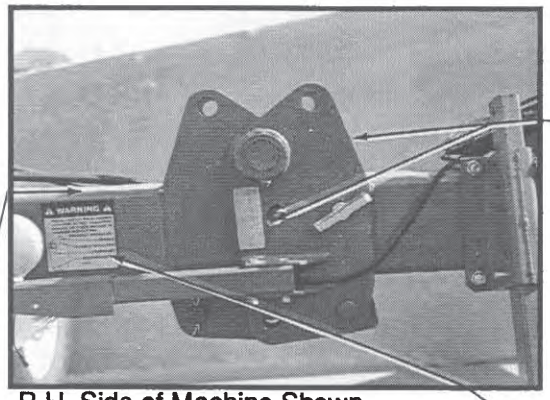
Part No. 7100-42



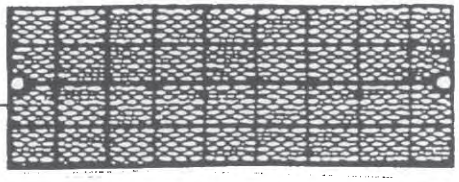
Part No. 7200-03
Red Reflector (Rear of Machine)
Part No. 7200-04
Amber Reflector (Front of Machine)

SAFETY WARNING SIGNS ⚠

55702-19



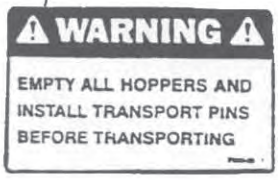
R.H. Side of Machine Shown
Folding Models Only



Part No. 7200-03
Red Reflector (Rear)
Part No. 7200-04
Amber Reflector (Front)

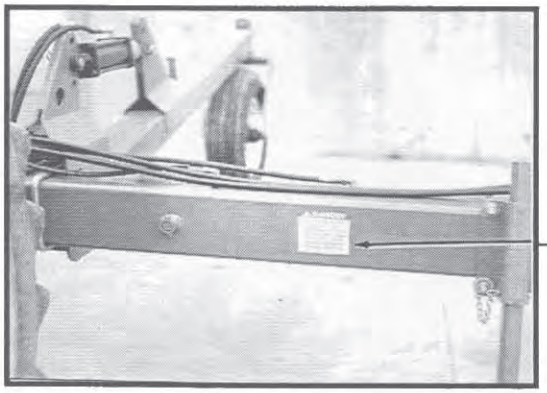
Part No. 7100-128 Right Side
Part No. 7100-127 Left Side
Serial No. XXXXX-16219

Part No. 7100-148 Right Side(Shown)
Part No. 7100-149 Left Side
Serial No. 16220-XXXXX



Part No. 7100-25

55712-9

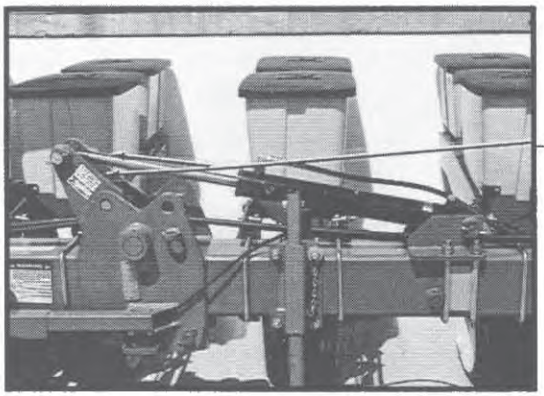


Folding Models Only

Part No. 7100-117

SAFETY WARNING SIGNS ⚠

53263-6



⚠ WARNING ⚠

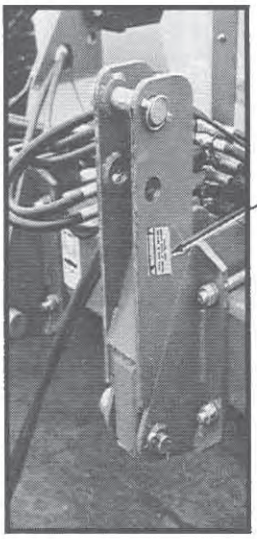
LOCK UP PIN SERVICE LOCATION IS BLOCKED BY EXTERNAL FOLD OPTION. USE ALTERNATE MEANS TO SUPPORT WING WHEN SERVICING WING FOLD HYDRAULICS.

7100-141

Part No. 7100-141

Optional External Wing Lift Assist Link

51803-2



⚠ WARNING ⚠

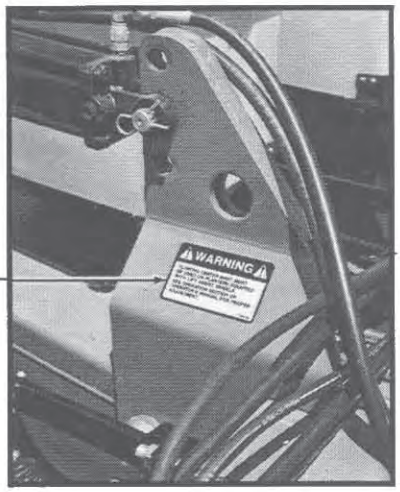
FLOATING CENTER MAST MUST BE USED ON PLANTERS EQUIPPED WITH LIFT ASSIST WHEELS.

SEE OPERATION SECTION OF OPERATOR'S MANUAL FOR PROPER ADJUSTMENT.

Part No. 7100-133

Optional Dual Lift Assist Wheel Attachment - Floating Top Mast

53761-6



Optional Dual Lift Assist Wheel Attachment - Wheel Tower

59386-4

⚠ CAUTION ⚠

AGRICULTURAL CHEMICALS CAN BE DANGEROUS. IMPROPER SELECTION OR USE CAN SERIOUSLY INJURE PERSONS, ANIMALS, PLANTS, SOIL OR OTHER PROPERTY. BE SAFE: SELECT THE RIGHT CHEMICAL FOR THE JOB. HANDLE IT WITH CARE. FOLLOW THE INSTRUCTIONS ON THE CONTAINER LABEL AND OF THE EQUIPMENT MANUFACTURER.

7100-115

Part No. 7100-115
Located on under side of granular chemical hopper lids.

MACHINE OPERATION

The following information is general in nature and was written to aid the operator in preparation of the tractor and planter for use, and to provide general operating procedures. The operator's experience, familiarity with the machine and the following information should combine for efficient planter operation and good working habits.

INITIAL PREPARATION OF THE PLANTER

Lubricate the planter and row units per the lubrication information in this manual. Make sure all tires have been properly inflated. See "Tire Pressure." Check all drive chains for proper tension, alignment and lubrication.

TRACTOR REQUIREMENTS

Approximate required minimum tractor horse power (H.P.) required for field work is listed below:

2 and 4 Row Models - 50-65 H.P.
6 Row Models - 55-85 H.P.
8 and 10 Row Models - 75-110 H.P.
12 Row Models - 140 & up H.P.

NOTE: Tractor must have adequate 3 point hitch lift capacity to lift weight of machine, attachments, seed and dry chemicals. Shipping weights do not include seed, dry chemicals or additional optional attachments.

Tractor front end stability is necessary for safe efficient operation. Therefore, it may be necessary to add front ballast to your tractor for satisfactory field operation, as well as adequate transport stability. Refer to your tractor operator's manual for front ballast recommendations.

The optional Dual Lift Assist Wheel Package is recommended on some sizes of planters and also depending on size of tractor being used with planter. Optional dual lift assist wheels are recommended on all folding Model 2100 planters.

12 Row models require minimum tractor hydraulic pressures of 2200-2300 PSI to fold the wings to the vertical transport position when fully equipped with KINZE's heaviest attachments. If the tractor to be used with this planter is rated with hydraulic output of less than 2250 PSI and the planter is equipped with the smaller 3 1/2" wing lift cylinders, installation of the optional External Wing Lift Assist Package is recommended.

TRACTOR PREPARATION AND HOOKUP

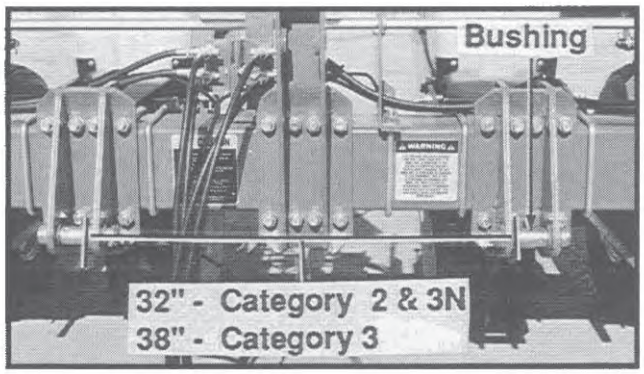
1. Set tractor rear wheel spacing at double the planter row spacing. For example: On a planter set for 36" rows, set the tractor wheel spacing at 72". On wide front end tractors set front wheel spacing equal to rear wheel spacing. Check tractor operator's manual for correct front and rear tire pressure.

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

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

Lower Link Pins

52567-45



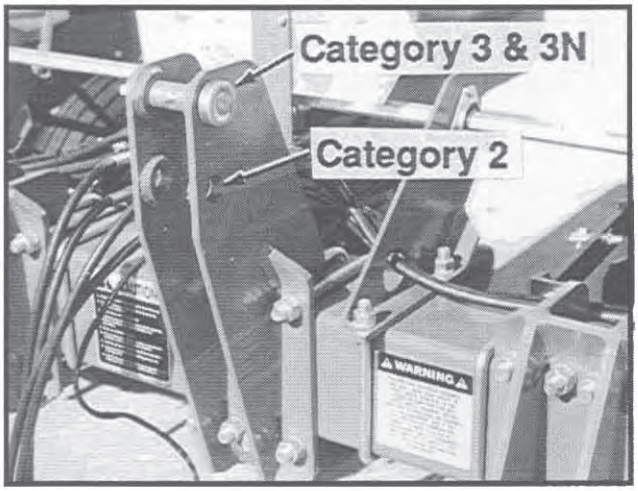
Category 2 requires pin only.
Category 3 and 3N requires pin and bushing.

Upper Link Pin

The upper hitch point has two holes. The hitch pin must be positioned in the lower hole for use with tractors equipped with Category 2 quick-attaching coupler and is recommended for use on tractors without quick-attaching coupler. Some Category 2 tractors without quick-attaching coupler are designed to accommodate the upper attaching holes. Check with the tractor manufacturer.

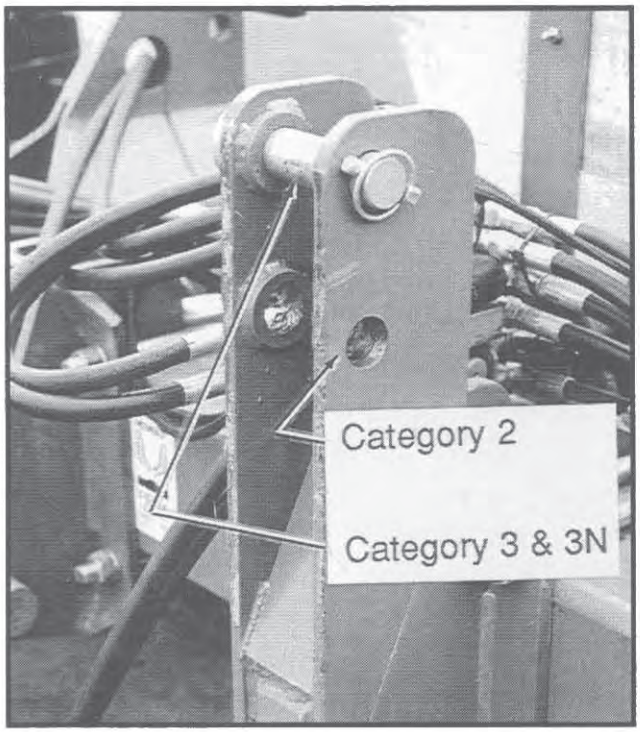
The hitch pin must be positioned in the upper hole for use with tractors equipped with Category 3 and 3N.

52567-49



Standard Lift Link

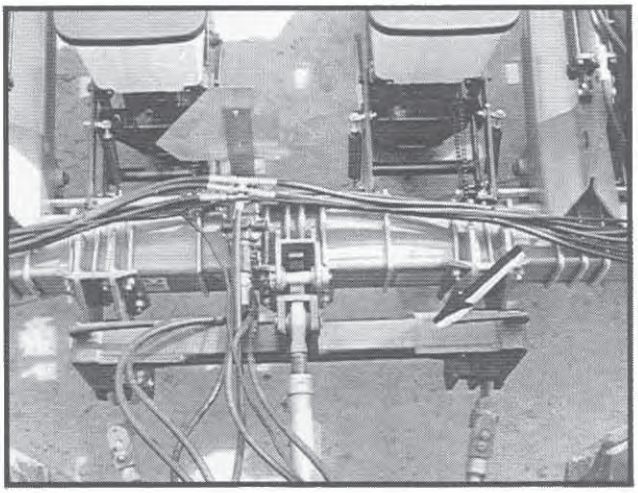
51803-2



Floating Lift Link (Used with lift assist wheels)

NOTE: In planting position, maintain 1" or less clearance between floating top mast and the stop. If the tractor has an adjustable center link, using the lowest adjustment hole will provide maximum clearance in the raised position and yet allow the planter to remain level during field operation.

52926-4



When using quick-attaching coupler (customer supplied), match pin location to pin spacing in quick-coupler. Adjust the tractor center link until the quick-coupler is vertical when in the planting position.

DANGER: Never transport folding models with lift assist wheels without floating link in place. If not in place a sudden stop could allow the toolbar to rotate forward causing most serious personal injury or damage to the equipment.

4. The planter is equipped with safety/warning lights which should be used whenever the planter is being transported. The connector is a 7 terminal breakaway conforming to ASAE standards. If your tractor is not equipped for safety/warning lights, check with your tractor dealer.

5. Connect hydraulic hoses to tractor ports in a sequence that is both familiar and comfortable to the operator. See "Hydraulic Operation".

Before attaching hoses, move tractor control levers back and forth to relieve any pressure in the tractor hydraulic system.

IMPORTANT: Always wipe hose ends to remove any dirt before connecting couplers to tractor ports.

CAUTION: Before the markers are operated, make sure all marker lockups are in working position.

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

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

7. Lower planter so drive wheels rest on ground and check to be sure planter is level. Readjust top link as required to level row units. See "Leveling The Planter".

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

LEVELING THE PLANTER

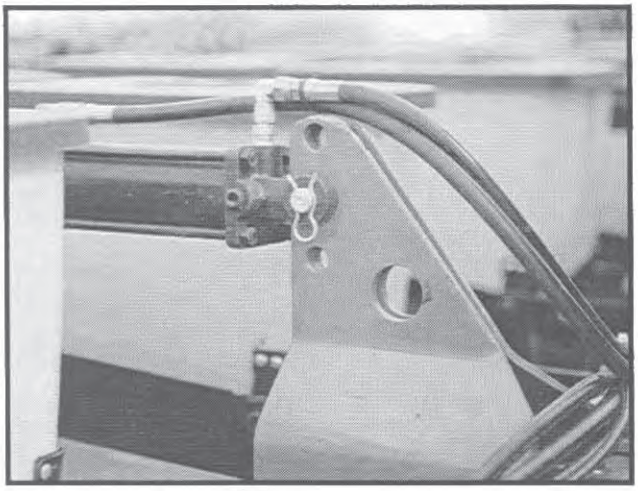
For proper operation of the planter and row units, it is important that the unit operate level.

When operating the Model 2100 planter, make sure the right and left arms are adjusted equally before attaching the planter unit. After the planter has been lowered to the correct operating depth, stop the tractor and stand beside the planter and check to be sure the frame is level fore and aft. If the row units angle up or downward, adjust the center link on the tractor accordingly.

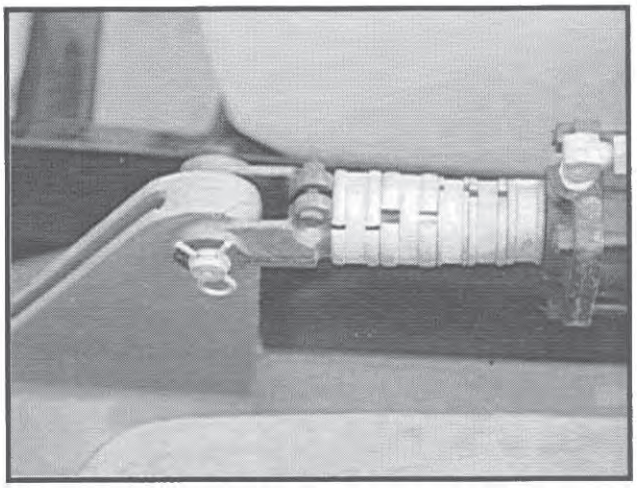
It is important for the planter to operate level laterally. Tire pressure must be maintained at pressures specified and drive wheel height must be adjusted equally. See "Wheel Module Height Adjustment".

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

51138-6

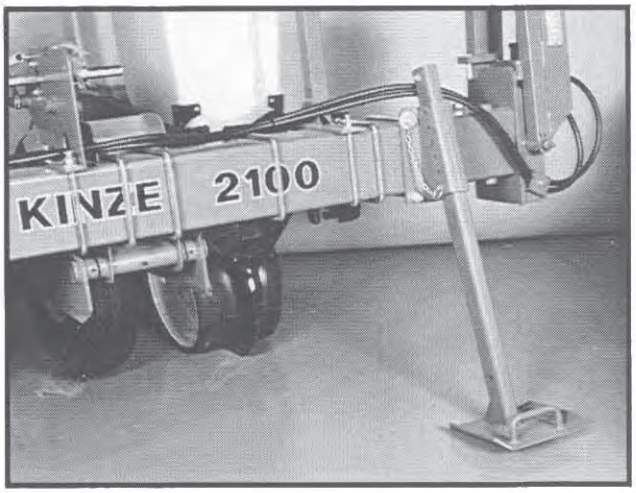


51138-5



PARKING STAND ADJUSTMENT

61048-22



Two parking stands, located on the front side of the main frame, are standard on all Model 2100 planters. The stands must be positioned so they are not directly behind the tractor tire or they will hit when the planter is raised.

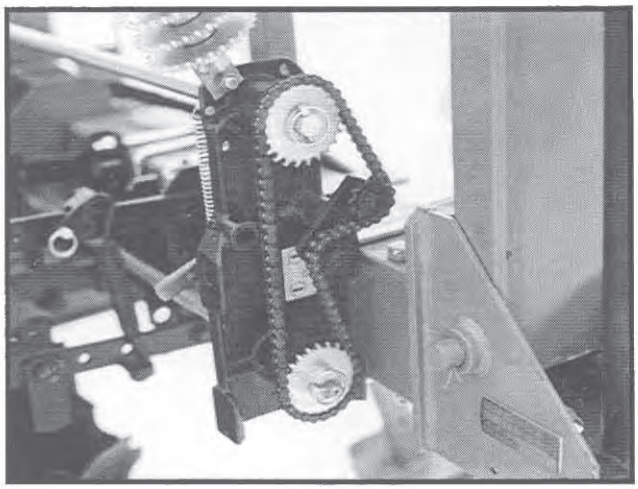
Raise to top position and pin when planting. Lower and pin for parking and storage.

On planters equipped with front mounted drive wheels, parking stands are not required.

Each parking stand has six positioning holes. By using these positioning holes, you can set the main frame height from 19" to 25".

TRANSMISSION ADJUSTMENT

61048-17



Planting population rate changes are made at the seed transmission(s). The planter is designed to allow simple, rapid changes in sprockets to obtain the desired planting population. By removing the lynch pins on the hexagon shafts, sprockets can be interchanged with those from the sprocket storage rod bolted to the transmission.

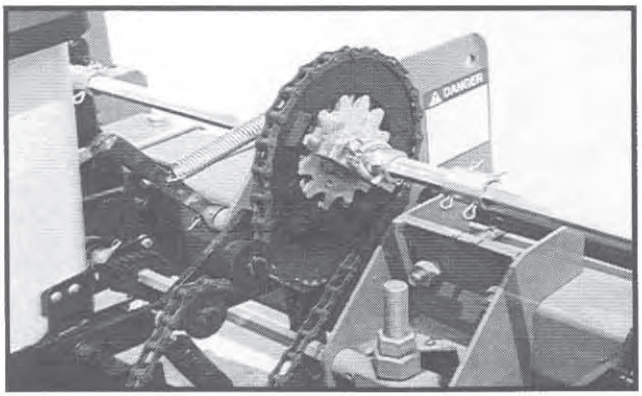
Chain tension is controlled by a spring-loaded dual-sprocket idler. The idler assembly is adjusted with a ratchet arm. This arm has a release position to remove spring tension for replacing sprockets. The amount of spring tension on the chain can be controlled by the ratchet arm.

A decal positioned near transmission module provides proper chain routing. The planting rate charts found at the back of this section will aid you in selecting the correct sprocket combinations.

2 TO 1 DRIVE REDUCTION

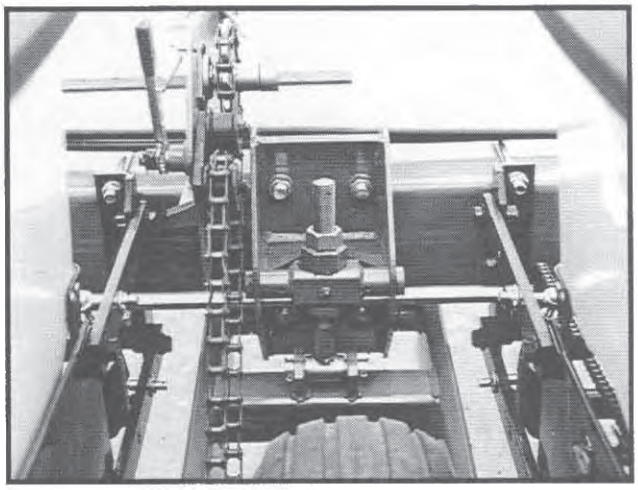
Use of the 2 to 1 drive reduction package will reduce drive line speed and application rates to approximately 50% of standard.

53704-12



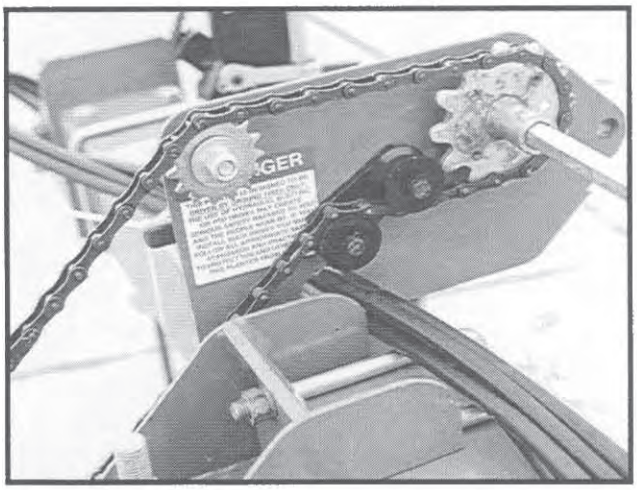
WHEEL MODULE HEIGHT ADJUSTMENT

51803-20



Standard Rear Mounted Wheel Module

52607-8



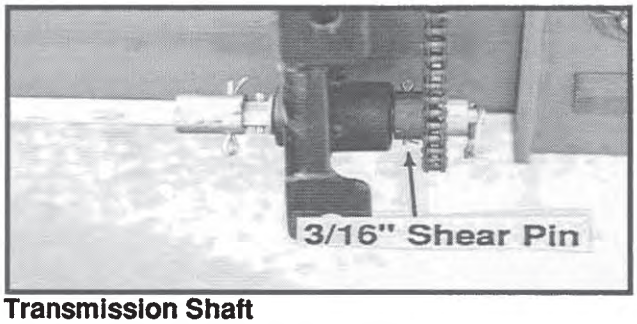
Optional Front Mounted Wheel Module

The wheel module assembly is designed so the drive wheel height can be adjusted to maintain a frame height of 20 1/2" in all planting situations. This is particularly useful when the planter is used for ridge planting or planting on beds. The wheel module assembly has an adjustment range of 7". Offset No. 2050 chain links which are included with the planter will need to be added when the upper end of the range is used. To adjust the wheel assembly, first release chain tension, loosen the jam nut using a 1 1/2" wrench or a 15" adjustable wrench and turn the adjusting nut using a 1 7/8" wrench or 15" adjustable wrench(clockwise to decrease frame height/counter clockwise to increase frame height). Tighten the jam nut and adjust chain tension.

SHEAR PROTECTION

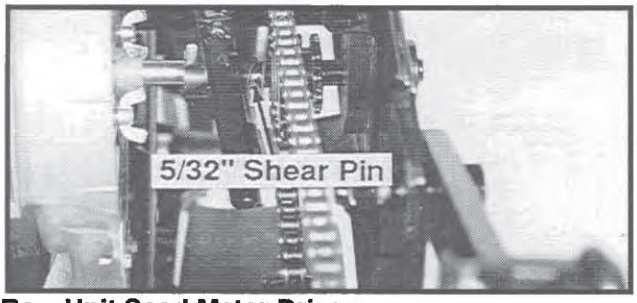
The planter drive line and row unit components are protected from damage by shear pins.

55702-9



Transmission Shaft

61658-27



Row Unit Seed Meter Drive

If excessive load should cause a pin to shear, it is important to determine where binding has occurred before replacing the pin. Replace shear pins with same size and type.

To prevent future binding or breakage of components, check drive line alignment and follow prescribed lubrication schedules.

TIRE PRESSURE

Tire pressure should be checked regularly and maintained as follows:

7.60 x 15" 4 Ply - 40 PSI

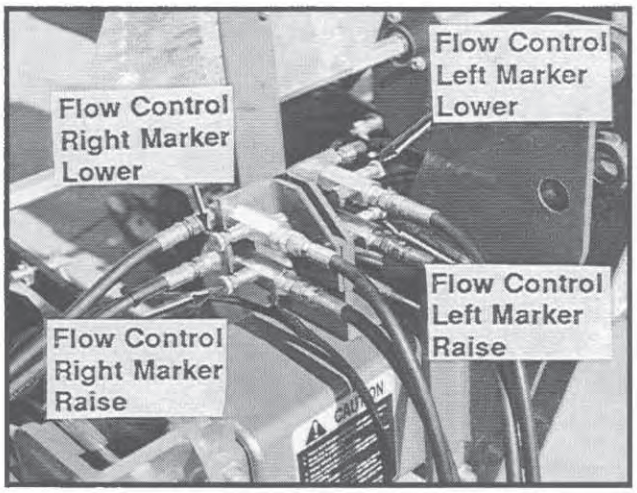
IMPORTANT: Tire pressure must be correctly maintained in all drive wheel tires to insure level and proper operation of planter. All rate charts are based on rolling radius of 7.60 x 15" tires inflated to 40 PSI.

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

MARKER SPEED ADJUSTMENT

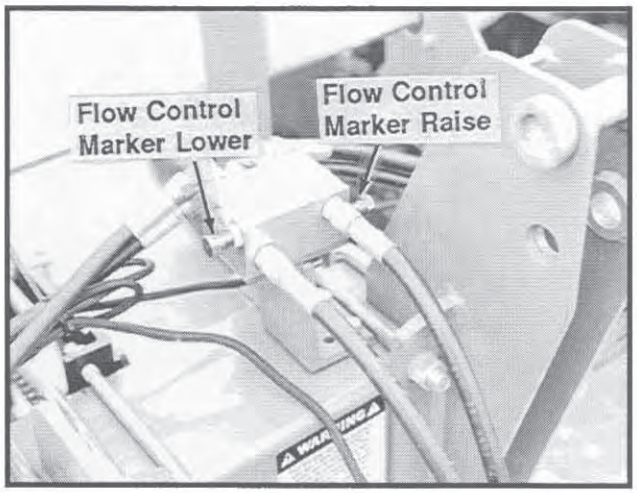
Rigid frame models with dual valve hydraulic system have four flow control valves or two flow control valves if equipped with the optional single valve system. Folding frame models have two flow control valves. Flow control valves control the lowering and raising speed of the markers. To adjust marker speed, loosen the jam nut and turn the control clockwise or "in" to slow the travel speed and counterclockwise or "out" to increase the travel speed. The adjusting bolt determines the amount of oil flow restriction through the valve, therefore determining travel speed of the markers.

52567-50



Rigid Frame Model With Dual Valve Hydraulic System

55398-3



Rigid Frame Model With Optional Single Valve Hydraulic System
(Also used on Folding Frame Model with Dual Valve Hydraulic System.)

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

NOTE: When oil is cold, hydraulics operate slowly. Make sure all adjustments are made with warm oil. Do not overtighten lock nut.

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

MARKER ADJUSTMENT

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

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

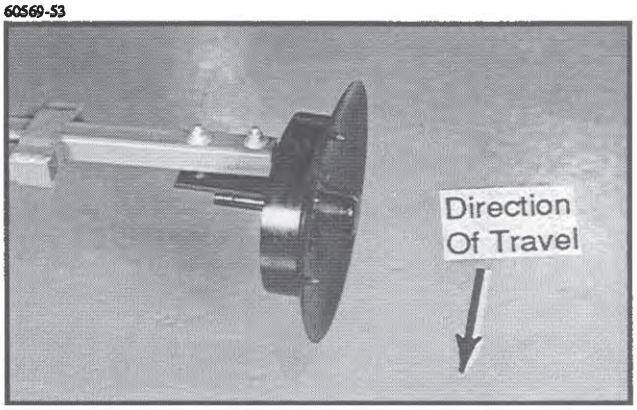
4 Rows	x	30" Row Spacing	=	120" Marker Dimension

The marker blade is installed so the concave side of the blade is outward to throw dirt away from the grease seals. The spindle bracket is slotted so the hub and blade can be angled to throw more or less dirt. To adjust the hub and spindle, loosen the 1/2" x 3 1/2" cap screws and move the bracket as required. Tighten bolts to the specified torque.

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

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

60569-53



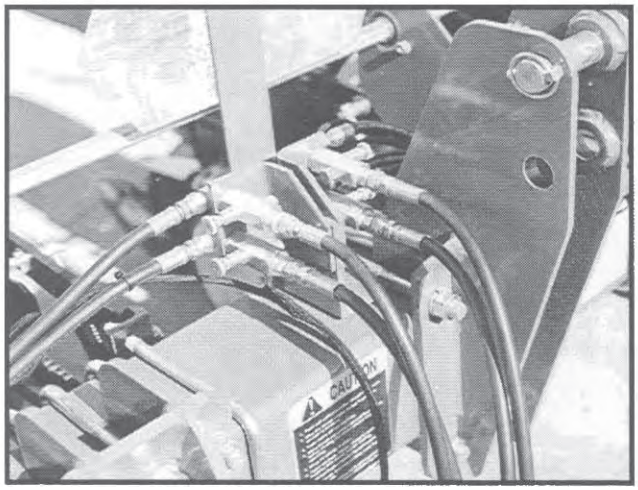
Marker blade shown with depth band. (Standard on 8 row wide - up.)

HYDRAULIC OPERATION

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

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

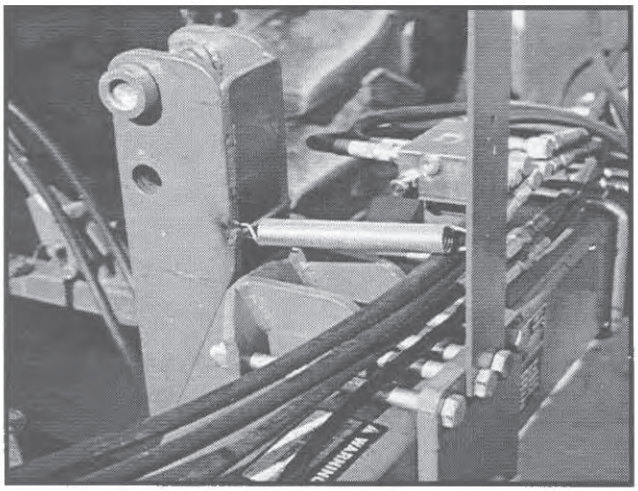
52567-51



Rigid Model With Dual Control Valve Marker System

Folding frame models are equipped with a single control valve marker system plus another control valve for folding the wings.

55702-11



Folding Model With Single Control Valve Marker System (Shown with SMV sign removed for visual clarity.)

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

Marker Hydraulic Operation

The dual valve marker system allows each marker to be operated independently. The single valve marker system uses a sequencing valve which directs hydraulic flow to operate the markers alternately.

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

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

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

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

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

Folding Frame Hydraulic Operation

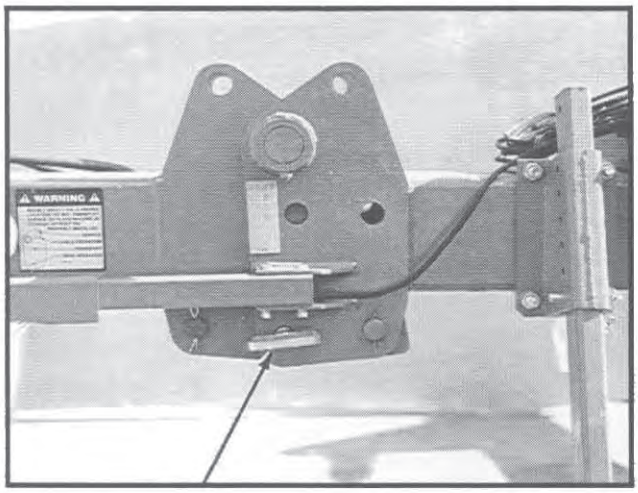
Folding frame models have the capability of folding the outer portion or wings of the planter toolbar vertically for narrower transport width. These models can be operated in the field with the wings either in the rigid position or flexed position.

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

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

The rigid position is required on tractors which don't have a float position capability and is also recommended in conditions where flex in the frame is not required for proper row unit operation. When the planter is being operated in this position the wings should be pinned rigid.

55702-2

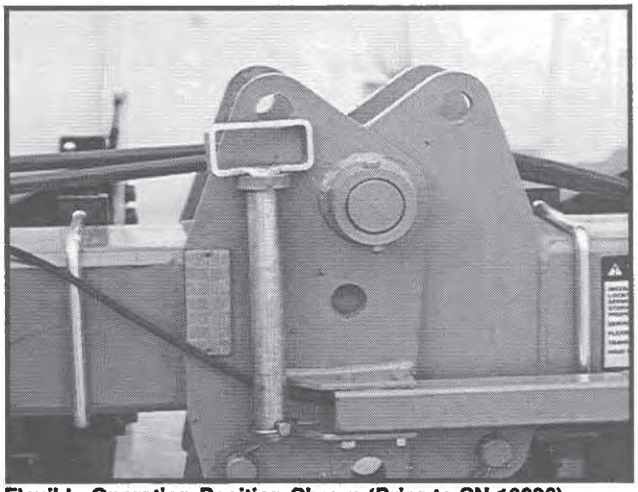


Rigid Position Shown

When planting in uneven terrain or anytime additional flex is needed and if the tractor hydraulic system has the float capability, the wings can be left unpinned to allow the wings to flex when the tractor hydraulic lever is in the float position.

It may be desirable to take the lever out of the float position to prevent the wings from sagging downward when the planter is raised.

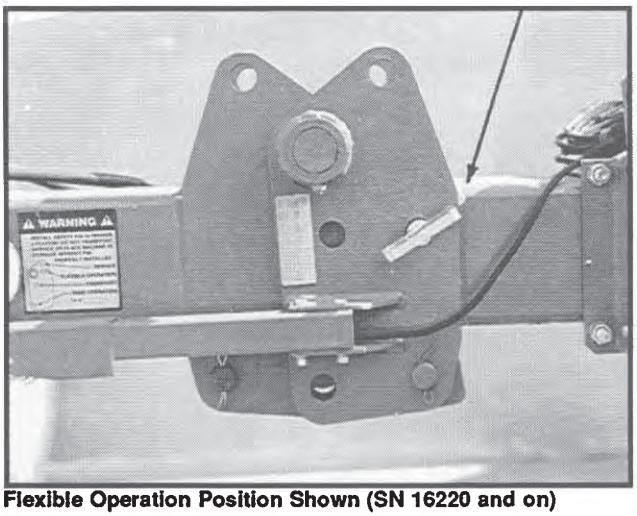
52567-29



Flexible Operation Position Shown (Prior to SN 16220)

NOTE: On models prior to serial number 16220, when operating with the wings in the flexed position, an upward flex of more than 5° could temporarily disengage the drive line to the center units.

55702-20



Flexible Operation Position Shown (SN 16220 and on)

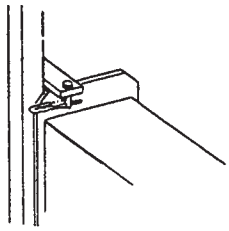
NOTE: On models serial number 16220 and on, when operating with the wings in the flexed position, install the wing safety pins as shown. This will limit the flex up and down to 5° and prevent the wings from flexing up far enough to disengage the drill shaft to the center units. The wing safety pins must be removed to fold the wings into the transport position.

CAUTION: Prior to folding the wings for transport, the markers must be folded and all hoppers located on the planter's wings emptied or removed.

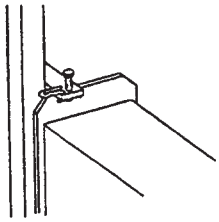
DANGER: Wings must be unfolded before detaching machine from tractor.

MARKER LOCKUPS (If Applicable)

APO041



Marker locked up for transport or working around the machine

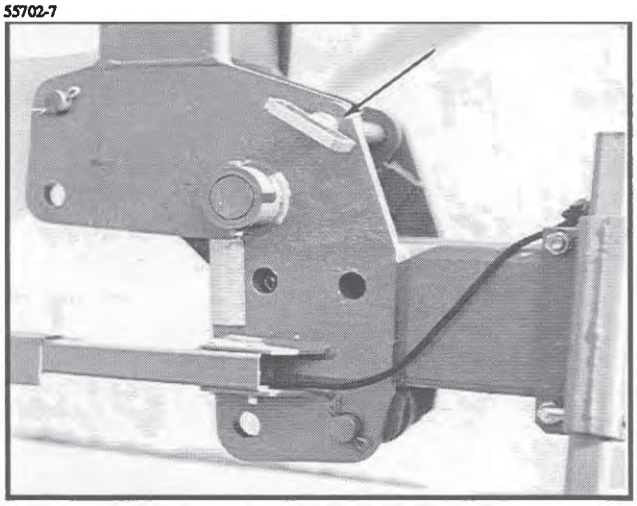


Pin stored in raised position for marker operation

Install marker lockups when transporting the planter or working around the planter. When not in use, store lockup pin in raised position with hair pin clip on upper side of tab.

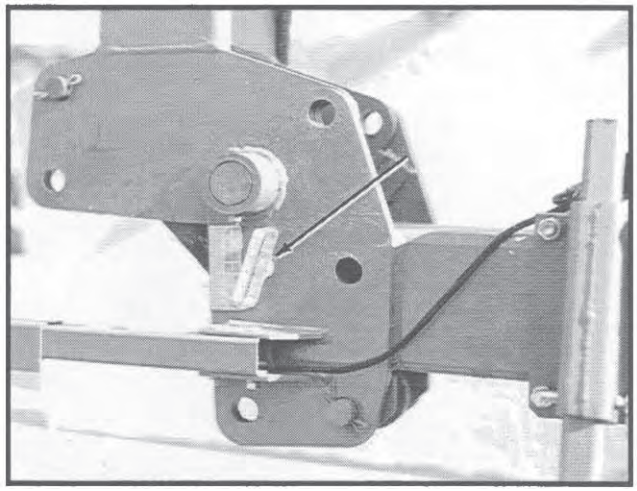
WING SAFETY PINS (If Applicable)

55702-7



Service Position

55702-5



Transport Position

The wing safety pins located in the hinge area are an added safety device. Always install the wing safety pins in the "transport" position before transporting the planter or working around the unit. Always install the wing safety pins in the "service" position when servicing the wing fold cylinder or wing fold linkage.

Install wing safety pin in "rigid" position for rigid toolbar operation and "flexible" position for wing flex operation. See "Hydraulic Operation".

Refer to decal located near each hinge for proper safety pin position for flexible operation, rigid operation, transport and service.

MACHINE OPERATION

TRANSPORTING THE PLANTER

WARNING: Always make sure flashing lights, reflectors and SMV emblem are in place and visible prior to transporting the machine on public roads. In this regard, check and comply with all federal, state and local regulations.

DANGER: Always install all safety lockups before transporting the planter.

TRACTOR SPEED

Planters are designed to operate within a speed range of 2 to 8 MPH. Variations in ground speed will produce variations in rates. Corn meter populations will tend to be disproportionately higher at high ground speeds.

METRIC CONVERSION TABLE

Multiply	By	To Get
Inches (in.)	x 2.54	= centimeters (cm)
Inches (in.)	x 25.4	= millimeters (mm)
Feet (ft.)	x 30.48	= centimeters (cm)
Acres	x 0.405	= hectares (ha)
Miles per hour (mph)	x 1.609	= kilometers per hour (kmph)
Pounds (lbs.)	x 0.453	= kilograms (kg)
Bushels (bu.)	x 35.238	= liters (l)
Gallons (gal.)	x 3.785	= liters (l)
Pounds per square inch (psi)	x 6.894	= kilopascals (kPa) (100 kPa = 1 bar)
Inch pounds (in. lbs.)	x 0.113	= newtons-meters (N•m)
Foot pounds (ft. lbs.)	x 1.356	= newtons-meters (N•m)
Centimeters (cm)	x .394	= inches (in.)
Millimeters (mm)	x .0394	= inches (in.)
Centimeters (cm)	x .0328	= feet (ft.)
Hectares (ha)	x 2.469	= acres
Kilometers per hour (kmph)	x 0.621	= miles per hour (mph)
Kilograms (kg)	x 2.208	= pounds (lbs.)
Liters (l)	x 0.028	= bushels (bu.)
Liters (l)	x 0.264	= gallons (gal.)
Kilopascals (kPa) (100 kPa = 1 bar)	x 0.145	= pounds per square inch (psi)
Newtons-meters (N•m)	x 8.85	= inch pounds (in. lbs.)
Newtons-meters (N•m)	x 0.738	= foot pounds (ft. lbs.)

FIELD TEST

A field test of the planter should be made prior to initial operation and periodically thereafter to ensure proper planter operation.

❑ Check the planter for fore and aft and lateral level operation. See "Leveling The Planter".

❑ Check **all** row units to be certain they are running level. When planting, the row unit parallel arms should be parallel to the ground.

❑ Check row markers for proper operation and adjustment. See "Marker Adjustment", "Marker Speed Adjustment" and "Marker Operation".

❑ Check for proper application rates and placement of granular chemicals on **all** rows. See "Checking Chemical Application Rates".

❑ Check for desired depth placement and seed population on **all** rows. See "Checking Seed Population".

After the planter has been field tested, reinspect the machine.

•Hoses And Fittings

•Bolts And Nuts

•Cotter Pins And Roll Pins

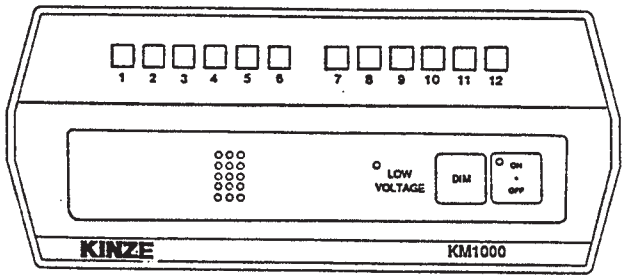
•Drive Chain Alignment And Tension

ELECTRONIC SEED MONITOR SYSTEM

The electronic seed monitor system consists of a console, which is mounted on the tractor; seed tubes with sensors, one of which is installed in each planter row unit; and a planter harness (harness, Y-connector and/or extension cable where applicable), which connects the individual seed tube sensors to the console.

The monitor is powered by the tractor battery (requires 12 volts DC).

KM1000 MONITOR



The console receives information from each of the sensors and translates this information for the operator, to let him know whether or not all rows are planting.

Turn the console ON by pressing the ON-OFF switch.

Each time the console is powered up it performs a sensor check and self-check. All row indicator lamps are turned on, the alarm sounds momentarily and then the console enters the operate mode. If a row indicator lamp does not come on when the console is powered up, it indicates that a problem exists with either the sensor, planter harness or a burned out row indicator lamp. See Troubleshooting in the Maintenance Section of this manual.

Begin planting and observe the row indicator lamps. All indicator lamps should be flashing at approximately the same rate. If one of the row lamps is flashing at a slower rate than the others it would indicate that row is planting at a slower rate and it should be checked for proper seed population.

The monitor continuously checks for seed flow while planting, as indicated by the flashing row indicator lamps on the console. If any planter unit seed sensor is not detecting seeds, the alarm will sound continuously and the row indicator lamp corresponding to the planter row unit will stop flashing. When this happens, stop planting and check to see what is wrong with the row unit.

When you lift your planter at the end of a row and seed flow stops in all planter units, the alarm will sound and all row indicator lamps will stop flashing. After approximately 2-4 seconds the alarm will stop sounding.

The intensity of the Row Indicator Lamps can be controlled by pressing and holding the switch labeled DIM. To set the intensity, press and hold the DIM switch until the lamps are at the desired intensity, release the switch. Holding the DIM switch will cause the intensity to decrease to its lowest level and then increase to its maximum level. This cycle will continue as long as the switch is depressed. When the console is turned OFF and then ON the row lamp intensity will return to maximum.

If you are only using a portion of the number of rows on your planter, the alarm can be silenced by disconnecting the seed sensors of the unused rows and turning the monitor OFF then back ON. The monitor will then ignore these unused rows and monitor the other rows normally.

When disabling planter rows, the monitor may look at the system as a different planter setup. Example, if you have an 8 row planter and you disable the right four rows (for planting point rows, etc.) by unplugging the seed sensors and turning the monitor OFF and back to ON, the monitor will look at it as a 4 row planter and shift the row indicator lamps to the center four positions. Therefore, planter row 1 will be indicated on the monitor as row 3, planter row 2 as row 4, etc. Row lamps 1, 2, 7 and 8 will be off.

If you disable the left four rows (planter rows 1, 2, 3 and 4) the monitor will operate normally as an 8 row system. Row indicators 1, 2, 3 and 4 will be off.

KM1000 Bezel Decal Selection Chart

NO. ROWS	BEZEL DECAL	ROW LAMPS
4	12	1 2 3 4 5 6 7 8 9 10 11 12
6	6	1 2 3 4 5 6
8	16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
*8	16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
10	12	1 2 3 4 5 6 7 8 9 10 11 12
12	12	1 2 3 4 5 6 7 8 9 10 11 12
*12	12	1 2 3 4 5 6 7 8 9 10 11 12
16	16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
*4 & 3 Solid Interplant	16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
*6 & 3 Skip Row Interplant	16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
*6 & 5 Solid Interplant	16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
*8 & 5 Skip Row Interplant	16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
*8 & 7 Solid Interplant	16	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

☐ Row lamp indicates planter row in use.

▒ Row lamp not used.

* With "Y" connector.

NOTE: Interplant diagrams assume that first interplant row is connected to row 1 of harness and harness is connected to R.H. half of "Y" connector.

KM3000 MONITOR

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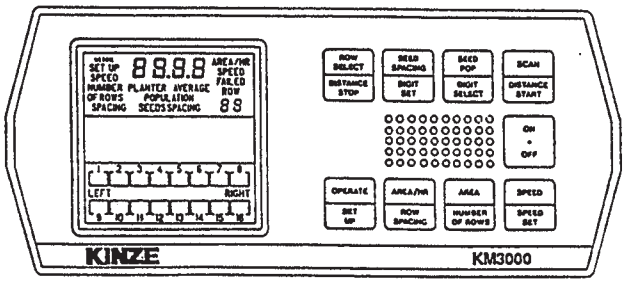

The KM3000 console may be equipped with one of two optional distance sensor features, a radar sensor which is mounted on the tractor or a pulse wheel (magnetic distance sensor) which is installed on the planter drive.

The operator's controls on the front panel of the console consist of nine pressure sensitive switches. Eight of the nine switches are dual function switches, performing one function during the OPERATE MODE and another function during the SET UP MODE. All switch functions are color coded to define between the OPERATE and SET UP modes. The upper half of each dual function switch is olive brown in color and contains the Operate functions. The lower half of each dual function switch is tan in color and contains the Set Up functions.

Turn console ON by pressing the ON-OFF switch. Note that the upper display shows random segments for a short time then sequences through all entered SET UP constants (SPEED, NUMBER OF ROWS and ROW SPACING). If the constants are not valid the alarm will sound for approximately four seconds and the monitor will enter the SET UP mode. See "Entering Constants". If all constants are valid (as previously entered) the alarm will sound momentarily and the monitor will enter the OPERATE mode.

Select the desired OPERATE function to be displayed by pressing the labelled switch.

SEED POP displays the seed population of each planter row in thousands of seeds per acre or hectare. In the SCAN mode the display will sequence through all planter rows. After the population for the highest planter row number is displayed, the average population for the total planter is shown. In the ROW SELECT mode a specific row can be selected and continuously monitored.

SEED SPACING displays the seed spacing of each planter row in inches or centimeters. In the SCAN mode the display will sequence through all planter rows. After the seed spacing for the highest planter row number is displayed, the average seed spacing for the total planter is shown. In the ROW SELECT mode a specific row can be selected and continuously monitored.

AREA/HR displays the predicted area in acres or hectares that will be covered in the next hour if the same planting rate is maintained. This prediction is based on the last 10 seconds of operation.

AREA displays the actual area covered in acres or hectares since the last reset. To reset area to 0000, press and hold the AREA switch for approximately 5 seconds.

SPEED displays current vehicle ground speed in MPH or KmPH.

A row failure will be indicated by the FAILED ROW number being displayed in the lower right hand corner of the upper display, the corresponding segment in the lower display will be blank, and the alarm will sound continuously. Failures of more than one row will be indicated by the FAILED ROW number in the upper display sequencing through all failed rows, the corresponding segments of all failed rows in the lower display will be blank, and the alarm will sound continuously. When you lift your planter at the end of a row or stop in the field and seed flow stops in all planter units, the alarm will sound for approximately four seconds and all row indicator segments (lower display) will stop flashing. The upper display will show the FAILED ROW message and will sequence through all planter row numbers.

In the all row failure mode or immediately following power up, the operate functions (population, seed spacing and area) can be displayed by pressing the touch switch labeled with the desired function. This display condition will remain for one minute after the last time a switch is pressed or until seeds are detected by the seed sensors.

A ground speed failure will be indicated by the SPEED FAILED message being displayed in the upper display. To continue using the monitor system until a replacement ground speed sensor is obtained, disconnect the ground speed sensor cable, enter the SET UP mode and enter your normal planting speed in MPH or KmPH in place of the SPEED SET calibration number. IMPORTANT: The accuracy of the POPULATION, SEED SPACING and AREA readouts will depend on the vehicle ground speed. If you do not drive at the speed entered in SPEED SET memory these functions will not be accurate. AREA will not accumulate in this mode.

IMPORTANT: Under normal use the monitor will accumulate area whenever there is seed flow in at least one seed sensor. In the all rows failed condition, such as when turning around at the end of the field, the area accumulation will stop.

The monitor can be used to count seeds in a selected row by performing the following:
1. Place console in SET UP mode. (Before performing Step 2 make sure you have recorded the SPEED constant.)
2. Set the SPEED constant to 0000. This can be done by manually setting each digit to zero using the DIGIT SELECT and DIGIT SET switches or by pressing and holding the SPEED SET switch for approximately 5 seconds.
3. Enter the OPERATE mode by pressing the OPERATE switch.
4. Press and release the ROW SELECT switch until the desired planter row number is displayed in the lower right corner of the upper display. The monitor will now show seed counts for the selected row.

To reset the display to zero and continue to monitor the same row unit, press the SCAN switch then the ROW SELECT.

To select another row unit, press the ROW SELECT switch until the desired planter row number is displayed. Each time the ROW SELECT switch is pressed the row number will be incremented one unit and the four digit display will be reset to zero.

IMPORTANT: To return to normal operation, enter the SET UP mode and re-enter the SPEED constant.

NOTE: The KM3000 is shipped from the factory setup for use with American measures. To convert the console to Metric measures, cut the wire loop (red wire) adjacent to the signal cable on the back of the console and tape the ends of the cut wire to prevent the two ends making contact with each other or the vehicle.

LOWER DISPLAY

The lower visual display contains up to sixteen segments and each one corresponds to a planter row unit. When the monitor is turned on the console senses the number of seed sensors connected to the planter harness and activates a segment for each one which flashes dark each time a seed is detected by the seed sensor. If up to 16 seed sensors are sensed the display will show segments for all sensors all the time. If more than 16 (17-32) seed sensors are sensed, then the display is split and up to 16 sensors are shown for the LEFT and RIGHT side of the planter.

EXAMPLE: If a 24 row planter is being used and the display message LEFT is on, the segments are showing seed flow for planter rows 1 through 12. When the display message RIGHT is on, the segments are showing seed flow for planter rows 13 through 24. When the RIGHT planter half is shown, the segment numbers 1 through 12 will represent planter rows 13 through 24 (segment 1 is planter row 13, segment 2 is row 14, up to segment 12 which is row 24).

ENTERING CONSTANTS (KM3000 Only)

Upon initial power-up or whenever memory is lost the following three constants must be entered before the system will enter the "operate" mode. The following examples are for an 8 row planter with 30" row spacing.

