M0145

OPERATOR & PARTS MANUAL

MODEL 2200
FLEX ECONO-FOLD® PLANTER

This manual is applicable to: Model: 2200 Flex Econo-Fold® Planters

Serial Number: 605000 and on

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

Model Number _____

Serial Number _____

Date Purchased _____

8/90

PREDELIVERY/DELIVERY CHECK LIST

TO THE DEALER

Predelivery service includes assembly, lubrication, adjustment and test. This service assures 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.

❑ Be sure wing locks and drive wheel lockups work properly.

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 _____

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 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 2200 Flex Econo-Fold® planter is available in various row spacings and permits installation of various row unit attachments.

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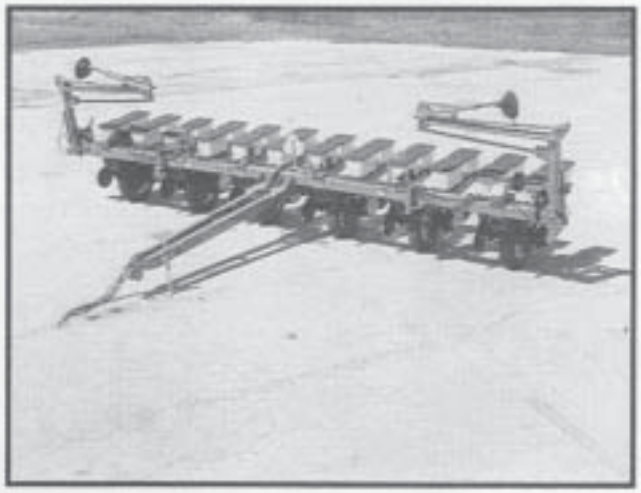

GENERAL INFORMATION

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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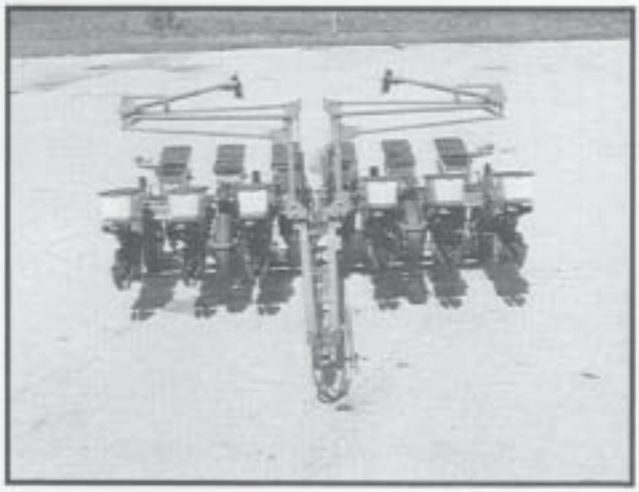

SERIAL NUMBER

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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