1. ROW SPACING - The distance between the rows on your planter.
Press the "row spacing" switch. The upper display will show "set up", "row spacing" and "000.0".
Press the "digit select" switch (a short alarm burst will be heard each time the switch activates) until the second "0" to the left of the decimal point is flashing.
Press the "digit set" switch until a "3" is shown in this location: 030.0.
NOTE: Holding the "digit set" switch will cause the digit to increment from 0 through 9.

NOTE: If you have a solid row planter of 15", 18", 19", 30", 36" or 38" row spacing, program that number in for row spacing. If you have a skip row planter, determine row spacing by taking the total distance between the two outside rows (in inches) and divide by the number of planter rows minus 1.

EXAMPLE: 8 row 30" planter with 13 row 15" skip row interplant

Step 1. Total distance between center of outside row on left end of planter to center of outside row on right end of planter = 210"

Step 2. 13 rows (number of total rows) minus 1 = 12

Step 3. 210" ÷ 12 = 17.5" average row spacing

Step 4. Program 17.5 (round to closest tenth acre)

2. NUMBER OF ROWS - The number of active rows on your planter. (Example for 8 row planter)

Press the "number of rows" switch. The upper display will show "set up", number of rows" and "00".

Press the "digit set" switch until until the right hand "0" is flashing.

Press the "digit set" switch until a 8 is shown in this location: 08.

3. SPEED - A number that is the result of the speed calibration procedure. Used with both radar and magnetic distance sensors.

The speed set calibration number matches the console to the ground speed sensor when calibrated over a specified measured distance. When the calibration procedure is completed and the speed set constant established, the value should be written down and retained in the event battery voltage is removed from the console and the information in memory is lost. In this event, the constant may be re-entered manually using the"digit select" and "digit set" switches. The speed set calibration procedure must be repeated and new speed set number established if the radar or magnetic distance sensor mounting is changed for any reason.

NOTE: When obtaining the following speed set number, actual in-field conditions should be simulated as close as possible.

A. Measure an accurate 400 foot (150 meter) in-field course, preferably on level ground. Mark the "start" and "finish" of the course so it will be plainly visible from the cab as you drive past.

B. With the upper display showing messages "set up" and "speed" and the four digit display showing all zero's (to reset four digit display to zero's, press and hold the "speed set" switch for approximately 5 seconds), drive up to the marked course at normal planting speed.

C. When even with the "start" marker, press the "distance start" switch. Four dashes will appear on the console display.

D. Drive at a steady speed through the entire course. When even with the "finish" marker, press the "distance stop" switch.

E. The speed set number will be displayed. Record this number for future reference.

SPEED SET NUMBER _____

IMPORTANT: This procedure may have to be repeated after performing the Radar Vibration Test. See Radar Vibration Test.

NOTE: The accuracy of the area computations, population, seed spacing and vehicle ground speed readout are dependent upon the accuracy of the operator entered constants. Use care when determining the constants which describe your planter.

RADAR VIBRATION TEST
(KM3000 With Radar Sensor Only)

To check for vibration, start vehicle engine and slowly increase engine RPM (while watching the ground speed readout) to approximately 1800 RPM. If the ground speed readings are above zero, the radar sensor must be mounted in an alternate, more stable location.

INTERPLANT ROWS

The half of the "Y" connector marked row 1 is used for the main rows on the planter and the other half for interplant rows. When interplant rows are not being used, switch the console to the OFF position and disconnect the interplant rows at the "Y" connector. Switch the console back ON. It will be necessary to reprogram "row spacing" and "number of rows" on the KM3000 console.

To activate the interplant rows, switch the console to the OFF position and reconnect the interplant rows at the "Y" connector. Switch the console ON. Reprogram "row spacing" and "number of rows" on the KM3000 console.

CHECKING SEED POPULATION

1. Tie up one or more sets of closing wheels by running a light chain between the hopper support panel and closing wheels. It may be necessary to decrease closing wheel arm spring tension.

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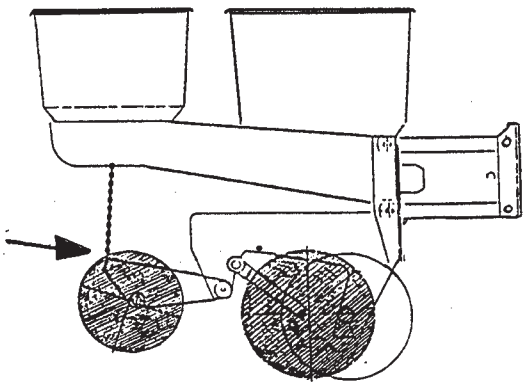

2. Plant a short distance and check to see if seed is visible in the seed trench. Adjust planting depth to a shallower setting if seed is not visible and recheck.

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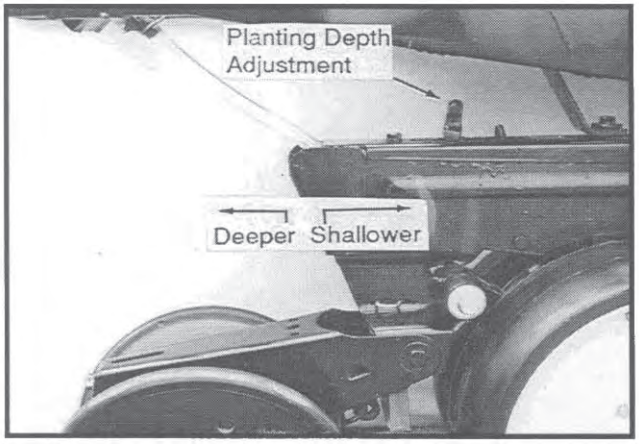

3. Measure 1/1000 of an acre. See chart for correct distance for row width spacing being planted. For example, if planting 30" rows 1/1000 of an acre would be 17'5".

LENGTH OF ROW IN FEET AND INCHES				
Fraction Of Acre	Row Width			
	30"	36"	38"	40"
1/1000	17'5"	14'6"	13'10"	13'1"

NOTE: When planting with closing wheels raised and planting depth set shallow, seeds may bounce or roll affecting seed spacing accuracy.

4. Count seeds in measured distance.

5. Multiply the number of seeds placed in the 1/1000 of an acre by 1000. This will give you total population.

EXAMPLE: With 30" row spacing 17'5" equals 1/1000 acre.

26 Seeds Counted	x	1000	=	26,000 Seeds Per Acre

Seed count can be affected by drive ratio between drive wheel and seed meter, tire pressure and/or seed meter malfunction.

If seed check shows the average distance between seeds in inches is significantly different than the seed rate chart indicates, first check drive ratio between drive wheel and seed meter. Check drive wheel air pressure, check for incorrect sprocket(s) in drive line and check drive and driven sprockets in transmission for proper selection.

Second check for seed meter malfunction. For example, if spacing between kernels of corn at the transmission setting being used is 8" and a gap of 16" is observed, a finger has lost its seed and not functioned properly. If two seeds are found within a short distance of each other, the finger has metered two seeds instead of one.

See "Finger Pickup Corn Meter Troubleshooting" and/or "Brush-Type Seed Meter Troubleshooting" in the Row Unit Operation Section of this manual.

Determining Pounds Per Acre (Brush-Type Seed Meter)

To determine pounds per acre:

Seeds Per Acre On Chart	+	Seeds Per Pound From Seed Tag On Bag	=	Pounds Per Acre

To determine bushels per acre:

Pounds Per Acre	+	Unit Weight Of Seed	=	Bushels Per Acre

The unit weight of:

1 Bushel Soybeans = 60 Pounds
1 Bushel Cottonseed = 32 Pounds
1 Bushel Milo = 56 Pounds

If seeds per pound information is not available the following is an average:

2,600 seeds per pound for medium size soybeans
15,000 seeds per pound for medium size milo
4,500 seeds per pound for medium size cotton

If seed check shows planting rate is significantly different than seed rate chart shows or if a particular meter is not planting accurately, remove seed disc and check meter for buildup of foreign material in the meter or the brush. Check the brush for damaged bristles. Remove foreign material from meter and replace upper and lower brushes if necessary

CHECKING GRANULAR CHEMICAL APPLICATION RATE

Many things can affect the rate of delivery of granular chemicals. Temperature, humidity, speed, ground conditions, flowability of different material or any obstruction in the meter.

A field check is important to determine correct application rates.

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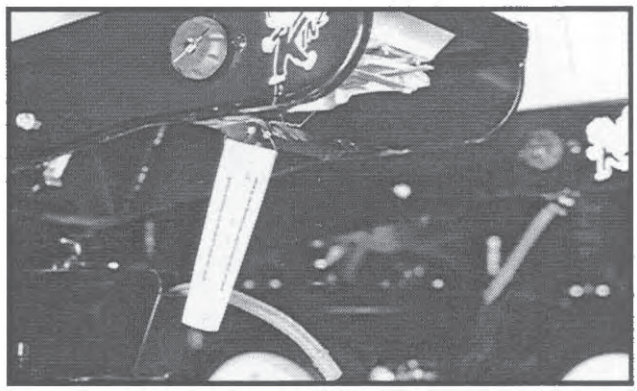


To check, fill insecticide and/or herbicide hoppers. Attach a calibrated vial to each granular diffuser. Lower the planter and proceed as follows.

NOTE: It is not necessary for seed meter clutch to be engaged during test. Disengage clutch to avoid dropping seed.

Drive 1320 feet at planting speed. Weigh the chemical in ounces that was caught in one vial. Multiply that amount by the factor shown to determine pounds per acre.

LBS. PER ACRE FACTOR FOR GIVEN WIDTH	
Row Width	Factor
30 Inch	0.83
36 Inch	0.69
38 Inch	0.65
40 Inch	0.62

EXAMPLE: You are planting 30" rows. You have planted for 1320 feet at the desired planting speed. You caught 12.0 ounces of chemical in one vial. 12.0 ounces times 0.83 equals 9.96 pounds per acre.

NOTE: It is important to check calibration of all rows.

Metering Gate

Use the metering gate setting for distributing insecticide or herbicide as a starting point. The chart is based on a 5 miles per hour planting speed. For speeds faster than 5 miles per hour a higher gate setting should be used. For speeds slower than 5 miles per hour a lower gate setting should be used.

WARNING: Agricultural chemicals can be dangerous if not selected and handled with care. Always read and follow directions supplied by the chemical manufacturer.

GENERAL PLANTING RATE INFORMATION

These planting rate charts are for KINZE Model 2100 3 Point Mounted Planters. See "Tire Pressure" for recommended tire pressures.

Not all row spacings listed are applicable to all model planters.

IMPORTANT: The sprocket combinations listed in these charts are best for average conditions. Changes in sprocket combinations may be required to obtain desired planting population. TO PREVENT PLANTING MISCALCULATIONS, MAKE FIELD CHECKS TO BE SURE YOU ARE PLANTING AT THE DESIRED RATE.

The size and shape of seed may affect the planting rate.

Finger Pickup Corn Meter
Larger grades will generally plant more accurately at the high end of the ground speed range than small grades. Higher than optimum speeds may result in population rate increase or higher incidence of doubles, particularly with small seed.

Brush-Type Seed Meter (Soybean, Milo/Sorghum, Acid-delinted Cotton)
Rate charts are given in seeds per acre as well as seed spacing in inches rounded off to the nearest tenth of an inch. Because of the large range in seed size, pounds per acre is not a suggested method of selecting transmission settings. When using smaller size seeds it may appear the pounds per acre is below what was expected and vice versa on large seed. To determine pounds per acre, use the formula given in "Determining Pounds Per Acre (Brush-Type Seed Meter)" in the "Checking Seed Population" section of this manual.

Seed population per acre with 15" rows will be double the rate for 30" rows, as well as 18" rows verses 36" rows and 19" rows verses 38" rows, at the listed sprocket combination.

In some cases, for example when planting 15" row soybeans or milo/grain sorghum, the 2:1 (1/2) rate sprockets on the drive may be required to obtain the desired population and seed spacing.

NOTE: Use of the 2 to 1 drive reduction package will reduce the planter transmission speed. The seeding rate will be approximately 1/2 of the chart reading when using the 2 to 1 drive reduction package. Planting speed can affect actual seeding rate. Make a field check and adjust setting in the transmissions as needed to obtain the desired seed drop.

PLANTING RATES FOR FINGER PICKUP CORN METERS
APPROXIMATE SEED POPULATIONS/ACRE FOR VARIOUS ROW WIDTHS

30 Inch	36 Inch	38 Inch	40 Inch	Transmission Sprockets Drive	Transmission Sprockets Driven	Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
16,862	14,051	13,312	12,646	17	28	4 to 8	12.4
17,486	14,572	13,805	13,115	17	27	4 to 8	12.0
18,159	15,132	14,336	13,619	17	26	4 to 8	11.5
18,845	15,704	14,878	14,134	19	28	4 to 8	11.1
18,885	15,737	14,909	14,164	17	25	4 to 8	11.1
19,543	16,286	15,429	14,657	19	27	4 to 8	10.7
19,672	16,393	15,530	14,754	17	24	4 to 8	10.6
20,295	16,912	16,022	15,221	19	26	4 to 8	10.3
20,527	17,106	16,206	15,395	17	23	4 to 8	10.2
21,107	17,589	16,663	15,830	19	25	4 to 8	9.9
21,986	18,322	17,357	16,490	19	24	4 to 8	9.5
22,813	19,011	18,010	17,110	23	28	4 to 8	9.2
22,942	19,118	18,112	17,207	19	23	4 to 8	9.1
23,658	19,715	18,677	17,743	23	27	4 to 8	8.8
23,805	19,837	18,793	17,853	24	28	4 to 8	8.8
24,568	20,473	19,395	18,426	23	26	4 to 8	8.5
24,686	20,572	19,489	18,515	24	27	4 to 8	8.5
24,796	20,664	19,576	18,597	25	28	4 to 8	8.4
24,849	20,707	19,617	18,636	17	19	4 to 7.5	8.4
25,550	21,292	20,171	19,163	23	25	4 to 7.5	8.2
25,636	21,363	20,239	19,227	24	26	4 to 7.5	8.2
25,715	21,429	20,301	19,286	25	27	4 to 7.5	8.1
25,788	21,490	20,359	19,341	26	28	4 to 7.5	8.1
26,615	22,179	21,012	19,961	23	24	4 to 7.5	7.9
26,661	22,218	21,048	19,996	24	25	4 to 7.5	7.8
26,704	22,253	21,082	20,028	25	26	4 to 7.5	7.8
26,743	22,286	21,113	20,058	26	27	4 to 7.5	7.8
26,780	22,317	21,142	20,085	27	28	4 to 7.5	7.8
27,772	23,143	21,925	20,829	23	23	4 to 7	7.5
28,800	24,000	22,737	21,600	28	27	4 to 7	7.3
28,840	24,033	22,769	21,630	27	26	4 to 7	7.3
28,929	24,108	22,839	21,697	25	24	4 to 7	7.2
28,979	24,150	22,879	21,735	24	23	4 to 7	7.2
29,908	24,924	23,612	22,431	28	26	4 to 6.5	7.0
29,994	24,995	23,679	22,495	27	25	4 to 6.5	7.0
30,187	25,156	23,832	22,640	25	23	4 to 6.5	6.9
31,039	25,866	24,505	23,279	19	17	4 to 6.5	6.7
31,105	25,920	24,556	23,328	28	25	4 to 6.5	6.7
31,243	26,036	24,666	23,433	27	24	4 to 6.5	6.7
31,394	26,162	24,785	23,546	26	23	4 to 6.5	6.7
32,401	27,001	25,579	24,300	28	24	3 to 6	6.5
32,602	27,168	25,738	24,451	27	23	3 to 6	6.4
33,619	28,016	26,541	25,214	23	19	3 to 5.5	6.2
33,809	28,174	26,692	25,357	28	23	3 to 5.5	6.2
35,080	29,234	27,695	26,310	24	19	3 to 5.5	6.0
36,542	30,452	28,849	27,407	25	19	3 to 5	5.7
37,574	31,312	29,664	28,180	23	17	3 to 5	5.6
38,004	31,670	30,003	28,503	26	19	3 to 5	5.5
39,207	32,673	30,953	29,406	24	17	3 to 5	5.3
39,465	32,888	31,157	29,599	27	19	3 to 5	5.3
40,841	34,034	32,243	30,631	25	17	3 to 4.5	5.1
40,927	34,106	32,311	30,695	28	19	3 to 4.5	5.1
42,475	35,396	33,533	31,856	26	17	3 to 4.5	4.9
44,108	36,757	34,822	33,081	27	17	3 to 4.5	4.7
45,742	38,118	36,112	34,307	28	17	3 to 4.5	4.6

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

PLANTING RATES FOR BRUSH-TYPE SEED METERS

APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

Transmission Sprockets		60 Cell Soybean Or High Rate Milo/ Grain Sorghum				Average Seed Spacing In Inches	48 Cell Specialty Soybean Or High Rate Acid-delinted Cotton				Average Seed Spacing In Inches	Speed Range (MPH)
Drive	Driven	30 Inch	36 Inch	38 Inch	40 Inch		30 Inch	36 Inch	38 Inch	40 Inch		
17	28	84,308	70,256	66,559	63,231	2.5	67,446	56,205	53,246	50,584	3.1	2 to 8
17	27	87,430	72,859	69,024	65,573	2.4	69,944	58,286	55,219	52,458	3.0	2 to 8
17	26	90,793	75,661	71,679	68,095	2.3	72,634	60,528	57,342	54,475	2.9	2 to 8
19	28	94,226	78,522	74,389	70,670	2.2	75,381	62,818	59,512	56,536	2.8	2 to 8
19	27	97,716	81,430	77,144	73,287	2.1	78,173	65,144	61,715	58,630	2.7	2 to 8
17	24	98,359	81,966	77,652	73,769	2.1	78,688	65,573	62,122	59,016	2.7	2 to 8
17	23	102,636	85,530	81,028	76,977	2.0	82,109	68,424	64,822	61,581	2.5	2 to 8
19	25	105,533	87,945	83,316	79,150	2.0	84,427	70,355	66,653	63,320	2.5	2 to 8
19	24	109,931	91,609	86,787	82,448	1.9	87,944	73,286	69,430	65,958	2.4	2 to 8
23	28	114,063	95,053	90,050	85,548	1.8	91,712	76,042	72,520	68,438	2.3	2 to 8
19	23	114,710	95,592	90,561	86,033	1.8	91,768	76,474	72,448	68,826	2.3	2 to 8
24	28	119,023	99,186	93,965	89,267	1.8	95,218	79,349	75,173	71,414	2.2	2 to 8
24	27	123,431	102,859	97,445	92,573	1.7	98,744	82,288	77,957	74,059	2.1	2 to 8
17	19	124,243	103,536	98,087	93,182	1.7	99,394	82,829	78,469	74,546	2.1	2 to 8
24	26	128,178	106,815	101,193	96,134	1.6	102,542	85,453	80,955	76,907	2.0	2 to 8
26	28	128,941	107,451	101,796	96,706	1.6	103,154	85,962	81,437	77,364	2.0	2 to 8
24	25	133,305	111,088	105,241	99,979	1.6	106,645	88,870	84,194	79,984	2.0	2 to 8
26	27	133,717	111,431	105,566	100,288	1.6	106,973	89,144	84,453	80,230	2.0	2 to 8
23	23	138,860	115,717	109,626	104,145	1.5	111,088	92,573	87,701	83,315	1.9	2 to 8
27	26	144,201	120,167	113,843	108,150	1.4	115,360	96,134	91,074	86,520	1.8	2 to 8
24	23	144,897	120,748	114,393	108,673	1.4	115,918	96,598	91,514	86,938	1.8	2 to 8
25	23	150,935	125,779	119,159	113,201	1.4	120,747	100,622	95,326	90,560	1.7	2 to 8
19	17	155,196	129,330	122,523	116,397	1.3	124,157	103,464	98,019	93,118	1.7	2 to 8
27	24	156,217	130,181	123,329	117,163	1.3	124,974	104,146	98,664	93,730	1.7	2 to 8
28	24	162,003	135,003	127,897	121,502	1.3	129,603	108,002	102,318	97,202	1.6	2 to 8
23	19	168,093	140,078	132,705	126,070	1.2	134,475	112,062	106,165	100,856	1.6	2 to 8
28	23	169,047	140,872	133,458	126,785	1.2	135,237	112,698	106,766	101,429	1.5	2 to 8
24	19	175,402	146,168	138,475	131,551	1.2	140,322	116,934	110,781	105,242	1.5	2 to 8
25	19	182,710	152,259	144,245	137,033	1.1	146,168	121,806	115,395	109,626	1.4	2 to 8
23	17	187,869	156,558	148,318	140,902	1.1	150,296	125,246	118,654	112,722	1.4	2 to 8
26	19	190,019	158,349	150,015	142,514	1.1	152,014	126,678	120,011	114,011	1.4	2 to 7
27	19	197,327	164,439	155,785	147,995	1.1	157,862	131,552	124,627	118,397	1.3	2 to 7
28	19	204,635	170,530	161,554	153,477	1.0	163,709	136,424	129,243	122,781	1.3	2 to 7
26	17	212,374	176,978	167,664	159,280	0.9	169,899	141,582	134,131	127,424	1.2	2 to 7
27	17	220,542	183,785	174,112	165,407	0.9	176,434	147,029	139,289	132,325	1.2	2 to 7
28	17	228,710	190,592	180,561	171,533	0.9	182,968	152,474	144,448	137,226	1.1	2 to 7

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information.

NOTE: When using the 2 to 1 Drive Reduction Package, rates will be approximately 1/2 of given numbers.

IMPORTANT: Always check seed population in the field to ensure planting rates are correct.

PLANTING RATES FOR BRUSH-TYPE SEED METERS (Continued)

APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

Transmission Sprockets		36 Cell Acid-delinted Large Cotton				Average Seed Spacing In Inches	30 Cell Milo/Grain Sorghum Or Acid-delinted Cotton				Average Seed Spacing In Inches	Speed Range (MPH)
Drive	Driven	30 Inch	36 Inch	38 Inch	40 Inch		30 Inch	36 Inch	38 Inch	40 Inch		
17	28	50,585	42,154	39,935	37,938	4.1	42,154	35,128	33,279	31,615	5.0	2 to 8
17	27	52,458	43,715	41,414	39,343	4.0	43,715	36,429	34,512	32,786	4.8	2 to 8
17	26	54,475	45,396	43,007	40,856	3.8	45,396	37,830	35,839	34,047	4.6	2 to 8
19	26	56,536	47,113	44,634	42,402	3.7	47,113	39,261	37,195	35,335	4.4	2 to 8
19	27	58,630	48,858	46,286	43,973	3.6	48,858	40,715	38,572	36,644	4.3	2 to 8
17	24	59,016	49,180	46,591	44,262	3.5	49,180	40,983	38,826	36,885	4.3	2 to 8
17	23	61,582	51,318	48,617	46,186	3.4	51,318	42,765	40,514	38,488	4.1	2 to 8
19	25	63,320	52,766	49,990	47,490	3.3	52,767	43,972	41,658	39,575	4.0	2 to 8
19	24	65,958	54,965	52,073	49,469	3.2	54,965	45,804	43,394	41,224	3.8	2 to 8
23	28	68,438	57,031	54,030	51,329	3.1	57,032	47,526	45,025	42,774	3.7	2 to 8
19	23	68,826	57,355	54,336	51,619	3.0	57,355	47,796	45,280	43,016	3.6	2 to 8
24	28	71,413	59,512	56,380	53,561	2.9	59,511	49,593	46,983	44,634	3.5	2 to 8
24	27	74,058	61,716	58,468	55,544	2.8	61,715	51,430	48,723	46,287	3.4	2 to 8
17	19	74,545	62,122	58,852	55,909	2.8	62,121	51,768	49,043	46,591	3.4	2 to 8
24	26	76,907	64,090	60,716	57,680	2.7	64,089	53,408	50,597	48,067	3.3	2 to 8
26	28	77,365	64,471	61,078	58,024	2.7	64,471	53,726	50,898	48,353	3.2	2 to 8
24	25	79,984	66,653	63,145	59,988	2.6	66,653	55,544	52,621	49,990	3.1	2 to 8
26	27	80,230	66,858	63,340	60,173	2.6	66,858	55,715	52,783	50,144	3.1	2 to 8
23	23	83,316	69,430	65,776	62,486	2.5	69,430	57,858	54,813	52,072	3.0	2 to 8
27	26	86,520	72,101	68,305	64,890	2.4	72,100	60,084	56,921	54,075	2.9	2 to 8
24	23	86,939	72,449	68,635	65,203	2.4	72,449	60,374	57,196	54,336	2.9	2 to 8
25	23	90,560	75,467	71,495	67,920	2.3	75,467	62,889	59,579	56,600	2.8	2 to 8
19	17	93,118	77,598	73,514	69,839	2.3	77,598	64,665	61,262	58,199	2.7	2 to 8
27	24	93,731	78,109	73,998	70,297	2.2	78,109	65,091	61,665	58,581	2.7	2 to 8
28	24	97,202	81,001	76,739	72,901	2.2	81,002	67,501	63,949	60,751	2.6	2 to 8
23	19	100,856	84,047	79,624	75,642	2.1	84,047	70,039	66,353	63,035	2.5	2 to 8
28	23	101,428	84,523	80,075	76,072	2.1	84,523	70,436	66,729	63,393	2.5	2 to 8
24	19	105,241	87,701	83,086	78,931	2.0	87,701	73,084	69,238	65,776	2.4	2 to 8
25	19	109,626	91,355	86,546	82,219	1.9	91,355	76,129	72,122	68,516	2.3	2 to 8
23	17	112,722	93,935	88,991	84,541	1.9	93,935	78,279	74,159	70,451	2.2	2 to 8
26	19	114,011	95,009	90,008	85,508	1.8	95,009	79,174	75,007	71,257	2.2	2 to 7
27	19	118,397	98,664	93,470	88,798	1.8	98,664	82,220	77,892	73,998	2.1	2 to 7
28	19	122,782	102,318	96,932	92,086	1.7	102,318	85,265	80,777	76,738	2.0	2 to 7
26	17	127,424	106,187	100,598	95,568	1.6	106,187	88,489	83,832	79,640	2.0	2 to 7
27	17	132,325	110,272	104,467	99,244	1.6	110,271	91,893	87,056	82,703	1.9	2 to 7
28	17	137,226	114,355	108,336	102,919	1.5	114,355	95,296	90,280	85,766	1.8	2 to 7

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information.

NOTE: When using the 2 to 1 Drive Reduction Package, rates will be approximately 1/2 of given numbers.

IMPORTANT: Always check seed population in the field to ensure planting rates are correct.

PLANTING RATES FOR BRUSH-TYPE SEED METERS (Continued)
APPROXIMATE HILLS/ACRE FOR VARIOUS ROW WIDTHS

Due to variations in cotton seed size, meters equipped with the 12 cell acid-delinted hill-drop cotton disc will plant from 3 to 6 seeds per cell.

To determine planter transmission setting, **determine desired hill spacing and select the transmission ratio closest to the hill spacing in inches on the chart. To decrease population increase spacing. To increase population decrease spacing.**

To determine population per acre, **determine average seeds per hill and hills per acre by doing a field check. Measure 1/1000 of an acre (1/1000 acre = Length of row 17' 5" for 30" row widths, 14' 6" for 36" row widths, 13' 10" for 38" row widths and 13' 1" for 40" row widths). Multiply average seeds per hill by hills per acre. EXAMPLE: 4 seeds per hill x (13 hills x 1000) = 52,000**

Transmission Sprockets		NUMBER OF HILLS PER ACRE 12 Cell Hill-drop Cotton, Acid-delinted				Average Hill Spacing In Inches	Speed Range (MPH)
Drive	Driven	30 Inch	36 Inch	38 Inch	40 Inch		
17	28	16,862	14,051	13,312	12,646	12.4	2 to 8
17	27	17,486	14,572	13,805	13,114	12.2	2 to 8
17	26	18,158	15,132	14,336	13,619	11.5	2 to 8
19	28	18,845	15,704	14,878	14,134	11.1	2 to 8
19	27	19,543	16,286	15,429	14,658	10.7	2 to 8
17	24	19,672	16,393	15,530	14,754	10.6	2 to 8
17	23	20,527	17,106	16,206	15,395	10.2	2 to 8
19	25	21,107	17,589	16,663	15,830	9.9	2 to 8
19	24	21,986	18,322	17,358	16,490	9.5	2 to 8
23	28	22,813	19,010	18,010	17,110	9.2	2 to 8
19	23	22,942	19,118	18,112	17,206	9.1	2 to 8
24	28	23,804	19,837	18,793	17,854	8.8	2 to 8
24	27	24,686	20,572	19,489	18,515	8.5	2 to 8
17	19	24,848	20,707	19,617	18,596	8.4	2 to 8
24	26	25,636	21,363	20,239	19,227	8.2	2 to 8
26	28	25,788	21,490	20,359	19,341	8.1	2 to 8
24	25	26,661	22,218	21,048	19,996	7.8	2 to 8
26	27	26,743	22,286	21,113	20,058	7.8	2 to 8
23	23	27,772	23,143	21,925	20,829	7.5	2 to 8
27	26	28,840	24,034	22,768	21,630	7.3	2 to 8
24	23	28,980	24,150	22,878	21,734	7.2	2 to 8
25	23	30,187	25,156	23,832	22,640	6.9	2 to 8
19	17	31,039	25,866	24,505	23,280	6.7	2 to 8
27	24	31,244	26,036	24,666	23,432	6.7	2 to 8
28	24	32,401	27,000	25,580	24,300	6.5	2 to 8
23	19	33,619	28,016	26,541	25,214	6.2	2 to 8
28	23	33,809	28,174	26,692	25,357	6.2	2 to 8
24	19	35,080	29,234	27,695	26,310	6.0	2 to 8
25	19	36,542	30,452	28,849	27,406	5.7	2 to 8
23	17	37,574	31,312	29,664	28,180	5.6	2 to 8
26	19	38,004	31,670	30,003	28,503	5.5	2 to 7
27	19	39,466	32,888	31,157	29,599	5.3	2 to 7
28	19	40,927	34,106	32,311	30,695	5.1	2 to 7
26	17	42,475	35,396	33,533	31,856	4.9	2 to 7
27	17	44,108	36,757	34,822	33,081	4.7	2 to 7
28	17	45,742	38,118	36,112	34,306	4.6	2 to 7

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information.

NOTE: When using the 2 to 1 Drive Reduction Package, rates will be approximately 1/2 of given numbers.

IMPORTANT: Always check seed population in the field to ensure planting rates are correct.

DRY INSECTICIDE APPLICATION RATES
APPROXIMATE POUNDS/ACRE AT 5 MPH FOR VARIOUS ROW WIDTHS

Meter Setting	30 Inch	36 Inch	38 Inch	40 Inch
CLAY GRANULES				
10	5.1	4.3	4.0	3.8
11	5.6	4.7	4.4	4.2
12	6.3	5.3	5.0	4.7
13	7.1	5.9	5.6	5.3
14	7.9	6.6	6.2	5.9
15	8.8	7.3	6.9	6.6
16	9.9	8.3	7.8	7.4
17	11.0	9.2	8.7	8.3
18	11.8	9.8	9.3	8.9
19	13.5	11.3	10.7	10.1
20	14.6	12.2	11.5	11.0
21	16.0	13.3	12.6	12.0
22	16.9	14.1	13.3	12.7
23	17.7	14.8	14.0	13.3
24	19.4	16.2	15.3	14.6
25	21.5	17.9	17.0	16.1
26	23.7	19.8	18.7	17.8
27	24.8	20.7	19.6	18.6
28	26.2	21.8	20.7	19.7
29	28.7	23.9	22.7	21.5
30	30.5	25.4	24.1	22.9
SAND GRANULES				
5	3.0	2.5	2.4	2.3
6	5.0	4.2	3.9	3.8
7	5.5	4.6	4.3	4.1
8	6.5	5.4	5.1	4.9
9	8.0	6.7	6.3	6.0
10	9.2	7.7	7.3	6.9
11	10.5	8.8	8.3	7.9
12	11.5	9.6	9.1	8.6
13	13.0	10.8	10.3	9.8
14	14.5	12.1	11.4	10.9
15	16.0	13.3	12.6	12.0
16	18.0	15.0	14.2	13.5
17	20.0	16.7	15.8	15.0
18	22.5	18.8	17.8	16.9
19	25.0	20.8	19.7	18.8
20	26.5	22.1	20.9	19.9
21	28.5	23.8	22.5	21.4
22	30.5	25.4	24.1	22.9
23	33.0	27.5	26.1	24.8
24	35.5	29.6	28.0	26.6
25	38.0	31.7	30.0	28.5

IMPORTANT: The above chart represents average values and should be used only as a starting point. The granular chemical flows through the given meter opening at a nearly uniform rate regardless of roller speed. Your actual rate will vary depending upon the insecticide you are using, your planting speed and your plant population. Planting speed/ground speed has the greatest effect on application rate.

Your actual rate must be checked in the field with the actual insecticide that you are using and at the speed and population at which you will be planting.

DRY HERBICIDE APPLICATION RATES
APPROXIMATE POUNDS/ACRE AT 5 MPH FOR VARIOUS ROW WIDTHS

CLAY GRANULES

Meter Setting	30 Inch	36 Inch	38 Inch	40 Inch
10	4.8	4.0	3.8	3.6
11	5.4	4.5	4.3	4.1
12	6.0	5.0	4.7	4.5
13	6.7	5.6	5.3	5.0
14	7.5	6.3	5.9	5.6
15	8.5	7.1	6.7	6.4
16	9.3	7.8	7.3	7.0
17	10.2	8.5	8.1	7.7
18	11.0	9.2	8.7	8.3
19	12.0	10.0	9.5	9.0
20	13.0	10.8	10.3	9.8
21	14.0	11.7	11.1	10.5
22	15.0	12.5	11.8	11.3
23	16.2	13.5	12.8	12.2
24	17.5	14.6	13.8	13.1
25	18.7	15.6	14.8	14.0
26	20.0	16.7	15.8	15.0
27	21.5	17.9	17.0	16.1
28	23.3	19.4	18.4	17.5
29	25.0	20.8	19.7	18.8
30	27.5	22.9	21.7	20.6

IMPORTANT: The above chart represents average values and should be used only as a starting point. The granular chemical flows through the given meter opening at a nearly uniform rate regardless of roller speed. Your actual rate will vary depending upon the herbicide you are using, your planting speed and your plant population. Planting speed/ground speed has the greatest affect on application rate.

Your actual rate must be checked in the field with the actual herbicide that you are using and at the speed and population at which you will be planting.

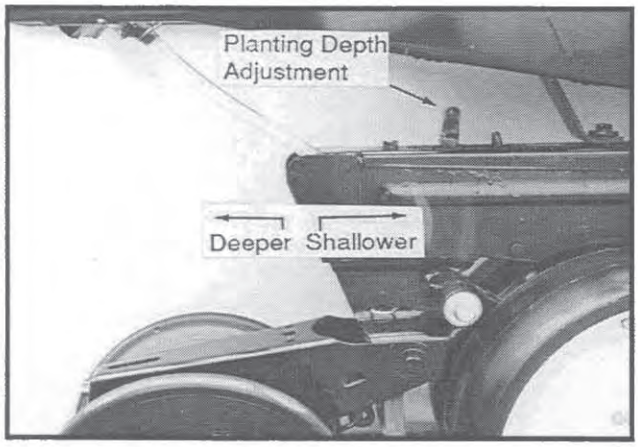
ROW UNIT OPERATION

PLANTING DEPTH

Planting depth is maintained by the row unit gauge wheels. To increase or decrease the planting depth, first raise the planter to remove weight from the wheels. Then lift the depth adjustment handle and reposition it forward to decrease depth or rearward to increase planting depth. Adjust all units to the same depth initially. Then lower the planter and check operation and planting depth of all row units. It may be necessary to readjust some rows to obtain uniform operation.

WARNING: Never work under the planter while in raised position without using safety lock-ups or safety stands.

50677-13



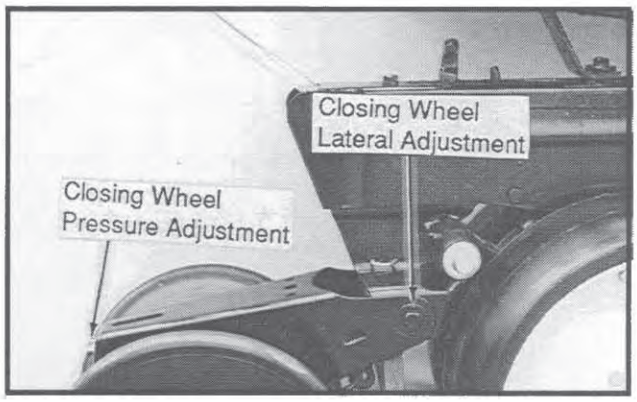
CLOSING WHEEL PRESSURE

After adjusting for planting depth, check the operation of the closing wheels. The closing wheels should gently close the row without sinking in or compacting the soil. To increase spring pressure on the closing wheels, turn the adjustment bolt located at the rear of the closing wheel arm in a clockwise direction. Turning the bolt counterclockwise decreases spring tension.

Adjust all row units to a similar setting. Tension setting can be determined by checking the position of the tension spring through the viewing slot on top of the closing wheel arm. When planting in light soil at average depth (approximately 2") start by setting the dimension between the bolt head and the rear edge of the spring plug at 2 inches. For medium soil at average depth, increase spring tension to obtain 1 1/2" between the bolt head and spring plug. For heavy soil and average planting depths of 2 to 3 inches, set the bolt dimension at approximately 1".

IMPORTANT: In field conditions that require a light soil setting of more than 2", it is recommended that a jam nut be placed on the bolt and tightened against the spring plug. This will prevent bolt loss when operating with minimum spring tension.

50677-13



CLOSING WHEEL LATERAL ADJUSTMENT

Slotted holes in the wheel arm stop allow for lateral adjustment of the closing wheel assembly.

Loosen hardware which attaches the closing wheel arm to the wheel arm stop. Shift the closing wheel assembly within the limits of the adjustment slots until the closing wheels are aligned with the row unit. Tighten hardware.

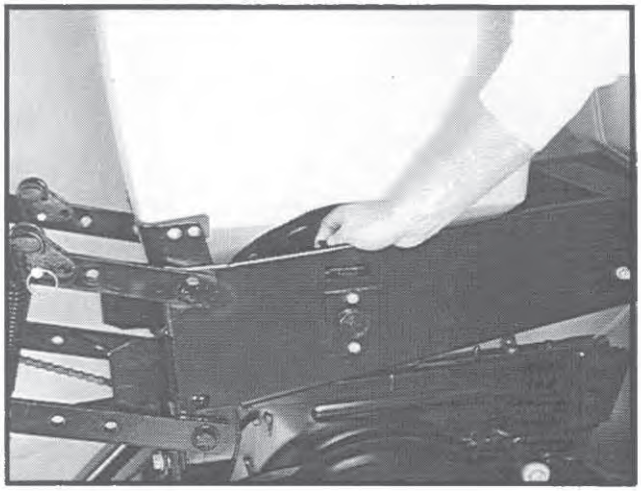
WARNING: Raise planter and install cylinder lockups or safety stands before making closing wheel adjustments.

ROW UNIT OPERATION

SEED METER DRIVE RELEASE

The seed meter drive is equipped with a clutch release mechanism that allows the drive to be disconnected from the seed metering unit. Disconnecting the drive allows the operator to check granular chemical application rates without dropping seed. It also allows one or more of the rows to be disconnected when finishing fields.

60569-43



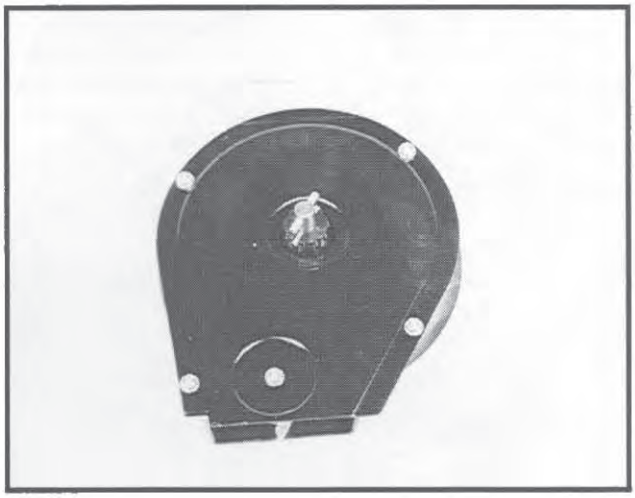
To disengage the drive, lift the release handle and pull outward until the handle locks in the slot in the side of the hopper side panel. To engage the row unit, lift and unlatch the handle. Spring tension will return the mechanism to the drive position.

Erratic seed spacing may result from misalignment between the drive coupler and seed meter input shaft. Misalignment may cause momentary stoppage of brush-type meter seed disc. Check alignment after initial installation. If adjustment is required, refer to "Meter Drive Adjustment" for correct procedure.

FINGER PICKUP CORN METER

Refer to the planting rate charts for recommended seed drive transmission sprocket combinations.

60620-14



IMPORTANT: To provide efficient operation of the finger pickup corn meters and extend the life of components, sprinkle a teaspoon of powdered graphite over the top of the seed twice daily. The graphite will filter down into the seed pickup mechanism and provide lubrication.

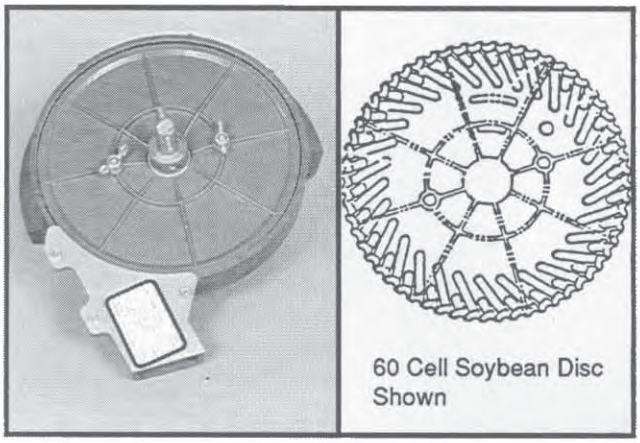
53761-1

See "Finger Pickup Corn Meter Troubleshooting" and "Finger Pickup Corn Meter Inspection/Adjustment" for additional information.

ROW UNIT OPERATION

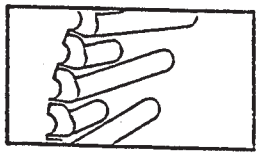
BRUSH-TYPE SEED METER

60607-40

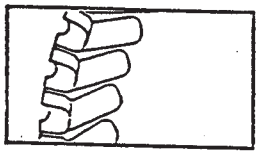


The following seed discs are available for use with the brush-type seed meter:

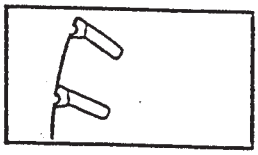
Soybean: *60 cells to meter seed sizes from 2200 to 4000 seeds per pound (Black color-coded).*



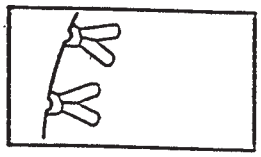
Specialty soybean: *48 cells to meter seed sizes from 1400 to 2200 seeds per pound (Dark blue color-coded).*



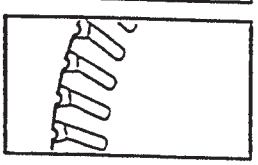
Small milo/grain sorghum: *30 cells to meter seed sizes from 14,000 to 20,000 seeds per pound (Red color-coded).*



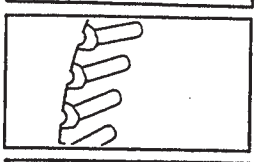
Large milo/grain sorghum: *30 cells to meter seed sizes from 10,000 to 16,000 seeds per pound (Light blue color-coded).*



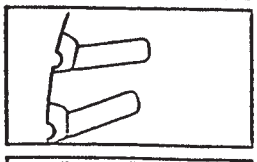
High rate milo/grain sorghum: *60 cells to meter seed sizes from 12,000 to 18,000 seeds per pound (Red color-coded).*



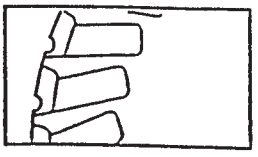
High rate large milo/grain sorghum: *60 cells to meter seed sizes from 10,000 to 14,000 seeds per pound (Yellow color-coded).*



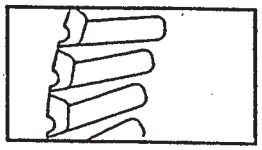
Cotton, acid-delinted: *30 cells to meter seed sizes from 4200 to 5200 seeds per pound (White color-coded).*



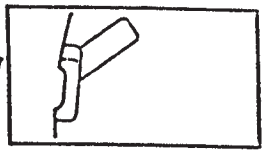
Large cotton, acid-delinted: *36 cells to meter seed sizes 3800 to 4400 seeds per pound (Tan color-coded).*



High rate cotton, acid-delinted: *48 cells to meter seed sizes 4200 to 5200 seeds per pound (Light green color-coded).*



Hill-drop cotton, acid-delinted: *12 cells, 3 to 6 seeds/cell, to meter seed sizes from 4000 to 5200 seeds per pound (Brown color-coded).*



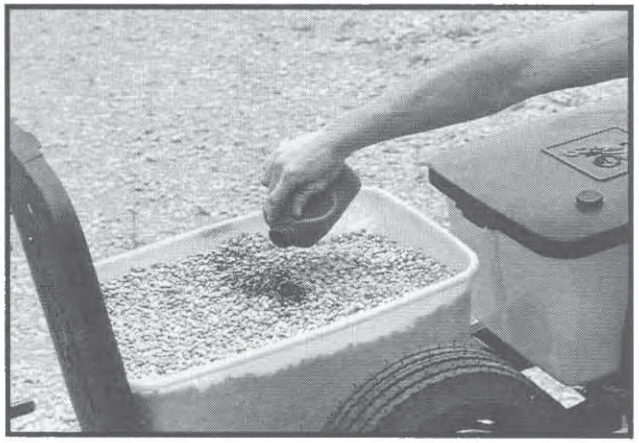
When installing the seed disc onto the meter hub, turn the disc counterclockwise while tightening the two wing nuts that retain the disc. The seed disc should have only slight resistance when rotated counterclockwise after wing nuts are tight.

The brush-type seed meter attaches to the seed hopper in the same manner as the finger pickup corn meter. Secure to bottom of seed hopper with two 5/16" flanged hex nuts. DO NOT OVER TIGHTEN.

Erratic seed spacing may result from misalignment between the drive coupler and seed meter input shaft. Misalignment may cause momentary stoppage of seed disc. Check alignment after initial installation. If adjustment is required, refer to "Meter Drive Adjustment" for correct procedure.

IMPORTANT: Use powdered graphite or talc with each hopper fill of seed. Additional graphite or talc may be required to retard buildup of seed treatments on meter components. Frequency of monitor seed tube cleaning may be affected due to use of additional graphite or talc.

53761-1



One tablespoon of **powdered graphite** per hopper fill of seed should be added to the seed each time the hopper is filled. This prolongs the life of the seed meter components, reduces buildup of seed treatment on components in the meter and improves seed spacing.

Talc seed lubricant may be used in lieu of graphite to reduce seed treatment buildup on seed disc and meter components and will improve meter performance. Coat seed disc and brushes with talc before installing meter. Fill hopper 1/2 full of seed, add 1/4 cup of talc and mix thoroughly. Finish filling hopper, add another 1/4 cup of talc and mix thoroughly. Adjust rate of talc use as needed so all seeds are coated, while avoiding a buildup of talc in the bottom of the hopper. Humid conditions and/or small sized seeds with extra seed treatment may require as much as one cup of talc per hopper to prevent seed treatment buildup on seed discs and/or brushes.

CAUTION: Some liquid seed treatments or inoculants may create buildup on the seed disc or brush. Check frequently for proper population and/or seed delivery when using any liquid seed treatment. All seed treatment should be thoroughly mixed with the seed per the manufacturers' recommendations. Seed treatment dumped on top of the seed after the hopper is filled, and not mixed properly will cause bridging of the seed in the meter, reducing population or stopping the meter from planting. Additional graphite or talc may be required to retard buildup of seed treatments on meter components.

IMPORTANT: Foreign material, such as hulls, stems, etc., may affect seed delivery. Clean seed is required to ensure accurate seed metering from the brush-type seed meter. Seed discs should be removed daily to check for buildup of foreign material, such as hulls, in the seed meter or the brushes.

Refer to the planting rate charts in this manual for recommended seed drive transmission sprocket combinations.

SEED HOPPER

60620-69

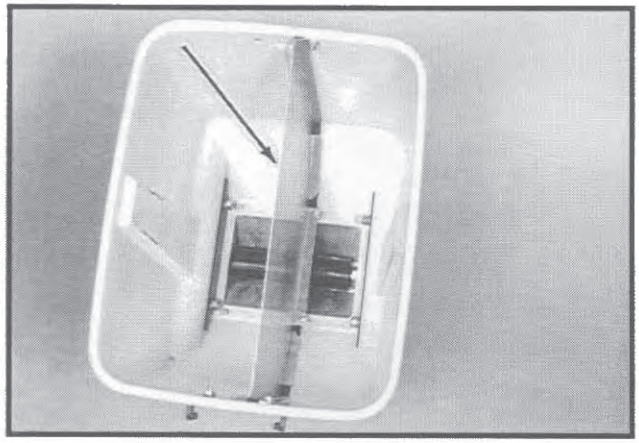
The seed hopper has a capacity of 1.6 bushels.

When filling the seed hopper use clean seed and make certain there are no foreign objects in the hopper. **Replace hopper lids after hoppers are filled to prevent the accumulation of dust or dirt in the seed meter which will cause premature wear.** See "Finger Pickup Corn Meter Lubrication" and/or "Brush-Type Seed Meter Lubrication".

Periodically empty the hoppers completely to remove any foreign objects and ensure proper seed meter operation. To empty hopper, disengage drive release and hopper latch and lift hopper off the hopper support. See "Meter Drive Release".

GRANULAR CHEMICAL HOPPER

61786-2



The granular chemical hopper has a 70 pound capacity. With the use of a hopper divider the hopper has two compartments with a 35 pound capacity in each.

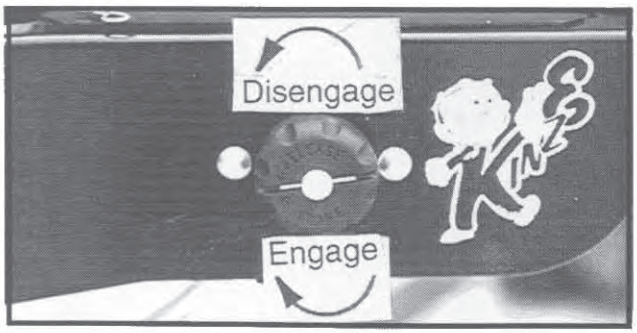
Be sure no foreign objects get into the hopper when it is being filled. Replace the hopper lids after filling the hoppers to prevent the accumulation of dirt and moisture.

The metering gate located on the bottom of the hopper regulates the application rate. See "Dry Insecticide and Dry Herbicide Application Rate Charts" in this manual. Calibrate using the chemical manufacturer's instructions.

⚠ DANGER: Agricultural chemicals can be dangerous. Improper selection or use can seriously injure persons, animals, plants, soil or other property. BE SAFE: Select the right chemical for the job. Handle it with care. Follow the instructions on the container label.

The granular chemical clutch drive coupler and meter shaft can be disengaged and engaged by turning the throwout knob located at the rear of the hopper support panel. To engage the drive, turn the knob 1/4 turn clockwise. To disengage the drive, turn the knob 1/4 turn counterclockwise. Slotted holes in the hopper support panel and clutch housing allow for alignment adjustment between the clutch drive coupler and meter shaft.

54948-18

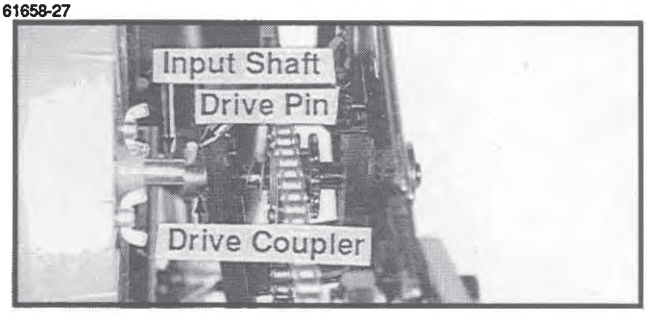


SEED METER DRIVE ADJUSTMENT

IMPORTANT: The seed meter drive coupler must be properly aligned with the meter input shaft.

Improper alignment between the drive coupler and input shaft of the meter can cause the meter housing to flex as the meter rotates. This continual flexing of the meter housing can cause damage to the housing. Any time the hopper support panel is removed or replaced vertical and horizontal alignment should be checked.

61658-27



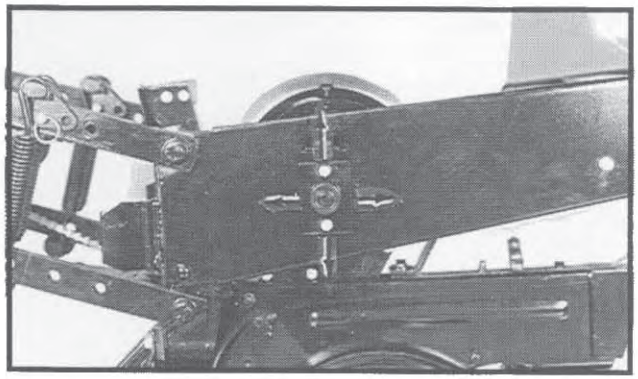
To check alignment:

- Inspect meter input shaft to make sure drive pin is centered.
- Install hopper with meter onto support panel. Latch hopper.
- Rotate meter input shaft so drive pin is vertical.
- Rotate drive clutch so slots in coupler are vertical.
- Engage clutch.
- Clutch coupler should engage meter shaft freely with equal amount of pin extending beyond each side of drive coupler.
- Disengage clutch.
- Rotate both meter shaft and drive clutch to the horizontal position.
- Re-engage clutch.
- Clutch coupler should engage meter shaft freely with equal amount of pin extending beyond each side of drive coupler.

To adjust drive clutch:

- Slightly loosen both 5/16" cap screws.
- Move clutch assembly to correct any misalignment.
- Tighten both 5/16" cap screws.

60569-12



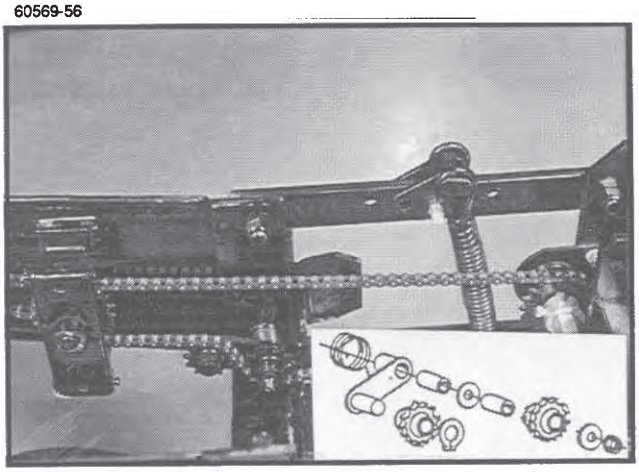
ROW UNIT OPERATION

ROW UNIT CHAIN ROUTING

For proper operation and to minimize wear, the row unit drive chains must be properly tensioned and aligned.

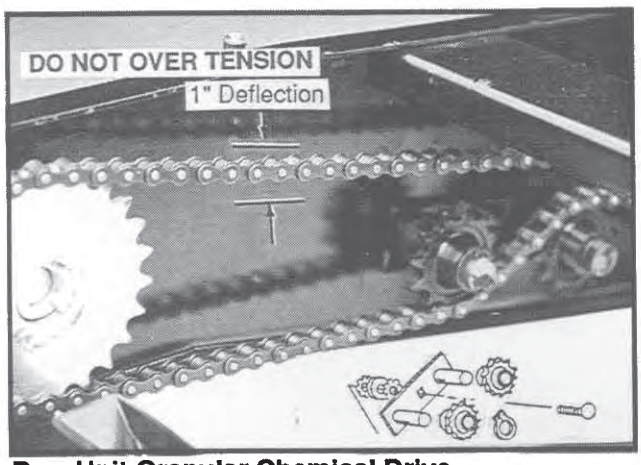
Inspect and replace weak, worn or broken springs and/or idlers and idler bushings.

60569-56



Row Unit Meter Drive

54948-12



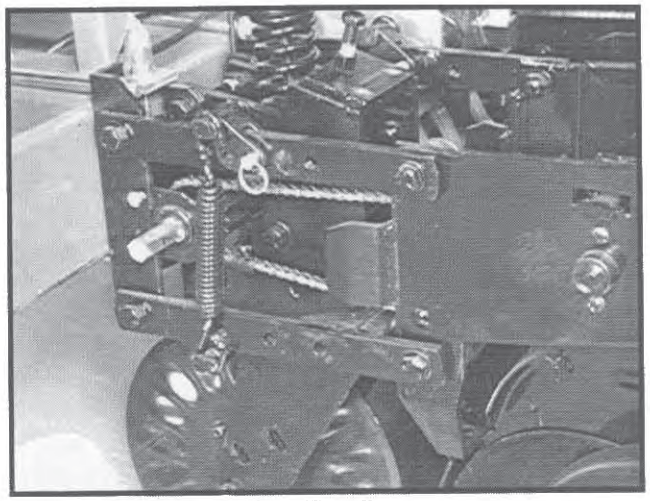
Row Unit Granular Chemical Drive

QUICK ADJUSTABLE DOWN FORCE SPRINGS

Quick adjustable down force springs are designed to increase penetration in hard soil and keep the row unit from bouncing in rough field conditions.

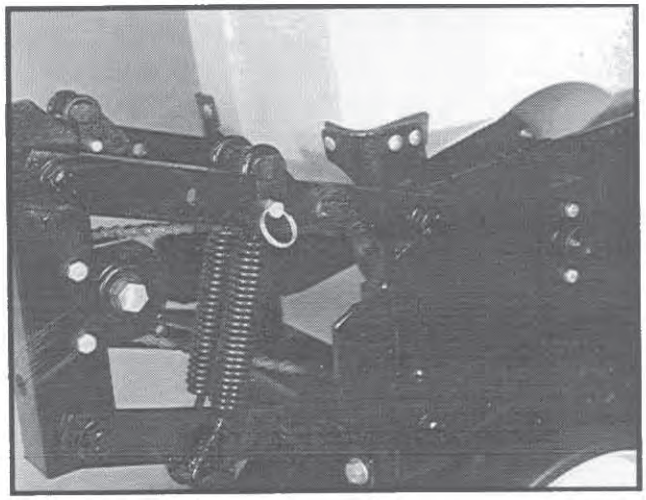
Two springs per row, one on the L.H. parallel arms and one on the R.H. parallel arms, are used unless equipped with row unit mounted no till coulters. Four springs per row are used with row unit mounted no till coulters. Two springs per row are used with frame mounted coulters, row unit mounted and frame mounted disc furrowers and row unit mounted bed levelers.

61703-4



Two Springs Per Row (Dual)

60569-33

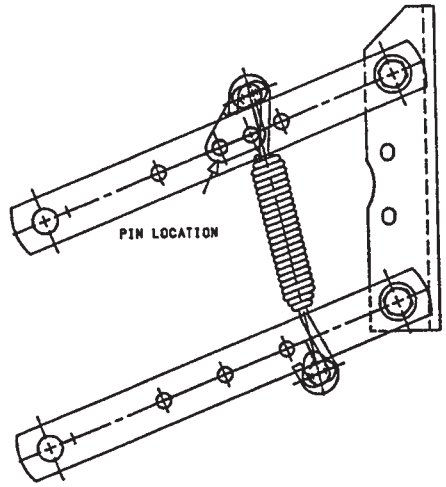


Four Springs Per Row (Quad)
(Used only in conjunction with row unit mounted no till coulters)

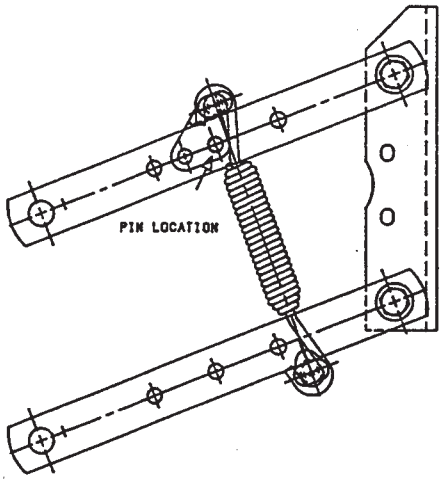
ROW UNIT OPERATION

There are four positions for spring tension adjustment. Position one allows for minimum down pressure and position four for maximum down pressure.

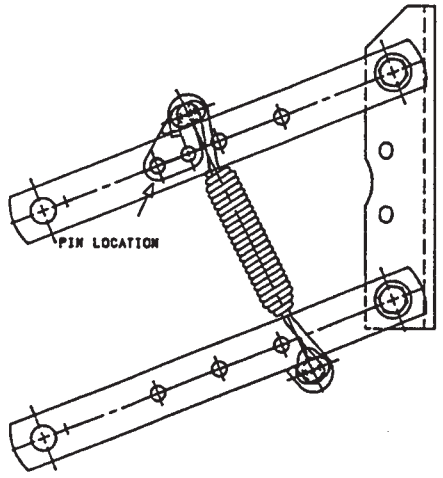
L0096



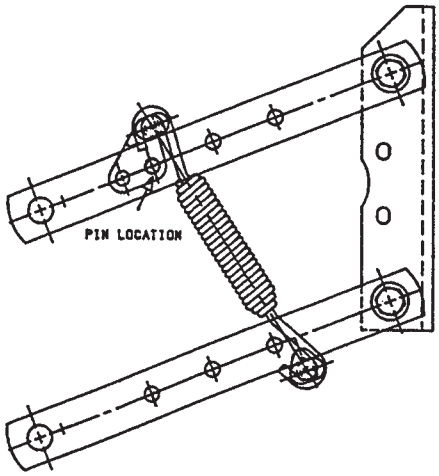
Position 1



Position 2



Position 3



Position 4

To adjust spring tension, raise planter and remove spring mount pin at top of spring. Slide mount to desired position and install pin.

NOTE: It is necessary for the operator to adjust springs according to field conditions. If springs are adjusted for too much down pressure for field conditions, it is possible for the row units to lift the planter to the extent that the drive wheels do not make sufficient contact. Too much down pressure in soft field conditions can cause the row unit to run too deep.

DANGER: Always install safety lockups or lower machine to the ground before working under or around the machine.

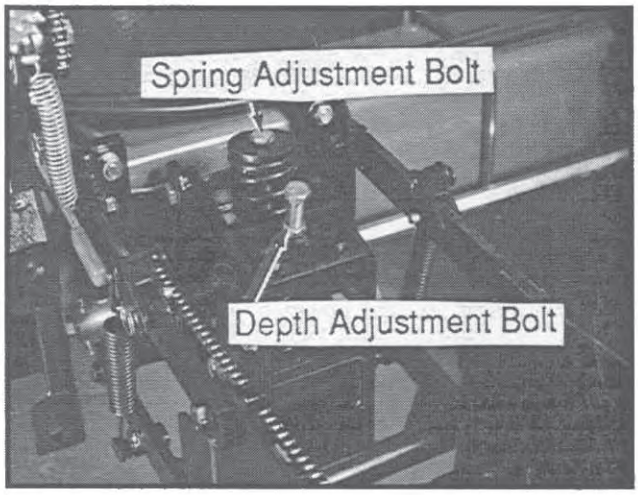
NOTE: Springs must always be installed with open side of spring hooks toward seed hopper to prevent binding on spring mount adjustment pin.

FRAME MOUNTED COULTER

The frame mounted coulter is designed to allow required spring down pressure on the coulter for maximum penetration while exerting less load shock on the row unit.

The frame mounted coulter can be used with or without the depth control bar installed. In most applications, especially in rocky planting conditions, the depth control bar **should not be used**. Use of the depth control bar transfers down force from the coulter to the row unit making less down force available to the coulter blade.

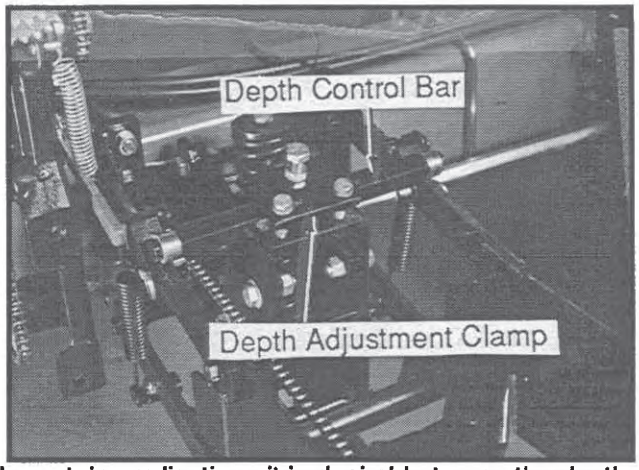
56314-14



DEPTH ADJUSTMENT
(Without Depth Control Bar Installed)

When the depth control bar is not used, operating depth of the coulter blade is determined by adjusting the depth adjustment bolt and positioning of the blade assembly in the fork mount. The depth adjustment bolt will stop downward travel of the coulter arm assembly. One turn of the adjusting bolt will change depth setting approximately 1/4". Initial setting of the depth adjustment bolt should be with approximately 1 3/8" of thread showing. With this setting and the bar height at 21", the coulter depth will be approximately 2" with coulter mounting spindle in top hole. Turn the adjustment bolt clockwise to decrease operating depth. Turn the depth adjustment bolt counterclockwise to increase operating depth.

56314-16

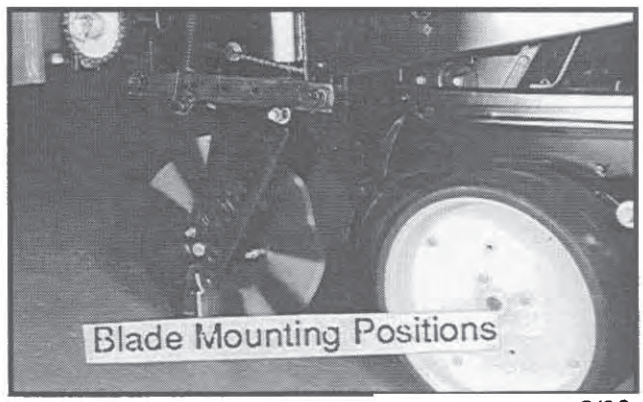


In certain applications it is desirable to use the depth control bar. In uneven terrain, use of the depth control bar allows greater depth control. The up and down movement of the row unit allows the coulter to move up and down at a rate of approximately 1/2 that of the row unit, maintaining a more uniform operating depth. When using the disc furrower attachment, the depth control bar should always be used as operating depth of the coulter is critical for the disc furrowers to operate with minimal gouging.

DEPTH ADJUSTMENT
(With Depth Control Bar Installed)

When using the depth control bar, down force springs must be located in the forward position and the depth adjustment bolt used only to attach the depth adjustment clamp to the coulter assembly. Operating depth of the coulter blade is adjusted by positioning the blade assembly in the fork mount. Four blade mounting adjustment positions are available at 1/2" increments. Initial position of the blade assembly should be the top hole. This position will locate the coulter blade approximately 1/4" shallower than the row unit opener blade. In heavy residue it may be desirable to position the blade assembly in the second position to insure that the residue is cut and not forced down into the seed zone. Additional holes are used to compensate for coulter blade wear.

56314-1



Down force adjustment is made by tightening or loosening the spring adjustment bolt. With the planter in the in the raised position, turn the bolt clockwise to increase down force or counterclockwise to decrease down force. Set all rows equally.

Compressed Spring Length (Including Washer)	Pounds Down Pressure With Blade 1/2" Above Maximum Down Position	Pounds Down Pressure With Blade 4" Above Maximum Down Position
13 5/16"	90	230
12 5/16"	190	330
Suggested initial setting		
11 5/16"	300	430

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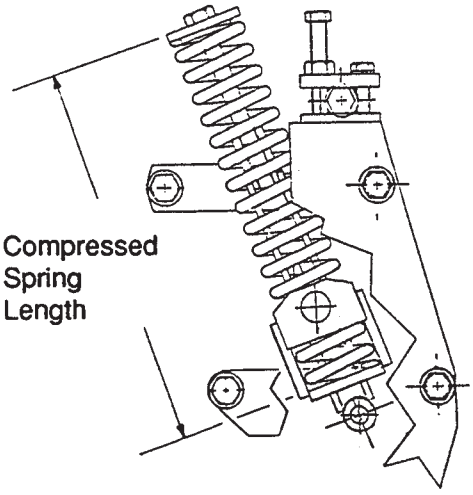
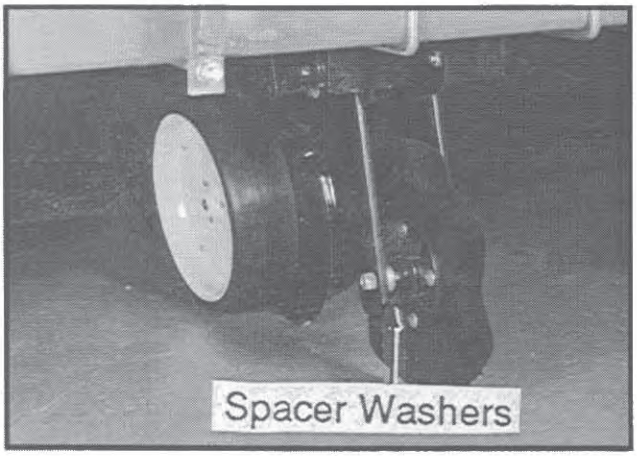


NOTE: Excessive down force may cause increased wear on components.

The coulter blade can be aligned with the row unit disc opener by moving the spacer washers from one side of the coulter blade hub to the other.

56314-12



Field adjustment should be made as needed. Operating height of the planter frame will affect operating depth of the frame mounted coulter.

DISC FURROWERS

(For use with Frame Mounted Coulter)

Disc furrowers for use with the frame mounted coulter may be equipped with either 12" solid blades or 12" notched blades.

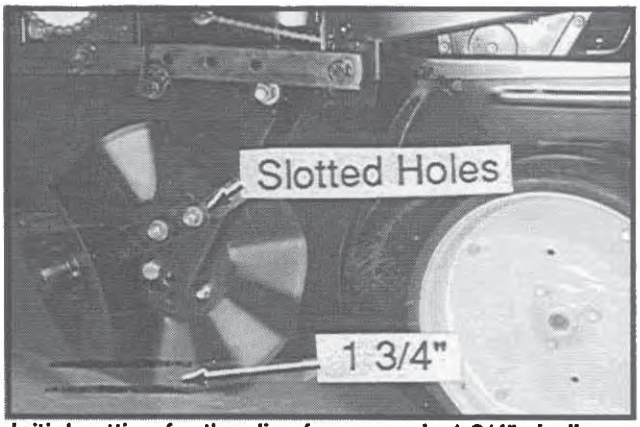
Disc furrowers are used to clear crop residue, dirt clods and dry soil from in front of the row units for a clean and smooth seed bed. Notched blades are used for heavier trash conditions. The notched blades cut crop residue and move it aside to prevent plugging or pushing the soil.

56314-19

Discs can be adjusted so front edges meet by adding spacer washers between the disc furrower arm and frame mounted coulter fork mount.

Slotted holes in the frame mounted coulter fork mount and in the disc furrower arm allow for vertical and horizontal adjustment. Discs can be adjusted so the front edges meet or one disc can be moved to the rear and the other to the front of the slot so cutting edge of one disc overlaps the edge of the other disc.

56314-17



Initial setting for the disc furrowers is 1 3/4" shallower than the coulter blade. Further adjustment may be desired for various applications.

NOTE: The depth control bar should always be used when the frame mounted coulter is equipped with disc furrowers.

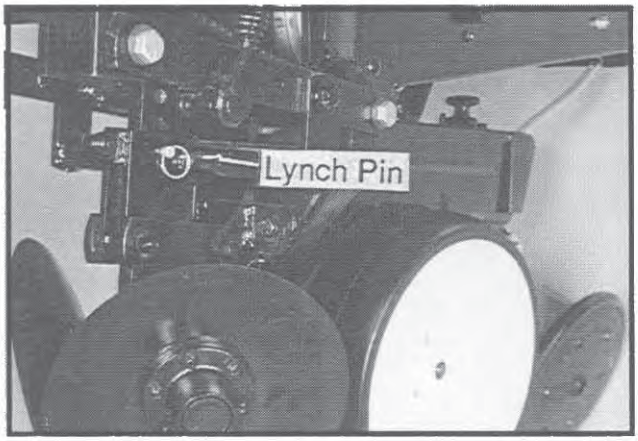
ROW UNIT OPERATION

ROW UNIT MOUNTED DISC FURROWER

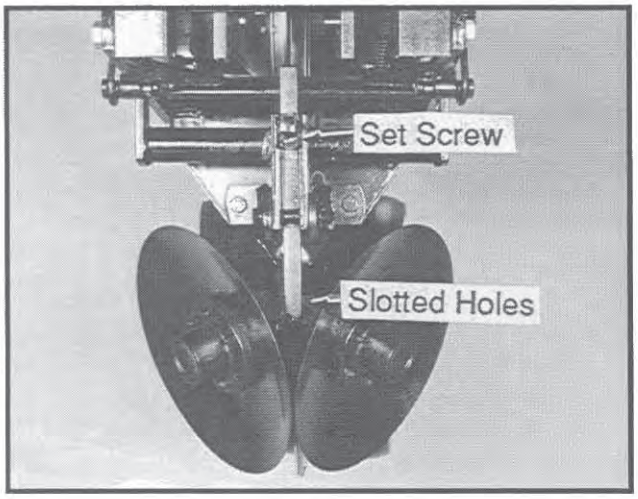
The row unit mounted disc furrower may be equipped with either 12" solid blades or 12" notched blades.

Disc furowers are used to clear crop residue, dirt clods and dry soil from in front of the row units for a clean and smooth seed bed. Notched blades are used for heavier trash conditions. The notched blades cut crop residue and move it aside to prevent plugging or pushing the soil.

59386-23



59386-20

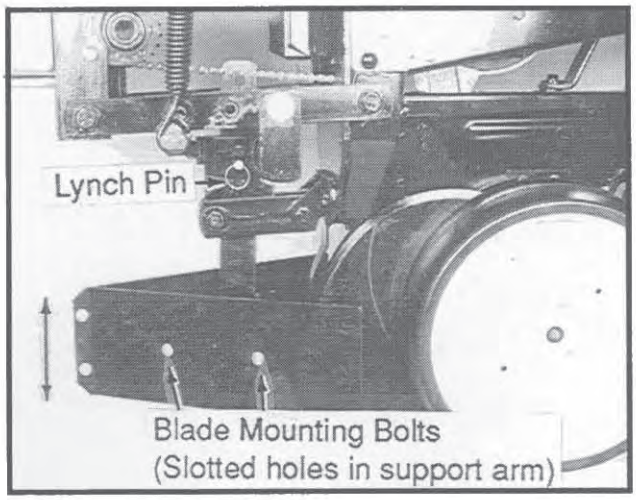


Vertical adjustment in 1/3" increments is possible by removing the lynch pin which secures the vertical support arm and moving the support arm up or down as required. Re-install lynch pin. Finer adjustment can be attained by removing the lynch pin and using the 5/8" x 2 1/4" set screw to clamp the support arm in the required position.

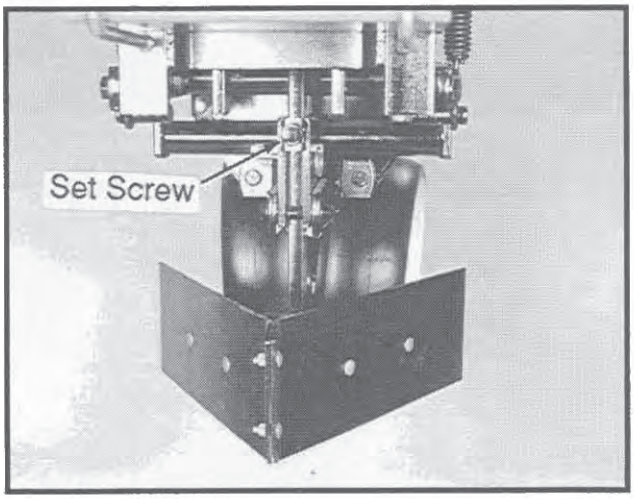
Slotted holes in the support arm where the discs are mounted allow fore and aft adjustment of the discs. Discs can be adjusted so the front edges meet or one disc can be moved to the rear and the other to the front of the slot so cutting edge of one disc overlaps the edge of the other disc. The dust cap must be removed to make these adjustments.

ROW UNIT MOUNTED BED LEVELER

59386-26



59386-30



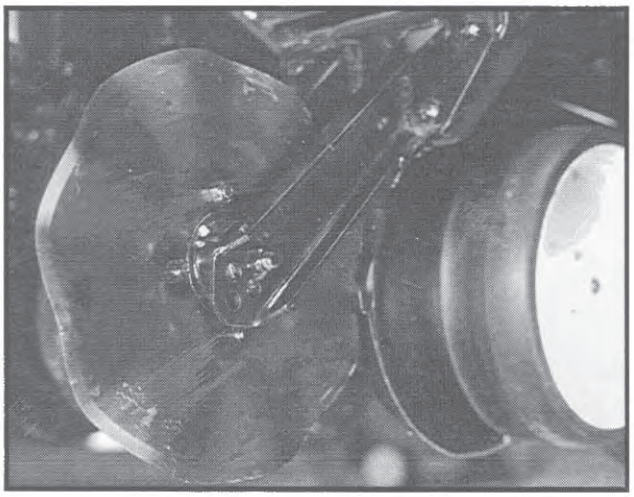
Vertical adjustment in 1/3" increments is possible by removing the lynch pin which secures the vertical support arm and moving the support arm up or down as required. Re-install lynch pin. Finer adjustment can be attained by removing the lynch pin and using the 5/8" x 2 1/4" set screw to clamp the support arm in the required position.

Slotted holes in the support arm where the blades are mounted allow tilting of the blades. The blades can be tilted up or down at the front for desired adjustment.

NOTE: The row unit mounted bed leveler is not compatible with row spacings less than 36".

ROW UNIT MOUNTED NO TILL COULTER

60569--42



Row unit mounted no till coulters with 1" rippled, 1" fluted or 3/4" fluted blades may be used on plateless row units. (1" fluted shown)

Four quick adjustable down force springs are required per row when using row unit mounted no till coulters. See "Quick Adjustable Down Force Springs".

For proper operation the coulter blade should be aligned in relation to the row unit double disc openers. The coulter assembly can be adjusted by loosening the four attaching bolts, moving coulter arm to align and tightening the four attaching bolts.

The coulter blade can be adjusted to one of four 1/2" incremental settings in the forked arm. Using the top adjustment hole places the 16" diameter coulter blade approximately 1/4" shallower than the row unit disc opener. Using the second adjustment hole from the top places the coulter blade approximately 1/4" below the row unit disc opener. Using the third adjustment hole places the coulter blade approximately 3/4" below the row unit disc opener and using the bottom adjustment hole places the coulter blade approximately 1 1/4" below the row unit disc opener. Initially the blade should be set in the highest position. As the coulter blade wears or the disc opener blades wear or for various planting conditions the blade may be adjusted to one of the three lower settings.

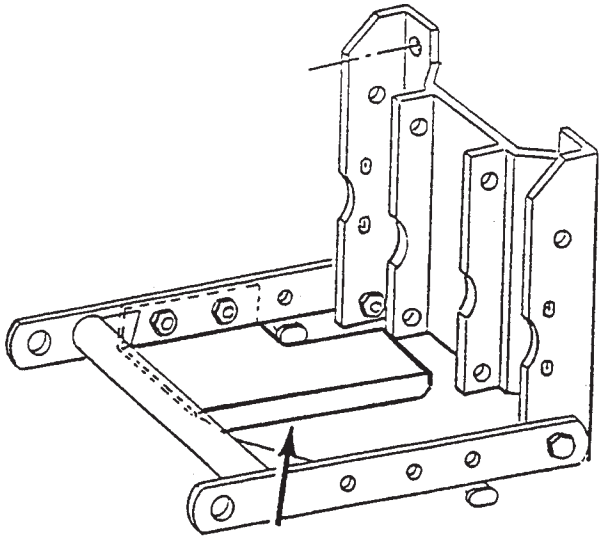
It is most desirable to run the coulter blade 1/4" shallower than the row unit disc opener so it won't disturb the seed bed below the seed trench opened by the double disc opener.

In heavy residue it may be necessary to run the coulter blade deeper to insure cutting of residue and prevent pushing residue into the seed zone.

Operating depth can be checked by setting the planter down on a level concrete floor and checking the relationship between the coulter blade and row unit opener blade. Make sure the planter is level and coulter is square with the planter frame and aligned with the row unit disc opener.

ROW UNIT CHAIN SHIELD

RUB015/RUB016



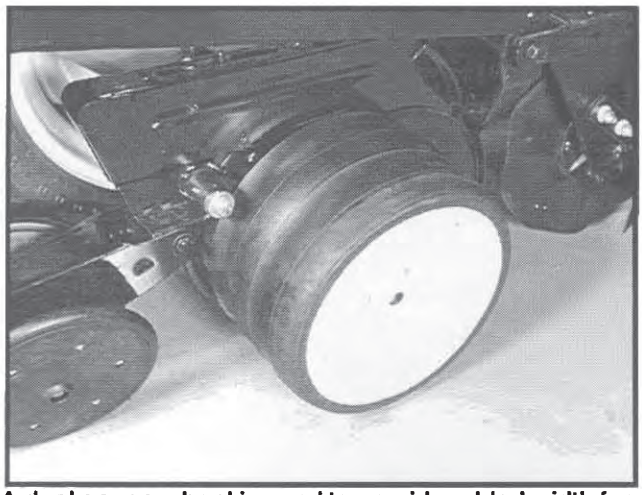
Row unit chain shields are designed for use on conventional row units when row unit mounted no till coulters are used. The shields CAN NOT BE USED on interplant push units or row units equipped with frame mounted coulters, row unit mounted disc furrowers or row unit mounted bed levelers.

The shield protects the row unit drive chain from damage caused by residue in no till conditions.

ROW UNIT OPERATION

DUAL GAUGE WHEEL

65249-11

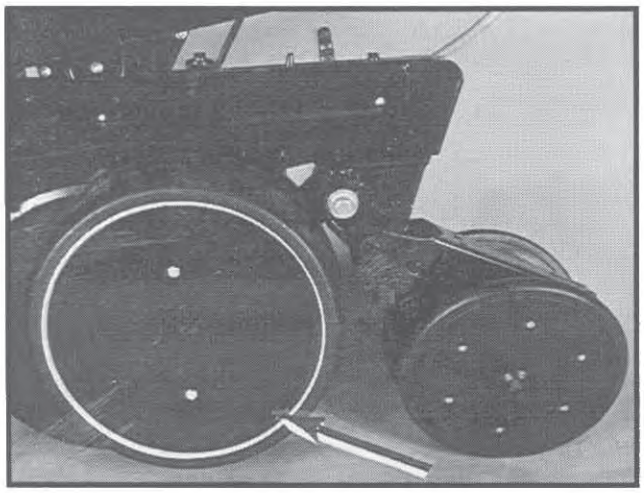


A dual gauge wheel is used to provide added width for additional row unit flotation in light sandy soil.

In some applications such as narrow row widths (less than 36")or where clearance is a problem, the added width of the dual gauge wheel may prevent its use.

ROW UNIT GAUGE WHEEL COVER

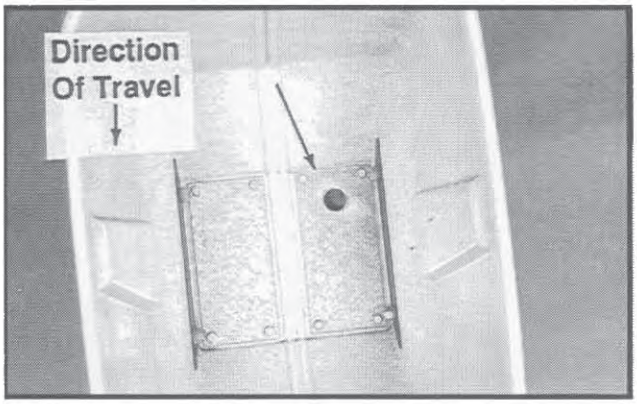
60607-37



The row unit gauge wheel cover when installed on the gauge wheel next to the drive wheels of the planter will aid in protecting the row unit from rock damage.

GRANULAR CHEMICAL RESTRICTOR PLATE

65249-18



The granular chemical restrictor plate is designed for use in the granular chemical hopper when granular chemical application rates below 4 pounds are desired.

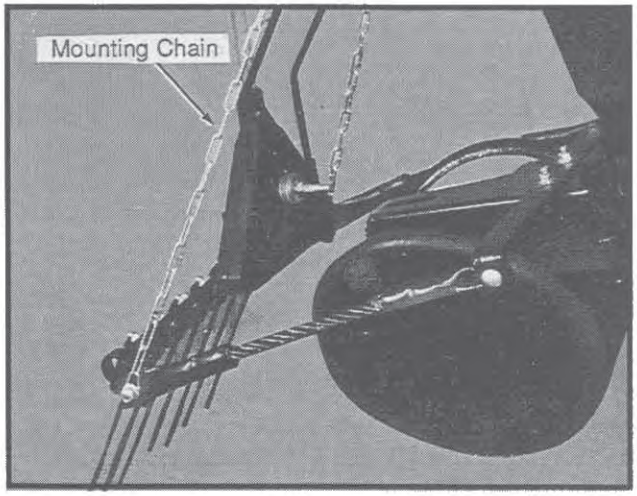
IMPORTANT: Check application rate of all rows in the field with the granular chemical you are using and at the speed and population at which you will be planting. See "Checking Granular Chemical Application Rate".

DANGER: Agricultural chemicals can be dangerous. Improper selection or use can seriously injure persons, animals, plants, soil or other property. BE SAFE: Select the right chemical for the job. Handle it with care. Follow the instructions on the container label.

SPRING TOOTH INCORPORATOR

The spring tooth incorporator smooths the soil behind the row unit and incorporates granular chemicals. The two mounting chains on each spring tooth incorporator should be adjusted so there is approximately 1/8" slack in the chain when the unit is lowered to planting position.

00138-17



CLOSING WHEEL TROUBLESHOOTING

Problem	Possible Cause	Solution
Closing wheels leave severe imprint in soil.	Too much closing wheel down pressure.	Adjust closing wheel pressure.
Closing wheels not firming soil around seed.	Insufficient closing wheel down pressure.	Adjust closing wheel pressure.
Closing wheel running on top of seed furrow.	Improper centering.	Align. See "Closing Wheel Lateral Adjustment".

BRUSH-TYPE SEED METER TROUBLESHOOTING

Problem	Possible Cause	Solution
Low count.	Meter RPM's too high.	Reduce planting speed.
	Misalignment between drive clutch and meter.	See "Meter Drive Adjustment".
	Seed sensor not picking up all seeds dropped.	Clean seed tube. Switch meter to different row. If problem stays with same row, replace sensor.
	Lack of lubrication causing seeds not to release from disc properly.	Use graphite or talc as recommended.
	Seed size too large for seed disc being used.	Switch to smaller seed or appropriate seed disc. See "Brush-Type Seed Meter" for proper seed disc for size of seed being used.
	Seed treatment buildup in meter.	Reduce amount of treatment used and/or thoroughly mix treatment with seed.
Low count at low RPMs and higher count at higher RMPs.	Foreign material odged in upper brush.	Remove seed disc and remove foreign material from between brush holder and bristles. Clean with compressed air.
	Worn upper brush.	Replace.
Low count at higher RPMs and normal count at low RPMs.	Seed disc worn in the agitation groove area.	Replace disc.
High count.	Seed size too small for seed disc.	Switch to larger seed or appropriate seed disc.
	Incorrect seed rate transmission setting.	Reset transmission.
Upper brush layed back.	Seed treatment buildup on brush.	Remove brush. Wash with soap and water. Dry thoroughly before reinstalling.
	Buildup of foreign material at base of brush.	Remove brush holder and brush. Clean with compressed air. Reinstall.

FINGER PICKUP CORN METER TROUBLESHOOTING

Problem	Possible Cause	Solution
One row not planting seed.	Drive release not engaged.	Engage drive release mechanism.
	Foreign material in hopper.	Clean hopper and finger carrier mechanism.
	Seed hopper empty.	Fill seed hopper.
	Pin sheared in drive release sprocket.	Replace pin. Inspect meter for obstructions or defective parts.
	Row unit drive chain off of sprocket or broken.	Check drive chain.
Drive release does not engage properly.	Drive release shaft is not aligned properly with meter drive shaft.	Align drive mechanism. See "Meter Drive Adjustment".
Unit is skipping.	***Foreign material or obstruction in meter.***	***Clean out and inspect.***
	Finger holder improperly adjusted.	***Adjust to proper setting. (22 to 25 in. lbs. rolling torque)***
	Broken fingers.	***Replace fingers and/or springs as required.***
	Planting too slowly.	Increase planting speed to within recommended range.
Planting too many doubles.	Planting too fast.	Stay within recommended speed range.
	Loose finger holder.	***Adjust to specs. (22 to 25 in. lbs. rolling torque)***
	Worn brush in carrier plate.	***Inspect and replace if necessary.***
Over planting.	***Worn carrier plate.***	***Inspect and replace if necessary.***
Under planting.	***Belt installed backwards.***	***Remove and install correctly.***
	Weak springs.	***Replace.***
	Spring not properly installed.	***Remove finger holder and correct.***
	Seed belt catching or dragging.	***Replace belt.***
	Brush dislodging seed.	***Replace brush.***
Irregular or incorrect seed spacing.	Driving too fast.	Check chart for correct speed.
	Wrong tire pressure.	Inflate tires to correct air pressure.
	Drive wheels slipping.	Reduce down pressure on row unit down force springs.
	Wrong sprockets.	Check seed rate charts for correct sprocket combinations.
Seed spacing not as indicated in charts.	Wrong tire pressure.	Inflate tires to correct air pressure.
	Inconsistent seed size.	Do field check and adjust sprockets accordingly.
	Wrong sprockets.	Check chart for correct sprocket combination.
	Charts are approximate.	Slight variations due to wear in meter components and tire slippage due to field conditions may produce seed spacing variations.
	Stiff or worn drive chains.	Replace chains.
Scattering of seeds.	Planting too fast.	Reduce planting speed.
	Seed tube improperly installed.	Check seed tube installation.
	Seed tube worn or damaged.	Replace seed tube.
Seed tubes and/or openers plugging.	Allowing planter to roll backward when lowering.	Lower planter only when tractor is moving forward.
Inconsistent seed depth.	Rough seed bed.	Adjust down pressure springs. Reduce planting speed.
	Partially plugged seed tube.	Inspect and clean.
	Seed tube improperly installed.	Install properly.

LUBRICATION

The following pages show the locations of all lubrication points. Proper lubrication of all moving parts will help ensure efficient operation of your KINZE planter and prolong the life of friction producing parts.

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

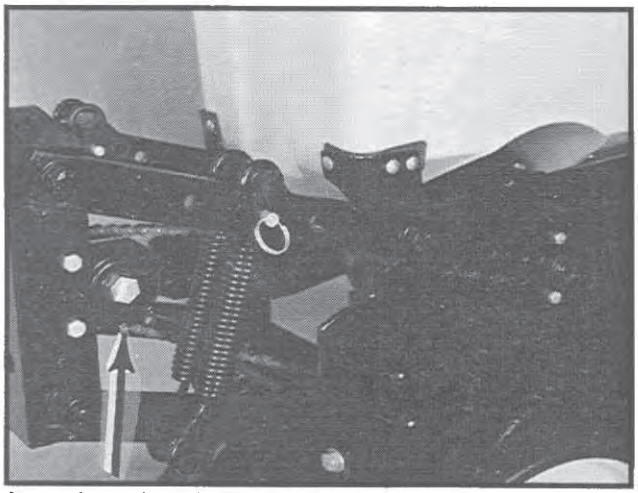
LUBRICATION SYMBOLS

Lubricate at frequency indicated with an SAE multipurpose type grease.

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

SEALED BEARINGS

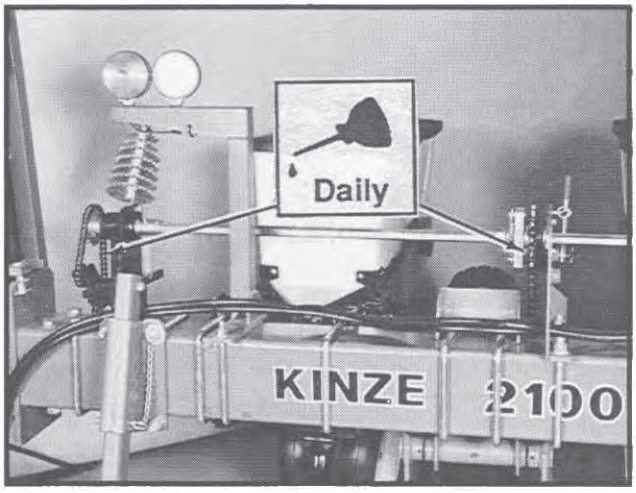
60569-33



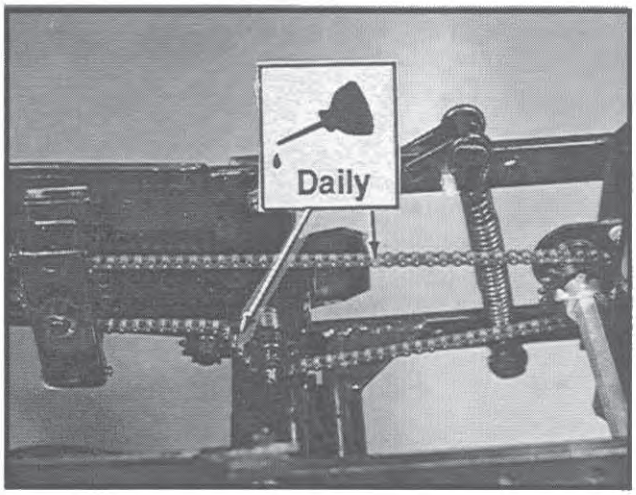
A number of sealed bearings are used on your KINZE planter to provide trouble free operation. These are located in such areas as the drive shaft, row units and transmission bearings. Sealed bearings are lubricated for life, and due to the seals, relubrication is not practical.

DRIVE CHAINS

61048-26



60569-56



All transmission and drive chains should be lubricated daily with a high quality SAE 10 weight oil or a quality spray lubricant. Extreme operating conditions such as dirt, temperature or speed may require more frequent lubrication. If a chain becomes stiff, it should be removed, soaked and washed in solvent to loosen and remove dirt from the joints. Then soak the chain in oil so the lubricant can penetrate between the rollers and bushings.

WHEEL BEARINGS

Wheel bearings should be checked annually. Inspect for lubrication. Pump grease into the hub until grease comes out around the seals.

Lift wheel off the ground. Check for endplay in the bearings by moving the tire in and out. Rotate the tire to check for roughness in the bearings. If bearings sound rough, the hub should be removed and the bearings inspected and replaced if necessary. See "Wheel Bearing Packing Or Replacement".

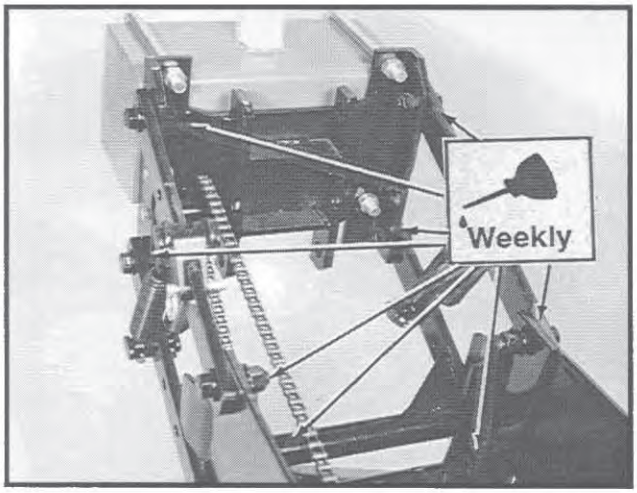
LUBRICATION

BUSHINGS

Lubricate bushings at the frequency indicated.

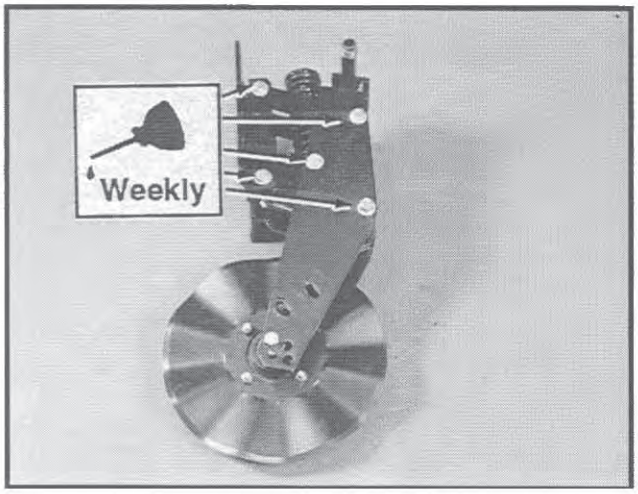
Using a wrench, check each bolt for proper torque. If bolt is loose, it should be removed and the bushing inspected for cracks and wear. Replace bushing if necessary. **Only hardened flat washers should be used. Replace damaged flat washers with proper part. Torque bolts to 130 ft. lbs.**

59386-43



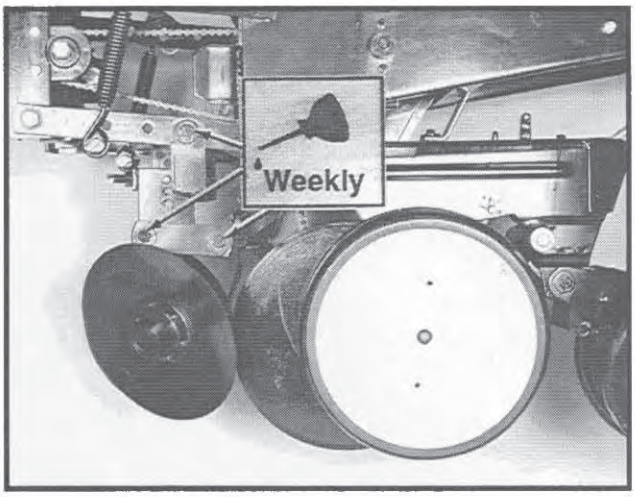
Row Unit Parallel Arms (8 per row)

56314-8



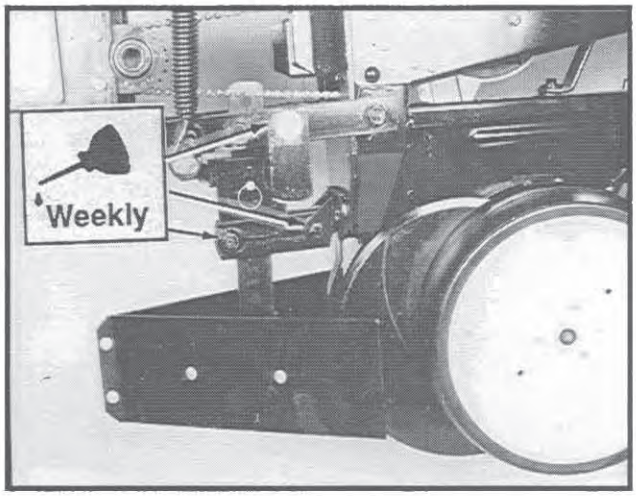
Frame Mounted Coulter Parallel Linkage (10 per row)
Shown not installed on row unit for visual clarity.

59386-18



Row Unit Mounted Disc Furrower Parallel Linkage (6 per row)

59386-26



Row Unit Mounted Bed Leveler Parallel Linkage (6 per row)

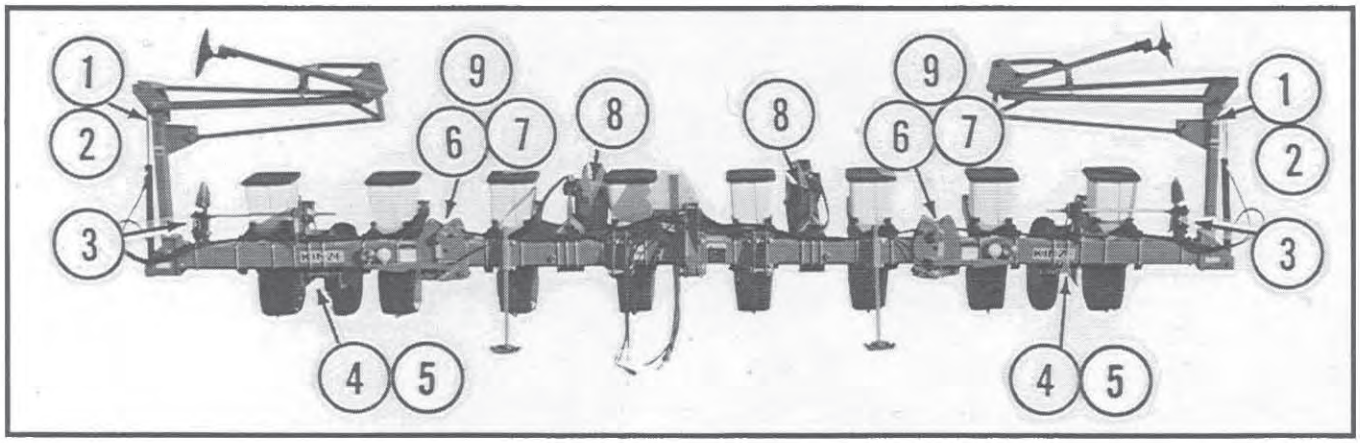
LUBRICATION

GREASE FITTINGS

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

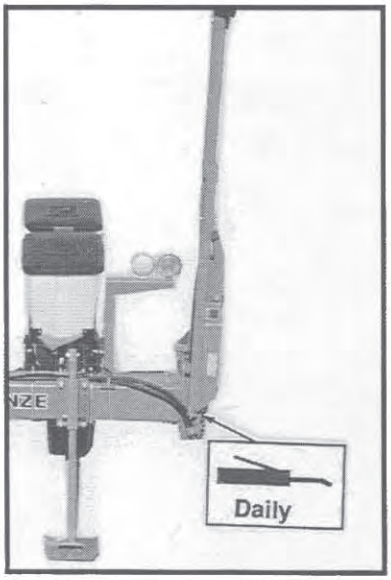
8 Row Folding Model With Low Profile Markers Shown

55702-17A



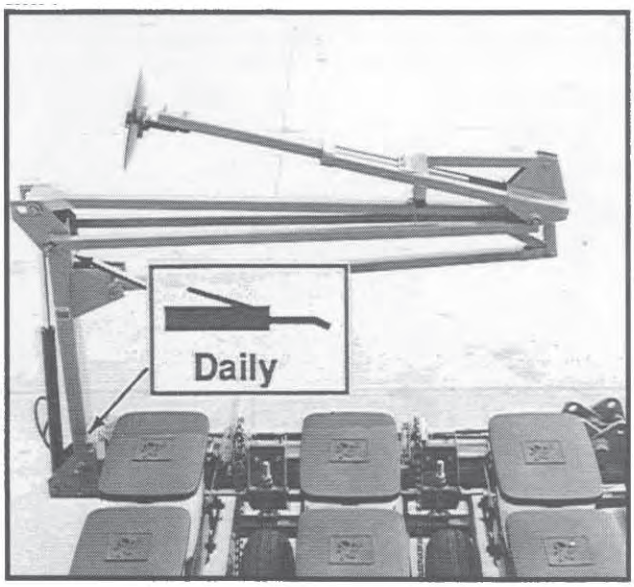
DANGER: Always install safety blocks or lower to the ground before working under or around the machine.

52567-2A



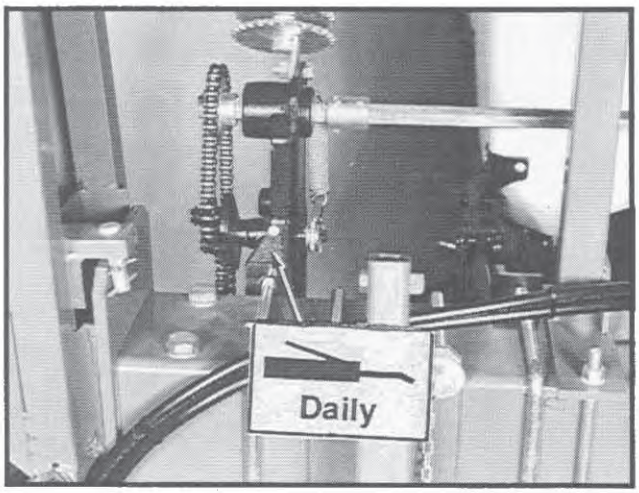
1. Conventional Markers - 4 Zerks Per Assembly

53555-8



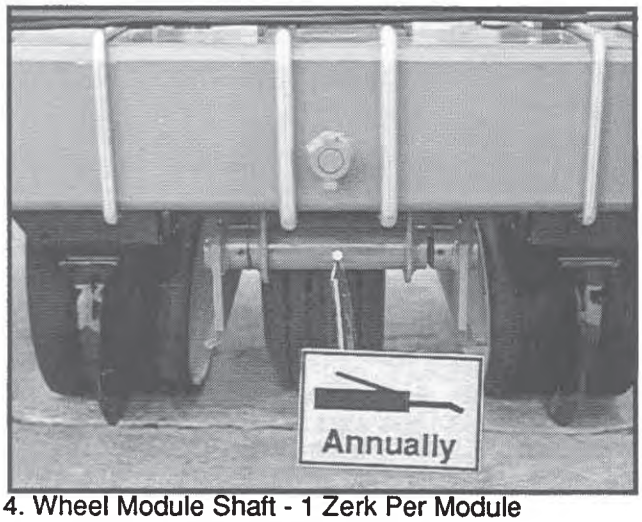
2. Low Profile Markers - 2 Zerks Per Assembly

61048-48



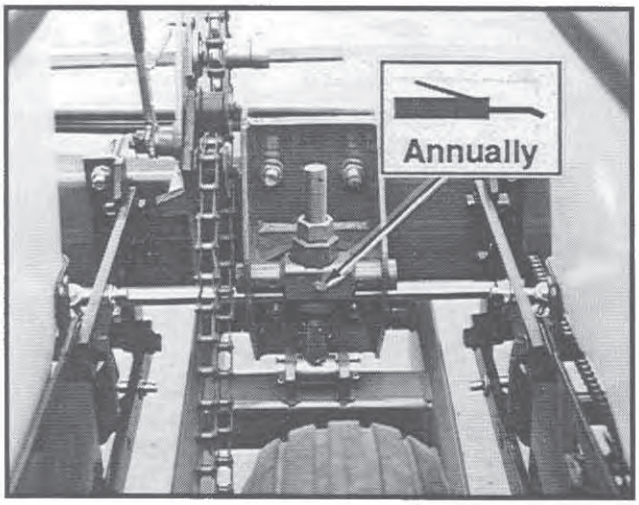
3. Transmission Assembly - 1 Zerk Per Assembly(Idler)

52567-7



4. Wheel Module Shaft - 1 Zerk Per Module

51803-20

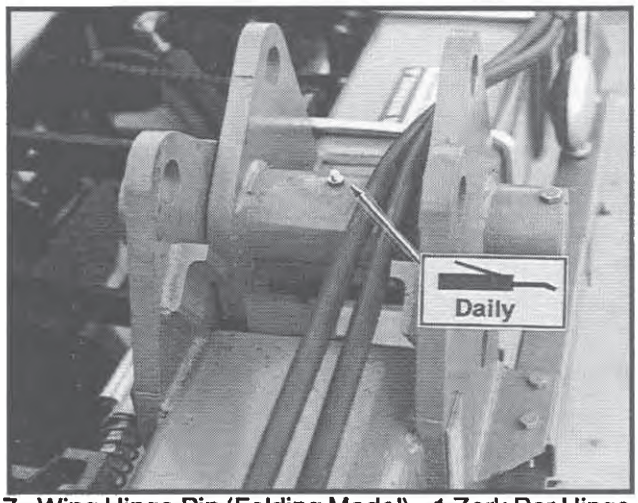


5. Wheel Module Jack Screw - 1 Zerk Per Module

51138-13

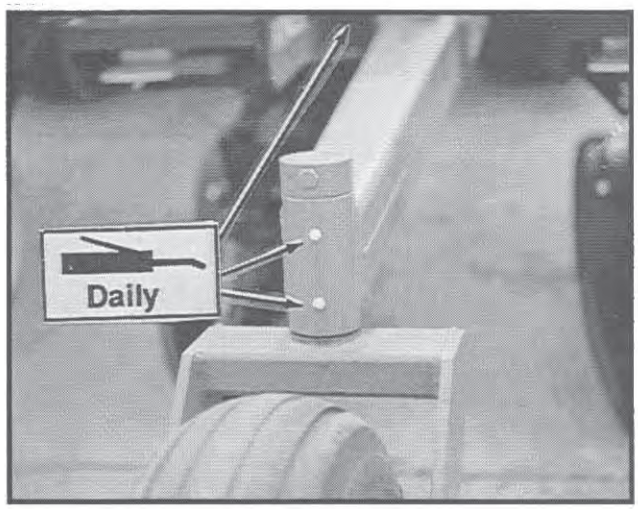
6. Wing Hinge Linkage(Folding Model) - 3 Zerks Per Hinge

52567-28



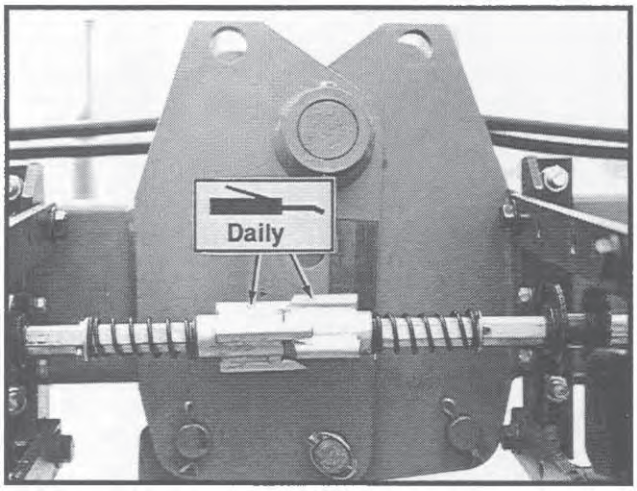
7. Wing Hinge Pin (Folding Model) - 1 Zerk Per Hinge

51138-4



8. Lift Assist Wheel Arm (Applicable Model) - 3 Zerks Per Arm Assembly(One at wheel tower pivot-Not Shown)

53704-2

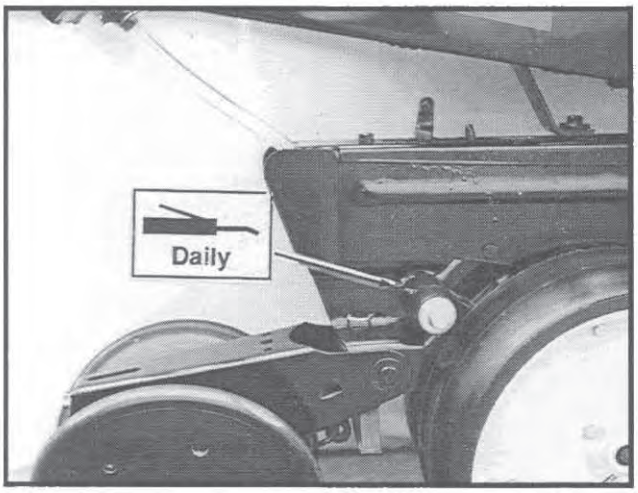


9. Drill Shaft Coupler (Folding Model-Where Applicable) - 2 Zerks Per Hinge Area

LUBRICATION

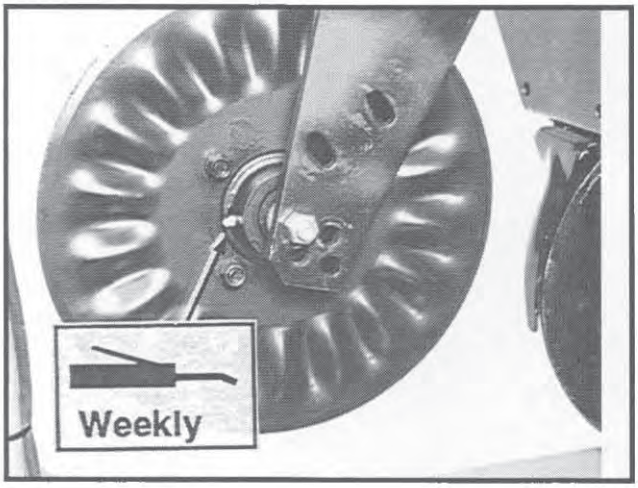
Row Unit

50677-13



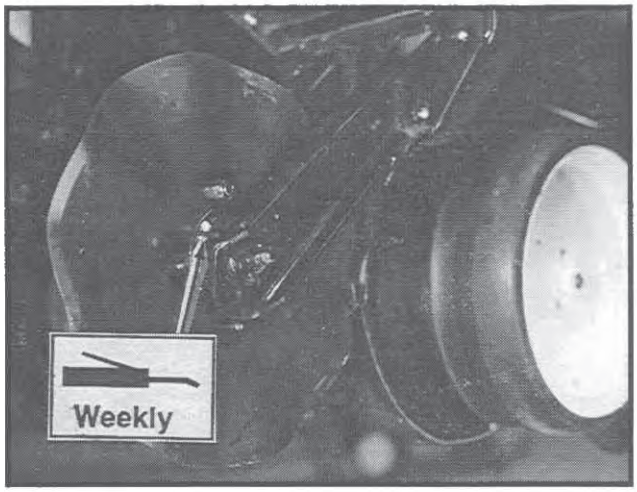
Gauge Wheel Arm - 1 Zerk Per Arm

56673-6



Frame Mounted Coulter Hub - 1 Zerk Per Hub

60569-42



Row Unit Mounted No Till Coulter Hub - 1 Zerk Per Hub

MAINTENANCE

MOUNTING BOLTS AND HARDWARE

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

All bolts used on the KINZE planter are Grade 5 (high strength) unless otherwise noted. Refer to the torque values chart when tightening bolts.

NOTE: Over tightening bolts can cause as much damage as under tightening. Tightening a bolt beyond the recommended range can reduce its shock load capacity.

TORQUE VALUES CHART - PLATED HARDWARE

Bolt Diameter	Grade 2		Grade 5		Grade 8	
	Coarse	Fine	Coarse	Fine	Coarse	Fine
1/4"	50 In. Lbs.	56 In. Lbs.	76 In. Lbs.	87 In. Lbs.	9 Ft. Lbs.	10 Ft. Lbs.
5/16"	8 Ft. Lbs.	9 Ft. Lbs.	13 Ft. Lbs.	14 Ft. Lbs.	18 Ft. Lbs.	20 Ft. Lbs.
3/8"	15 Ft. Lbs.	17 Ft. Lbs.	23 Ft. Lbs.	26 Ft. Lbs.	33 Ft. Lbs.	37 Ft. Lbs.
7/16"	25 Ft. Lbs.	27 Ft. Lbs.	37 Ft. Lbs.	41 Ft. Lbs.	52 Ft. Lbs.	58 Ft. Lbs.
1/2"	35 Ft. Lbs.	40 Ft. Lbs.	57 Ft. Lbs.	64 Ft. Lbs.	80 Ft. Lbs.	90 Ft. Lbs.
9/16"	50 Ft. Lbs.	60 Ft. Lbs.	80 Ft. Lbs.	90 Ft. Lbs.	115 Ft. Lbs.	130 Ft. Lbs.
5/8"	70 Ft. Lbs.	80 Ft. Lbs.	110 Ft. Lbs.	125 Ft. Lbs.	160 Ft. Lbs.	180 Ft. Lbs.
3/4"	130 Ft. Lbs.	145 Ft. Lbs.	200 Ft. Lbs.	220 Ft. Lbs.	280 Ft. Lbs.	315 Ft. Lbs.
7/8"	125 Ft. Lbs.	140 Ft. Lbs.	320 Ft. Lbs.	350 Ft. Lbs.	450 Ft. Lbs.	500 Ft. Lbs.
1"	190 Ft. Lbs.	205 Ft. Lbs.	480 Ft. Lbs.	530 Ft. Lbs.	675 Ft. Lbs.	750 Ft. Lbs.
1 1/8"	265 Ft. Lbs.	300 Ft. Lbs.	600 Ft. Lbs.	670 Ft. Lbs.	960 Ft. Lbs.	1075 Ft. Lbs.
1 1/4"	375 Ft. Lbs.	415 Ft. Lbs.	840 Ft. Lbs.	930 Ft. Lbs.	1360 Ft. Lbs.	1500 Ft. Lbs.
1 3/8"	490 Ft. Lbs.	560 Ft. Lbs.	1100 Ft. Lbs.	1250 Ft. Lbs.	1780 Ft. Lbs.	2030 Ft. Lbs.
1 1/2"	650 Ft. Lbs.	730 Ft. Lbs.	1450 Ft. Lbs.	1650 Ft. Lbs.	2307 Ft. Lbs.	2670 Ft. Lbs.

NOTE: Unplated bolts should be torqued aproximately 1/3 higher than the above values. Bolts having lock nuts should be tightened to approximately 50% of amounts shown in chart. Bolts lubricated prior to installation should be torqued to 70% of value shown on chart.

GRADE 2
No Marks

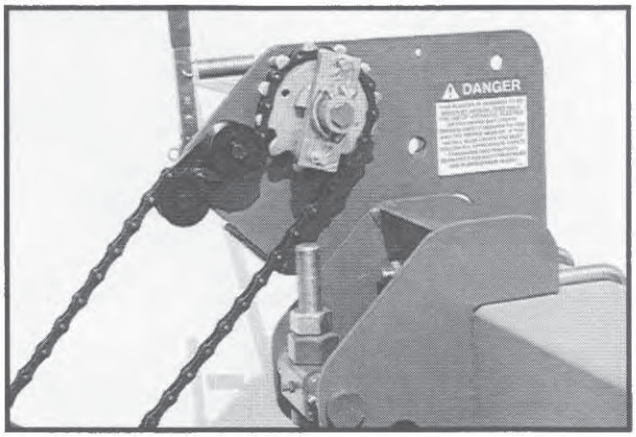
GRADE 5
3 Marks

GRADE 8
6 Marks

CHAIN TENSION ADJUSTMENT

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

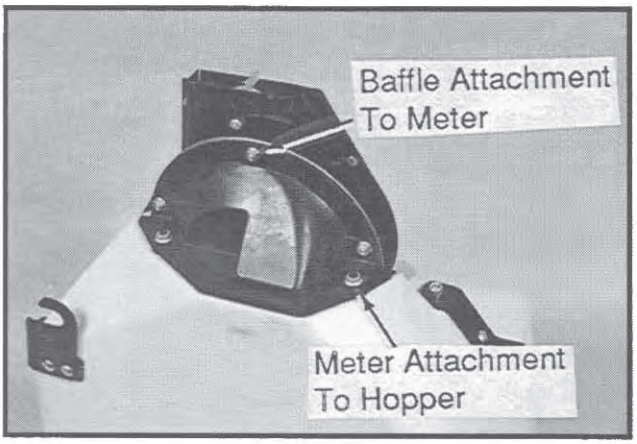
53051-17



FINGER PICKUP CORN METER INSPECTION/ADJUSTMENT

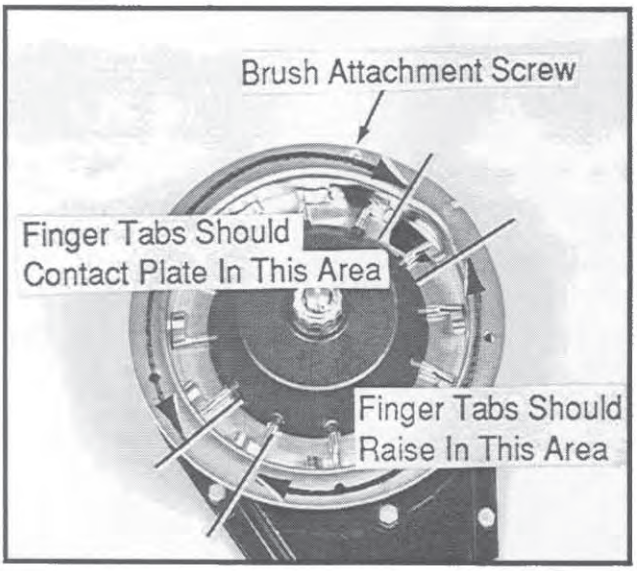
To inspect or service the finger pickup corn meter, remove the meter from the seed hopper by removing the two nuts which secure the mechanism to the hopper. Remove the baffle from the meter assembly by removing three cap screws. This will permit access to the finger pickup.

60620-8



Rotate the seed meter drive by hand to ensure that the springs are holding the tabs of the fingers against the carrier plate where indicated in the photo and that the fingers are being raised in the correct area.

60620-17

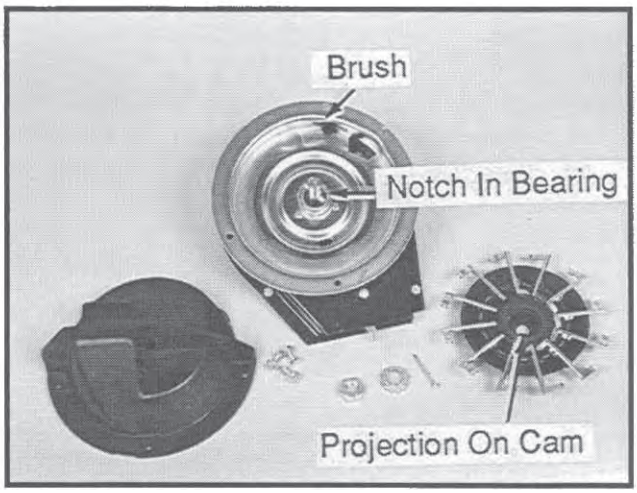


A build-up of debris or chaff may prevent proper finger operation and will require disassembly and cleaning of the corn meter as follows:

1. Remove cotter pin, lock nut and adjusting nut from drive shaft.

2. Carefully lift finger holder, along with fingers and cam, off of the shaft and clean.

60620-3



3. Check brush for wear and replace if necessary or following every 100 acres per row of operation.

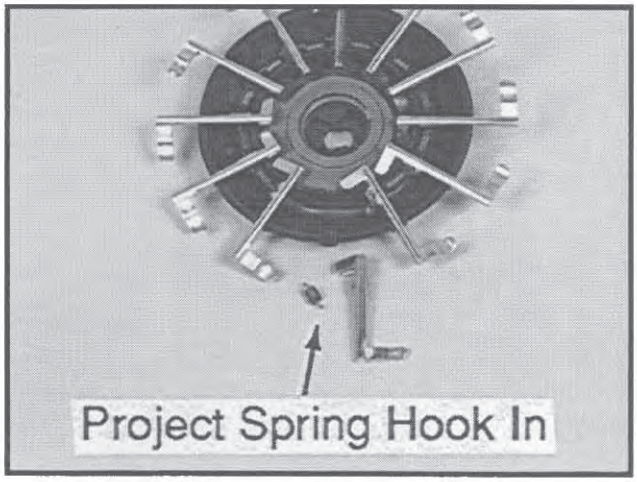
EXAMPLE: Approximately 600 acres of corn on a 6 row machine or 800 acres on an 8 row machine.

NOTE: It is not necessary to remove finger holder to remove brush.

4. To replace fingers or springs, remove springs from fingers and remove finger from holder by lifting it out of the friction fit slot. Under average conditions, life expectancy of these parts should be 600-900 acres per row of operation.

5. After cleaning and/or replacing defective parts, reassemble the meter in the reverse order. When replacing fingers, make sure the open end of the spring loop is toward the inside of the finger holder.

60620-22



6. Make sure fingers are installed in holder so that holder will be positioned flush with the carrier plate when assembled. A projection on the cam is designed to align with a mating notch in the bearing housing to ensure proper operation when assembled.

50725-4

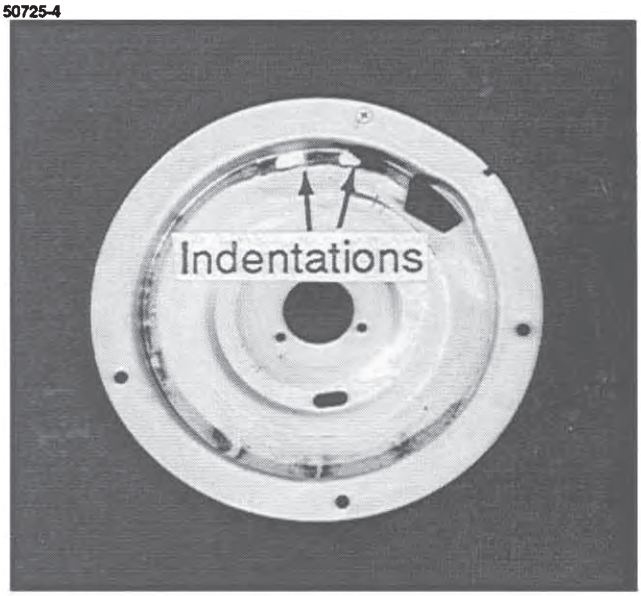


Photo shows worn plate

7. Before installing the finger holder on the carrier plate, check the indentations on the carrier plate for wear. Excessive wear of the carrier plate at the indentations will cause over planting especially when using small sizes of seed corn.

Inspect the carrier plate annually. Under average conditions, the life expectancy of the carrier plate should be 250-300 acres per row of operation.

8. With finger holder flush against the carrier, install adjusting nut until it contacts the finger holder with a slight resistance. Continue to turn the nut an additional 1/3 turn or torque to 22 to 25 inch pounds of rolling torque on input shaft.

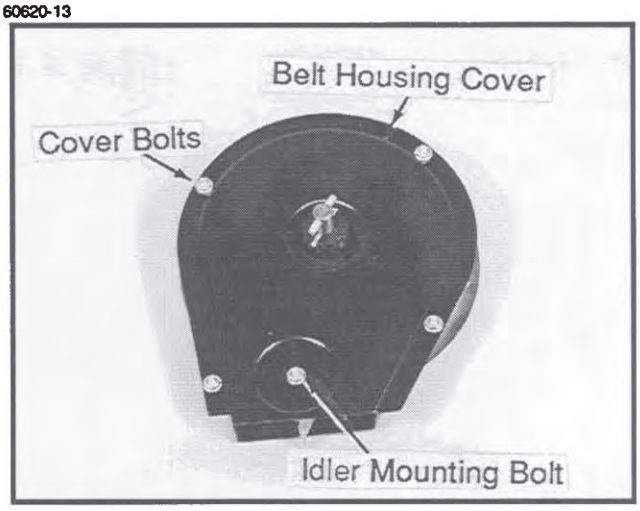
9. Turn finger holder by hand to make sure it is positioned firmly against the carrier, but is not over tightened and can be rotated with moderate force.

10. Install cage nut and cotter pin and reinstall housing.

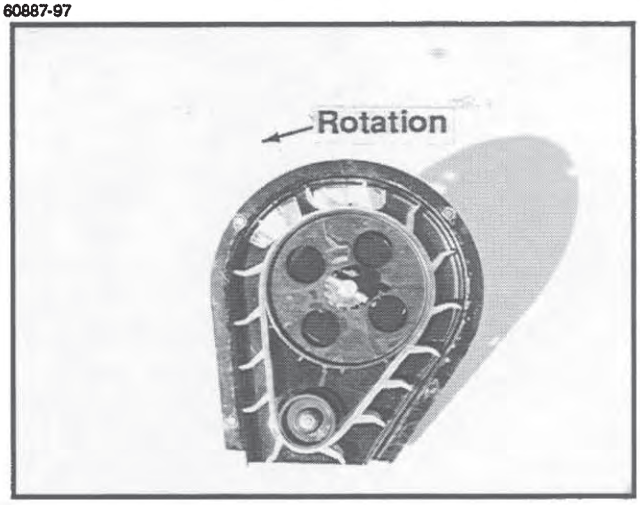
NOTE: Check tightness of adjusting nut on each unit after first day of use and periodically thereafter.

To inspect or replace the seed belt, remove the four cap screws around the edge of the housing cover and the nut from the belt idler mounting bolt.

60620-13



60887-97



If the belt is being replaced, make sure it is reinstalled to correctly orient the paddles as shown. A diagram molded into the drive sprocket also illustrates the correct orientation.

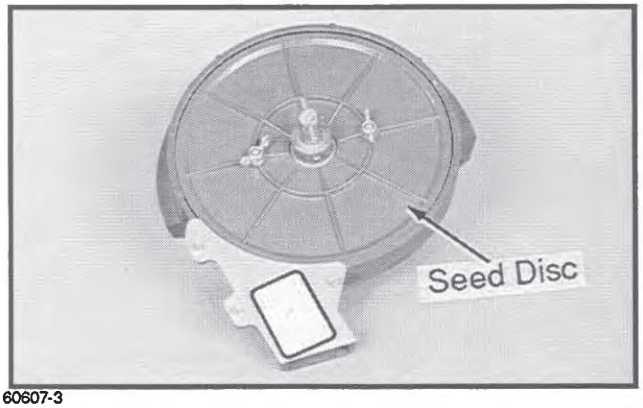
CAUTION: Do not over tighten hardware.

FINGER PICKUP CORN METER CLEANING

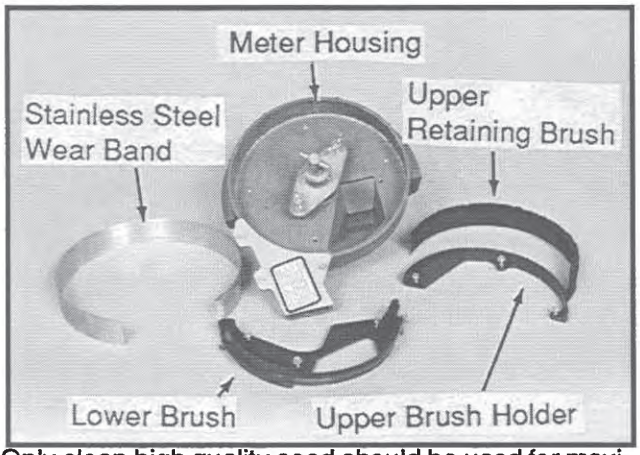
1. Disassemble meter.
2. Blow out any foreign material present in the meter mechanism.
3. Wash in mild soap and water. DO NOT USE GASOLINE, KEROSENE OR ANY OTHER PETROLEUM BASED PRODUCT.
4. Dry thoroughly.
5. Coat lightly with a rust inhibiter.
6. Store in a dry place.

BRUSH-TYPE SEED METER MAINTENANCE

60607-10

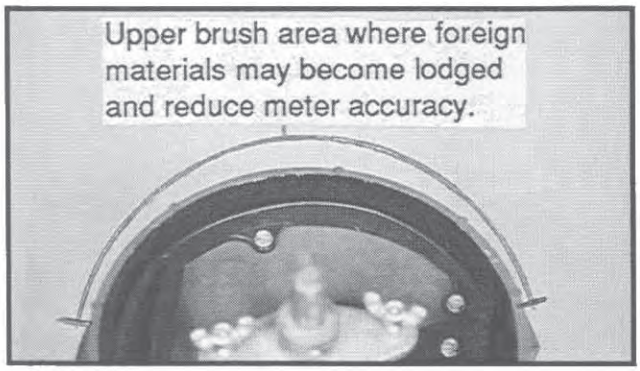


60607-3



Only clean high quality seed should be used for maximum meter accuracy. Damaged or cracked seed, hulls or foreign materials may become lodged in the upper seed retaining brush and greatly reduce meter accuracy. It is suggested that the seed disc be removed daily, inspected and cleaned. Check for buildup of foreign material on the seed disc, particularly in the seed loading slots. Clean the disc by washing it with soap and water. Check for cracked seed, hulls, etc. lodged between the brush holder and stainless steel wear band which can greatly reduce the accuracy of the meter because the retaining brush will not be able to retain the seed in the seed disc pocket. Use compressed air to clean the brush areas of the meter housing.

60607-8



Estimated life expectancies of the upper and lower brushes, stainless steel wear strip and seed disc are 200-300 acres per row.

Cleaning brush-type seed meter for storage:

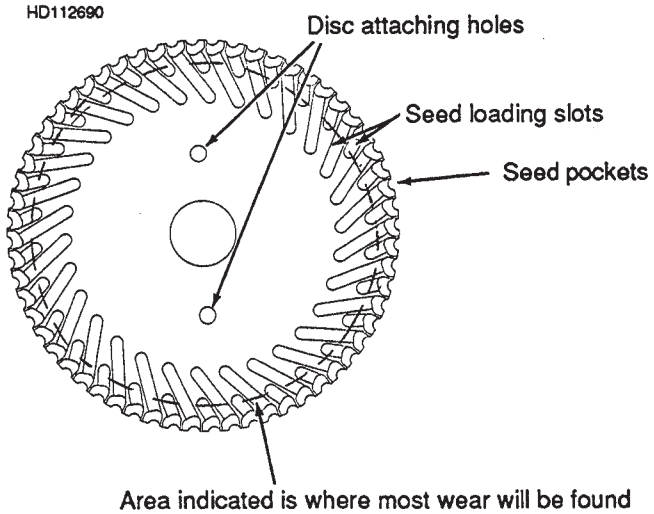
1. Remove meter from seed hopper by removing the two nuts which secure the meter to the hopper.
2. Remove seed disc and wash with soap and water and dry thoroughly.
3. Remove upper retaining brush by removing the three hex head screws from the brush holder and removing brush holder and retaining brush.
4. Remove the three hex head screws from the lower brush and and remove lower brush and stainless steel wear band.
5. Wash all parts and meter housing with soap and water and dry thoroughly.
6. Inspect all parts for wear and replace worn parts.
7. Reassemble meter except for seed disc. Meter should be stored without seed disc installed.

Installation Of Upper Retaining Brush

Position retaining brush into inner perimeter of seed retention area. Make sure the base of the brush is tight against the bottom of the meter housing. Install brush holder and three hex head screws and tighten.

Seed Disc Wear

HD112690



Most wear on the seed disc will be found in the area between the seed loading slots. If wear in this area is greater than .075" and accuracy starts to drop off at higher meter RPMs, the seed disc should be replaced. Wear will affect planting accuracy at high RPMs. To measure for wear lay a straight edge across the surface of the disc and measure the gap between the disc and the straight edge.

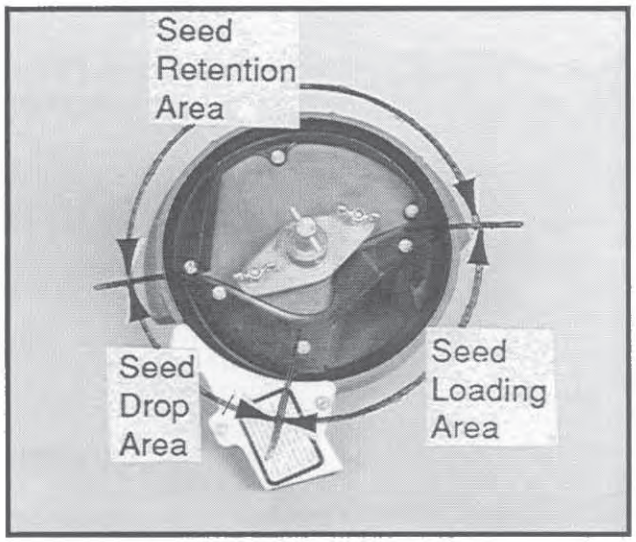
Stainless Steel Wear Band

60607-38

The purpose of the stainless steel wear band is to protect the meter housing from wear. The band is .030" thick and should be replaced when approximately .020" of wear is found in the primary area of wear. If the wear band is allowed to wear through or if the meter is used without the wear band in place, damage to the meter housing may occur.

Upper Retaining Brush

60607-21



The upper retaining brush holds seed in the disc seed pocket in the seed retention area.

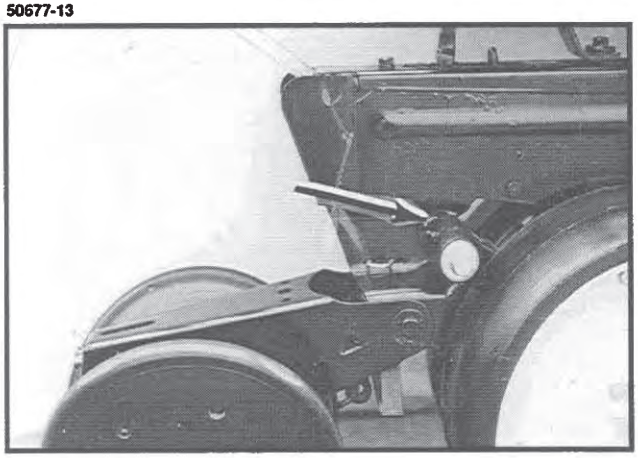
The retaining brush must apply enough pressure against the seed in the disc seed pocket as the disc rotates through the seed retention area to prevent the seed from dropping out of the disc pocket. A damaged spot, excessive wear on the brush or foreign material lodged in the brush may greatly reduce meter performance.

The retaining brush should be replaced at approximately 200-300 acres per row of use or sooner if damage or excessive wear is found.

GAUGE WHEEL ADJUSTMENT

To prevent an accumulation of dirt or trash, gauge wheels should just contact the opener blades. Gauge wheels and opener blades should turn with only slight resistance.

50677-13

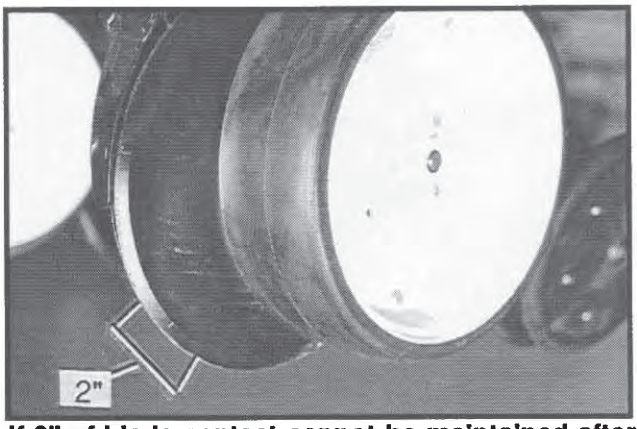


To adjust clearance between gauge wheels and opener blades, add or remove 1 1/64" spacer washers between the shank and gauge wheel arm. Store remaining spacer washers between gauge wheel arm and flat washer on outer side of gauge wheel arm.

NOTE: It may be desirable to space gauge wheel further from blade when operating in sticky soils.

15" SEED OPENER DISC/BEARING ASSEMBLY

60569-48



If 2" of blade contact cannot be maintained after removing spacer washers, the blade should be replaced.

To replace disc/bearing assembly:

1. Remove gauge wheel.
2. Remove bearing dust cap.
3. Remove jam nut and washer from outside of disc/bearing assembly.

NOTE: Left hand side of opener uses a left hand threaded nut. DO NOT OVER TIGHTEN. Damage to mounting spindle will require replacement of row unit shank assembly.

4. Remove disc/bearing assembly. The spacer bushings between the shank and disc are used to maintain the blade to blade contact at 2".
5. After installing new disc/bearing assembly, install washer and jam nut to secure disc/bearing assembly. Torque 5/8"-11 Grade 2 nut to value shown in Torque Values Chart.
6. Replace bearing dust cap.

It may be necessary to replace only the bearing if the bearing sounds rough when the disc is rotated.

To replace bearing:

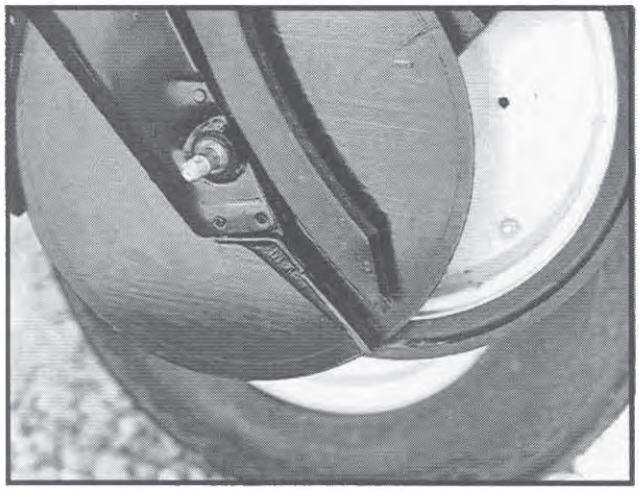
1. Remove gauge wheel, bearing cap, jam nut, washer and disc/bearing assembly.
2. Remove 1/4" rivets from bearing housing to expose bearing.
3. After installing new bearing, install three evenly spaced 1/4" bolts into three of the six holes in the bearing housing to hold the bearing and bearing housing in place. Install rivets in the other three holes. Remove 1/4" bolts and install rivets in those three holes..
4. Reinstall disc/bearing assembly, washer and jam nut. Torque 5/8"-11 Grade 2 nut to value shown in Torque Values Chart at end of this section.
5. Replace bearing dust cap.

SEED TUBE GUARD

The seed tube guard protects the seed tube and acts as the inner scraper for the disc opener blades.

Remove the seed tube and check for wear. Excessive wear on the seed tube indicates a worn seed tube guard.

50881-9

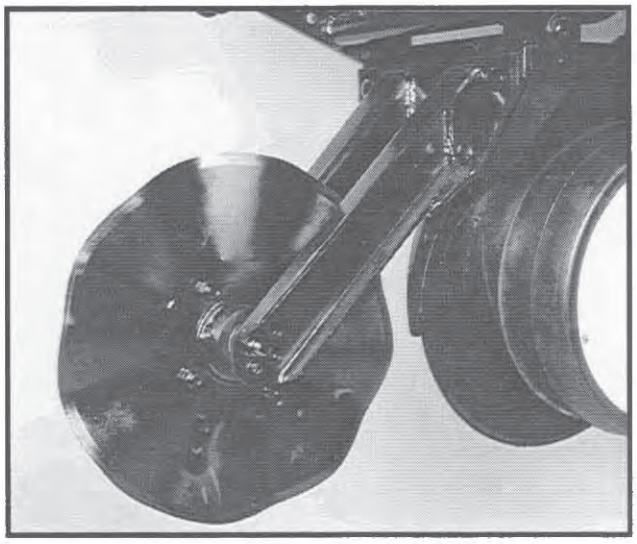


No till planting or planting in hard ground conditions will increase seed tube guard wear and necessitate more frequent inspection.

The gauge wheel and seed opener discs must be removed before the seed tube guard can be replaced.

ROW UNIT MOUNTED NO TILL COULTER

59386-40



If properly maintained and lubricated the bearings in the row unit mounted no till coulter hub may never need to be replaced. Lubricate at frequency indicated in the Lubrication Section of this manual. Check periodically to be sure nuts and hardware are tightened to proper torque specification. Be sure the coulter is positioned square with the planter frame and aligned in front of row unit disc opener.

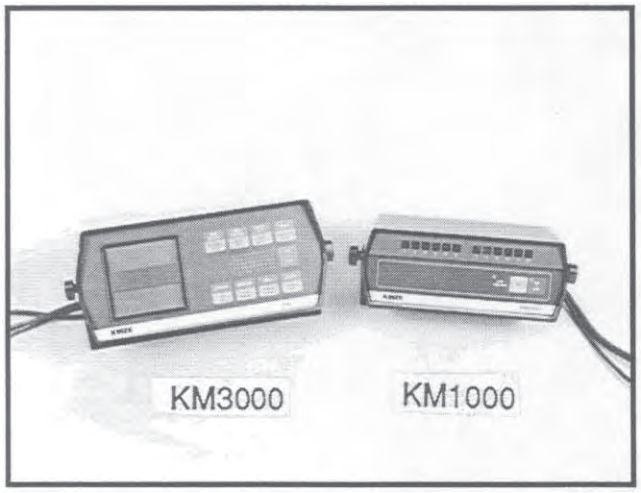
The coulter blade can be adjusted to one of four settings. Initially the blade is set in the highest position. As the blade wears it can be adjusted to one of the three lower settings. See "Row Unit Mounted No Till Coulter" in Operation Section of this manual.

When the 16" diameter coulter blade is worn to a 14 1/2" diameter (maximum allowable wear), it should be replaced.

Timely lubrication at the frequency indicated in the lubrication section of this manual is necessary to purge moisture and dirt from bearing and seal. This will also lubricate the seal. Add grease until it comes out around the seal.

ELECTRONIC SEED MONITOR SYSTEM TROUBLESHOOTING

60656-5



The general procedure to use, if a problem occurs, is to isolate the cause to a sensor, sensor lead, planter harness, console cable or the console, in that order. Make necessary repairs after problem has been isolated.

1. Sensors

Check for excessive dirt inside sensor. Check for cut or damaged wires. Connect sensor to the planter harness in a row that is operating properly. If it then operates correctly, sensor is good.

In some cases static electricity may cause dust and seed treatment to accumulate on the sensing elements in the sensor. Enough may accumulate to cause the sensor to malfunction, which can cause monitor to indicate a fault condition. Low humidity and dry soil conditions tend to cause this condition. When this occurs, clean the inside of the sensors, using a dry bottle brush.

If, for any reason a sensor becomes inoperative and a replacement sensor is not immediately available, disconnect the sensor lead connector from the planter harness, turn monitor OFF and then back ON. This will keep the alarm from sounding for this row only. Replace the defective seed sensor (using high rate seed sensor only) as soon as possible. After sensor is replaced make certain the monitor is turned OFF and back ON to reactivate the sensor position.

If sensor leads are damaged, carefully cut away the cable covering at the damaged area. Repair damaged wire or wires by soldering wires together, being sure to match wire colors, then tape each repaired wire. Finally, tape over cut portion of the cable cover. If necessary, relocate and secure cable so that the same type of damage will not occur again.

2. Planter Harness And Console Cable

Carefully examine planter harness and console cable for damage. If harness and/or cable is cut or pinched, carefully cut away the harness/cable covering. Repair cut or damaged wire by soldering wires together, being sure to match wire colors. Tape each repaired wire, then tape over cut harness/cable covering. If necessary, relocate and secure harness/cable so that the same type damage will not occur again.

3. Console

Check for a blown fuse, located on the console rear panel. Check battery connections and make certain they are clean and tight. Make certain battery is fully charged.

If console fuse is blown replace with a 5-amp type AGC. If fuse blows again, console needs repair or replacement.

CAUTION: DO NOT REPLACE FUSE WITH A FUSE HAVING A HIGHER AMPERAGE RATING.

If the battery cable is not damaged, battery connections are clean and tight and the battery is fully charged, the console is defective and needs to be repaired or replaced.

KM1000 TROUBLESHOOTING CHART

SYMPTON	PROBABLE CAUSE	ACTION REQUIRED
1. Low Voltage Indicator is ON.	Connected to 6 volt battery.	Connect to 12 volt battery.
	System voltage insufficient.	Insure greater than 11.0 volts.
	Battery connection corroded.	Inspect battery connections. If console power cable terminals or battery terminals are dirty or corroded, clean terminals as required.
	Console defective.	Repair or replace console. Contact your KINZE Dealer.
2. One row indicator lamp fails to flash when planting. Alarm does not sound.	Burned out row indicator lamp.	Replace row indicator lamp with a 1892 lamp only. (Part No. R0595).
3. One row indicator lamp fails to flash when planting. Alarm sounds continuously. Seeds are being planted by the row unit.	Sensing elements inside seed sensor.	Clean sensing elements using a dry bottle brush. NOTE: Some seed treatment chemicals are detrimental to the operation of seed sensors and refuse to be removed by dry brushing. To remove such treatment from the inside of a sensor, proceed as follows: Wet a bottle brush with water, then apply a moderate amount of kitchen cleanser (such as Ajax® or Comet®) to the brush. Scrub inside of sensor until treatment is removed, then rinse sensor in clear cold water. Dry thoroughly.
	Defective sensor.	Plug suspect sensor cable into an adjacent row that is operating correctly. If sensor does not operate, sensor is defective. If you wish to continue planting and a replacement sensor is not available, disconnect the defective sensor cable from the planter harness, turn the monitor OFF and then back ON. The monitor will ignore the disconnected row sensor and you can continue to monitor all other rows.

KM1000 TROUBLESHOOTING CHART (Continued)

SYMPTON	PROBABLE CAUSE	ACTION REQUIRED
4. One row indicator lamp fails to come one when the console is powered up.	Burned out row indicator lamp.	Replace row indicator lamp with a number 1892 lamp only. (Part No. R0595)
	Defective seed sensor or planter harness.	Disconnect the suspected sensor from the planter harness row lead. Disconnect the sensor from the planter harness of an adjacent row. Reverse the harness row leads to the sensors (connect the suspected sensor to the adjacent row planter harness lead and the adjacent sensor to the suspected row harness lead).
	Defective seed sensor or planter harness.	Turn console power OFF then back ON. If the symptom moves to the adjacent row, the seed sensor is defective and needs replaced. If the symptom does not move, the planter harness or console is defective and needs repaired. Visually inspect the planter harness for cuts, pinching, etc., if damage is found, repair by cutting away the cable covering and splicing the wires (being sure to match wire colors). Solder the splices and tape each wire individually. Tape over repaired cable.
	Console defective.	Repair or replace console. Contact your KINZE Dealer.
5. Monitor completely "dead".	Blown fuse.	Check fuse, located on rear panel of console. If fuse is blown, replace with a 5-amp, type AGC. If fuse blows again, check power connection to battery. If connections are reversed fuse will blow. If battery connections are correct, console needs repair or replacement. Contact your KINZE Dealer.
	Poor battery connections.	Check battery connections. Connections must be clean and tight.

KM1000 TROUBLESHOOTING CHART (Continued)

SYMPTON	PROBABLE CAUSE	ACTION REQUIRED
5. (Cont'd.)	Cut or broken battery cable.	Visually inspect the battery cable for a cut or broken wire. If wires are cut or broken, splice the wires being sure to match wire colors. Solder the splices and tape each wire individually. USE ONLY ROSIN CORE SOLDER.
	Console defective.	Repair or replace console. Contact your KINZE Dealer.
6. When monitor is turned ON, row indicator lamps are dark, green power indicator is ON and monitor will not enter operate mode.	Defective seed sensor.	Leave monitor turned on. Unplug seed sensors one at a time starting with row 1. When you disconnect a sensor and the remaining row indicator lamps come on, the sensor or its cable is defective. Visually inspect the sensor cable. If damaged, repair. If no cable damage is found, the sensor is defective and needs to be replaced. If all but the last sensor is disconnected and the problem still exists, reconnect a sensor before disconnecting the last sensor. If the last sensor is disconnected and the problem still exists, the planter harness, console cable or console is at fault.
	Planter harness shorted.	Visually inspect the planter harness (including all row unit cables) for cuts, pinching and other types of damage. If damage is found, cut away cable covering and repair the individual wires. Tape over repaired wire and cable.
	Console defective.	If the console cable, planter harness, and seed sensors are normal, the console is at fault and needs to be repaired or replaced. Contact your KINZE Dealer.

KM3000 TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	ACTION REQUIRED
1. Display readout incomplete (fragmented) alarm sounds continuously.	Low battery voltage.	Recharge or replace battery.
	Battery connections corroded.	Inspect battery connection. If console power cable terminals or battery terminals are dirty or corroded, clean terminals as required.
	Console defective.	Repair or replace console. Contact your KINZE Dealer.
2. One row indicator segment (lower display) fails to flash when planting. Population readout for the planter row is .0. Alarm sounds continuously. Seeds are being planted by the row unit.	Sensing elements inside of seed sensor are dirty.	Clean sensing elements using a dry bottle brush. NOTE: Some seed treatment chemicals are detrimental to the operation of seed sensors and refuse to be removed by dry brushing. To remove such treatment from the inside of a sensor proceed as follows: Wet a bottle brush with water, then apply a moderate amount of kitchen cleanser (such as Ajax® or Comet®) to the brush. Scrub inside of sensor until treatment is removed, then rinse sensor in clear cold water. Dry thoroughly.
	Defective sensor.	Plug suspect sensor cable into an adjacent row that is operating correctly. If sensor does not operate, sensor is defective. If you wish to continue planting and a replacement sensor is not available, disconnect the defective sensor cable from the planter harness, turn the monitor OFF and then back ON. The monitor will ignore the disconnected row sensor and you can continue to monitor all other rows.

KM3000 TROUBLESHOOTING CHART (Continued)

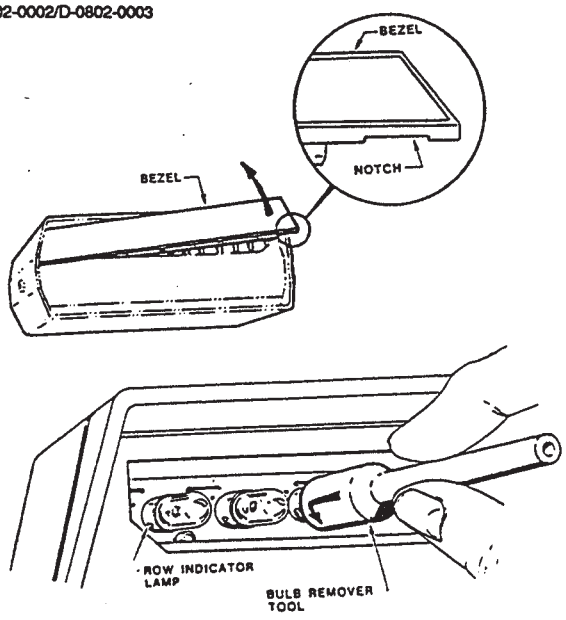
SYMPTOM	PROBABLE CAUSE	ACTION REQUIRED
3. Monitor completely "dead".	Blown console fuse.	Check fuse, located on rear panel of console. If fuse is blown, replace with a 5-amp, type AGC. If fuse blows again, check power connection to battery. If connections are reversed fuse will blow. If battery connections are correct, console needs to be repaired or replaced. Contact your KINZE Dealer.
	Poor battery connections.	Check battery connections. Connections must be clean and tight.
	Cut or broken battery cable.	Visually inspect the battery cable for a cut or broken wire. If wires are cut or broken, splice the wires being sure to match wire colors. Solder the splices and tape each wire individually. USE ONLY ROSIN CORE SOLDER.
	Low battery voltage.	Check battery voltage. Must be at least 12 volts. If not, recharge or replace battery.
	Console defective.	Repair or replace console. Contact your KINZE Dealer.
4.When monitor is turned ON, row display (lower display) remains blank. Upper display shows SPEED, NUMBER OF ROWS, and ROW SPACING constants. Monitor will not enter OPERATE mode.	Defective (shorted) seed sensor.	Leave monitor turned ON. Unplug seed sensors one at a time starting with row 1. When you disconnect a sensor and the remaining row display segments come on and the monitor enters the operate mode, the sensor or its cable is defective. Visually inspect the sensor cable, if damaged repair. If no cable damage is found, the sensor is defective and needs replaced. If all sensors are disconnected and problem still exists, the planter harness, console cable or console is at fault.

KM3000 TROUBLESHOOTING CHART (Continued)

SYMPTOM	PROBABLE CAUSE	ACTION REQUIRED
4. (Cont'd.)	Planter harness shorted.	Visually inspect the planter harness (including all row unit cables) for cuts, pinching and other types of damage. If damage is found, cut away cable covering and repair the individual wires. Tape over repaired wire and cable.
	Console cable shorted.	Visually inspect the console cable for cuts, pinching and other types of damage. If damage is found, cut away cable covering and repair the individual wires. Tape over repaired wire and cable.
	Console defective.	If the console cable, planter harness and seed sensors are normal, the console is at fault and needs to be repaired or replaced. Contact your KINZE Dealer.

SEED MONITOR ROW INDICATOR BULB REPLACEMENT (KM1000 Only)

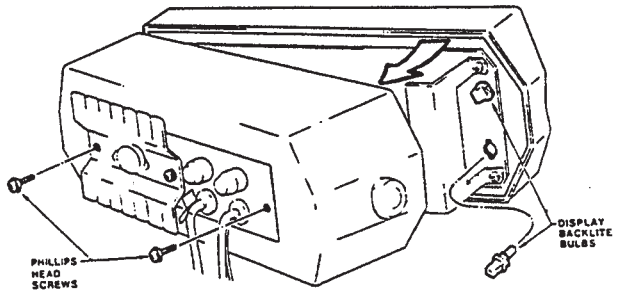
D-0802-0002/D-0802-0003



Carefully remove the row indicator bezel as shown. Use your fingernail to pry up along the lower outside edge of the bezel. Remove bezel. Remove burned out bulb using a bulb remover tool. Press in on bulb, turn 1/4 turn counterclockwise and remove bulb. Replace bulb with a No. 1892 (Part No. R0595) only. Replace bezel.

SEED MONITOR DISPLAY BACKLITE BULB REPLACEMENT (KM3000 Only)

D-0841-0006

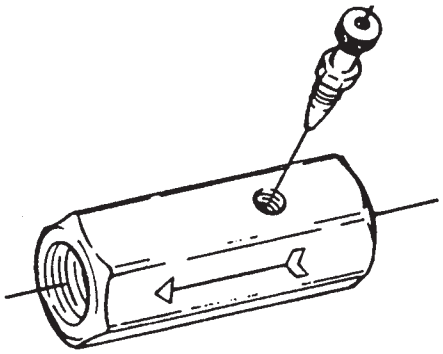


Remove the two outside Phillips head screws. NOTE: DO NOT REMOVE THE CENTER PHILLIPS HEAD SCREW. Carefully separate the console case from the front panel. Remove the defective bulb by turning the lamp assembly 1/4 turn counterclockwise and pulling straight out. Replace bulb with a GE #73 bulb (Part No. R1084). Carefully assemble the console front panel, case and rear panel and install the two Phillips head screws. **CAUTION: Make sure that all wires are located where they will not be pinched or cut.**

FLOW CONTROL VALVE INSPECTION

The flow control valves should be adjusted for raise and lower speed as part of the assembly procedure or upon initial operation. If the valve fails to function properly or requires frequent adjustment, the needle valve should be removed for inspection. Check for foreign material and contamination on both the valve and the seating area of the valve body. Replace any components found to be defective.

NOTE: The flow control valve must be installed with the arrow pointed toward the tractor.



VALVE BLOCK ASSEMBLY INSPECTION

(Marker Sequencing & Flow Control Valves)

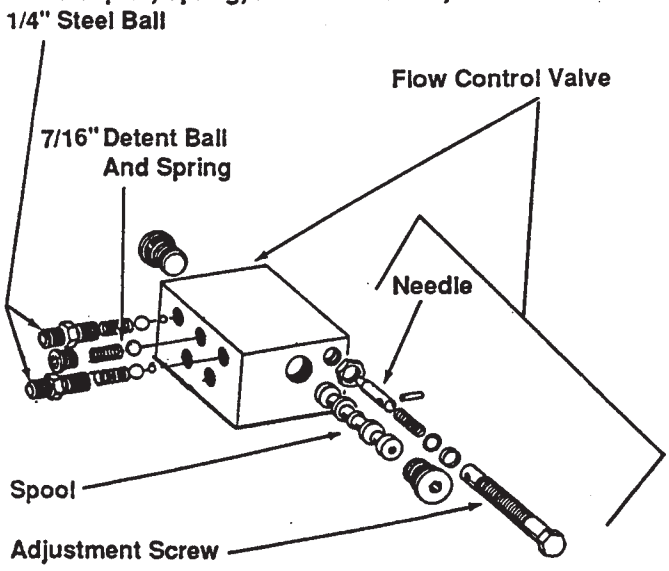
The valve block assembly consists of the marker sequencing and flow control valves in one assembly.

The sequencing valve portion consists of a chambered body containing a spool and series of check valves to direct hydraulic oil flow. Should the valve malfunction, the components may be removed for inspection.

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

IMPORTANT: Make sure correct check ball(s) and spring are installed in each valve bore upon reassembly.

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



MARKER OPERATION TROUBLESHOOTING		
PROBLEM	**POSSIBLE CAUSE**	**POSSIBLE SOLUTION**
Both markers lowering and only one raising at a time.	Hoses from cylinders to valve connected backwards.	Check hosing diagram in manual and correct.
Same marker always operating.	Spool in sequencing valve not shifting.	Remove spool, inspect for foreign material, making sure all ports in spool are open. Clean and re-install.
Both markers lower and raise at same time.	Foreign material under check ball in sequencing valve. Check ball missing or installed incorrectly in sequencing valve.	Remove hose fitting, spring and balls and clean. May be desirable to remove spool and clean as well. Disassemble and correct. See illustration in Parts Section.
Marker (in raised position) settling down.	Damaged o-ring in marker cylinder or cracked piston. Spool in sequencing valve not shifting completely because detent ball or spring is missing. Spool in sequencing valve shifting back toward center position.	Disassemble cylinder and inspect for damage and repair. Check valve assembly and install parts as needed. Restrict flow of hydraulic oil from tractor to sequencing valve.
Neither marker will move.	Flow control closed too far.	Loosen locking nut and turn flow control adjustment bolt out or counterclockwise until desired speed is set.
Markers moving to fast.	Flow control open too far.	Loosen locking nut and turn flow control adjustment bolt in or clockwise until desired speed is set.
Sporadic marker operation speed.	Needle sticking open in flow control valve.	Remove flow control, inspect and repair or replace.

MARKER BEARING LUBRICATION OR REPLACEMENT

1. Remove marker blade.

2. Remove hub cap from hub.

3. Remove cotter pin, nut and washer.

4. Slide hub from spindle.

5. Remove bearings and cups and discard if bearings are being replaced. Clean hub and dry. Remove bearings only and not cups if repacking.

6. Press in new bearing cups with thickest edge facing in. (Bearing replacement procedure only.)

7. Pack bearings with heavy duty wheel bearing grease thoroughly forcing grease between roller cone and bearing cage. Also fill the space between the bearing cups in the hub with grease.

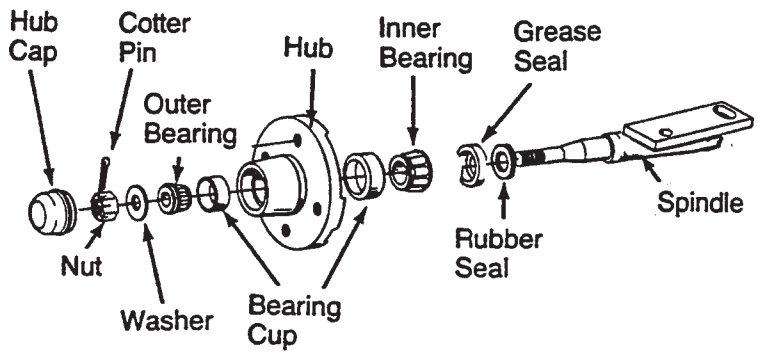
8. Place inner bearing in place and press in new rubber seal and grease seal.

9. Clean spindle and install hub.

10. Install outer bearing, washer or outer seal and slotted hex nut. Tighten slotted hex nut while rotating hub until there is some drag. This assures that all bearing surfaces are in contact. Back off slotted nut to nearest locking slot and install cotter pin.

11. Fill hub caps approximately 3/4 full of wheel bearing grease and install on hub.

12. Install blade and hub cap retainer on hub and tighten evenly and securely.



WHEEL BEARING LUBRICATION OR REPLACEMENT

1. Raise tire clear of ground and remove wheel.

2. Remove double jam nuts and slide hub from spindle.

3. Remove bearings and cups and discard if bearings are being replaced. Clean hub and dry. Remove bearings only and not cups if repacking.

4. Press in new bearing cups with thickest edge facing in. (Bearing replacement procedure only.)

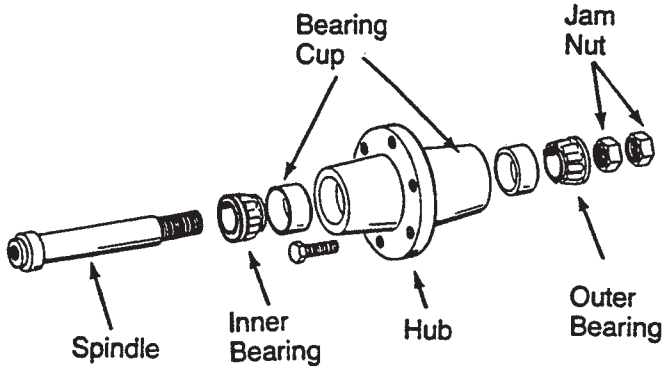
5. Pack bearings with heavy duty wheel bearing grease thoroughly forcing grease between roller cone and bearing cage. Also fill the space between the bearing cups in the hub with grease.

6. Place inner bearing in place.

7. Clean spindle and install hub.

8. Install outer bearing and jam nut. Tighten jam nut while rotating hub until there is some drag. This assures that all bearing surfaces are in contact. Back off jam nut 1/4 turn or until there is only slight drag when rotating the hub. Install second jam nut to lock against first.

9. Install wheel on hub and tighten evenly and securely.



PREPARATION FOR STORAGE

Store the planter in a dry sheltered area if possible.

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

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

Lubricate planter and row units at all lubrication points.

If possible, remove weight from all tires particularly if the unit is stored outdoors, in which case it is best to remove wheels and tires for storage in a cool dry area.

Inspect the planter and row units for parts that are in need of replacement and order during the "off" season.

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

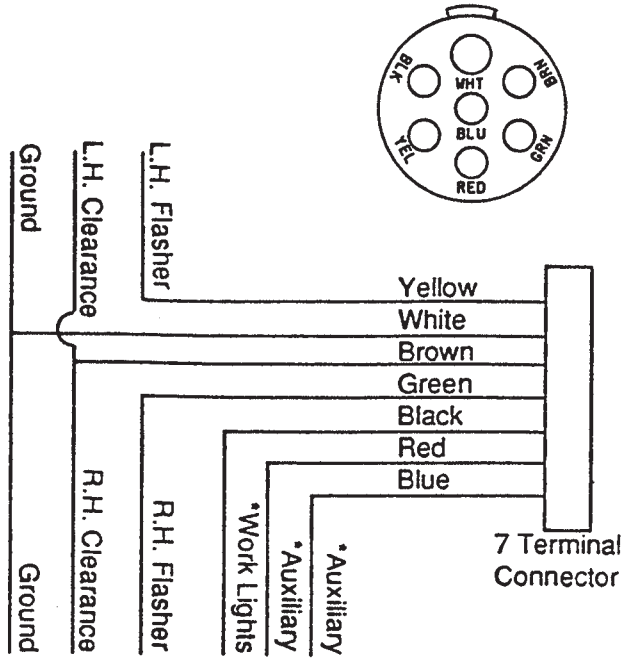
Clean seed meters and store in a dry area.

Remove seed discs from brush-type seed meter. Clean and store meters with discs removed.

Grease exposed areas of cylinder rods before storing planter.

Grease or paint disc openers and marker blades to prevent rust.

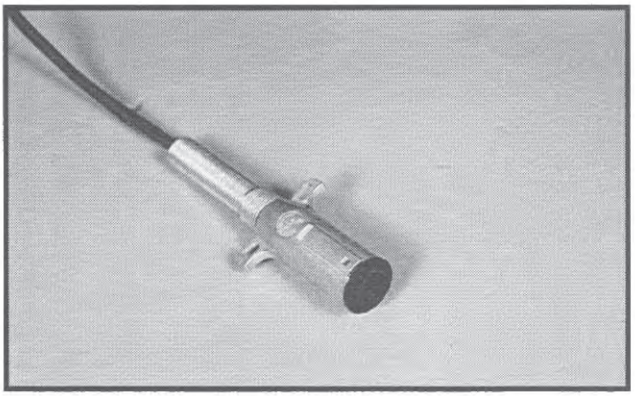
WIRING DIAGRAM



*Optional lights and wires (to be supplied by customer) may be wired into existing plug terminals.

Light package supplied on the Model 2100 planter meets ASAE standards. For the correct wiring harness to be wired into the lights on your tractor, check with the tractor manufacturer.

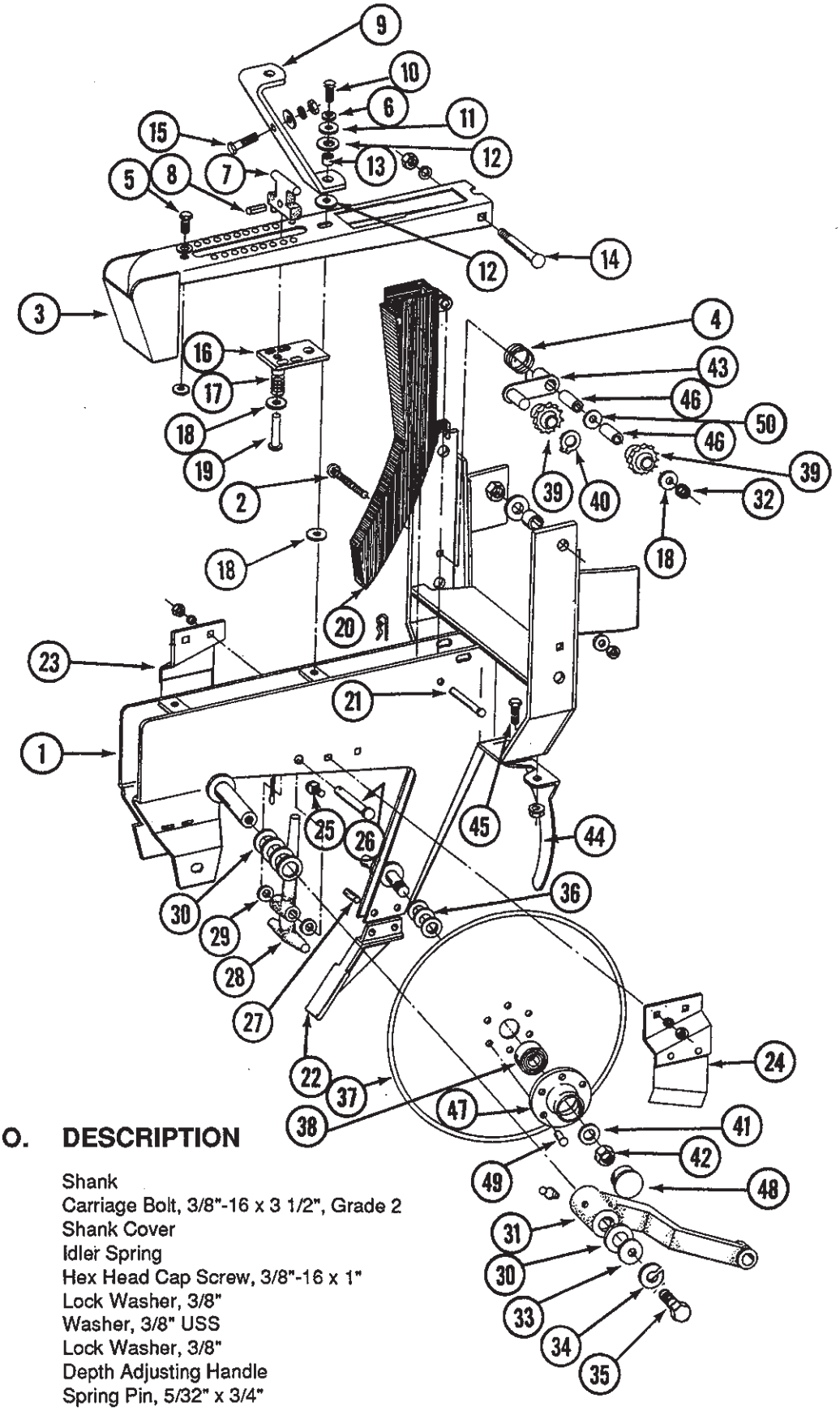
61111-36



PARTS LIST INDEX

SHANK ASSEMBLY

RUB006/RUA004



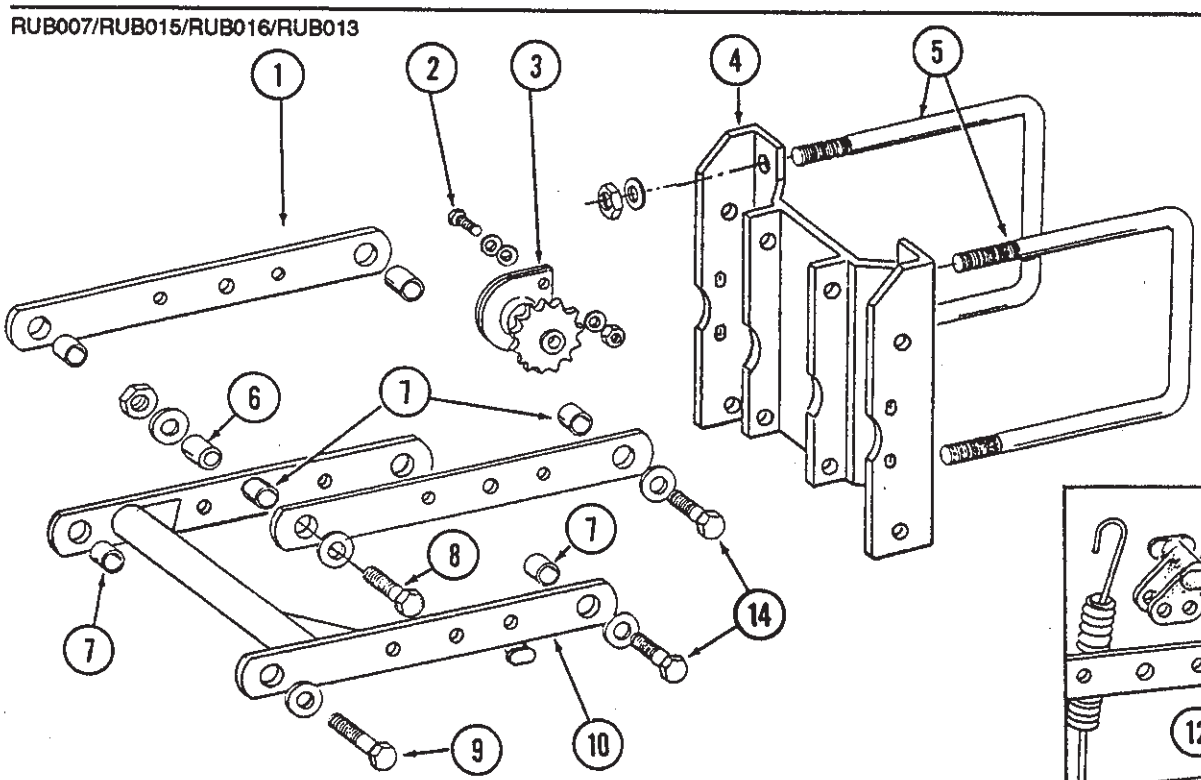
ITEM	PART NO.	DESCRIPTION
1.	A0860	Shank
2.	10307	Carriage Bolt, 3/8"-16 x 3 1/2", Grade 2
3.	A0811	Shank Cover
4.	D1065	Idler Spring
5.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
	10210	Washer, 3/8" USS
6.	10229	Lock Washer, 3/8"
7.	B0102	Depth Adjusting Handle
8.	10605	Spring Pin, 5/32" x 3/4"
9.	D1027	Stabilizer Bracket
10.	10003	Hex Head Cap Screw, 3/8"-16 x 1 1/2"
11.	10208	Special Washer, 13/32"
12.	D1120	Rubber Washer

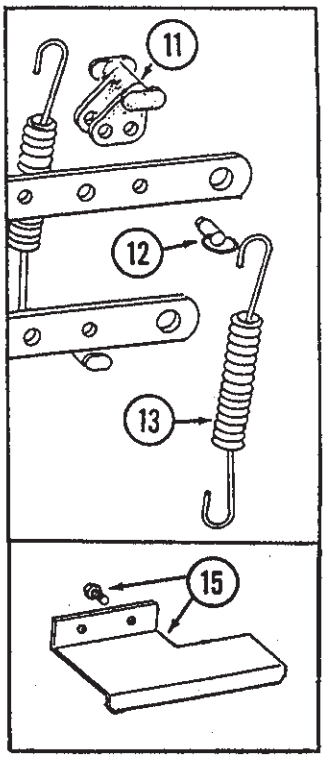
SHANK ASSEMBLY

ITEM	PART NO.	DESCRIPTION
13.	D1110	Bushing
14.	10304	Carriage Bolt, 3/8"-16 x 3", Grade 2
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
15.	10305	Carriage Bolt, 3/8"-16 x 1", Grade 2
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
16.	B0105	Depth Adjusting Slide
17.	D1066	Compression Spring
18.	10210	Washer, 3/8" USS
19.	10552	Clevis Pin, 3/8" x 2"
20.	D1130	Seed Tube, Regular
	A5880	Seed Tube W/High Rate Sensor
	R1062	Seed Tube (With holes for high rate sensor installation)
	R1087	Sensor Only (For A5880)
21.	10551	Clevis Pin, 1/4" x 2 1/2"
	10669	Hair Pin Clip, No. 22
22.	B0103	Seed Tube Guard
23.	A2012L	Disc Scraper, Left Hand
24.	A2012R	Disc Scraper, Right Hand
25.	10328	Hex Head Cap Screw, 3/8"-16 x 5/8"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
26.	10555	Clevis Pin, 1/2" x 2 1/2"
	10451	Cotter Pin, 1/8" x 1"
27.	10601	Spring Pin, 1/4" x 3/4"
28.	B0104	Depth Adjusting Stop
29.	10206	Washer, 1/2"
30.	10526	Spacer Washer, 1 1/64"
31.	A2116	Wheel Arm With Grease Fitting
	10640	Grease Fitting, 1/4"-20
32.	10108	Lock Nut, 3/8"-16
33.	10216	Washer, 1/2" USS
34.	10228	Lock Washer, 1/2"
35.	10014	Hex Head Cap Screw, 1/2"-13 x 1"
36.	10213	Machine Bushing, 1 3/64"
37.	D1030	Disc, 15"
38.	A2014	Bearing
39.	D7426	Idler Sprocket
40.	10435	Retaining Ring
41.	10204	Washer, 21/32"
42.	10503	Jam Nut, 5/8"-11, Right Hand
	10504	Jam Nut, 5/8"-11, Left Hand
43.	A2056	Idler Arm
44.	D1033	Shield
45.	10303	Carriage Bolt, 5/16"-18 x 1", Grade 2
	10620	Flange Nut, 5/16"-18
46.	D1026	Spacer
47.	D1031	Housing
48.	D6533	Bearing Cap
49.	10427	Rivet, 1/4" x 1/2"
50.	10384	Special Washer, 3/8"
A.	A2013	Disc And Bearing Assembly, Less Bearing Cap (Items 37-38, 47 and 49)

PARALLEL ARMS, MOUNTING BRACKET AND QUICK ADJUSTABLE DOWN FORCE SPRINGS

RUB007/RUB015/RUB016/RUB013

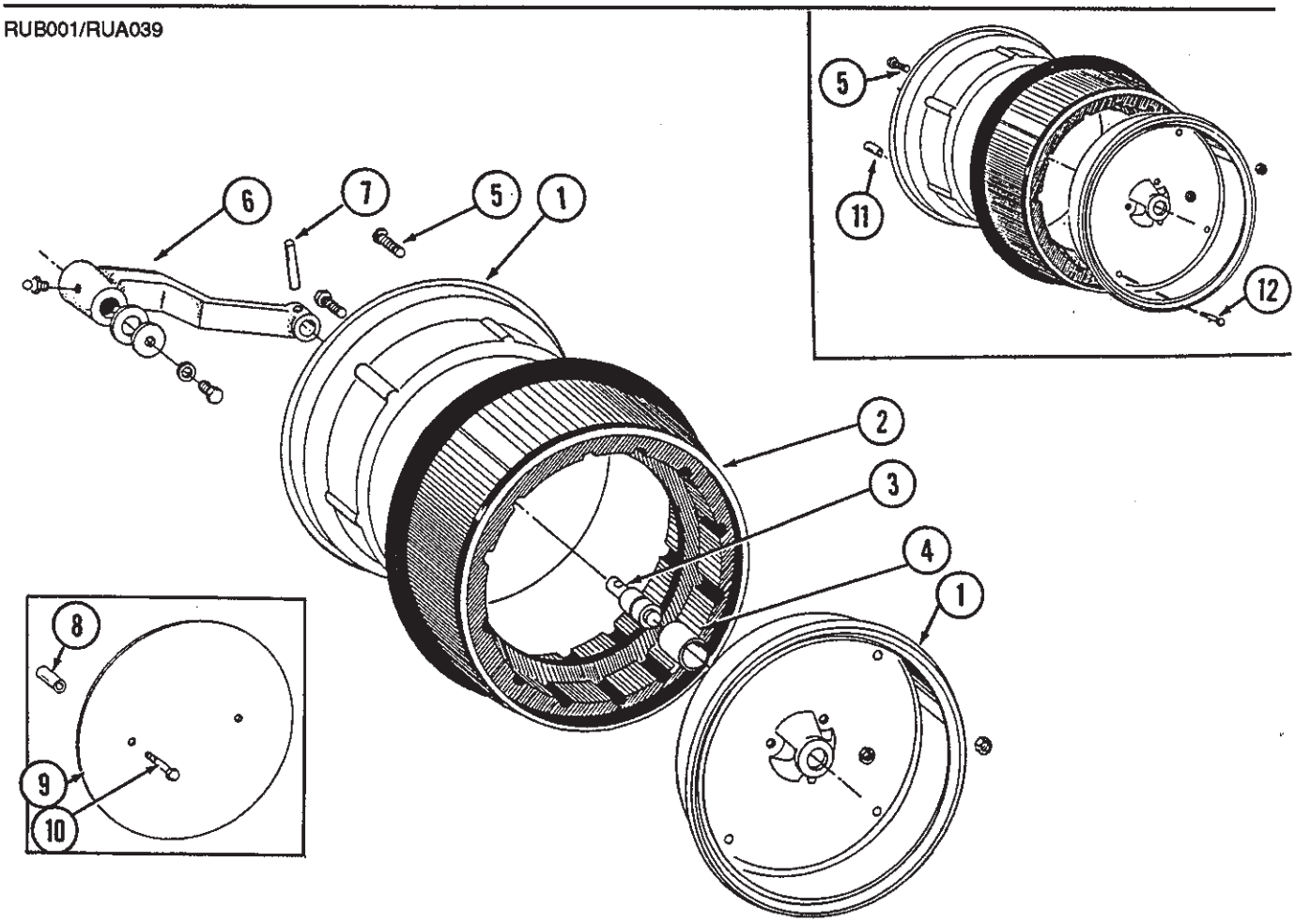




ITEM	PART NO.	DESCRIPTION
1.	D7619	Upper Arm
2.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10210	Washer, 3/8" USS (As Required)
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
3.	A1720	Bearing/Sprocket, 7/8" Bore
4.	A5798	Support Plate
5.	D1114	U-Bolt, 7" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
6.	D1109	Pivot Bushing
7.	B0218	Bushing
8.	10006	Hex Head Cap Screw, 5/8"-11 x 2 1/4"
	D7805	Special Washer
	10107	Lock Nut, 5/8"-11
9.	10005	Hex Head Cap Screw, 5/8"-11 x 1 3/4"
	D7805	Washer, Special
	10107	Lock Nut, 5/8"-11
10.	A5651	Lower Arm
11.	B0186	Spring Anchor
12.	10545	Detent Pin, 1" Grip
13.	D8249	Spring
14.	10008	Hex Head Cap Screw, 5/8"-11 x 2"
	D7805	Washer, Special
	10107	Lock Nut, 5/8"-11
15.	7192X	Chain Shield Package With Hardware (Used with Row Unit Mounted No Till Coulters)
	10037	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13

GAUGE WHEEL

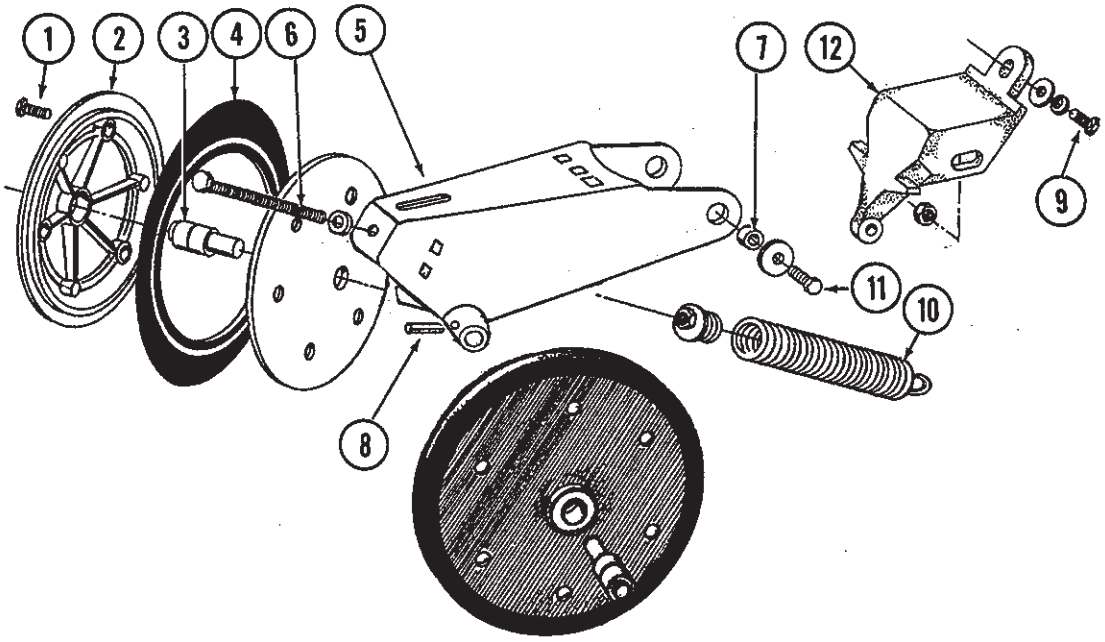
RUB001/RUA039



ITEM	PART NO.	DESCRIPTION
1.	D1048	Half Wheel
2.	D1086	Tire
3.	A2022	Bearing
4.	B0118	Bearing Sleeve
5.	10018	Hex Head Cap Screw, 5/16"-18 x 5/8"
	10109	Lock Nut, 5/16"-18
6.	A2116	Wheel Arm With Grease Fitting
	10640	Grease Fitting, 1/4"-20
7.	10603	Spiral Pin, 1/4" x 1 1/4"
8.	D0973	Sleeve, 1 1/2"
9.	D1353	Wheel Cover (Optional)
10.	10069	Hex Head Cap Screw, 5/16"-18 x 2 1/4"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
11.	D8811	Sleeve, 4 1/8"
12.	10661	Hex Head Cap Screw, 5/16"-18 x 4 1/2"
	10109	Lock Nut, 5/16"-18
A.	A2021	Gauge Wheel Complete (Items 1-5)
B.	1K149	Gauge Wheel Cover Package, 1 Row, Includes: (1)10069, (4)10106, (4)10232, (4)D0973, (2)D1353 (Items 8-10)
C.	R1099	Dual Gauge Wheel Hardware Package, Includes: (3)10018, (7)10109, (4)10661, (4)D8811 (Items 5, 11 And 12) NOTE: One package required per wheel. IN ADDITION: Order (1)D1086 and (2)D1048

CLOSING WHEEL

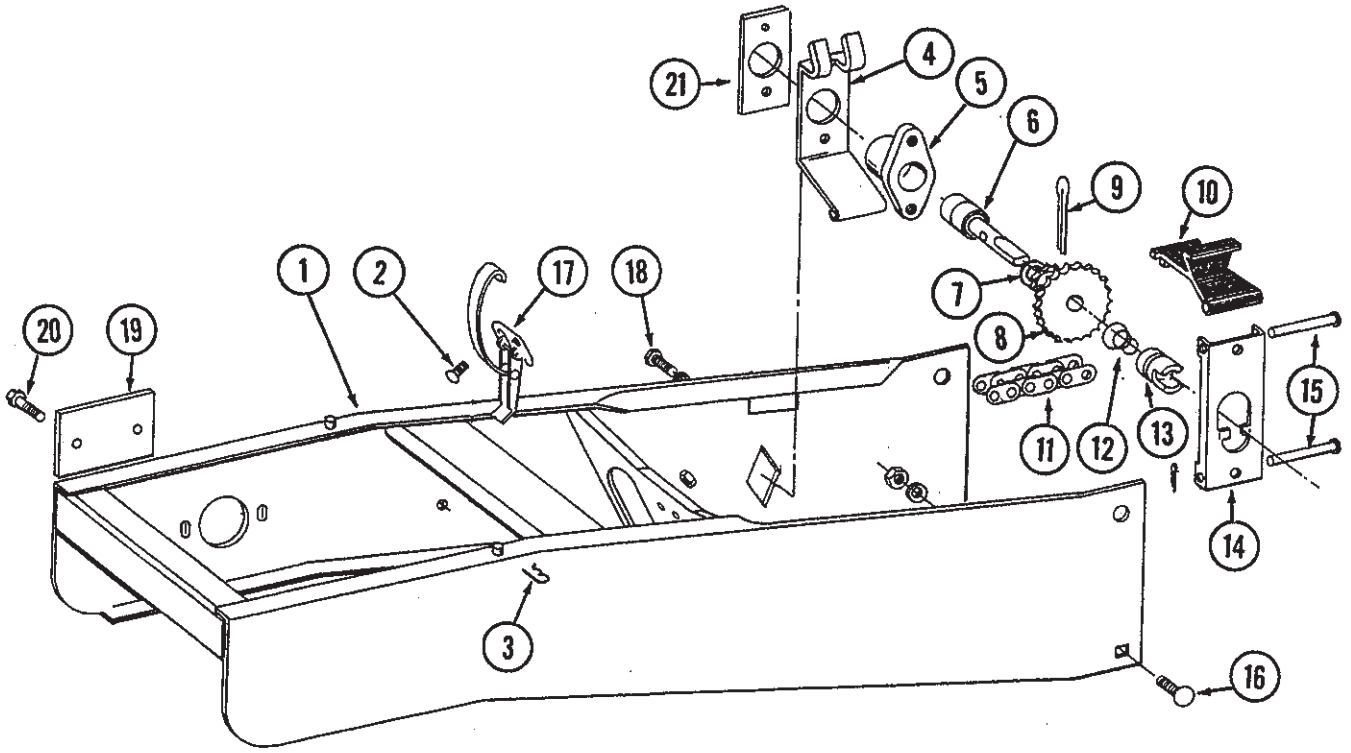
RUB004



ITEM	PART NO.	DESCRIPTION
1.	10064	Hex Head Cap Screw, 1/4"-20 x 1"
	10103	Hex Nut, 1/4"-20
2.	D4455	Half Wheel, Nylon
3.	A2022	Bearing
4.	D1085	Tire, 1" x 15"
5.	A6056	Arm With Spindles
6.	10015	Hex Head Cap Screw, 1/2"-13 x 5", Grade 2 Full Thread
	10525	Internal Tooth Lock Washer, 1/2"
7.	D1111	Bushing
8.	10603	Spiral Spring Pin, 1/4" x 1 1/4"
9.	10003	Hex Head Cap Screw, 3/8"-16 x 1 1/2"
	10229	Lock Washer, 3/8"
	10210	Washer, 3/8" USS
10.	A2054	Spring With Plug
11.	10016	Hex Head Cap Screw, 1/2"-13 x 2"
	10216	Washer, 1/2" USS
	10111	Lock Nut, 1/2"-13
12.	B0113	Wheel Arm Stop
A.	A3086	Standard Closing Wheel Complete With Bearing, Nylon (Items 1-4)

HOPPER SUPPORT AND METER DRIVE

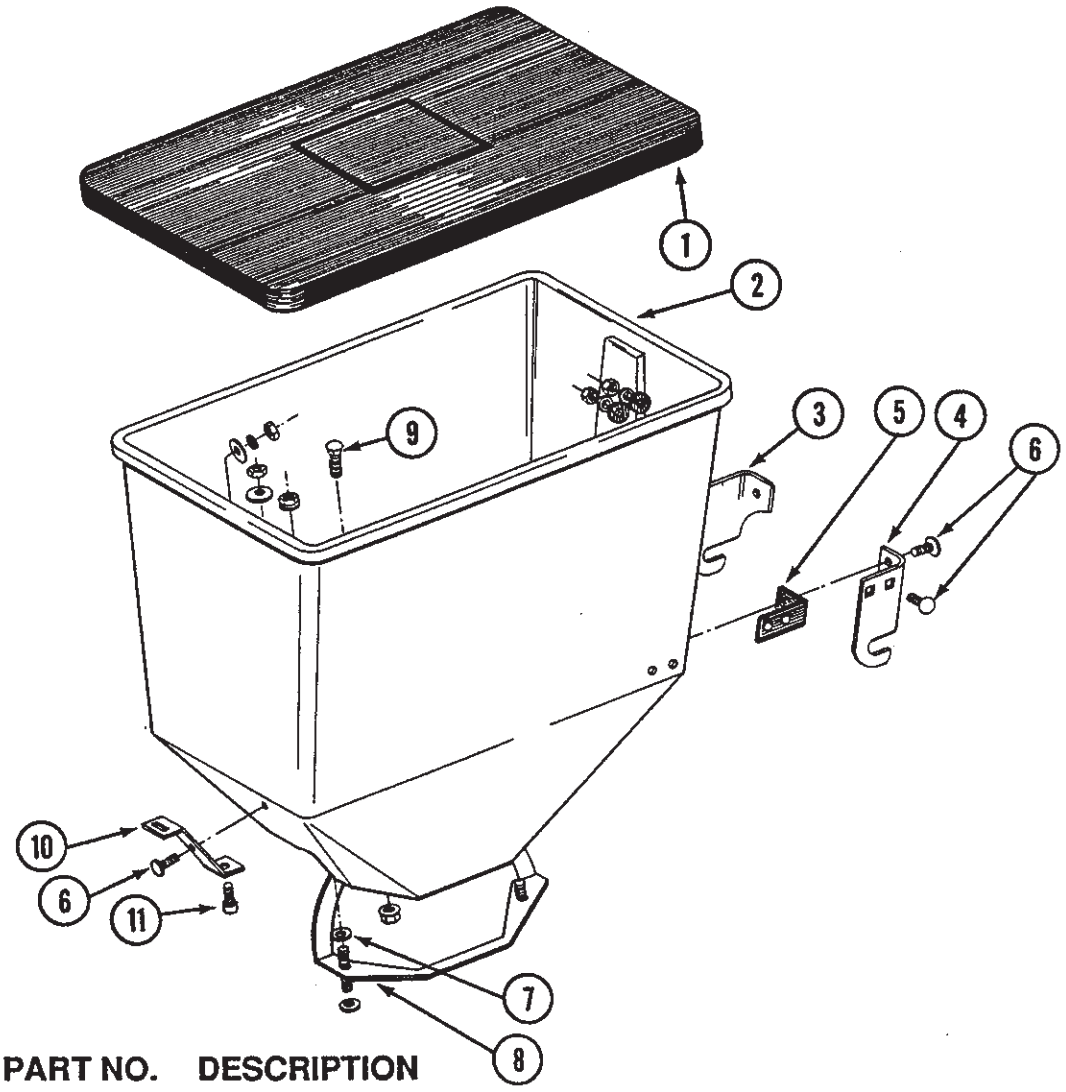
RUB005



ITEM	PART NO.	DESCRIPTION
1.	A5906	Hopper Support
2.	10309	Carriage Bolt, 1/4"-20 x 5/8", Grade 2
	10621	Flange Nut, 1/4"-20
3.	10670	Spring Locking Pin, No. 3
4.	D1037	Bearing Support
5.	B0108	Bearing Housing
6.	A2016	Bearing
7.	10204	Machinery Bushing, 21/32" (As Required)
8.	B0107	Sprocket, 11/19 Tooth
9.	10457	Cotter Pin, 5/32" x 1 1/2"
10.	D1035	Release Handle
11.	3303-98	Roller Chain, No. 41, 98 Links Including Connector Link
	R0196	Connector Link, No. 41
12.	D8458	Compression Spring
13.	B0109	Drive Coupler
14.	D1036	Drive Release Lever
15.	10553	Clevis Pin, 1/4" x 2 5/8"
	10455	Cotter Pin, 1/16" x 1/2"
16.	10305	Carriage Bolt, 3/8"-16 x 1", Grade 2
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
17.	A2007	Hopper Hold Down Latch
18.	10019	Hex Head Cap Screw, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
19.	D7618	Cover
20.	10312	Carriage Bolt, 5/16"-18 x 3/4"
	10620	Flange Nut, 5/16"-18
21.	D2128	Plate
A.	A4822	Meter Drive Assembly Complete (Items 4-10,12-15 And 18)

SEED HOPPER

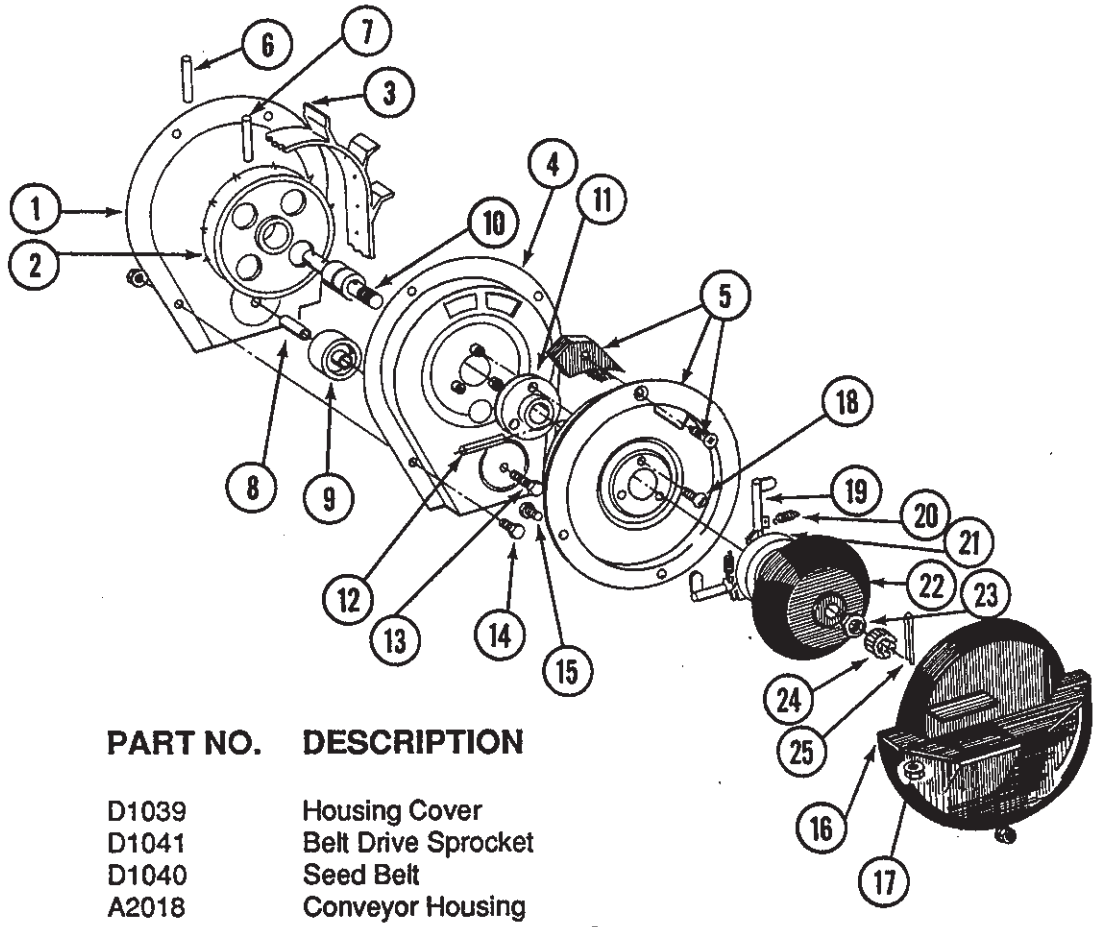
RUA015



ITEM	PART NO.	DESCRIPTION
1.	A2327	Lid With Clip
2.	D1053	Seed Hopper
3.	D1051L	Bracket, Left Hand
4.	D1051R	Bracket, Right Hand
5.	D1054	Mounting Pad
6.	10310	Carriage Bolt, 1/4"-20 x 3/4", Grade 2
	D1121	Rubber Washer
	10209	Washer, 1/4" USS
	10110	Self Locking Nut, 1/4"-20
7.	D1121	Rubber Washer
8.	A2027	Retainer
9.	10310	Carriage Bolt, 1/4"-20 x 3/4", Grade 2
	10621	Whiz Lock Nut, 1/4"
10.	D1055	Clip
11.	10520	Hex Head Cap Screw, 3/8"-16 x 3/4", Grade 8
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
A.	A2058	Seed Hopper With Hardware, Less Lid (Items 2-11)

FINGER PICKUP CORN METER

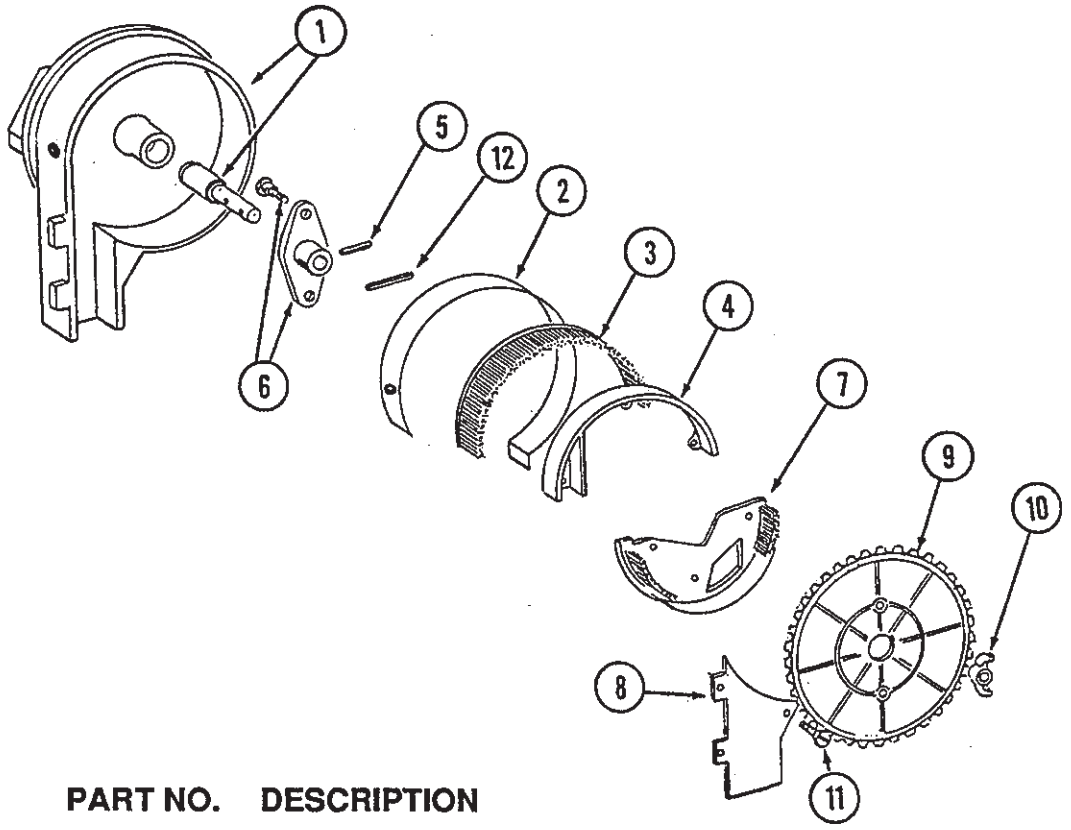
RUA015



ITEM	PART NO.	DESCRIPTION
1.	D1039	Housing Cover
2.	D1041	Belt Drive Sprocket
3.	D1040	Seed Belt
4.	A2018	Conveyor Housing
5.	R0664	Carrier With Brush And Screw
	A2020	Brush
	10690	Rolling Thread Screw, No. 10 x 3/4"
6.	10602	Spring Pin, 1/4" x 1 1/2"
7.	10604	Spring Pin, 3/16" x 1 1/2"
8.	B0120	Bushing
9.	D1042	Idler
10.	A2019	Bearing
11.	B0110	Bearing Housing
12.	10603	Spring Pin, 1/4" x 1 1/4"
13.	10021	Hex Head Cap Screw, 1/4"-20 x 1 1/2"
	10621	Flange Nut, 1/4"
14.	10022	Hex Head Cap Screw, 1/4"-20 x 1/2"
	10621	Flange Nut, 1/4"
15.	10020	Hex Head Cap Screw, 1/4"-20 x 5/8"
	10323	Hex Flange Nut, 1/4"-20
16.	D1046	Seed Baffle
17.	10620	Flange Nut, 5/16"-18
18.	10401	Machine Screw, No. 10-32 x 5/8"
19.	D1044	Finger (12 Per Meter)
20.	D6501	Spring
21.	B0111	Cam
22.	D1045	Finger Holder
23.	10500	Jam Nut, 5/8"-18 UNF
24.	D1083	Cage Nut, 5/8"
25.	10470	Cotter Pin, 5/32" x 1"
A.	R0933	Finger Assembly (Items 19-22)

BRUSH-TYPE SEED METER

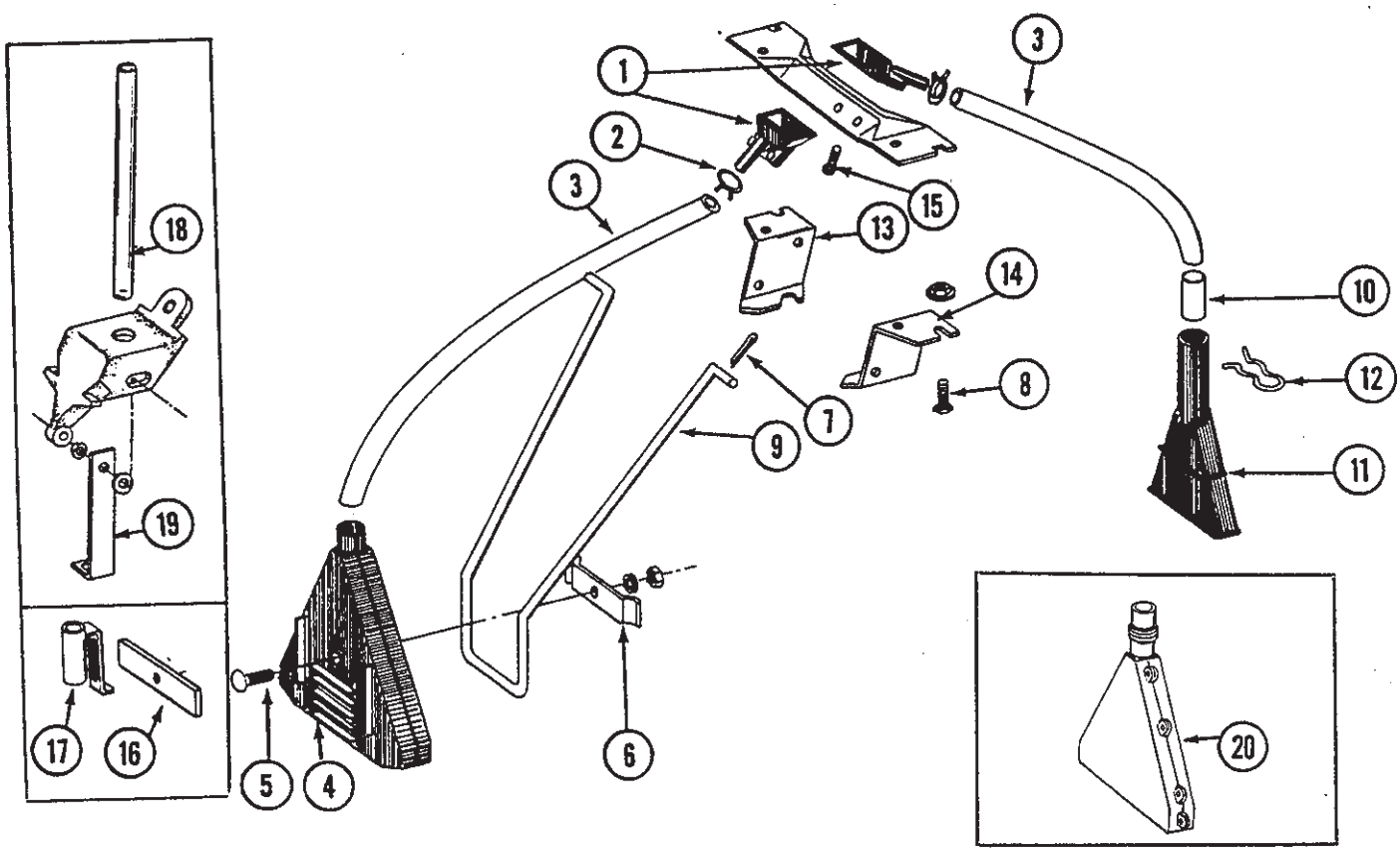
RUA037



ITEM	PART NO.	DESCRIPTION
1.	A6027	Housing W/Bearing
	A5698	Bearing
2.	D8778	Wear Strip
3.	A5699	Retaining Brush
4.	D8237	Upper Brush Holder
5.	10603	Spring Pin, 1/4" x 1 1/4"
6.	A6038	Hub W/Shoulder Bolts
	D1755	Shoulder Bolt, 1/4"
7.	A5834	Lower Brush Holder
8.	D7878	Cover
9.	A5794	Seed Disc, Soybean , 60 Cell, Black Color-coded
	A6184	Seed Disc, Specialty Soybean, 48 Cell, Dark Blue Color-coded
	A5982	Seed Disc, Small Milo/Grain Sorghum, 30 Cell, Red Color-coded
	A6187	Seed Disc, Large Milo/Grain Sorghum, 30 Cell, Light Blue Color-coded
	A5795	Seed Disc, High Rate Milo/Grain Sorghum, 60 Cell, Red Color-coded
	A6633	Seed Disc, High Rate Large Milo/Grain Sorghum, 60 Cell, Yellow Color-coded
	A5796	Seed Disc, Cotton, Acid-delinted, 30 Cell, White Color-coded
	A6168	Seed Disc, Large Cotton, Acid-delinted, 36 Cell, Tan Color-coded
	A6478	Seed Disc, High Rate Cotton, Acid-delinted, 48 Cell, Light Green Color-coded
	A6182	Seed Disc, Hill-drop Cotton, Acid-delinted, 12 Cell, Brown Color-coded
10.	10531	Nylon Insert Wing Nut, 1/4"-20
11.	10584	Slotted Tap Screw, No. 10-24 x 1/2"
12.	10602	Spring Pin, 1/4" x 1 1/2"

GRANULAR CHEMICAL BANDERS

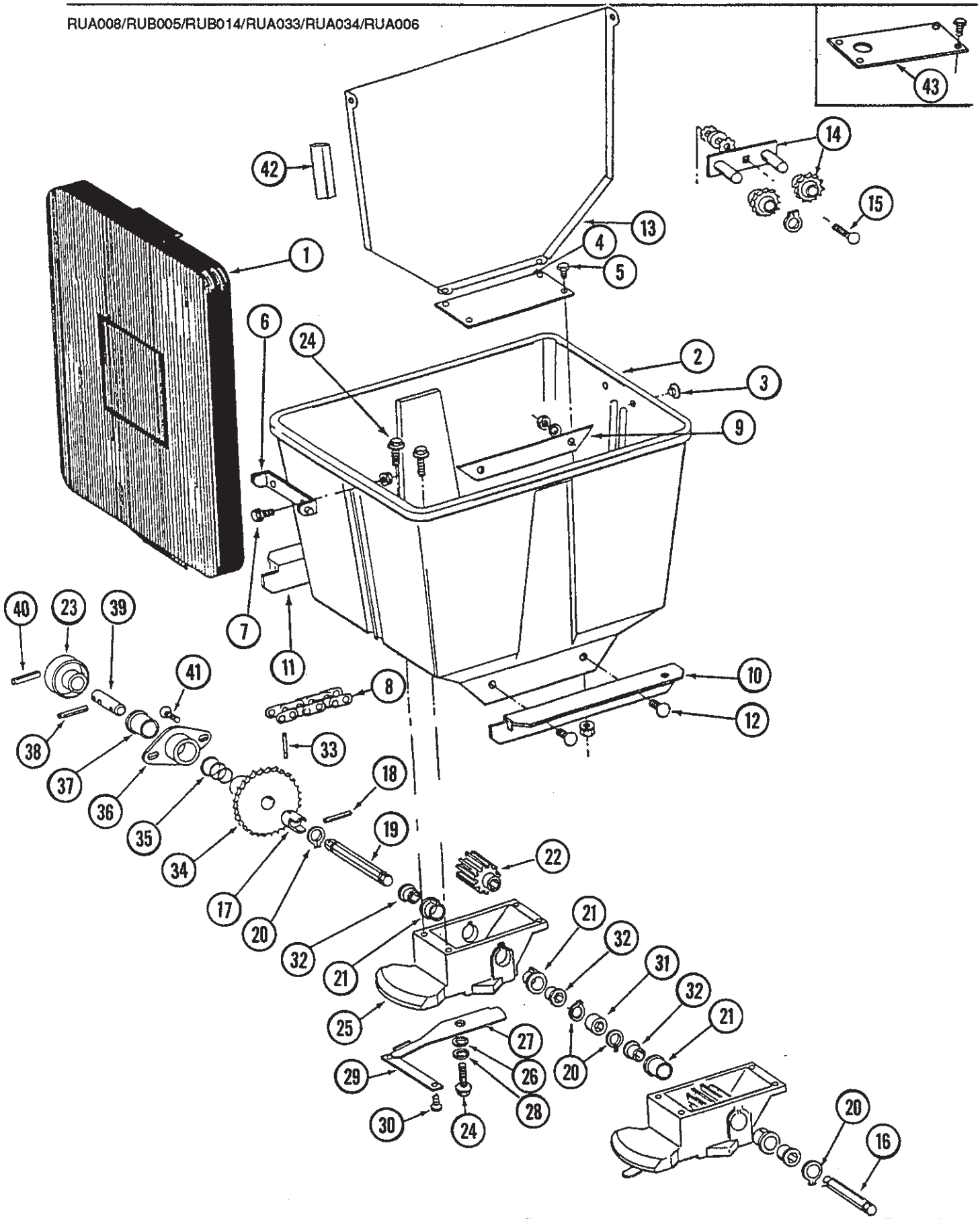
RUA013/RUA012/RUA016



ITEM	PART NO.	DESCRIPTION
1.	D2423	Funnel
2.	10680	Hose Clamp, 7/16"
3.	D1128	Hose, 7/16" x 18"
4.	A2075	Diffuser, 14" Band
5.	10306	Carriage Bolt, 3/8"-16 x 2", Grade 2
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
6.	D1118	Clamp
7.	10452	Cotter Pin, 1/8" x 1/2"
8.	10310	Carriage Bolt, 1/4"-20 x 3/4", Grade 2
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20
9.	D1116	Hanger
10.	D1082	Tube
11.	D1081	Spreader (7" Band)
12.	D1090	Spring Clip
13.	D1115L	Hanger Bracket, L.H.
14.	D1115R	Hanger Bracket, R.H.
15.	10523	Self Tapping Screw, No. 10 x 1/2"
16.	D1323	Strap (Rear Mount)
17.	A0485	Tube With Bracket (Rear Mount)
18.	D2947	Hose, 7/16" x 28" (Direct Drop)
19.	D2864	Bracket (Direct Drop)
20.	A6476	Slope-compensating Bander (3 1/2" or 7" Band)

GRANULAR CHEMICAL HOPPER WITH METER(S) & THROWOUT

RUA008/RUB005/RUB014/RUA033/RUA034/RUA006

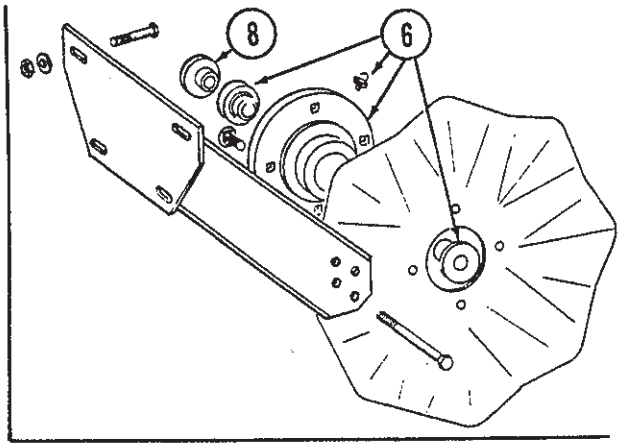


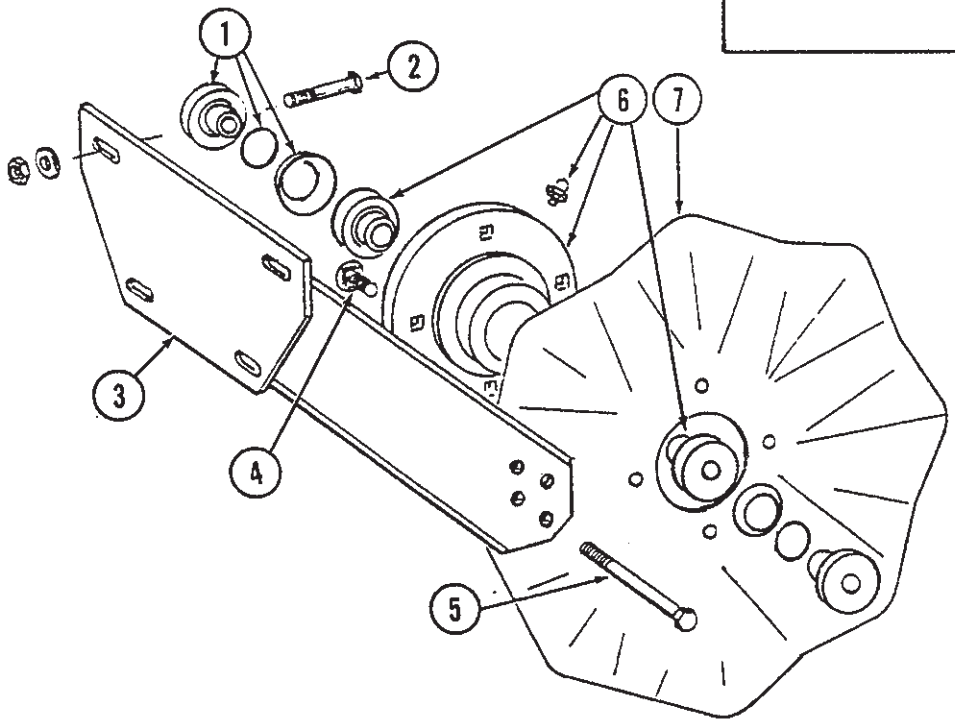
GRANULAR CHEMICAL HOPPER WITH METER(S) & THROWOUT

ITEM	PART NO.	DESCRIPTION
1.	A4444	Lid
2.	D1058	Hopper
3.	D1089	Plug
4.	D1056	Cover Plate
5.	10022	Hex Head Cap Screw, 1/4"-20 x 1/2"
	10621	Flange Nut, 1/4"-20
6.	D1060	Hinge
7.	10023	Hex Head Cap Screw, 1/4"-20 x 3/4"
	10621	Flange Nut, 1/4"-20
8.	3303-114	Roller Chain, No. 41, 114 Pitch Including Connector Link
	R0196	Connector Link, No. 41
9.	D1072	Strap
10.	D1059R	Support, Right Hand
11.	D1059L	Support, Left Hand
12.	10311	Carriage Bolt, 3/8"-16 x 3/4" Short Necked, Grade 2
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
13.	A2076	Divider
14.	A2008	Idler Arm With Sprockets And Rings
	D7426	Sprocket
	10435	Ring
15.	10305	Carriage Bolt, 3/8"-16 x 1", Grade 2
	10524	Internal-External Lock Washer, 3/8"
	10207	Washer, 3/8"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
16.	D7591	Shaft
17.	B0184	Coupling
18.	10546	Spring Pin, 3/16" x 1 1/4"
19.	D7588	Shaft
20.	10567	Retaining Ring
21.	B0115	Bearing
22.	D7148	Feed Roller, Hex Bore
23.	D7587	Knob
24.	10570	Self Tapping Screw, 1/4" x 3/4"
25.	B0116	Granular Housing
26.	10660	Wave Washer
27.	D1063	Metering Gate
28.	10209	Washer, 1/4" USS
29.	D1061	Support Strap
30.	10521	Self Tapping Screw, No. 10 x 3/8"
31.	D7592	Coupler, Hex Bore
32.	D7258	Hex Bushing
33.	10609	Spring Pin, 5/32" x 1"
34.	A5533	Sprocket, 24 Tooth
35.	D8458	Spring
36.	B0183	Bearing Mount
37.	B0121	Bearing
38.	10602	Spring Pin, 1/4" x 1 1/2"
39.	D7589	Throwout Pin
40.	10637	Spring Pin, 1/8" x 1 1/2"
41.	10312	Carriage Bolt, 5/16"-18 x 3/4"
	10620	Flange Nut, 5/16"-18
42.	3314-40	Foam Strip, 40"
43.	D8750	Restrictor Plate (Optional)

NO TILL COULTER, ROW UNIT MOUNTED

RUA036

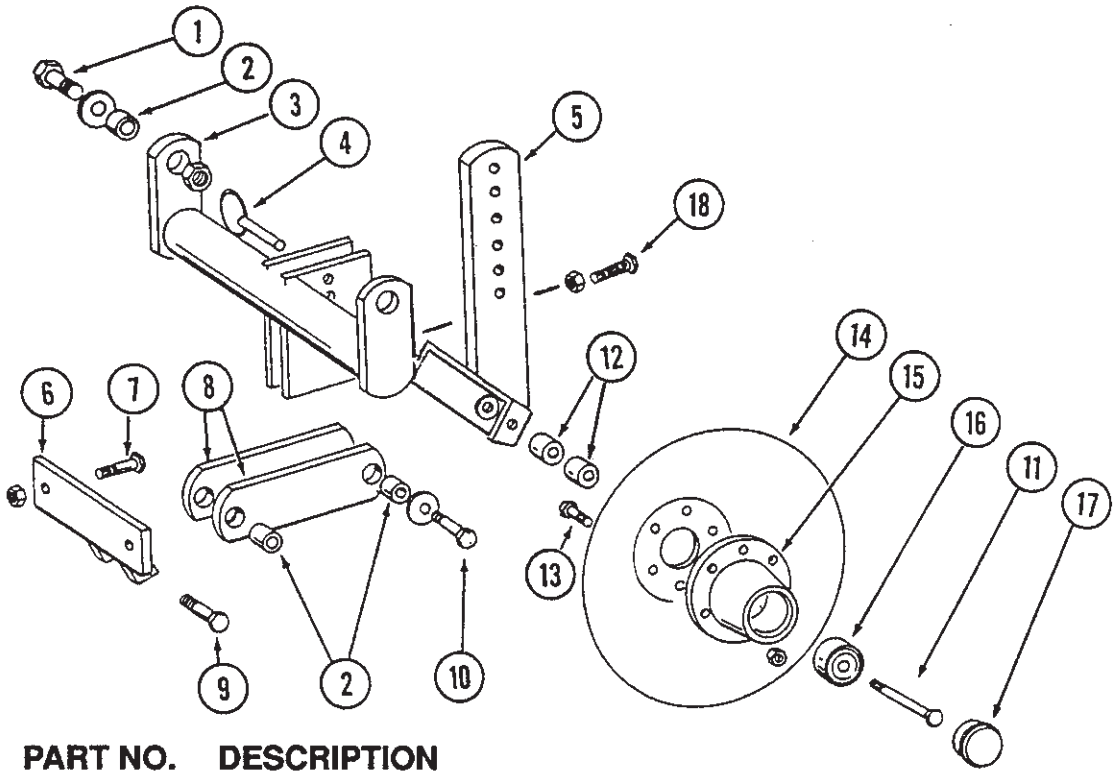




ITEM	PART NO.	DESCRIPTION
1.	GB0227	Adapter W/O-Ring And Spring Washer
	D8844	O-Ring
	D8843	Spring Washer
2.	10574	Carriage Bolt, 1/2"-13 x 1 1/4"
	10216	Washer, 1/2" USS
	10111	Lock Nut,1/2"-13
3.	A5625	Arm
4.	10574	Carriage Bolt, 1/2"-13 x 1 1/4"
	10111	Lock Nut, 1/2"-13
5.	10036	Hex Head Cap Screw, 5/8"-11 x 4"
	10107	Lock Nut, 5/8"-11
6.	GA5640	Hub W/Bearings And Grease Fitting
	A5622	Bearing
	10640	Grease Fitting, 1/4"-20
7.	D7803	Fluted Blade, 1", 8 Flutes (Shown)
	D7804	Rippled Blade, 1"
	D9254	Fluted Blade, 3/4", 13 Flutes
8.	B0191	Adapter (Sub GB0227)

DISC FURROWER, ROW UNIT MOUNTED

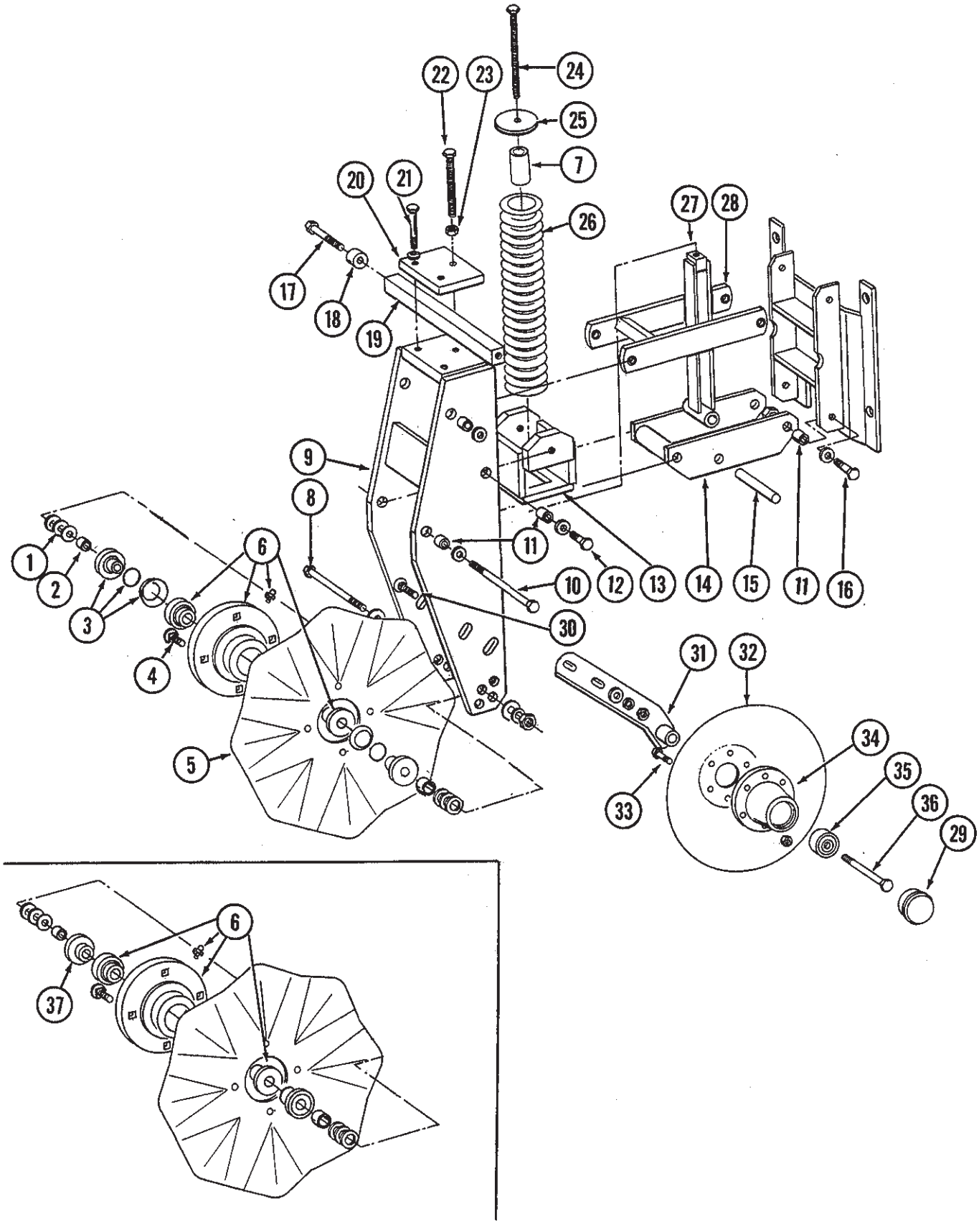
RUA038



ITEM	PART NO.	DESCRIPTION
1.	10039	Hex Head Cap Screw, 1/2"-13 x 1 3/4"
	10216	Washer, 1/2" USS
	10111	Lock Nut, 1/2"-13
2.	D7889	Bushing
3.	A5719	Mounting Bracket
4.	10536	Pin
5.	A5718	Support Arm
6.	A5715	Anchor
7.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10111	Lock Nut, 1/2"-13
8.	D7890	Link
9.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10216	Washer, 1/2" USS
	10111	Lock Nut, 1/2"-13
10.	10585	Hex Head Cap Screw, 1/2"-13 x 3 1/4"
	10216	Washer, 1/2" USS
	10111	Lock Nut, 1/2"-13
11.	10318	Hex Head Cap Screw, 5/8"-11 x 4 1/2"
	D7805	Special Washer
	10107	Lock Nut, 5/8"-11
12.	D7817-01	Spacer, 3/4"
	D7817-04	Spacer, 1/2"
13.	10572	Truss Head Slotted Machine Screw, 5/16"-18 x 7/8"
	10106	Hex Nut, 5/16"-18
14.	D7823	Solid Disc, 12" (Shown)
	D8307	Notched Disc, 12"
15.	B0195	Hub
16.	A2014	Bearing
17.	D1132	Dust Cap
18.	10503	Jam Nut, 5/8"-11
	10597	Set Screw, 5/8"-11 x 2 1/4"

FRAME MOUNTED COULTER W/DISC FURROWER

RUA035

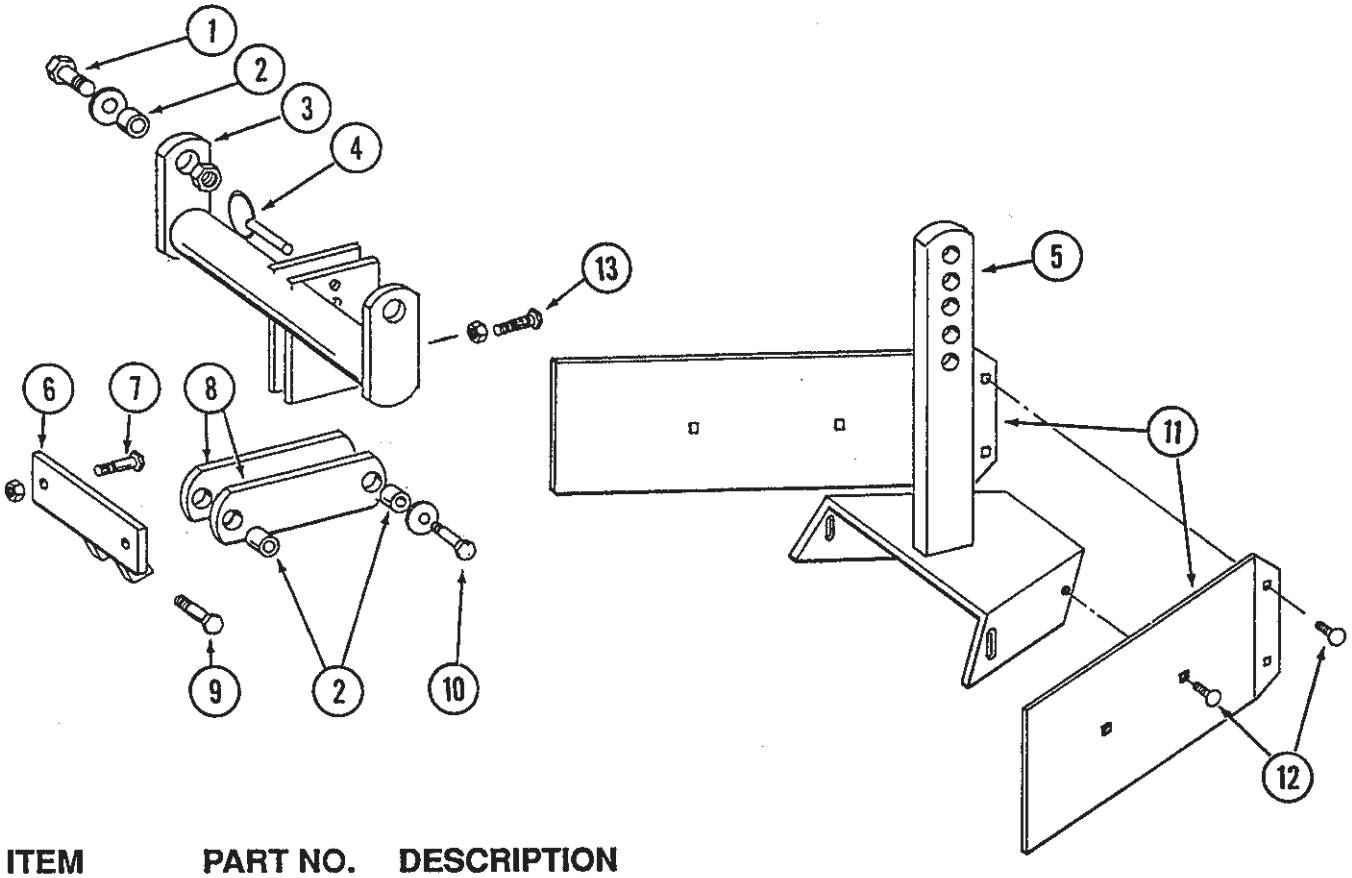


FRAME MOUNTED COULTER W/DISC FURROWER

ITEM	PART NO.	DESCRIPTION
1.	10217	Washer, 5/8" USS
2.	D7817-04	Spacer, 1/2"
3.	GB0227	Adapter W/O-Ring And Spring Washer
	D8844	O-Ring
	D8843	Spring Washer
4.	10574	Carriage Bolt, 1/2"-13 x 1 1/4"
	10111	Lock Nut, 1/2"-13
5.	D7803	Fluted Blade, 1", 8 Flutes (Shown)
	D7804	Rippled Blade, 1"
	D9245	Fluted Blade, 3/4", 13 Flutes
6.	GA5640	Hub W/Bearings And Grease Fitting
	A5622	Bearing
	10640	Grease Fitting, 1/4"-20
7.	D7817-09	Stop, 1 3/4"
8.	10068	Hex Head Cap Screw, 5/8"-11 x 6"
	10107	Lock Nut, 5/8"-11
9.	A5643	Fork Mount
10.	10012	Hex Head Cap Screw, 5/8"-11 x 6 1/2"
	D7805	Washer
	10107	Lock Nut, 5/8"-11
11.	B0218	Bushing
12.	10055	Hex Head Cap Screw, 5/8"-11 x 1 1/4"
	D7805	Washer
13.	A5637	Spring Socket
14.	A5631	Lower Parallel Link
15.	D7815	Pin, 5/8" x 4 1/4"
16.	10008	Hex Head Cap Screw, 5/8"-11 x 2"
	D7805	Washer
	10107	Lock Nut, 5/8"-11
17.	D7818	Special Bolt
18.	D7817-01	Roller, 3/4"
19.	D7816	Depth Control Bar
20.	D7811	Depth Adjustment Clamp
21.	10581	Hex Head Cap Screw, 1/2"-13 x 2 1/4"
	10228	Lock Washer, 1/2"
22.	10582	Hex Head Cap Screw, 5/8"-11 x 4", Full Thread
23.	10104	Hex Nut, 5/8"-11
24.	10573	Hex Head Cap Screw, 5/8"-11 x 5 1/2", Full Thread
25.	B0196	Washer
26.	D7831	Compression Spring
27.	A5635	Spring Guide
28.	A5630	Upper Parallel Link
29.	D1132	Dust Cap
30.	10197	Carriage Bolt, 1/2"-13 x 2"
	10206	Washer, 1/2" SAE
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
31.	A5636	Arm
32.	D7823	Solid Disc, 12" (Shown)
	D8307	Notched Disc, 12"
33.	10572	Truss Head Slotted Machine Screw, 5/16"-18 x 7/8"
	10106	Hex Nut, 5/16"-18
34.	B0195	Hub
35.	A2014	Bearing
36.	10036	Hex Head Cap Screw, 5/8"-11 x 4"
	10107	Lock Nut, 5/8"-11
37.	B0191	Adapter (Sub GB0227)

BED LEVELER, ROW UNIT MOUNTED

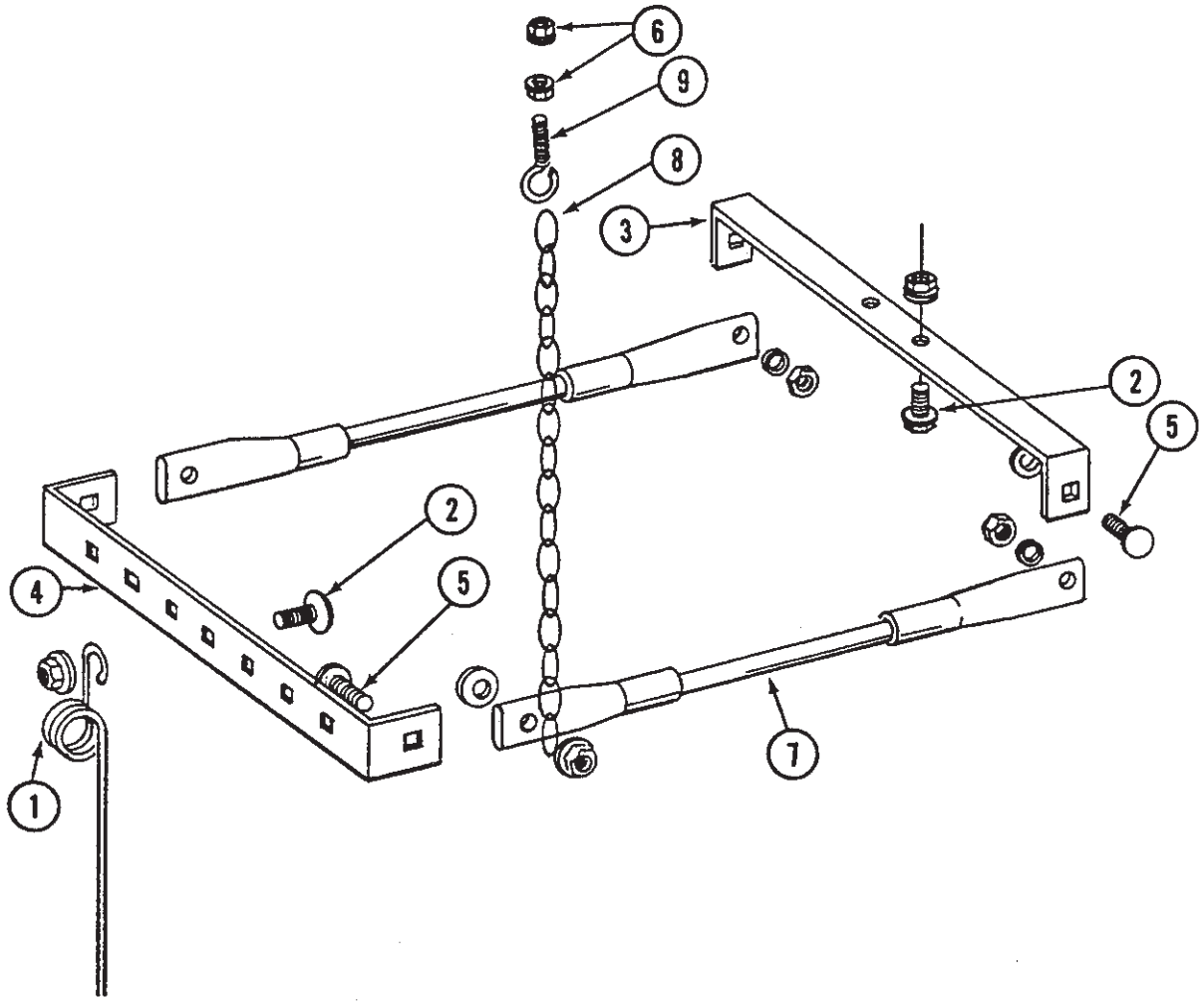
RUA038/RUA040



ITEM	PART NO.	DESCRIPTION
1.	10039	Hex Head Cap Screw, 1/2"-13 x 1 3/4"
	10216	Washer, 1/2" USS
	10111	Lock Nut, 1/2"-13
2.	D7889	Bushing
3.	A5719	Mounting Bracket
4.	10536	Pin
5.	A5892	Leveler
6.	A5715	Anchor
7.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10111	Lock Nut, 1/2"-13
8.	D7890	Link
9.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10216	Washer, 1/2" USS
	10111	Lock Nut, 1/2"-13
10.	10585	Hex Head Cap Screw, 1/2"-13 x 3 1/4"
	10216	Washer, 1/2" USS
	10111	Lock Nut, 1/2"-13
11.	D8266	Blade
12.	10303	Carriage Bolt, 5/16"-18 x 1"
	10219	Washer, 5/16" USS
	10109	Lock Nut, 5/16"
13.	10503	Jam Nut, 5/8"-11
	10597	Set Screw, 5/8"-11 x 2 1/4"

SPRING TOOTH INCORPORATOR

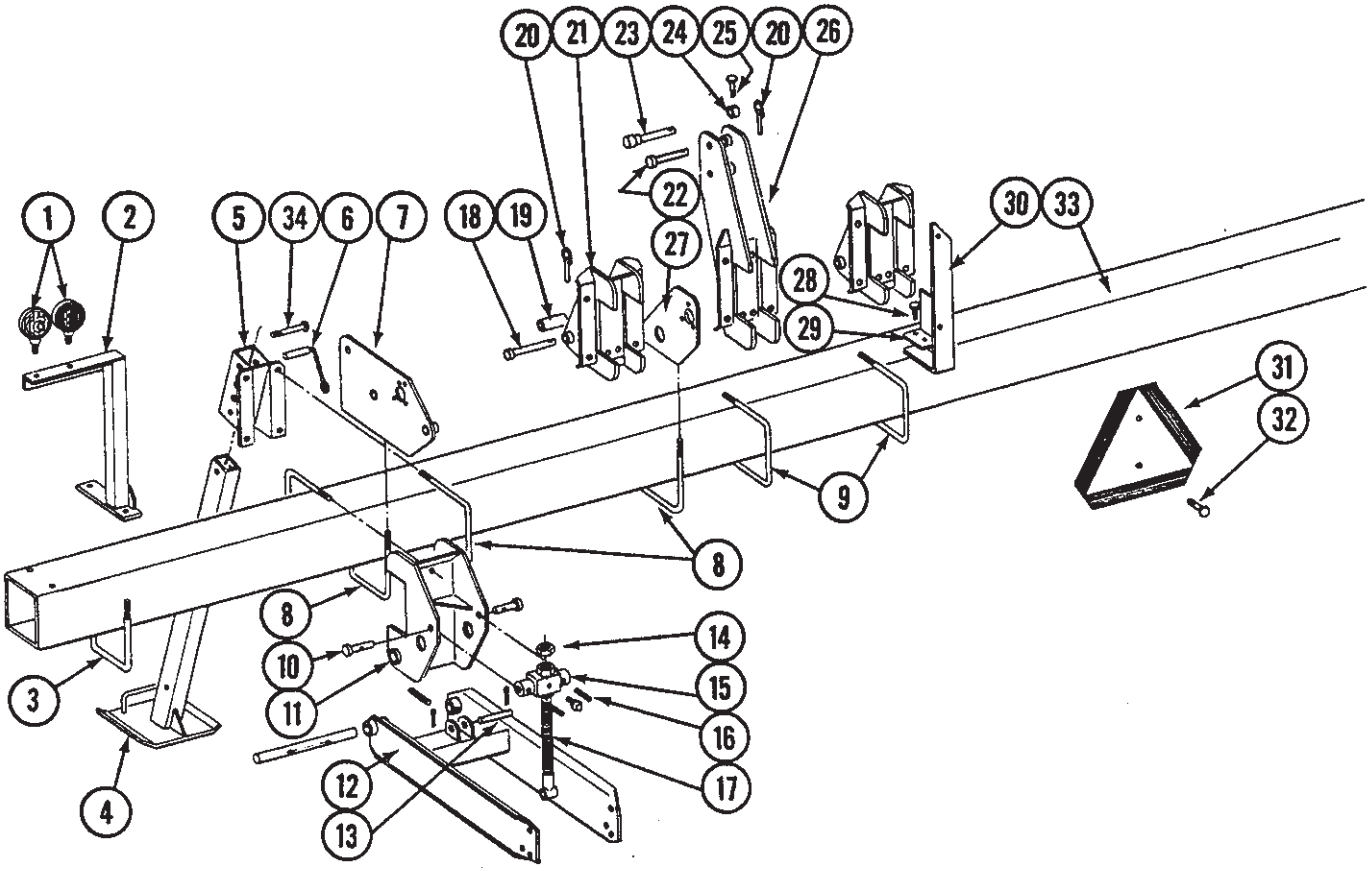
RUA011



ITEM	PART NO.	DESCRIPTION
1.	D1145	Spring Tooth
2.	10308	Carriage Bolt, 3/8"-16 x 3/4", Grade 2
	10622	Flange Lock Nut, 3/8"-16
3.	D1143	Front Bracket
4.	D1144	Rear Bracket
5.	10305	Carriage Bolt, 3/8"-16 x 1", Grade 2
	10529	External Tooth Lock Washer, 3/8"
	10622	Flange Lock Nut, 3/8"-16
6.	10621	Flange Lock Nut, 1/4"-20
7.	A2094	Cable Assembly
8.	3305-01	Chain
9.	D2460	Eyebolt, 1/4"-20

RIGID TOOLBAR ASSEMBLY

PFA043



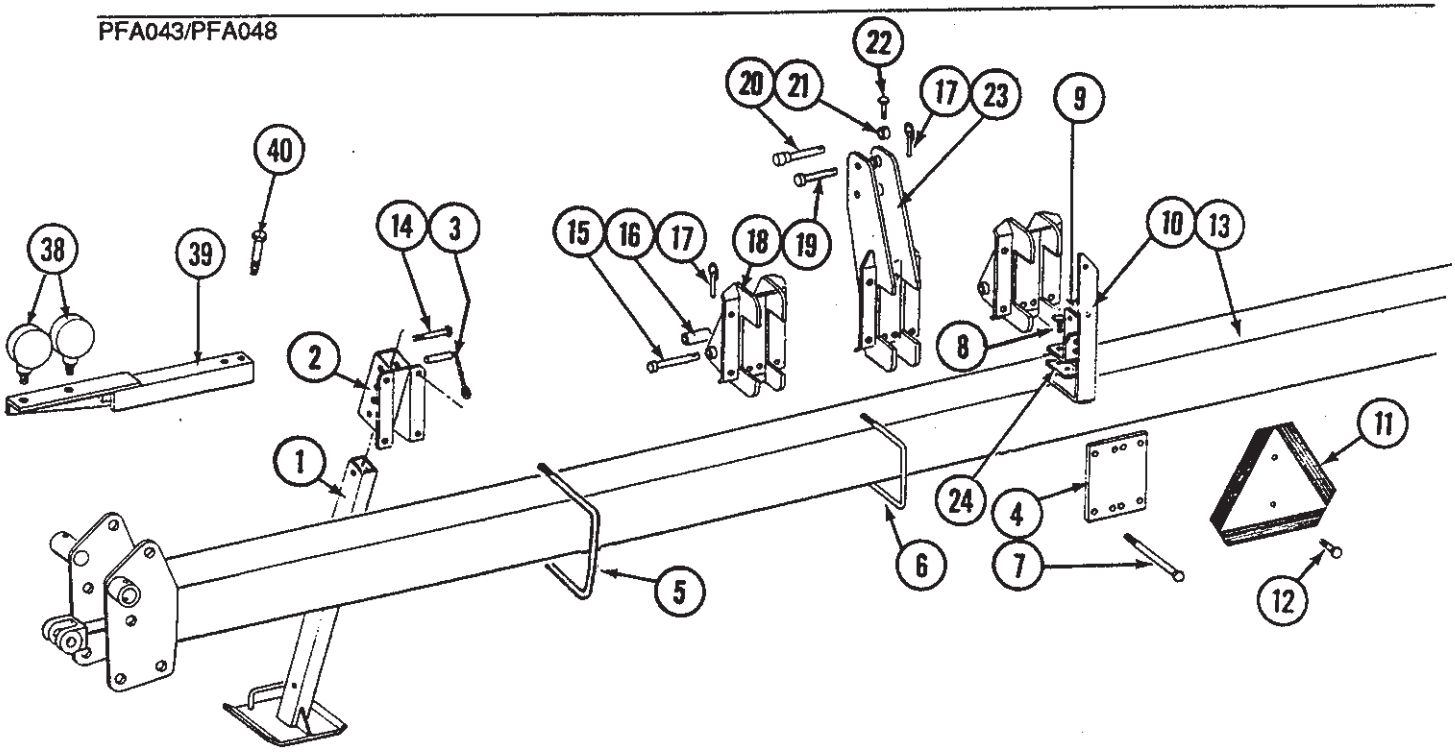
ITEM	PART NO.	DESCRIPTION
1.	A4122	Single Red Light Assembly Complete W/Female Terminal
	A4123	Double Amber Light Assembly Complete W/Male Terminal
	R0968	Bulb, No. 1156
	R0970	Red Lens
	R0969	Amber Lens
	10289	Hex Nut, 1/2"-20
	10525	Star Washer, 1/2"
	10266	Female Terminal
	10269	Male Terminal
2.	A4775	Bracket, L.H. (Shown)
	A4776	Bracket, R.H.
3.	D7145	U-Bolt, 7" x 7" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13

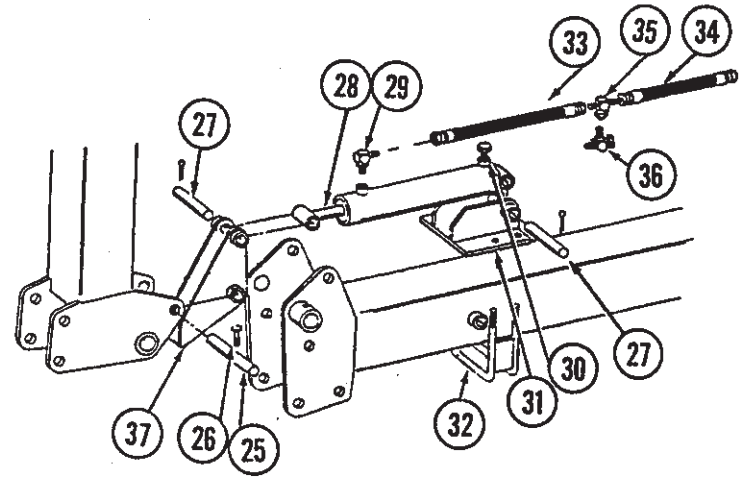
RIGID TOOLBAR ASSEMBLY

ITEM	PART NO.	DESCRIPTION
4.	A4732	Jack Stand
5.	A4707	Mount
6.	A4733	Detent Pin W/Chain
7.	A4699	Drive Plate, L.H. (Shown)
	A4700	Drive Plate, R.H.
8.	D1114	U-Bolt, 7" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
9.	D1748	U-Bolt, 7" x 7" x 3/4"-10
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10
10.	A4704	Pin
11.		Module W/Grease Fitting (Non-stock Item)
	10641	Grease Fitting, 1/8" NPT
12.		Arm W/Shaft And Spring Pin (Non-stock Item)
	D7042	Shaft, 1 1/4" x 12 1/8"
	10610	Spring Pin, 3/8" x 2"
13.	D7041	Pin, 1" x 4"
	10459	Cotter Pin, 3/16" x 1 1/2"
14.	10117	Hex Nut, 1"-8, Grade 2
15.	A4711	Jack Screw Mount W/Grease Fitting
	10641	Grease Fitting, 1/8" NPT
16.	10489	Spring Pin, 3/8" x 1 1/2"
17.	A4705	Adjuster Screw
18.	A4665	Lower Link Pin
19.	D7090	Adapter Bushing, Category 3
20.	D2557	Lynch Pin, 7/16"
21.		Lower Link (Non-stock Item)
22.	A4666	Link Pin, Category 3, 1 1/4"
23.	A4938	Link Pin, Optional Category 2, 1"
24.	D7338	Sleeve, Optional Category 2
25.	10048	Hex Head Cap Screw, 3/8"-16 x 2"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
26.	A4702	Center Mast
27.	A4709	Carrier Bearing Mount, L.H. (Shown), 4 Row Wide Through 10 Row 30
	A5466	Carrier Bearing Mount, R.H., 8 Row 40 and 10 Row 30 Only
28.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
29.	D5807	Valve Mounting Bracket
30.	D7152	SMV Mounting Bracket
31.	D2199	SMV Sign
32.	10023	Hex Head Cap Screw, 1/4"-20 x 3/4"
	10110	Lock Nut, 1/4"-20
33.		Toolbar, 7" x 7" x 120", 2 Row (120" Bar) And 4 Row 30 (Non-stock Item)
		Toolbar, 7" x 7" x 150", 4 Row 36/38/40 (Non-stock Item)
		Toolbar, 7" x 7" x 180", 6 Row 30 (Non-stock Item)
		Toolbar, 7" x 7" x 230", 6 Row 36/38/40 (Non-stock Item)
		Toolbar, 7" x 7" x 240", 2 Row (240" Bar) And 8 Row 30 (Non-stock Item)
		Toolbar, 7" x 7" x 310", 8 Row 40 (Non-stock Item)
		Toolbar, 7" x 7" x 300", 10 Row 30 (Non-stock Item)
34.	10016	Hex Head Cap Screw, 1/2"-13 x 2"
	10111	Lock Nut, 1/2"-13
A.	A4783	Light Wiring Harness, 180" (Not Shown) 2 Row (120" Bar) And 4 Row 30 Through 6 Row 30
	A4784	Light Wiring Harness, 258" (Not Shown) 2 Row (240" Bar) And 6 Row Wide Through 10 Row 30

CENTER FRAME ASSEMBLY (HYDRAULIC FOLD TOOLBAR)

PFA043/PFA048





Optional External Wing Lift Assist

ITEM	PART NO.	DESCRIPTION
1.	A4732	Jack Stand
2.	A4707	Mount
3.	A4733	Detent Pin W/Chain
4.		Mounting Bar (Non-stock Item)
5.	D1114	U-Bolt, 7" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
6.	D1748	U-Bolt, 7" x 7" x 3/4"-10
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10

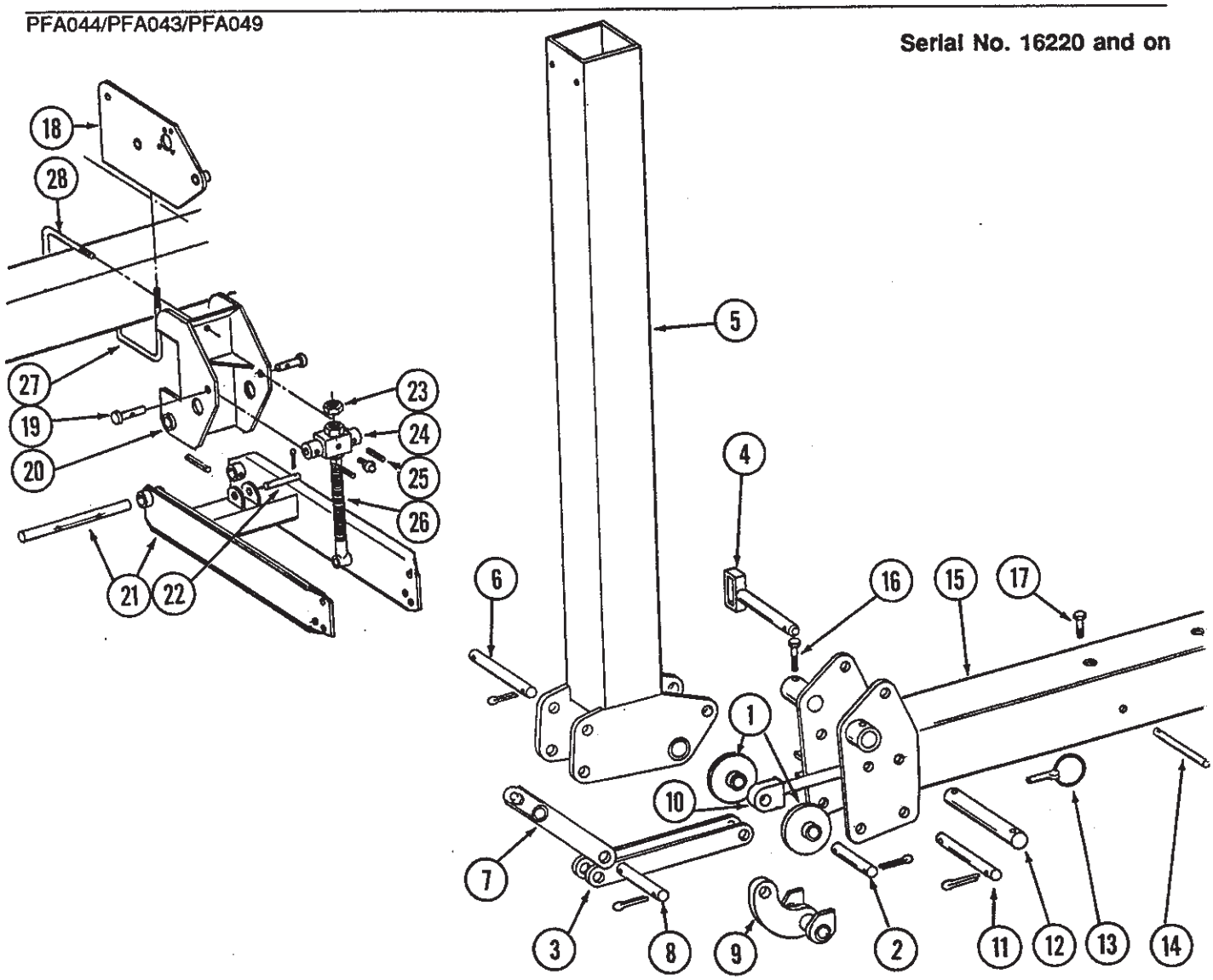
CENTER FRAME ASSEMBLY (HYDRAULIC FOLD TOOLBAR)

ITEM	PART NO.	DESCRIPTION
7.	10059	Hex Head Cap Screw, 3/4"-10 x 9 1/2"
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10
8.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10047	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
	10229	Lock Washer, 3/8"
9.	A5141	Valve Mounting Bracket
10.	D7152	SMV Mounting Bracket
11.	D2199	SMV Sign
12.	10023	Hex Head Cap Screw, 1/4"-13 x 3/4"
	10110	Lock Nut, 1/4"-13
13.		Center Toolbar, 7" x 7" x 144", 8 Row 36/38 (Non-stock Item)
		Center Toolbar, 7" x 7" x 150 1/2", 8 Row 40 (Non-stock Item)
		Center Toolbar, 7" x 7" x 183", 12 Row 30 (Non-stock Item)
14.	10016	Hex Head Cap Screw, 1/2"-13 x 2"
	10111	Lock Nut, 1/2"-13
15.	A4665	Lower Link Pin
16.	D7090	Adapter Bushing, Category 3
17.	D2557	Lynch Pin, 7/16"
18.		Lower Link (Non-stock Item)
19.	A4666	Link Pin, Category 3, 1 1/4"
20.	A4938	Link Pin, Optional Category 2, 1"
21.	D7338	Sleeve, Optional Category 2
22.	10048	Hex Head Cap Screw, 3/8"-16 x 2"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
23.	A4702	Center Mast
24.	D7628	Spacer
25.	D7582	Pin, 1 1/4" x 6 5/8"
26.	10049	Hex Head Cap Screw, 3/8"-16 x 2 1/2"
	10108	Lock Nut, 3/8"-16
27.	D4230	Shaft, 1 1/4" x 7 1/2"
	10460	Cotter Pin, 1/4" x 2"
28.		See "External Wing Lift Assist Cylinder"
29.	6801-06-08	Elbow, 3/4"-16 O-Ring To 9/16"-18 JIC
30.	A5531	Breather Plug
31.	A5529	Cylinder Anchor
32.	A5530	U-Bolt Assembly
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10
33.	A1114	Hose Assembly, 1/4" x 85"
34.	A1185	Hose Assembly, 1/4" x 74"
35.	6600-06	Outlet Tee, 9/16"-18 JIC
36.	6602-06	Run Tee, 9/16"-18 JIC
37.	A5540	Assist Link
38.	A4122	Single Red Light Complete W/Female Terminal
	A4123	Double Amber Light Assembly Complete W/Male Terminal
	R0968	Bulb, No. 1156
	R0970	Red Lens
	R0969	Amber Lens
	10289	Hex Nut, 1/2"-20
	10525	Star Washer, 1/2"
	10266	Female Terminal
	10269	Male Terminal
39.	A4901	Bracket, L.H. (Shown)
	A4900	Bracket, R.H.
40.	10325	Hex Head Cap Screw, 3/8"-16 x 2 3/4"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
A.	A4783	Light Wiring Harness, 180" (Not Shown)

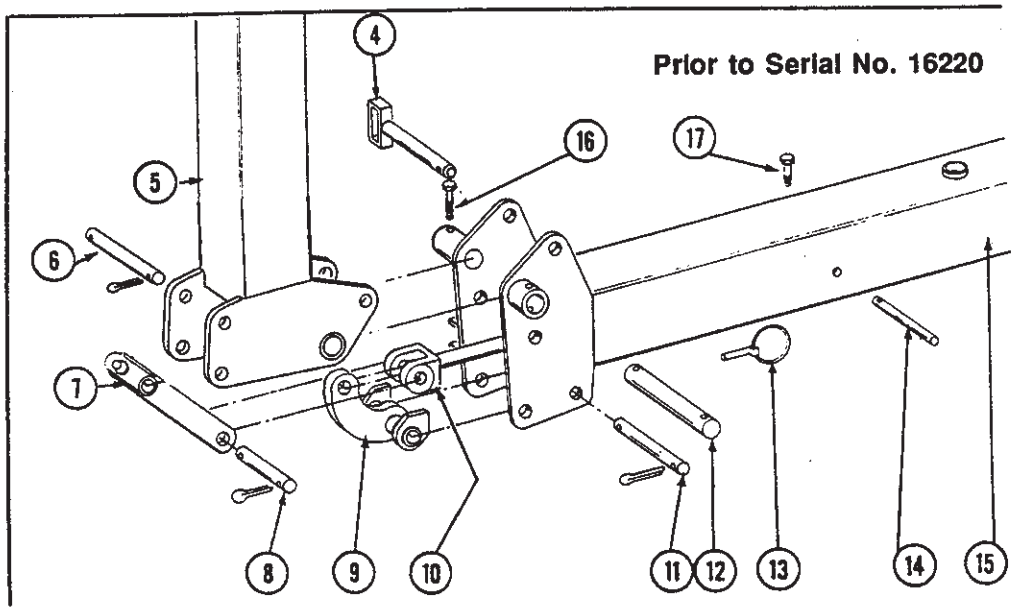
WING AND HINGE ASSEMBLY (HYDRAULIC FOLD TOOLBAR)

PFA044/PFA043/PFA049

Serial No. 16220 and on



Prior to Serial No. 16220

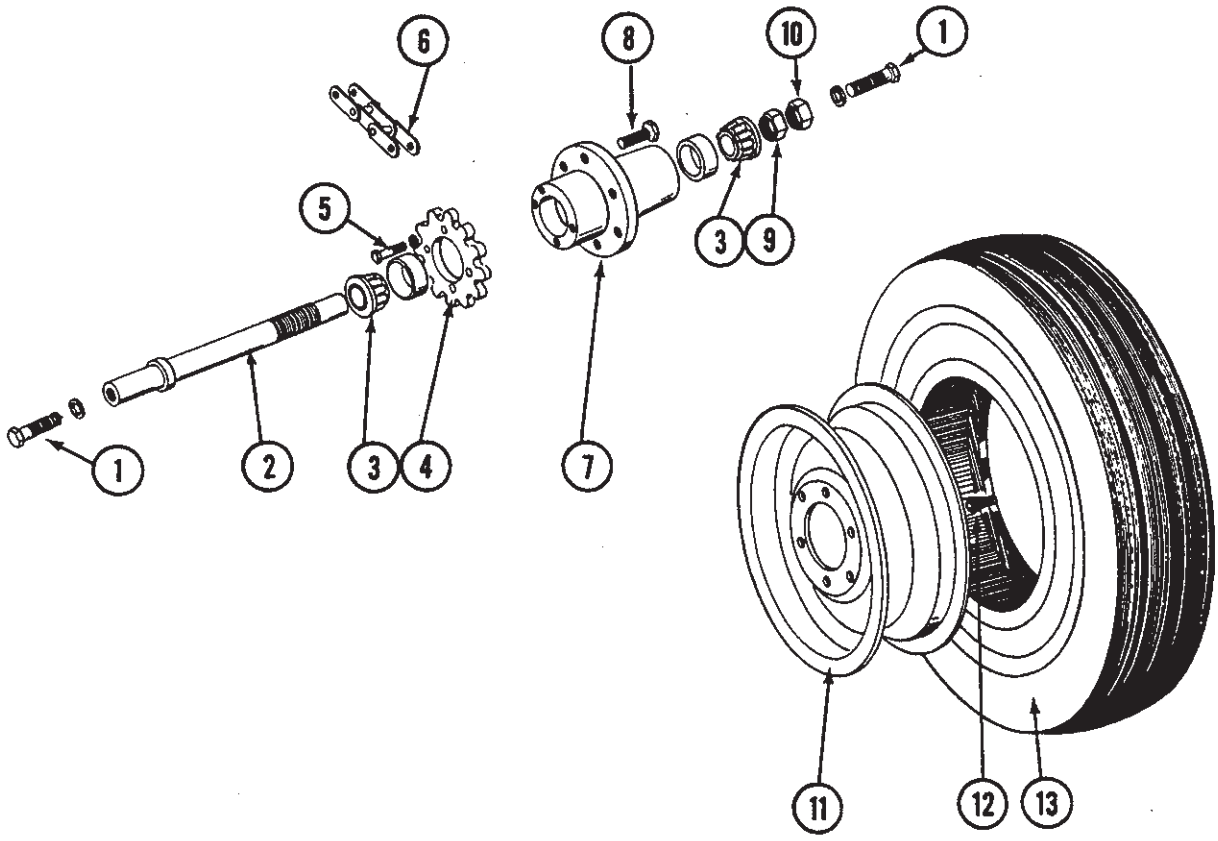


WING AND HINGE ASSEMBLY (HYDRAULIC FOLD TOOLBAR)

ITEM	PART NO.	DESCRIPTION
1.	A5659	Wheel
2.	D7861	Pin, 1 1/4" x 6 1/8"
	10460	Cotter Pin, 1/4" x 2"
3.	A5660	Link
4.	A4402	Safety Pin
5.		Wing W/Grease Fitting, 76", 8 Row 36/38 (Non-stock Item)
		Wing W/Grease Fitting, 80", 8 Row 40 (Non-stock Item)
		Wing W/Grease Fitting, 88 1/2", 12 Row 30 (Non-stock Item)
	10641	Grease Fitting, 1/8" NPT
6.	D3737	Pin, 1 1/4" x 8 1/2"
	10460	Cotter Pin, 1/4" x 2"
7.	A5805	Link
8.	D5841	Pin, 1 1/4" x 5 5/8"
	10460	Cotter Pin, 1/4" x 2"
9.	A4883	Link
10.		See "Wing Lift Cylinder (3 1/2" x 11" or 4" x 11")"
11.	D4724	Pin, 1 1/4" x 10"
	10460	Cotter Pin, 1/4" x 2"
12.	D7282	Hinge Pin, 2 1/8" x 13"
13.	D2558	Lynch Pin, 1/4"
	D2557	Lynch Pin, 7/16"
14.	D7302	Cylinder Pin, 1" x 6"
15.		See "Center Frame Assembly
16.	10061	Hex Head Cap Screw, 3/8"-16 x 3 1/2"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
17.	10048	Hex Head Cap Screw, 3/8"-16 x 2"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
18.	A4699	Drive Plate, L.H. (Shown)
	A4700	Drive Plate, R.H.
19.	A4704	Pin
20.		Module W/Grease Fitting (Non-stock Item)
	10641	Grease Fitting, 1/8" NPT
21.		Arm W/Shaft And Spring Pin (Non-stock Item)
	D7042	Shaft, 1 1/4" x 12 1/8"
	10610	Spring Pin, 3/8" x 2"
22.	D7041	Pin, 1" x 4"
	10459	Cotter Pin, 3/16" x 1 1/2"
23.	10117	Hex Nut, 1"-8, Grade 2
24.	A4711	Jack Screw Mount W/Grease Fitting
	10641	Grease Fitting, 1/8" NPT
25.	10489	Spring Pin, 3/8" x 1 1/2"
26.	A4705	Adjuster Screw
27.	D1114	U-Bolt, 7" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
28.	D1748	U-Bolt, 7" x 7" x 3/4"-10
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10

DRIVE WHEEL ASSEMBLY

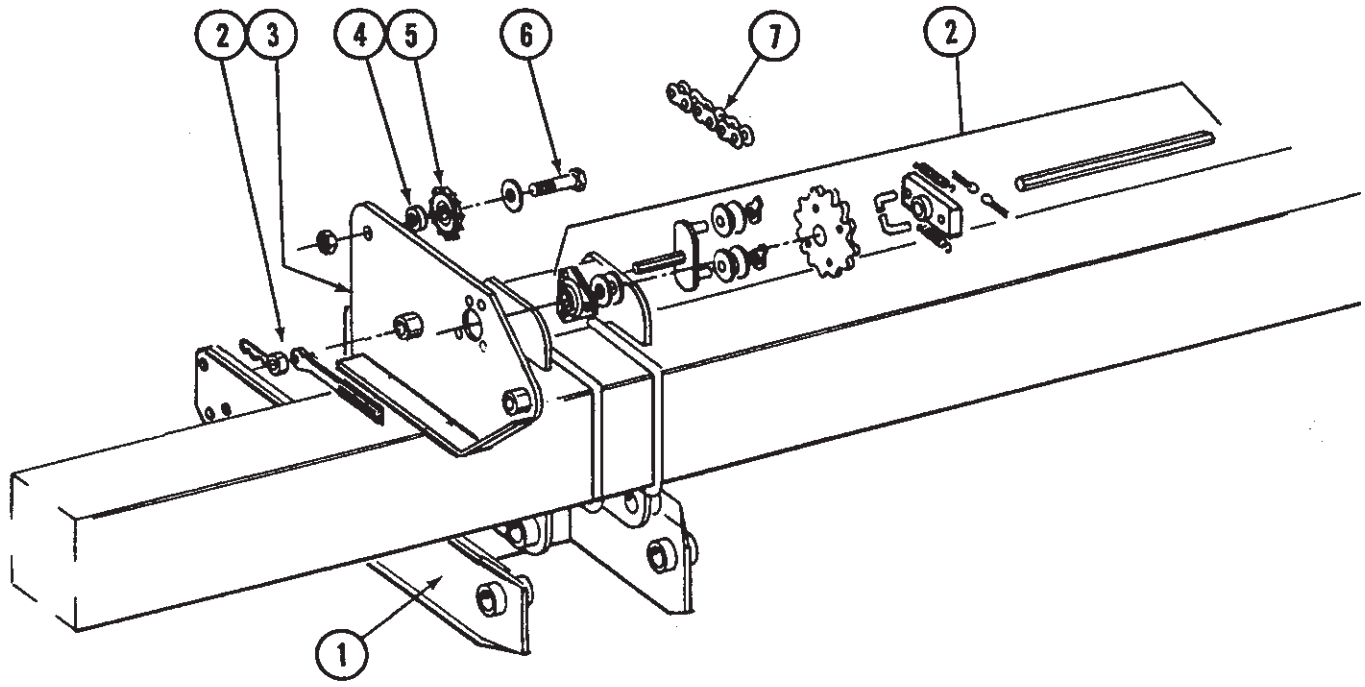
PLA025



ITEM	PART NO.	DESCRIPTION
1.	10026	Hex Head Cap Screw, 3/4"-10 x 2"
	10231	Lock Washer, 3/4"
2.	A4693	Spindle
3.	A0895	Bearing
4.	2500-17	Sprocket, 12 Tooth
5.	10019	Hex Head Cap Screw, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
6.	3200-62	Chain, No. 2050, 62 Pitch Including Connector Link
	3200-06	Chain, No. 2050 (Add to chain when using 2 to 1 reduction sprockets.)
	R0195	Connector Link, No. 2050
7.	A0926	Hub W/Cups, 6 Bolt
	R0434	Cup
8.	R0270	Bolt, 9/16"-18
9.	10092	Hex Nut, 1 1/2"-12, Grade 2
10.	10087	Jam Nut, 1 1/2"-12, Grade 2
11.	A4696	Wheel, 15" x 5"
12.	D1166	Valve Stem
13.	D0844	Tire, 7.60" x 15", 4 Ply

FRONT MOUNTED DRIVE WHEEL (OPTIONAL)

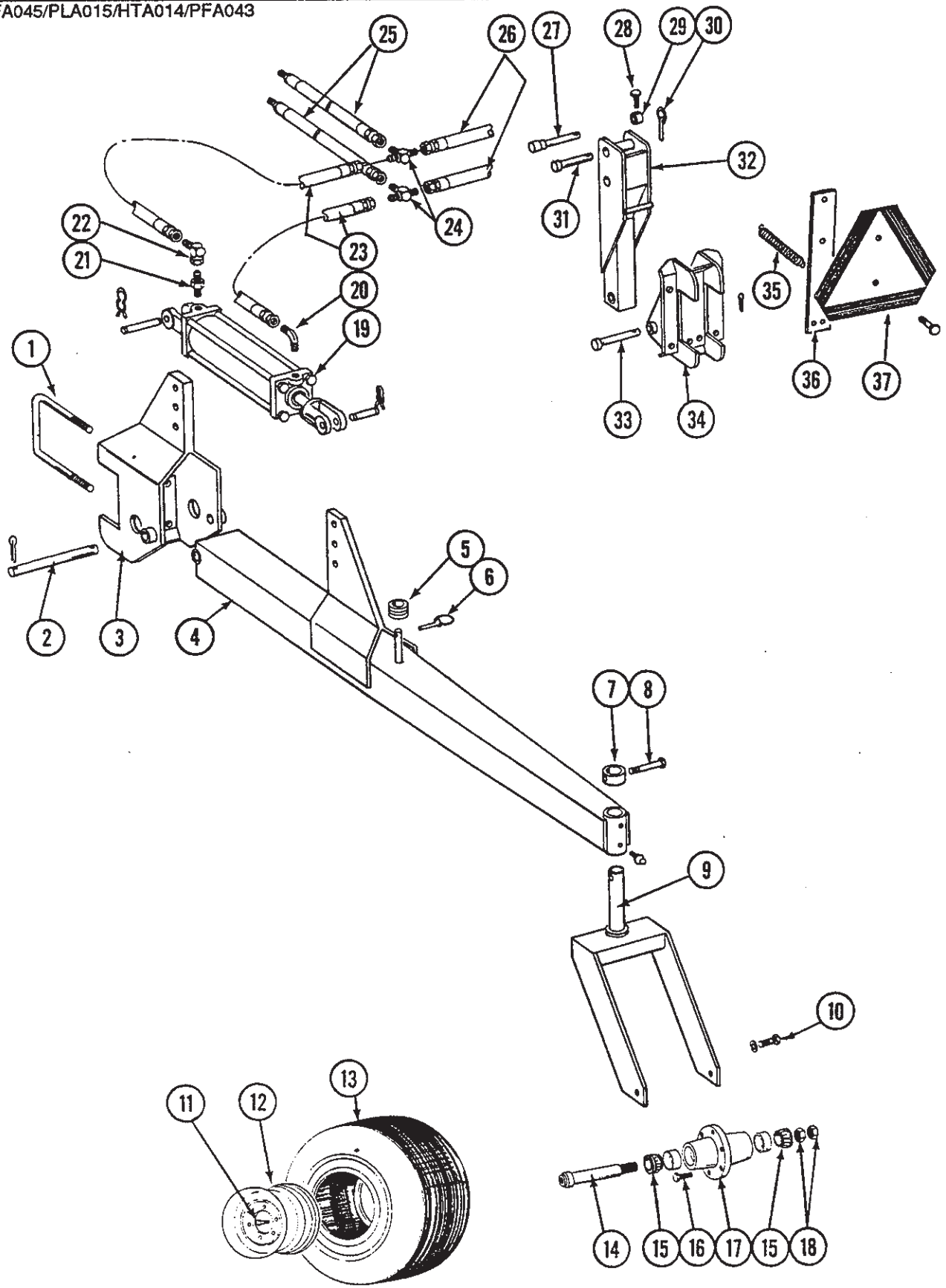
PTD064



ITEM	PART NO.	DESCRIPTION
1.		See "Rigid Toolbar Assembly" or "Wing And Hinge Assembly, Hydraulic Fold Toolbar"
2.		See "Drive Line, Rigid Toolbar" or "Drive Line, Hydraulic Fold Toolbar"
3.		See "Rigid Toolbar Assembly" or "Wing And Hinge Assembly, Hydraulic Fold Toolbar"
4.	D7101	Sleeve
5.	A0262	Idler Sprocket W/Bearing, 15 Tooth
6.	10009	Hex Head Cap Screw, 5/8"-11 x 2 1/2"
	10217	Washer, 5/8" USS (As Required)
	10107	Lock Nut, 5/8"-11
7.	3200-22	Chain, No. 2050, 22 Pitch Including Connector Link (Add to chain when using front mounted drive. See "Drive Wheel Assembly".)
	R0195	Connector Link, No. 2050

DUAL LIFT ASSIST W/FLOATING CENTER MAST (OPTIONAL)

PFA045/PLA015/HTA014/PFA043

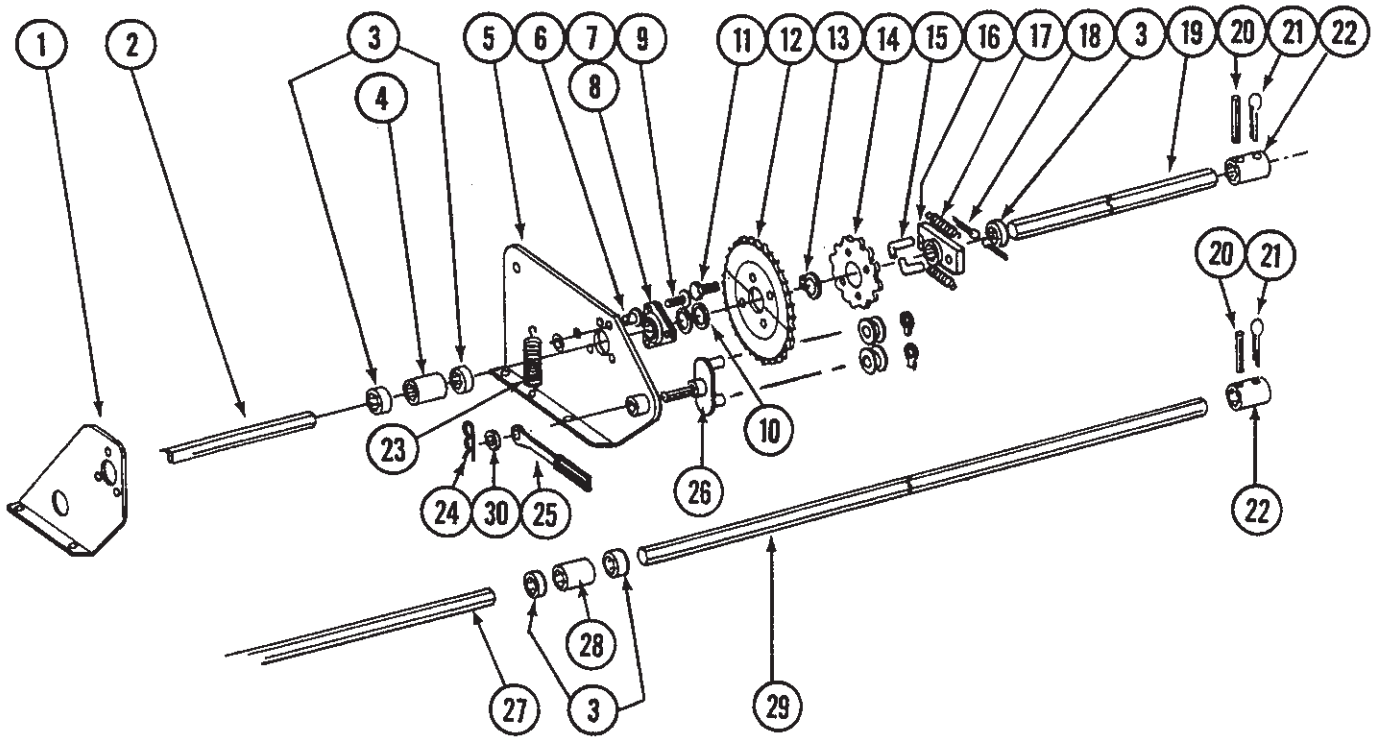


DUAL LIFT ASSIST W/FLOATING CENTER MAST (OPTIONAL)

ITEM	PART NO.	DESCRIPTION
1.	D1748	U-Bolt, 7" x 7" x 3/4"-10
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10
2.	D8311	Pin, 1 1/4" x 10 1/2"
	10460	Cotter Pin, 1/4" x 2"
3.		Wheel Tower (Non-stock Item)
4.		Tube W/Grease Fittings (Non-stock Item)
	10641	Grease Fitting, 1/8" NPT
5.	A4743	Stroke Control Collar Kit, Includes: (1)3/4", (1)1", (1)1 1/4", (1)1 1/2"
6.	D2558	Lynch Pin, 1/4"
7.	D7068	Cap
8.	10032	Hex Head Cap Screw, 1/2"-13 x 3 3/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
9.	A4715	Caster Wheel
10.	10026	Hex Head Cap Screw, 3/4"-10 x 2"
	10231	Lock Washer, 3/4"
11.	D1166	Valve Stem
12.	A5196	Wheel W/Valve Protector, 15" x 5"
13.	D0844	Tire, 7.60" x 15", 4 Ply
14.	A2558	Spindle
15.	A0895	Bearing
16.	R0270	Bolt, 9/16"-12
17.	A2148	Hub W/Cups, 6 Bolt
	R0434	Cup
18.	10087	Jam Nut, 1 1/2"-10, Grade 2
19.		See "Dual Lift Assist Cylinder"
20.	2501-08-08	Elbow, 3/4"-16 JIC To 1/2" NPT
21.	2404-08-08	Adapter, 3/4"-16 JIC To 1/2" NPT
22.	6500-08	Elbow, 3/4"-16 JIC Male To Female
23.	A1039	Hose Assembly, 3/8" x 76"
24.	2603-08	Tee, 3/4"-16 JIC
25.	A1005	Hose Assembly, 3/8" x 48"
26.	A1055	Hose Assembly, 3/8" x 66"
27.	A4938	Link Pin, Optional Category 2, 1 1/4"
28.	10048	Hex Head Cap Screw, 3/8"-16 x 2"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
29.	D7338	Sleeve, Category 2, 1"
30.	D2557	Lynch Pin, 7/16"
31.	A4666	Link Pin, Category 3, 1 1/4"
32.	A4972	Floating Top Mast
33.	A4665	Lower Link Pin
	10468	Cotter Pin, 3/8" x 2"
34.		Lower Link (Non-stock Item)
35.	D0829	Spring
36.	A5714	SMV/Spring Anchor
37.		See "Center Frame Assembly (Hydraulic Fold Toolbar)"

DRIVE LINE (RIGID TOOLBAR)

PTD062



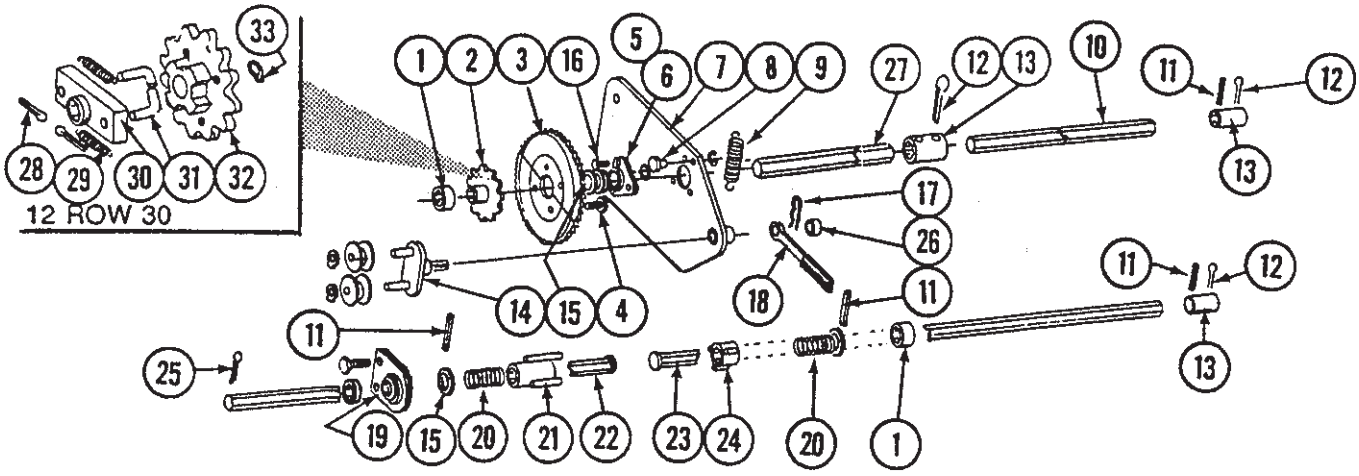
ITEM	PART NO.	DESCRIPTION
1.		See "Rigid Toolbar Assembly"
2.	D0914-120	Drive Shaft, 8 Row 40 And 10 Row 30 Only
3.	D0917	Lock Collar, 7/8" Hex, Less Set Screws
	10145	Set Screw, 5/16"-18 x 1/2"
4.	D1719	Coupler, 4", 8 Row 40 Only
	D2219	Lock Collar, 3", Less Set Screws, 8 Row 40 And 10 Row 30 Only
	10145	Set Screw, 5/16"-18 x 1/2"

DRIVE LINE (RIGID TOOLBAR)

ITEM	PART NO.	DESCRIPTION
5.		See "Rigid Toolbar Assembly"
6.	10478	Clevis Pin, 5/16" x 1"
	10409	Retaining Ring
7.	2100-03	Bearing, 7/8" Hex Bore, Spherical
8.	3400-01	Flangette
9.	10303	Carriage Bolt, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
10.	10233	Machine Bushing
11.	10002	Hex Head Cap Screw, 3/8"-16 x 3/4"
	10229	Lock Washer, 3/8"
12.	A2359	Sprocket, 48 Tooth, 2 To 1 Reduction
13.	10430	Ring
14.	A0376	Sprocket, 12 Tooth Ratchet
15.	D1255	"L" Pin
16.	A0378	Block
17.	D1256	Spring
18.	10464	Cotter Pin, 3/16" x 1"
19.	D5887-82	Drive Shaft, 2 Row (120" Bar) And 4 Row 30
	D5887-106	Drive Shaft, 4 Row 36/38/40
	D5887-142	Drive Shaft, 6 Row 30
	D5887-186	Drive Shaft, 6 Row 36/38/40
	D5887-202	Drive Shaft, 2 Row (240" Bar) And 8 Row 30
	D5887-144	Drive Shaft, 8 Row 40
	D5887-140	Drive Shaft, 10 Row 30
20.	10602	Spring Pin, 1/4" x 1 1/2"
21.	10460	Cotter Pin, 1/4" x 2"
22.	D5886	Coupler
23.	D5857	Spring
24.	10670	Hair Pin Clip, No. 3
25.	A4235	Ratchet Wrench W/Protective Closure
	10445	Protective Closure
26.	A0901	Idler W/Spools And Rings (Shown)
	A5545	Idler W/Spools And Rings (For use with 2 to 1 reduction sprocket.)
	D0916	Spool
	10435	Ring
27.	D5887-148	Drill Shaft, 8 Row 40 Only
	D5887-144	Drill Shaft, 10 Row 30 Only
28.	D7153	Coupler, 12", 8 Row 40 Only
	D1719	Coupler, 4", 8 Row 40 Only
	D2219	Lock Collar, 3", Less Set Screws, 8 Row 40 And 10 Row 30 Only
	10145	Set Screw, 5/16"-18 x 1/2"
29.	D5887-105	Drill Shaft, 2 Row (120" Bar) And 4 Row 30
	D5887-135	Drill Shaft, 4 Row 36/38/40
	D5887-165	Drill Shaft, 6 Row 30
	D5887-215	Drill Shaft, 6 Row 36/38/40
	D5887-225	Drill Shaft, 2 Row (240" Bar) And 8 Row 30
	D5887-148	Drill Shaft, 8 Row 40
	D5887-144	Drill Shaft, 10 Row 30
30.	D6819	Sleeve
A.	A0261R	Ratchet Sprocket Assembly, R.H. (Items 13-18)
	A0261L	Ratchet Sprocket Assembly, L.H. (Items 13-18)

DRIVE LINE (HYDRAULIC FOLD TOOLBAR)

PTD063/PLA008



ITEM	PART NO.	DESCRIPTION
1.	D0917	Lock Collar, 7/8" Hex, Less Set Screws
	10145	Set Screw, 5/16"-18 x 1/2"
2.	2500-18	Sprocket, 12 Tooth
3.	A2359	Sprocket, 48 Tooth, 2 To 1 Reduction
4.	10002	Hex Head Cap Screw, 3/8"-16 x 3/4"
	10229	Lock Washer, 3/8"
5.	2100-03	Bearing, 7/8" Hex Bore, Spherical
6.	3400-01	Flangette
7.		See "Wing And Hinge Assembly, Hydraulic Fold Toolbar"
8.	10478	Clevis Pin, 5/16" x 1"
	10409	Retaining Ring
9.	D5857	Spring
10.	D5887-36	Drive Shaft, 8 Row 36/38/40
	D6825-24	Drive Shaft, 12 Row 30
11.	10602	Spring Pin, 1/4" x 1 1/2"
12.	10460	Cotter Pin, 1/4" x 2"
13.	D5886	Coupler
14.	A0901	Idler W/Spools And Rings (Shown)
	A5545	Idler W/Spools And Rings (For use with 2 to 1 reduction sprocket.)
	D0916	Spool
	10435	Ring
15.	10233	Machine Bushing
16.	10303	Carriage Bolt, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
17.	10670	Hair Pin Clip, No. 3
18.	A1235	Ratchet Wrench W/Protective Closure
	10445	Protective Closure
19.	A2180	Bearing Hanger, 7/8" Hex
20.	D2962	Spring
21.	A4918	*Coupler W/Grease Fitting, 4"
	A5713	**Coupler W/Grease Fitting, 6"
	10641	Grease Fitting, 1/8" NPT

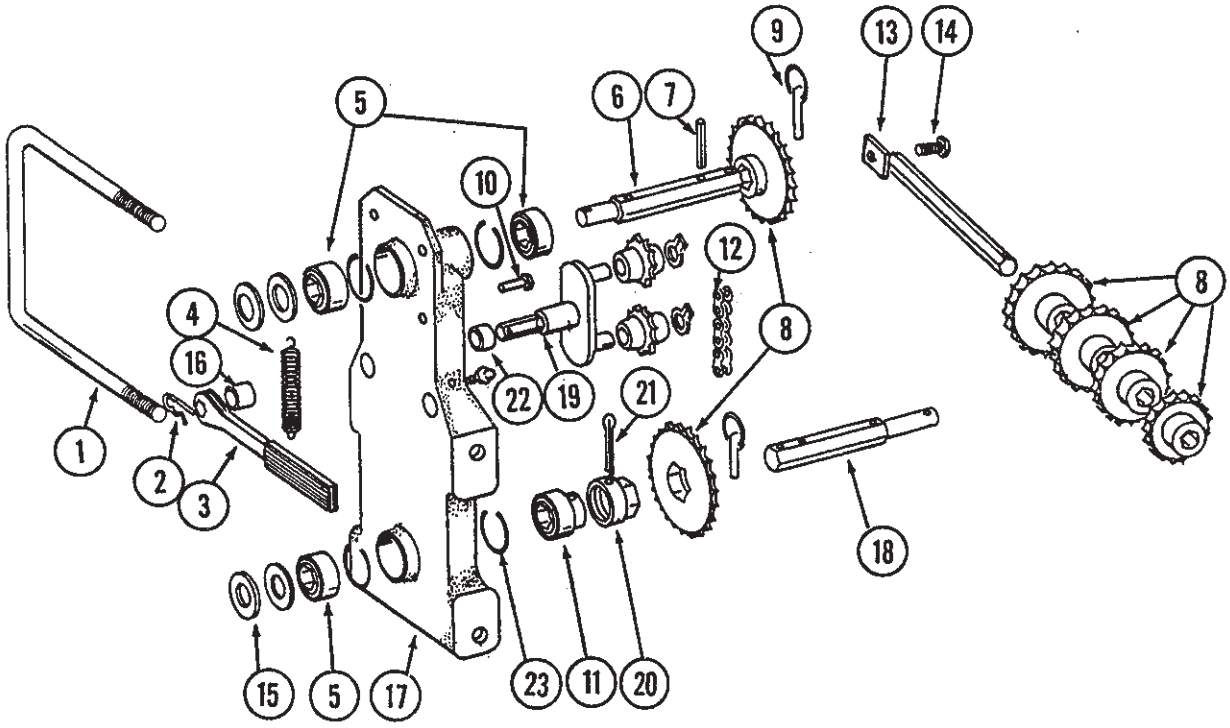
DRIVE LINE (HYDRAULIC FOLD TOOLBAR)

ITEM	PART NO.	DESCRIPTION
22.	A4912	*Center Section Drill Shaft, 60", R.H., 8 Row 36/38
	A4913	*Center Section Drill Shaft, 50", L.H., 8 Row 36/38
	A4915	*Center Section Drill Shaft, 82", R.H., 12 Row 30
	A4916	*Center Section Drill Shaft, 72", L.H., 12 Row 30
	A5705	**Center Section Drill Shaft, 60", R.H., 8 Row 36/38/40
	A5706	**Center Section Drill Shaft, 50", L.H., 8 Row 36/38
	A6540	**Center Section Drill Shaft, 51", L.H., 8 Row 40
	A5708	**Center Section Drill Shaft, 82", R.H., 12 Row 30
	A5709	**Center Section Drill Shaft, 72", L.H., 12 Row 30
23.	A4911	*Wing Drill Shaft, 68 1/2", 8 Row 36/38
	A4914	*Wing Drill Shaft, 81", 12 Row 30
	A5704	**Wing Drill Shaft, 68 1/2", 8 Row 36/38
	A6539	**Wing Drill Shaft, 72 1/2", 8 Row 40
	A5707	**Wing Drill Shaft, 81", 12 Row 30
24.	A4917	*Coupler W/Grease Fitting, 3"
	A5712	**Coupler W/Grease Fitting, 5"
	10641	Grease Fitting, 1/8" NPT
25.	10463	Cotter Pin, 1/4" x 1 1/2"
26.	D6819	Sleeve
27.	D5887-30	Drive Shaft, 12 Row 30 Only
28.	10464	Cotter Pin, 3/16" x 1"
29.	D1256	Spring
30.	A0378	Block
31.	D1255	"L" Pin
32.	A0376	Sprocket, 12 Tooth Ratchet
33.	10430	Ring
A.	A0261R	Ratchet Sprocket Assembly, R.H. (Items 28-33)
	A0261L	Ratchet Sprocket Assembly, L.H.

NOTE: Item 21 coupler and item 24 coupler identified with a single asterisk (*) are used with drill shafts identified with a single asterisk. Item 21 coupler and item 24 coupler identified with double asterisks (**) are used with drill shafts identified with double asterisks. For example, A4918 and A4917 couplers are used with A4912, A4913 and A4911 drill shafts on 8 row 36/38 planters.

TRANSMISSION ASSEMBLY

PTD041/PTD066

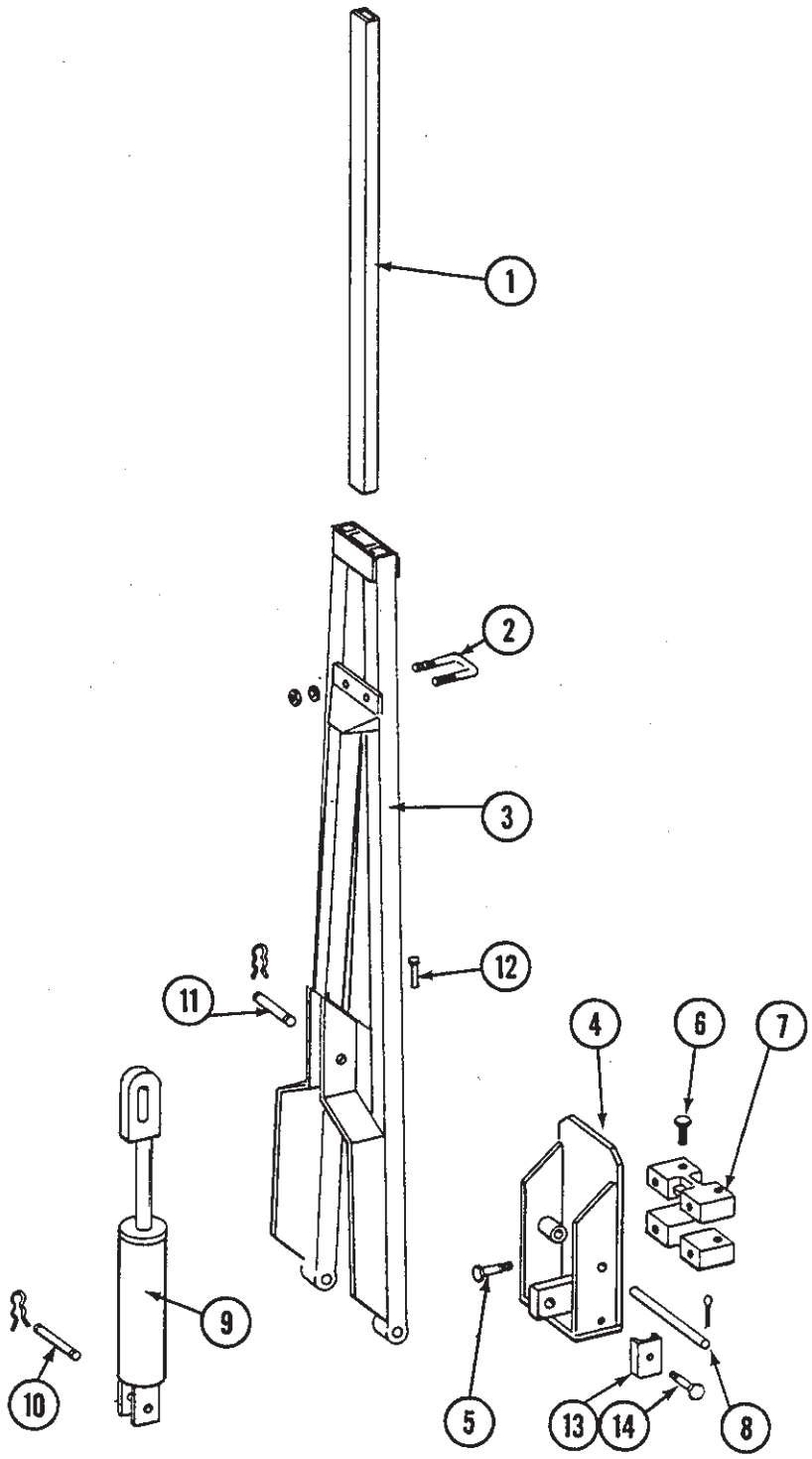


TRANSMISSION ASSEMBLY

ITEM	PART NO.	DESCRIPTION
1.	D1114	U-Bolt, 7" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10107	Hex Nut, 5/8"-11
2.	10670	Hair Pin Clip, No. 3
3.	A4235	Ratchet Wrench W/Protective Closure
	10445	Protective Closure
4.	D5857	Spring
5.	A5116	Bearing, 7/8" Hex Bore, Cylindrical
6.	D5215	Shaft, 7/8" x 6 3/8"
7.	10602	Spring Pin, 1/4" x 1 1/2"
8.	A5106	Sprocket, 17 Tooth
	A5107	Sprocket, 19 Tooth
	A5108	Sprocket, 23 Tooth (Qty. 2)
	A5109	Sprocket, 24 Tooth
	A5110	Sprocket, 25 Tooth
	A5111	Sprocket, 26 Tooth
	A5112	Sprocket, 27 Tooth
	A5113	Sprocket, 28 Tooth
9.	D2558	Lynch Pin, 1/4"
10.	10478	Clevis Pin, 5/16" x 1"
	10409	Retaining Ring, 5/16"
11.	A5624	Special Bearing, 7/8" Hex Bore x 1.6"
12.	3310-80	Chain, No. 40, 80 Pitch Including Connector Link
	R0912	Connector Link, No. 40
13.	A5146	Sprocket Storage Rod
14.	10037	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
15.	10233	Machine Bushing
16.	D6819	Sleeve
17.		Transmission Plate W/Grease Fittings (Non-stock Item)
	10641	Grease Fitting, 1/8" NPT
18.	D7822	Shaft, 7/8" x 7"
19.	A5628	Idler W/Sprockets And Rings
	D7426	Sprocket
	10435	Ring
20.	D7127	Shear Coupler
21.	10462	Cotter Pin, 3/16" x 2"
22.	D2734-01	Sleeve, 1/2"
23.	D6551	Ring
A.	A5495	Transmission Assembly (Items 1-23)

CONVENTIONAL MARKER
4 ROW 30/WIDE AND 6 ROW 30 (RIGID TOOLBAR)

MKR010

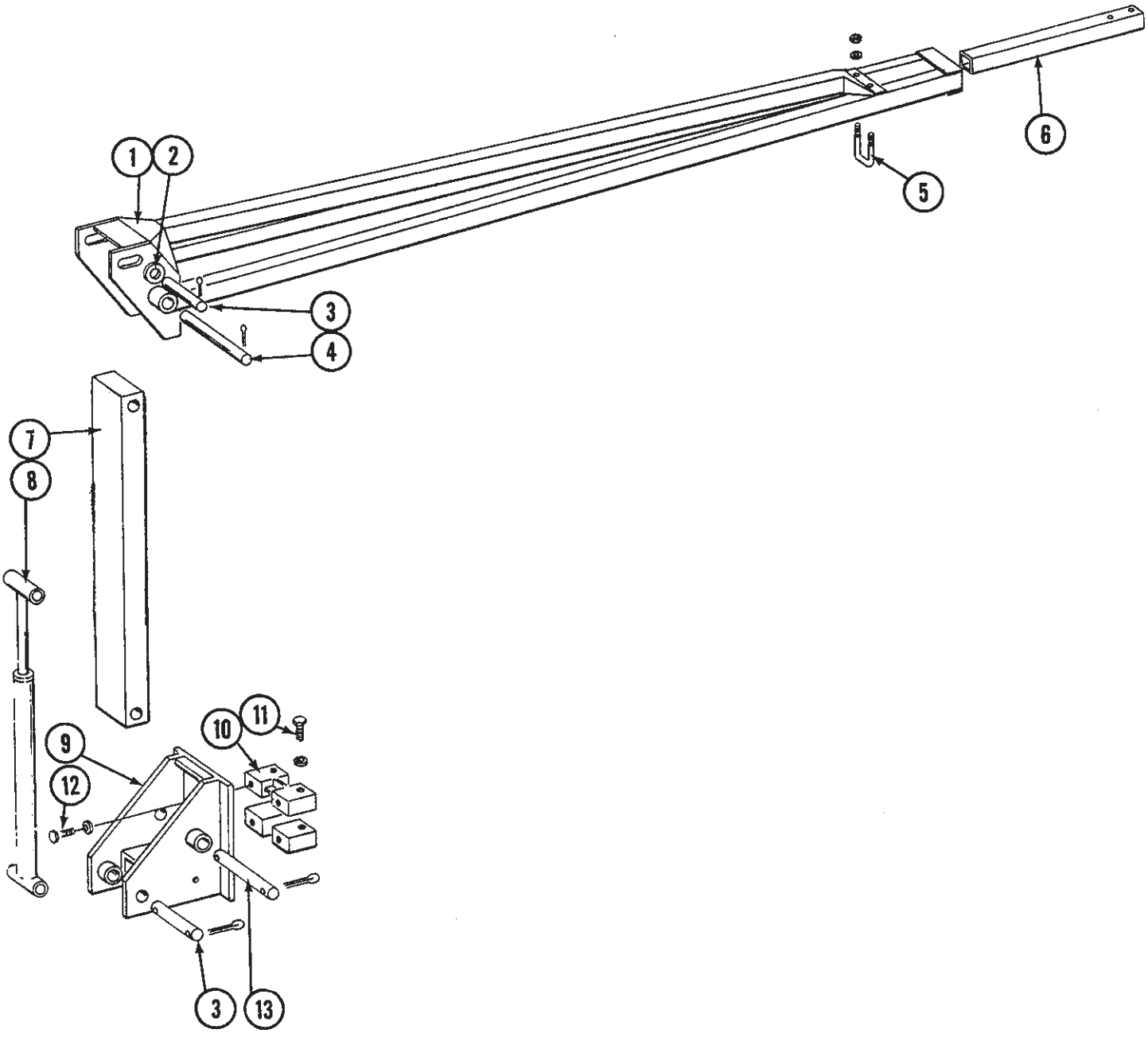


CONVENTIONAL MARKER
4 ROW 30/WIDE AND 6 ROW 30 (RIGID TOOLBAR)

ITEM	PART NO.	DESCRIPTION
1.	D0453-02	Extension Tube, 40", 4 Row 30 And 6 Row 30
	D0453-03	Extension Tube, 50", 4 Row 36/38/40
2.	D2721	U-Bolt, 2" x 2" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
3.	A5175	Arm W/Grease Fittings, 31 1/2", 4 Row 30
	A5184	Arm W/Grease Fittings, 44 1/2", 4 Row 36/38/40
	A5183	Arm W/Grease Fittings, 58 1/2", 6 Row 30
	10640	Grease Fitting, 1/4"-28
4.	A5177	Mount W/Grease Fittings, 4 Row 30
	A5178	Mount, 4 Row 36/38/40 And 6 Row 30
	10640	Grease Fitting, 1/4"-28
5.	10008	Hex Head Cap Screw, 5/8"-11 x 2", Grade 2
	10230	Lock Washer, 5/8"
6.	10026	Hex Head Cap Screw, 3/4"-10 x 2"
	10231	Lock Washer, 3/4"
7.	B0177	Tap Block
8.	D0438	Pin, 13 1/2"
	10460	Cotter Pin, 1/4" x 2"
9.		See "Conventional Marker Cylinder"
10.	R0367	Pin, 2 7/8"
	R0193	Clip
11.	R0375	Pin, 3 1/2"
	R0193	Clip
12.	D0462	Lockup Pin
	10670	Hair Pin Clip, No. 3
	10187	Spring Pin, 5/32" x 2"
13.	D5892	Hose Clamp
14.	10133	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18

DOUBLE FOLD MARKER (RIGID TOOLBAR)
6 ROW WIDE, 8 ROW 30/WIDE AND 10 ROW 30

MKR019/MKR008

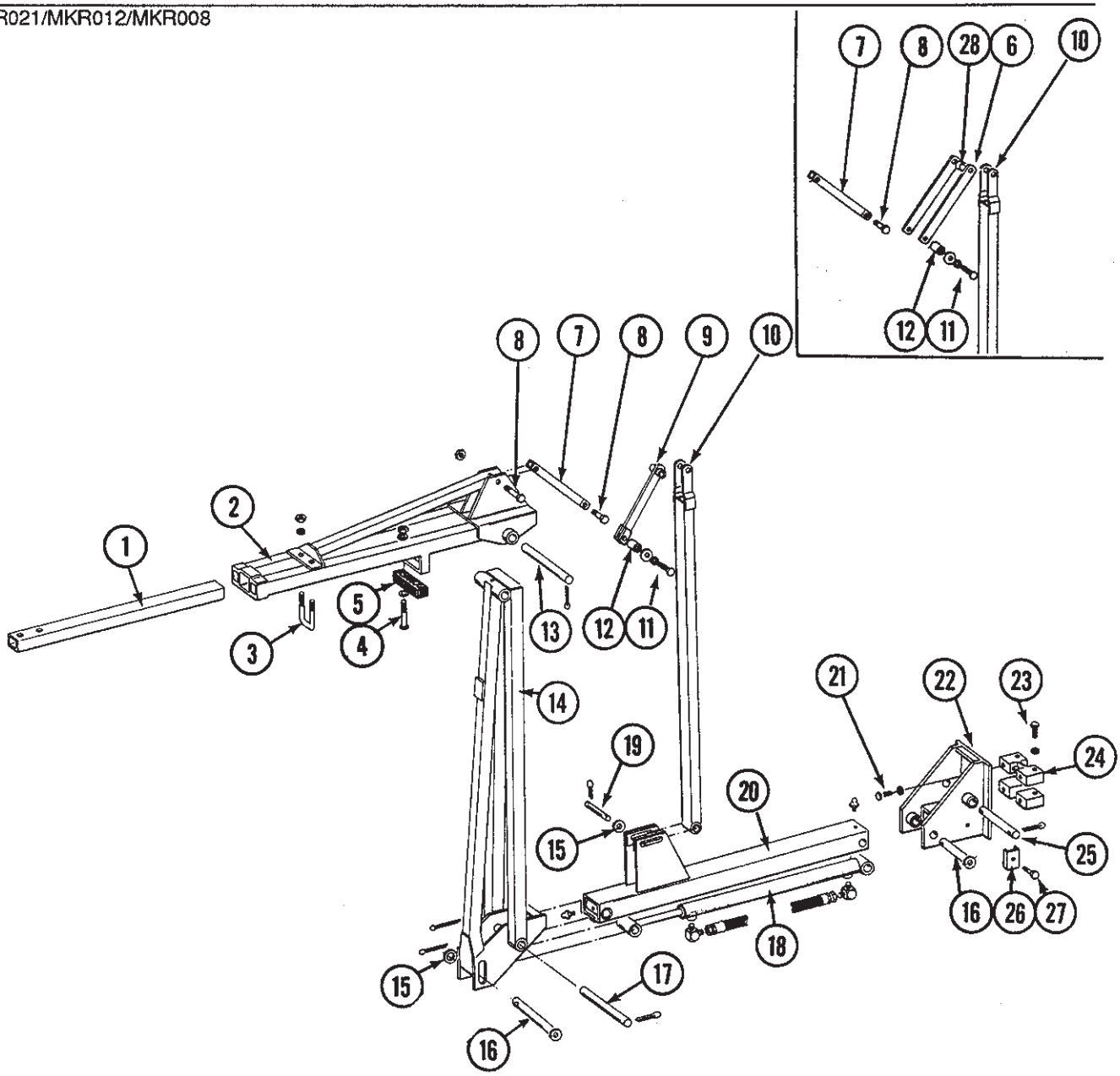


DOUBLE FOLD MARKER (RIGID TOOLBAR)
6 ROW WIDE, 8 ROW 30/WIDE AND 10 ROW 30

ITEM	PART NO.	DESCRIPTION
1.	A5190	Arm, Second Stage, 41 1/2", 6 Row 36/38/40
	A5188	Arm, Second Stage, 52 1/2", 8 Row 30
	A5192	Arm, Second Stage, 73 1/8", 8 Row 40 And 10 Row 30
2.	10226	Washer, 1 1/4" SAE
3.	D2161	Pin, 1 1/4" x 8 1/2"
	10460	Cotter Pin, 1/4" x 2"
4.	D3214	Pin, 1 1/4" x 12 1/4"
	10460	Cotter Pin, 1/4" x 2"
5.	D2721	U-Bolt, 2" x 2" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
6.	D0453-04	Extension Tube, 60", 6 Row 36/38/40
	D0453-03	Extension Tube, 50", 8 Row 30
	D0453-08	Extension Tube, 65", 8 Row 40 And 10 Row 30
7.	A5173	Arm W/Grease Fittings, First Stage
	10641	Grease Fitting, 1/8" NPT
8.		See "Double Fold Marker Cylinder"
9.	A5130	Mount
10.	B0177	Tap Block
11.	10026	Hex Head Cap Screw, 3/4"-10 x 2"
	10231	Lock Washer, 3/4"
12.	10008	Hex Head Cap Screw, 5/8"-11 x 2", Grade 2
	10230	Lock Washer, 5/8"
13.	D0652	Pin, 1 1/4" x 9 1/2"
	10460	Cotter Pin, 1/4" x 2"

TRIPLE FOLD MARKER, 8 ROW WIDE AND 12 ROW 30 (HYDRAULIC FOLD TOOLBAR)

MKR021/MKR012/MKR008

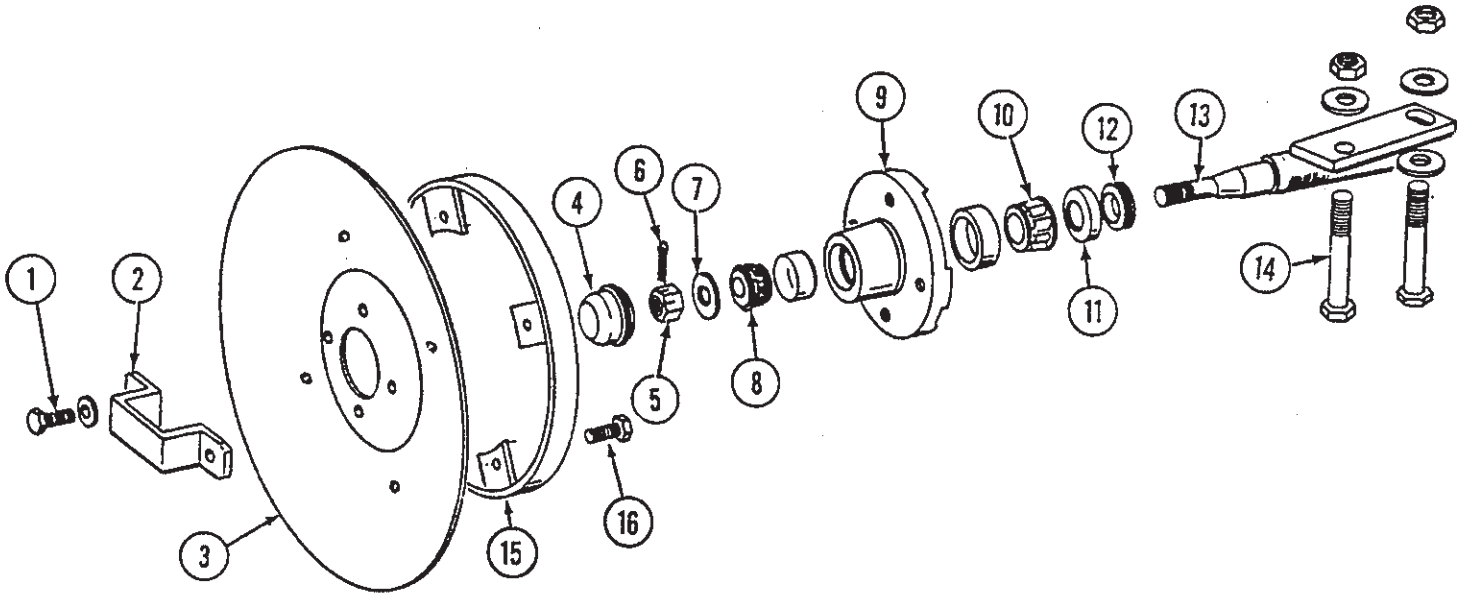


TRIPLE FOLD MARKER, 8 ROW WIDE AND 12 ROW 30 (HYDRAULIC FOLD TOOLBAR)

ITEM	PART NO.	DESCRIPTION
1.	D0453-05	Extension Tube, 55", 8 Row 36/38/40
	D0453-03	Extension Tube, 50", 12 Row 30
2.	A4905	Arm, Third Stage, 19 1/2", 8 Row 36/38/40
	A4887	Arm, Third Stage, 35",12 Row 30
3.	D2721	U-Bolt, 2" x 2" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
4.	10047	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
	10048	Hex Head Cap Screw, 3/8"-16 x 2"
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
5.	D2698	Rubber Stop
	D7902	Spacer Bar (If Applicable) (Not Shown)
6.	D8290	Bar
7.	A4894	Linkage, 15 1/4"
8.	10013	Hex Head Cap Screw, 5/8"-11 x 3 1/2"
	10107	Lock Nut, 5/8"-11
9.	A4891	Linkage, 11"
10.	A4910	Linkage Tube, 54 3/4", 8 Row 36/38/40
	A4893	Linkage Tube, 72 3/4", 12 Row 30
11.	10002	Hex Head Cap Screw, 3/8"-16 x 3/4"
	10229	Lock Washer, 3/8"
	10210	Washer, 3/8" USS
12.	D7398	Pin
13.	D2697	Pin, 7/8" x 11"
	10463	Cotter Pin, 1/2" x 1 1/2"
14.	A4903	Arm, Second Stage, 60", 8 Row 36/38/40
	A4885	Arm, Second Stage, 78", 12 Row 30
15.	10226	Washer, 1 1/4" SAE
16.	A6532	Pin, 1 1/4" x 7 5/8"
	10460	Cotter Pin, 1/4" x 2"
17.	D3214	Pin, 1 1/4" x 12 1/4"
	10460	Cotter Pin, 1/4" x 2"
18.		See "Triple Fold Marker Cylinder"
19.	D6136	Pin, 1 1/4" x 5"
	10460	Cotter Pin, 1/4" x 2"
20.	A4884	Arm W/Grease Fittings, First Stage
	10641	Grease Fitting, 1/8" NPT
21.	10008	Hex Head Cap Screw, 5/8"-11 x 2", Grade 2
	10230	Lock Washer, 5/8"
22.	A5130	Mount
23.	10026	Hex Head Cap Screw, 3/4"-10 x 2"
	10231	Lock Washer, 3/4"
24.	B0177	Tap Block
25.	D0652	Pin, 1 1/4" x 9 1/2"
	10460	Cotter Pin, 1/4" x 2"
26.	D5875	Hose Clamp
27.	10133	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
28.	D3180-08	Sleeve

MARKER SPINDLE/HUB/BLADE

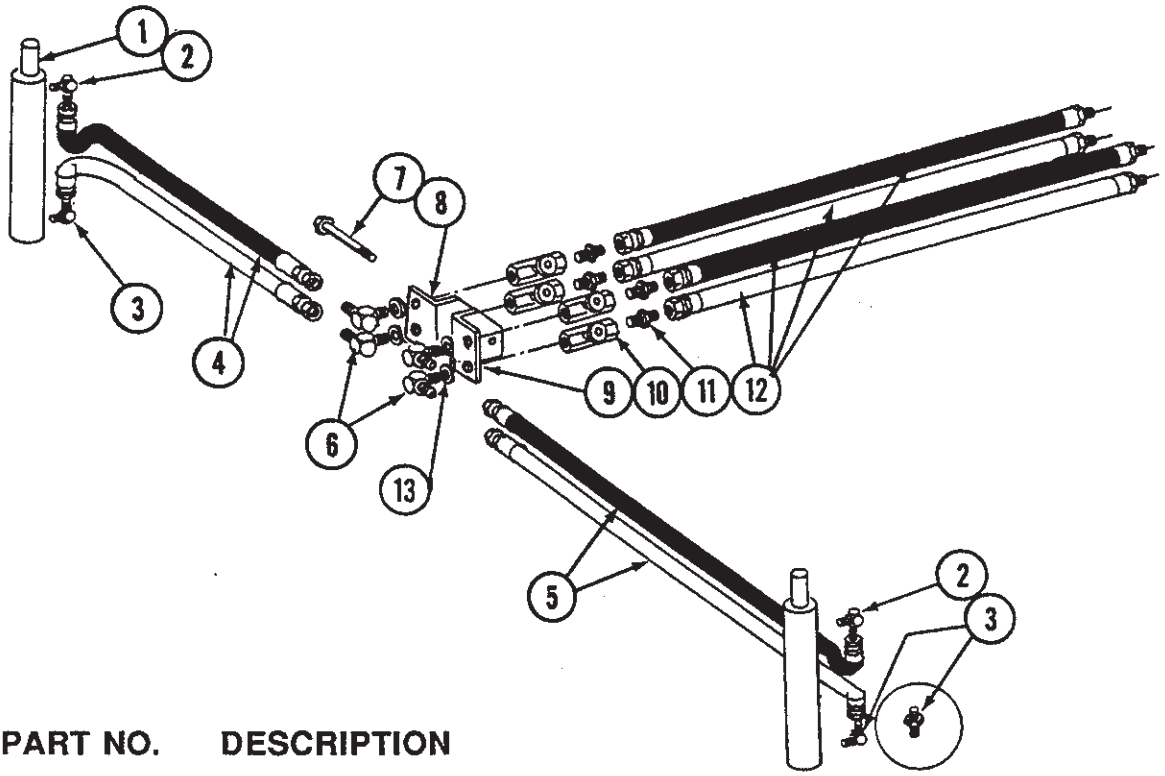
MKR020



ITEM	PART NO.	DESCRIPTION
1.	10722	Hex Head Cap Screw, 1/2"-20 x 1"
	10228	Lock Washer, 1/2"
2.	D2597	Retainer
3.	D0746	Blade, 16"
4.	D0840	Cap
5.	10725	Hex Slotted Nut, 5/8"-18
6.	10544	Cotter Pin, 5/32" x 1"
7.	10724	Washer, 5/8"
8.	A0257	Outer Bearing
9.	A0167	Hub With Cups
	R0151	Outer Cup
	R0150	Inner Cup
10.	A0245	Inner Bearing
11.	A0243	Grease Seal
12.	A0899	Rubber Seal
13.	A1677	Spindle, L.H.
	A1676	Spindle, R.H.
14.	10033	Hex Head Cap Screw, 1/2"-13 x 3 1/2"
	10168	Machine Bushing, 1/2", 7 Gauge
	10102	Hex Nut, 1/2"-13
15.	A5853	Depth Band, 8 Row36/38/40 And Up
16.	10019	Hex Head Cap Screw, 5/16"-18 x 1"
	10109	Lock Nut, 5/16"-18
A.	A1679	Hub And Spindle Assembly, L.H. (Items 1 And 4-13)
	A1678	Hub And Spindle Assembly, R.H. (Items 1 And 4-13)

MARKER HYDRAULIC SYSTEM (RIGID TOOLBAR), DUAL VALVE

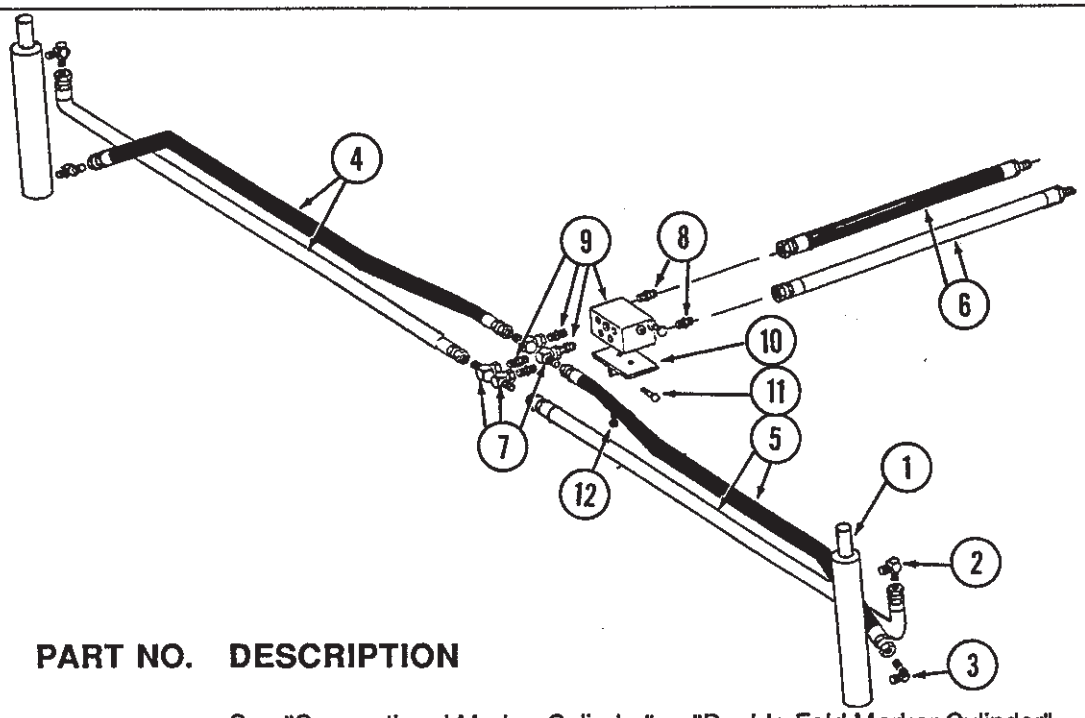
PHS033



ITEM	PART NO.	DESCRIPTION
1.		See "Conventional Marker Cylinder" or "Double Fold Marker Cylinder"
2.	6801-06-08	Elbow, 9/16"-18 Male JIC To 3/4"-16 O-Ring, 4 Row 30/Wide And 6 Row 30
	6801-08	Elbow, 3/4"-16 Male JIC To 3/4"-16 O-Ring, 6 Row Wide And 8 Row 30/Wide
3.	6801-06-08	Elbow, 9/16"-18 Male JIC To 3/4"-16 O-Ring, 4 Row 30/Wide And 6 Row 30
	6400-08	Connector, 3/4"-16 Male O-Ring To JIC, 6 Row Wide And 8 Row 30/Wide
4.	A1150	Hose Assembly, 1/4" x 103", 4 Row 30
	A1134	Hose Assembly, 1/4" x 116", 4 Row Wide
	A1106	Hose Assembly, 1/4" x 130", 6 Row 30
	A3114	Hose Assembly, 3/8" x 156", 6 Row Wide
	A1049	Hose Assembly, 3/8" x 160", 8 Row 30
	A3154	Hose Assembly, 3/8" x 196", 8 Row Wide And 10 Row 30
5.	A1170	Hose Assembly, 1/4" x 90", 4 Row 30
	A1172	Hose Assembly, 1/4" x 105", 4 Row Wide
	A1168	Hose Assembly, 1/4" x 120", 6 Row 30
	A3115	Hose Assembly, 3/8" x 146", 6 Row Wide
	A1013	Hose Assembly, 3/8" x 150", 8 Row 30
	A1028	Hose Assembly, 3/8" x 186", 8 Row Wide And 10 Row 30
6.	5701-06-06	Swivel Elbow, 90°, 9/16"-18 Male JIC To 3/8" NPT, 4 Row 30/Wide And 6 Row 30
	5701-08-06	Swivel Elbow, 90°, 3/4"-16 Male JIC To 3/8" NPT, 6 Row Wide, 8 Row 30/Wide And 10 Row 30
7.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
8.		Mounting Bracket, L.H. (Non-stock Item)
9.		Mounting Bracket, R.H. (Non-stock Item)
10.		See "Flow Control Valve"
11.	2404-06-06	Adapter, 9/16"-18 Male JIC To 3/8" NPT, 4 Row 30/Wide And 6 Row 30
	2404-08-06	Adapter, 3/4"-16 Male JIC To 3/8" NPT, 6 Row Wide, 8 Row 30/Wide And 10 Row 30
12.	A1101	Hose Assembly, 1/4" x 48", 4 Row 30/Wide And 6 Row 30
	A1005	Hose Assembly, 3/8" x 48", 6 Row Wide, 8 Row 30/Wide And 10 Row 30
13.	10215	Machine Bushing, 1 1/4" O.D.

MARKER HYDRAULIC SYSTEM (RIGID TOOLBAR), OPTIONAL SINGLE VALVE

PHS034

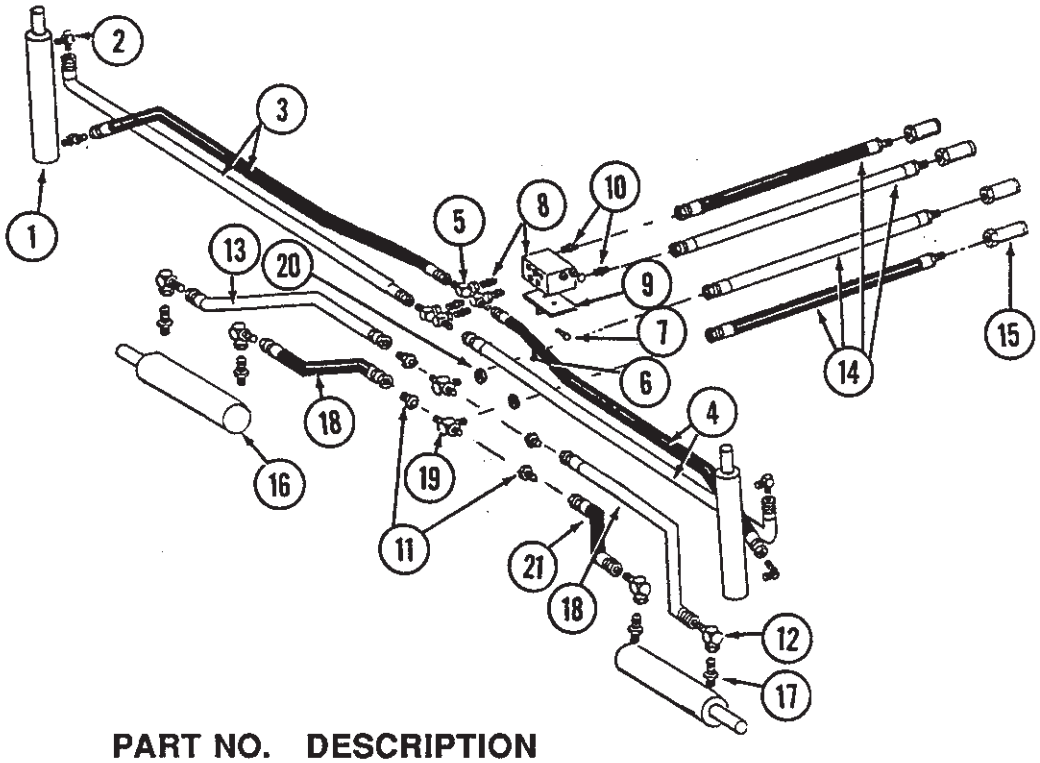


ITEM	PART NO.	DESCRIPTION
1.		See "Conventional Marker Cylinder" or "Double Fold Marker Cylinder"
2.	6801-06-08	Elbow, 9/16"-18 Male JIC To 3/4"-16 O-Ring, 4 Row 30/Wide And 6 Row 30
	6801-08	Elbow, 3/4"-16 Male JIC To 3/4"-16 O-Ring, 6 Row Wide, 8 Row 30/Wide And 10 Row 30
3.	6801-06-08	Elbow, 9/16"-18 Male JIC To 3/4"-16 O-Ring, 4 Row 30/Wide And 6 Row 30
	6400-08	Connector, 3/4"-16 Male O-Ring To JIC, 6 Row Wide, 8 Row 30/Wide And 10 Row 30
4.	A1150	Hose Assembly, 1/4" x 103", 4 Row 30
	A1134	Hose Assembly, 1/4" x 116", 4 Row Wide
	A1106	Hose Assembly, 1/4" x 130", 6 Row 30
	A3114	Hose Assembly, 3/8" x 156", 6 Row Wide
	A1049	Hose Assembly, 3/8" x 160", 8 Row 30
	A3154	Hose Assembly, 3/8" x 196", 8 Row Wide And 10 Row 30
5.	A1170	Hose Assembly, 1/4" x 90", 4 Row 30
	A1172	Hose Assembly, 1/4" x 105", 4 Row Wide
	A1168	Hose Assembly, 1/4" x 120", 6 Row 30
	A3115	Hose Assembly, 3/8" x 146", 6 Row Wide
	A1013	Hose Assembly, 3/8" x 150", 8 Row 30
	A1028	Hose Assembly, 3/8" x 186", 8 Row Wide And 10 Row 30
6.	A1101	Hose Assembly, 1/4" x 48", 4 Row 30/Wide And 6 Row 30
	A1005	Hose Assembly, 3/8" x 48", 6 Row Wide, 8 Row 30/Wide And 10 Row 30
7.	6500-06	Elbow, 9/16"-18 Male JIC To Female, 4 Row 30/Wide And 6 Row 30
	6500-08-06	Elbow, 3/4"-16 Male JIC To 9/16"-18 Female JIC, 6 Row Wide, 8 Row 30/Wide And 10 Row 30
8.	6400-06	Connector, 9/16"-18 Male JIC To 9/16"-18 O-Ring, 4 Row 30/Wide And 6 Row 30
	6400-08-06	Connector, 3/4"-16 Male JIC To 9/16"-18 O-Ring, 6 Row Wide, 8 Row 30/Wide And 10 Row 30
9.		See "Marker Sequencing/Flow Control Valve"
10.	A5632	Mounting Angle
11.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
12.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"

MARKER/WING LIFT HYDRAULIC SYSTEM (HYDRAULIC FOLD TOOLBAR), DUAL VALVE

PHS034/PHS002

Serial No. 16220 and on

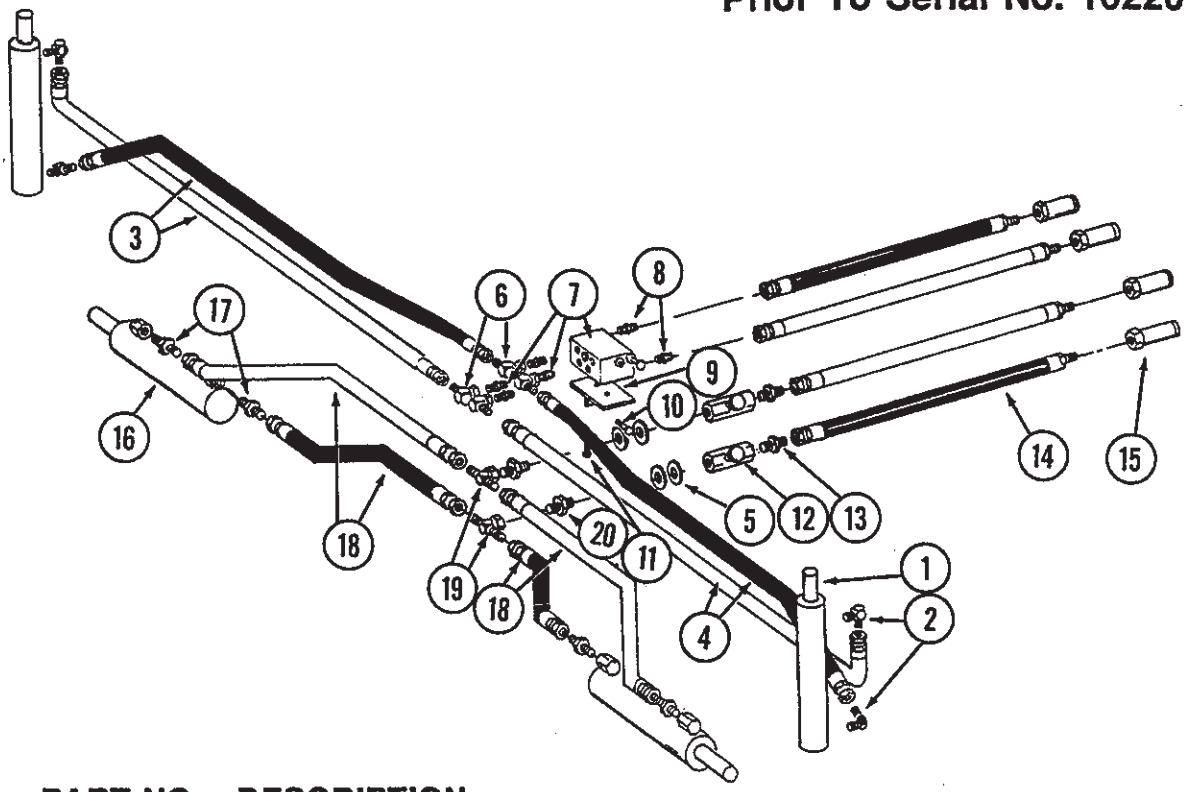


ITEM	PART NO.	DESCRIPTION
1.		See "Triple Fold Marker Cylinder"
2.	6801-08	Elbow, 3/4"-16 Male JIC To 3/4"-16 O-Ring
3.	A1054	Hose Assembly, 3/8" x 204", 8 Row Wide
	A1093	Hose Assembly, 3/8" x 230", 12 Row 30
4.	A1030	Hose Assembly, 3/8" x 192", 8 Row Wide
	A1057	Hose Assembly, 3/8" x 216", 12 Row 30
5.	6500-08-06	Elbow, 3/4"-16 Male JIC To 9/16"-18 Female JIC
6.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
7.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
8.		See "Marker Sequencing/Flow Control Valve"
9.	A5632	Mounting Angle
10.	6400-08-06	Connector, 3/4"-16 Male JIC To 9/16"-18 O-RIng
11.	2406-08-06	Reducer, 3/4"-16 Female JIC To 9/16"-18 Male JIC
12.	6500-06	Elbow, 9/16"-18 Male JIC To Female
13.	A1155	Hose Assembly, 1/4" x 48", 8 Row 36/38
	A1153	Hose Assembly, 1/4" x 56", 8 Row 40
	A1188	Hose Assembly, 1/4" x 66", 12 Row 30
14.	A3164	Hose Assembly, 3/8" x 52"
15.	D4086	Pioneer (ISO) Tip
16.		See "Wing Lift Cylinder(4" x 11")"
17.	6400-06-08	Adapter, 9/16"-18 Male JIC To 3/4"-16 O-Ring
18.	A1189	Hose Assembly, 1/4" x 36", 8 Row 36/38
	A1132	Hose Assembly, 1/4" x 44", 8 Row 40
	A1144	Hose Assembly, 1/4" x 54", 12 Row 30
19.	2703-08	Bulkhead Tee, 3/4"-16 Male JIC
20.	306-08	Nut, 3/4"-16
21.	A1169	Hose Assembly, 1/4" x 24", 8 Row 36/38
	A1181	Hose Assembly, 1/4" x 32", 8 Row 40
	A1132	Hose Assembly, 1/4" x 44", 12 Row 30

MARKER/WING LIFT HYDRAULIC SYSTEM (HYDRAULIC FOLD TOOLBAR), DUAL VALVE

PHS034

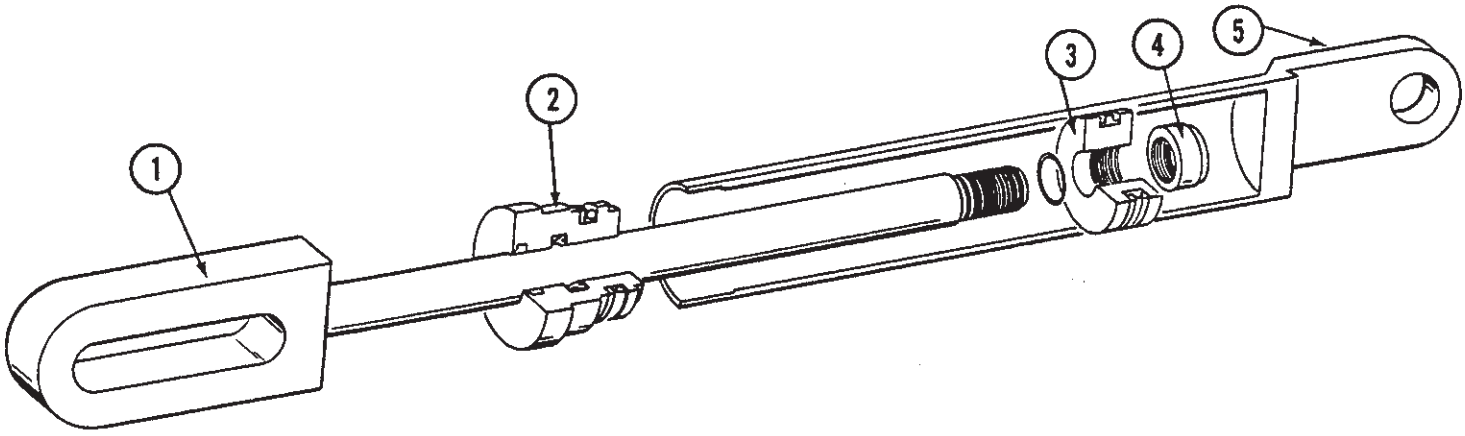
Prior To Serial No. 16220



ITEM	PART NO.	DESCRIPTION
1.		See "Triple Fold Marker Cylinder"
2.	6801-08	Elbow, 3/4"-16 Male JIC To 3/4"-16 O-Ring
3.	A3100	Hose Assembly, 3/8" x 196", 8 Row Wide
	A1093	Hose Assembly, 3/8" x 230", 12 Row 30
4.	A1028	Hose Assembly, 3/8" x 186", 8 Row Wide
	A1057	Hose Assembly, 3/8" x 216", 12 Row 30
5.	10204	Machine Bushing
	10213	Special Bushing
6.	6500-08-06	Elbow, 3/4"-16 Male JIC To 9/16"-18 Female JIC
7.		See "Marker Sequencing/Flow Control Valve"
8.	6400-08-06	Connector, 3/4"-16 Male JIC To 9/16"-18 O-Ring
9.	A5632	Mounting Angle
10.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
11.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
12.		See "Flow Control Valve"
13.	2404-08-06	Adapter, 3/4"-16 Male JIC To 3/8" NPT
	2501-08-06	Elbow, 3/4"-16 Male JIC To 3/8" NPT
14.	A3164	Hose Assembly, 3/8" x 52"
15.	D4086	Pioneer (ISO) Tip
16.		See "Wing Lift Cylinder(3 1/2" x 11")"
17.	6400-06	Adapter, 9/16"-18 Male JIC To O-Ring
18.	A1154	Hose Assembly, 1/4" x 72", 8 Row Wide
	A1170	Hose Assembly, 1/4" x 90", 12 Row 30
19.	6600-06	Tee, 9/16"-18 Male JIC To Female
20.	2404-06-06	Adapter, 9/16"-18 Male JIC To 3/8" NPT

CONVENTIONAL MARKER CYLINDER
4 ROW 30/WIDE AND 6 ROW 30 (RIGID TOOLBAR)

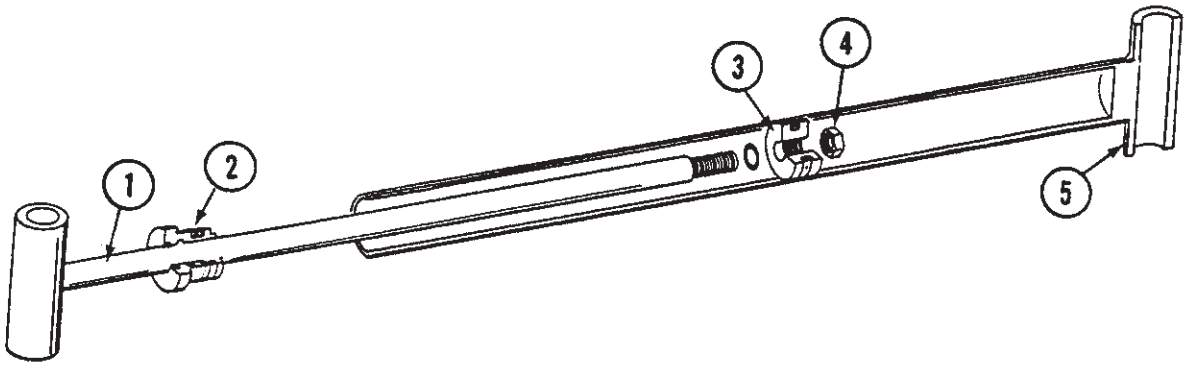
CYL030



ITEM	PART NO.	DESCRIPTION
1.	A5453	Rod Assembly
2.	D5949	Gland
3.	D4632	Piston
4.	R0959	Lock Nut, 3/4"-16
5.	A5454	Barrel
A.	A5095	Cylinder Complete, 2" x 8"
B.	R0927	Seal Kit, Includes: (1) T Seal, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Wiper

DOUBLE FOLD MARKER CYLINDER (RIGID TOOLBAR)
6 ROW WIDE, 8 ROW 30/WIDE And 10 ROW 30

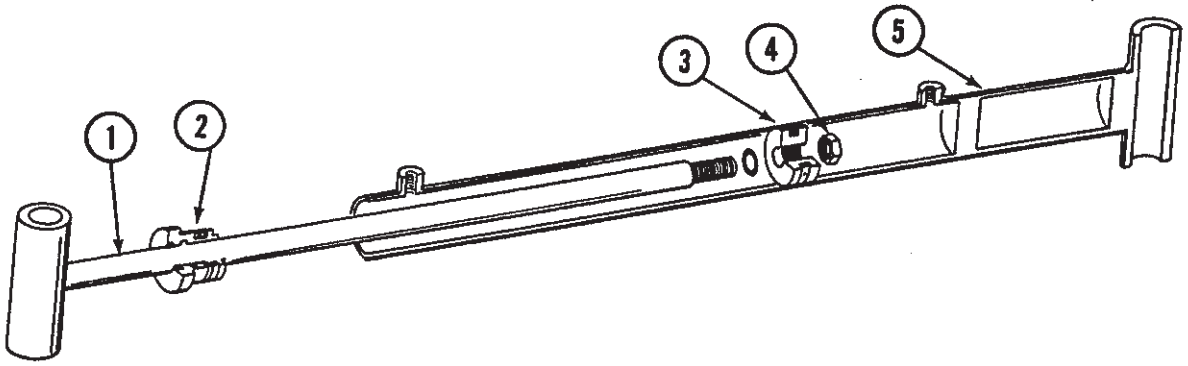
CYL039



ITEM	PART NO.	DESCRIPTION
1.	A5459	Rod Assembly
2.	D5949	Gland
3.	D4632	Piston
4.	R0959	Lock Nut, 3/4"-16
5.	A5460	Barrel
A.	A5097	Cylinder Complete, 2" x 20"
B.	R0927	Seal Kit, Includes: (1) T Seal, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Wiper

TRIPLE FOLD MARKER CYLINDER 8 ROW WIDE AND 12 ROW 30, (HYDRAULIC FOLD TOOLBAR)

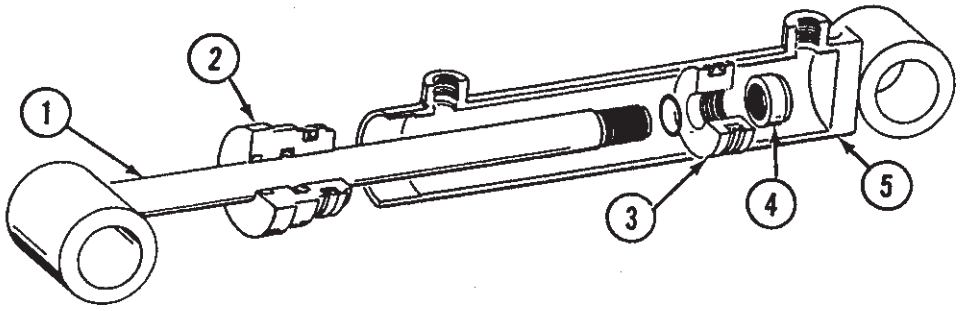
CYL039



ITEM	PART NO.	DESCRIPTION
1.	A5459	Rod Assembly
2.	D5949	Gland
3.	D4632	Piston
4.	R0959	Lock Nut, 3/4"-16
5.	A5458	Barrel
A.	A5096	Cylinder Complete, 2" x 20 1/16"
B.	R0927	Seal Kit, Includes: (1) T Seal, (2) O-Ring, (1) BU Ring, (1) U-Cup, (1) Wiper

OPTIONAL EXTERNAL WING LIFT ASSIST CYLINDER (HYDRAULIC FOLD TOOLBAR)

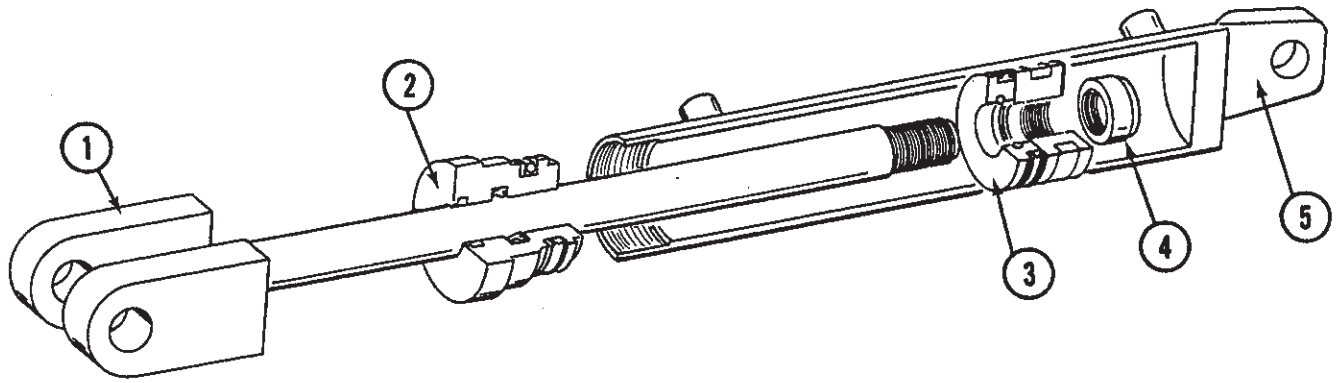
CYL032



ITEM	PART NO.	DESCRIPTION
1.	A4193	Rod Assembly
2.	D5954	Gland
3.	D4525	Piston
4.	R0964	Special Jam Nut
5.	A4192	Barrel
A.	A4115	Cylinder Complete, 2 1/2" x 20 1/16"
B.	R0963	Seal Kit, Includes: (1)T Seal, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper

WING LIFT CYLINDER (HYDRAULIC FOLD TOOLBAR)

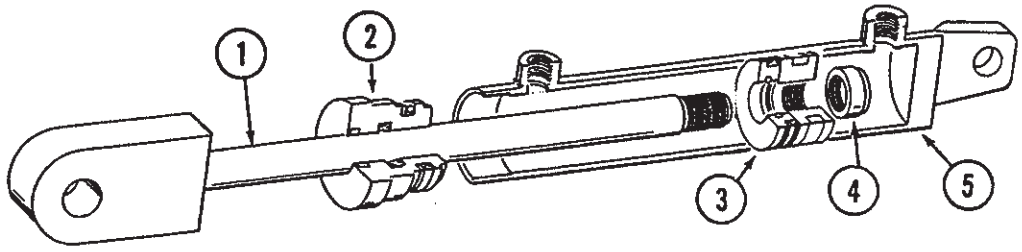
CYL047



ITEM	PART NO.	DESCRIPTION
1.	A4985	Rod Assembly
2.	D6569	Gland
3.	D4510	Piston
4.	R0987	Lock Nut, 1 1/4"-12
5.	A4984	Barrel
A.	A4823	Cylinder Complete, 3 1/2" x 11"
B.	R0996	Seal Kit, Includes: (1) T Seal, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Wiper, (1) Wear Ring

WING LIFT CYLINDER (HYDRAULIC FOLD TOOLBAR)

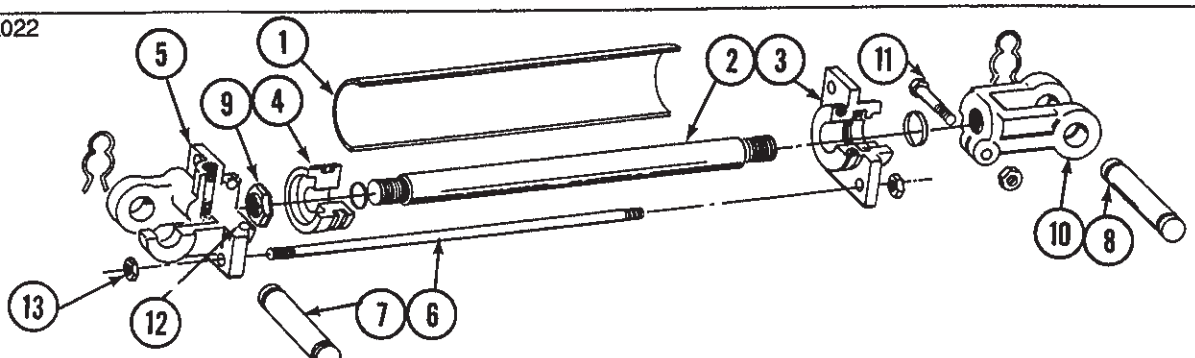
CYL032/CYL047



ITEM	PART NO.	DESCRIPTION
1.	A5702	Rod Assembly
2.	D6576	Gland
3.	D7884	Piston
4.	R0987	Lock Nut, 1 1/4"-12
5.	A5703	Barrel
A.	A5662	Cylinder Complete, 4" x 11"
B.	R1057	Seal Kit, Includes: (1)T Seal, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper, (1)Wear Ring

OPTIONAL DUAL LIFT ASSIST CYLINDER

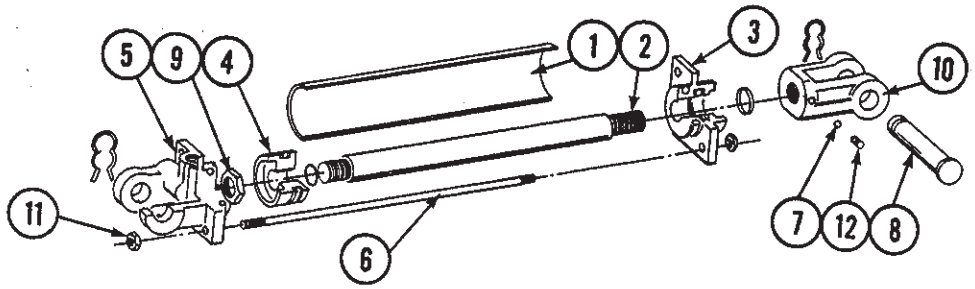
CYL022



ITEM	PART NO.	DESCRIPTION
1.		Barrel (Non-stock Item)
2.	R0174	Shaft
3.	R0175	Gland
4.	R0176	Piston
5.	R0177	Clevis
6.	R0178	Tie Rod
7.	R0179	Pin W/Clips, 3 5/8"
	R0193	Clip
8.	R0180	Pin W/Clips, 3 1/2"
	R0193	Clip
9.	R0203	Lock Nut, 1"-14
10.	R0456	Clevis
11.	10047	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
	10101	Hex Nut, 3/8"-16
12.	10170	Pipe Plug, 1/2"
13.	R0181	Hex Nut, 1/2"-13
A.	A1803	Cylinder Complete W/Pins And Clips, 3 1/2" x 8"
B.	R0153	Seal Kit, Includes: (1) Wiper, (3) BU Washers, (5) O-Rings

OPTIONAL DUAL LIFT ASSIST CYLINDER

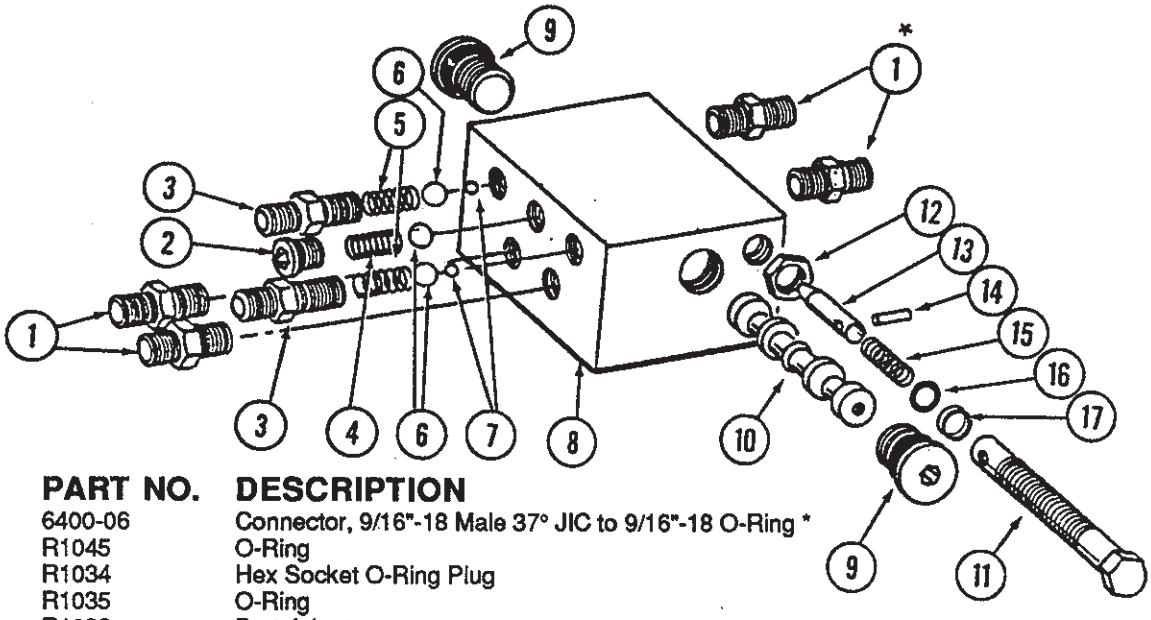
CYL048



ITEM	PART NO.	DESCRIPTION
1.		Barrel (Non-stock Item)
2.	R0709	Shaft
3.	R1025	Gland
4.	R1026	Piston
5.	R1027	Clevis
6.	R1024	Tie Rod
7.	R0716	Nylon Ball
8.	R0717	Pin W/Clip
9.	R0663	Nut
10.	R0714	Clevis
11.	R0181	Hex Nut, 1/2"-13
12.	10210	Set Screw, 3/8"-16 x 3/8"
A.	A5482	Cylinder Complete W/Pins And Clips, 3 1/2" x 8"
B.	R1028	Seal Kit, Includes: (1) Wiper, (4) BU Rings, (5) O-Rings, (1) U-Cup

MARKER SEQUENCING/FLOW CONTROL VALVE

VVB025

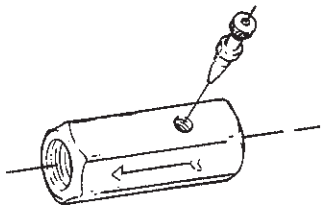


ITEM	PART NO.	DESCRIPTION
1.	6400-06	Connector, 9/16"-18 Male 37° JIC to 9/16"-18 O-Ring *
	R1045	O-Ring
2.	R1034	Hex Socket O-Ring Plug
	R1035	O-Ring
3.	R1032	Port Adapter
	R1045	O-Ring
4.	R1033	Detent Spring
5.	R1036	Spring
6.	R1044	7/16" Check Ball
7.	R1043	1/4" Steel Ball
8.		Valve Body (Non-stock Item)
9.	R1047	Hex Socket Plug
	R1037	O-Ring
10.		Spool (Non-stock Item)
11.	R1042	Adjustment Screw
12.	R1048	Hex Jam Nut, 1/2"-20
13.	R1038	Needle
14.	R1039	Spring Pin
15.	R1046	Compression Spring
16.	R1040	O-Ring
17.	R1041	Teflon BU Ring
A.	A5552	Valve Assembly Complete (Items 1-17)
B.	A5572	Flow Control Portion Only (Items 11-17)

*Not used on models with 3/8" hoses.

FLOW CONTROL VALVE

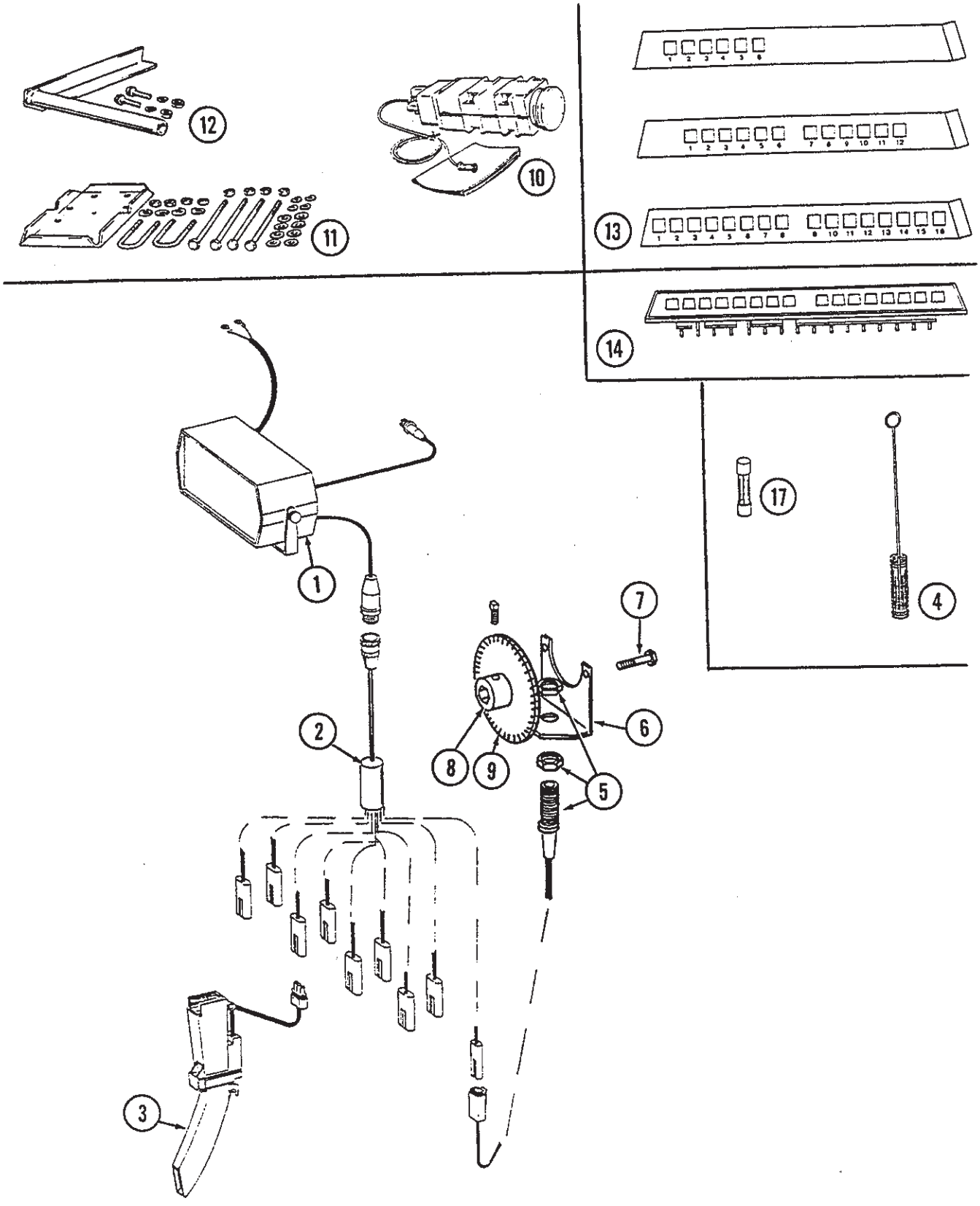
VVB001



ITEM	PART NO.	DESCRIPTION
A.	A0270A	Flow Control Valve (To identify-Rego KLF375 stamped on body)
	R0103	Needle Valve Only
B.	A0270B	Flow Control Valve (To identify-Deltrol stamped on valve body)
	R0642	Needle Valve Only
C.	A0270C	Flow Control Valve (To identify-Partrol stamped on valve body)
	R0767	Needle Valve Only

ELECTRONIC SEED MONITOR

ECP017/D-0640-0001/D-0640-0003/D-0640-0004/D-1172-0001/D-1172-0002/ECP019/ECP020/ECP021

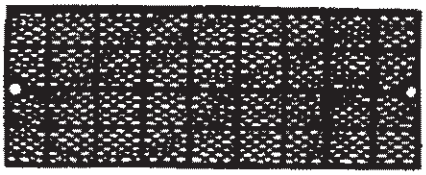


ELECTRONIC SEED MONITOR

ITEM	PART NO.	DESCRIPTION
1.	A5873	Console W/Mounting Bracket, KM1000
	A5874	Console W/Mounting Bracket, KM3000
	R1077	Mounting Bracket, KM1000
	R1078	Mounting Bracket, KM3000
	R1079	Console Mounting Bracket Hardware Package(Includes 2 wellnuts, 2 knobs and 1/4" hardware)
2.	A5875	Planter Harness, 4 Row
	A5876	Planter Harness, 6 Row
	A5877	Planter Harness, 8 Row
	A5878	Planter Harness, 10 Row And 12 Row
3.	A5880	Seed Tube W/High Rate Sensor
	R1062	Seed Tube (With holes for high rate sensor installation)
	R1087	Sensor Only (For A5880)
	R0676	Sunshade
	D2117	Tie Strap, 14 1/2"
4.	R0594	Brush
5.	A5600	Magnetic Distance Sensor (Used W/KM3000 Console Only)
6.	D7632	Magnetic Distance Sensor Bracket
7.	10171	Hex Head Cap Screw, 5/16"-18 x 1 1/4"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
8.	10145	Set Screw, 5/16"-18 x 1/2"
9.	A5549	Magnetic Distance Sensor Pulse Wheel (Used W/KM3000 Console Only)
10.	A4223	Radar Ground Sensor (Used W/KM3000 Console Only)
11.	A4229	Radar Sensor Mounting Bracket Package
12.	A4230	Radar Sensor Pipe Mounting Package
13.	R1081	KM1000 Bezel Decal, 6 Row
	R1082	KM1000 Bezel Decal, 12 Row (Used On 4 Row, 10 Row And 12 Row)
	R1083	KM1000 Bezel Decal, 16 Row (Used On 8 Row)
14.	R1080	KM1000 Bezel
15.	R0595	Bulb, KM1000 Row Lamp (Not Shown)
16.	R1084	Bulb, KM3000 Backlite (Not Shown)
17.	R0866	Fuse, 5-amp, Type AGC
	R1085	Fuse, 2-amp, Type AGC
18.	R0582	Male Hitch Connector Kit (Not Shown)
	R0583	Female Hitch Connector Kit (Not Shown)
A.	A5606	Sensor And Mounting Package, Includes Items 5-9

DECALS, REFLECTORS AND TIE STRAPS

2



3

⚠ WARNING ⚠

EMPTY ALL HOPPERS AND
INSTALL TRANSPORT PINS
BEFORE TRANSPORTING

7100-25

4

⚠ WARNING

TO AVOID INJURY- -
Stand clear- - Keep others away when raising or lowering ***markers.*** Before transporting planter fully extend hydraulic cylinders and install ***locking pins*** where provided.

7100-42 017188

5

⚠ CAUTION

1. Read and understand the Operator's Manual.
2. Stop the tractor engine before leaving the operator's platform.
3. Keep riders off the machine.
4. Make certain everyone is clear of the machine before starting the tractor engine and operating.
5. Keep all shields in place.
6. Never lubricate, adjust, unclog or service the machine with tractor engine running.
7. Wait for all movement to stop before servicing.
8. Keep hands, feet and clothing away from moving parts.
9. Use flashing warning lights when operating on highways except when prohibited by law.

6

⚠ DANGER

THIS PLANTER IS DESIGNED TO BE DRIVEN BY GROUND TIRES ONLY. THE USE OF HYDRAULIC, ELECTRIC OR PTO DRIVES MAY CREATE SERIOUS SAFETY HAZARDS TO YOU AND THE PEOPLE NEAR BY. IF YOU INSTALL SUCH DRIVES YOU MUST FOLLOW ALL APPROPRIATE SAFETY STANDARDS AND PRACTICES TO PROTECT YOU AND OTHERS NEAR THIS PLANTER FROM INJURY.

7

⚠ WARNING ⚠

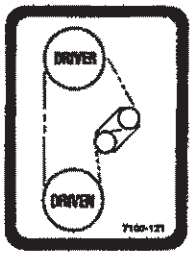
THIS MACHINE HAS BEEN DESIGNED AND BUILT WITH YOUR SAFETY IN MIND. ANY ALTERATION TO THE DESIGN OR CONSTRUCTION MAY CREATE SAFETY HAZARDS. DO NOT MAKE ANY ALTERATIONS OR CHANGES TO THE EQUIPMENT, BUT IF ANY ALTERATIONS OR CHANGES ARE MADE YOU MUST FOLLOW ALL APPROPRIATE SAFETY STANDARDS AND PRACTICES TO PROTECT YOU AND OTHERS NEAR THIS MACHINE FROM INJURY.

7100-90

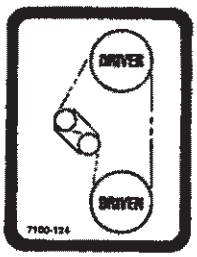
8

KINZE®

9



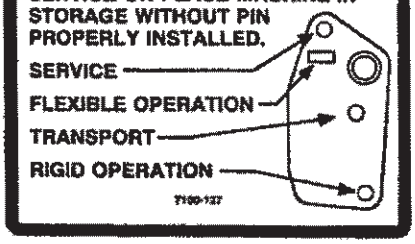
10



11

⚠ WARNING ⚠

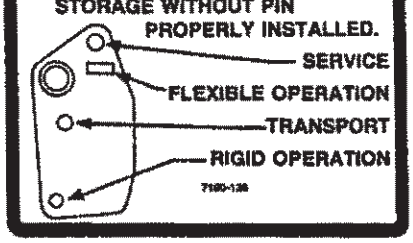
INSTALL SAFETY PIN IN PROPER LOCATION! DO NOT TRANSPORT, SERVICE OR PLACE MACHINE IN STORAGE WITHOUT PIN PROPERLY INSTALLED.



12

⚠ WARNING ⚠

INSTALL SAFETY PIN IN PROPER LOCATION! DO NOT TRANSPORT, SERVICE OR PLACE MACHINE IN STORAGE WITHOUT PIN PROPERLY INSTALLED.



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⚠ CAUTION ⚠

AGRICULTURAL CHEMICALS CAN BE DANGEROUS. IMPROPER SELECTION OR USE CAN SERIOUSLY INJURE PERSONS, ANIMALS, PLANTS, SOIL, OR OTHER PROPERTY. BE SAFE: SELECT THE RIGHT CHEMICAL FOR THE JOB. HANDLE IT WITH CARE. FOLLOW THE INSTRUCTIONS ON THE CONTAINER LABEL AND OF THE EQUIPMENT MANUFACTURER.

7100-118

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DECALS, REFLECTORS AND TIE STRAPS

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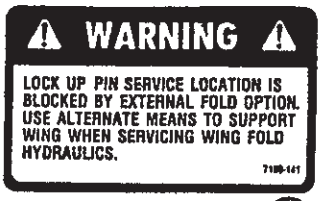

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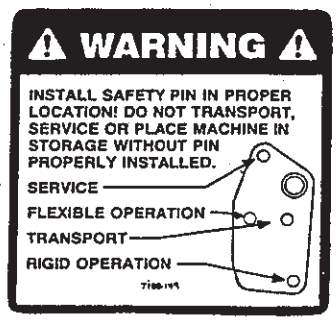

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ITEM	PART NO.	DESCRIPTION
1.	R0155	Blue Paint, Aerosol (Not Shown)
	R0439	Blue Paint, Quart (Not Shown)
	R0440	Blue Paint, Gallon (Not Shown)
2.	D1512	Tie Strap, 6"
	D2117	Tie Strap, 14 1/2"
3.	7200-03	Reflector, Red
	7200-04	Reflector, Amber
4.	7100-25	Decal, Warning
5.	7100-42	Decal, Warning
6.	7100-46	Decal, Caution
7.	7100-89	Decal, Danger
8.	7100-90	Decal, Warning
9.	7100-104	Decal, KINZE, 3" x 12"
10.	7100-121	Decal, Transmission
11.	7100-124	Decal, Transmission
12.	7100-127	Decal, Warning (Prior to Serial No. 16220)
13.	7100-128	Decal, Warning (Prior to Serial No. 16220)
14.	7100-115	Decal, Caution
15.	7100-132	Decal, Danger
16.	7100-133	Decal, Warning
17.	7100-140	Decal, Warning
18.	7100-141	Decal, Warning
19.	7100-148	Decal, Warning (Serial No. 16220 and on)
20.	7100-149	Decal, Warning (Serial No. 16220 and on)
21.	7100-117	Decal, Danger
22.	7100-157	Decal, 2100
23.	7100-144	Decal, Logo
24.	7100-182	Decal, Meter Alignment
25.	R0146	Powdered Graphite, 1 Pound (Not Shown)
	R1179	Talc Seed Lubricant, 2 Pounds (Not Shown)

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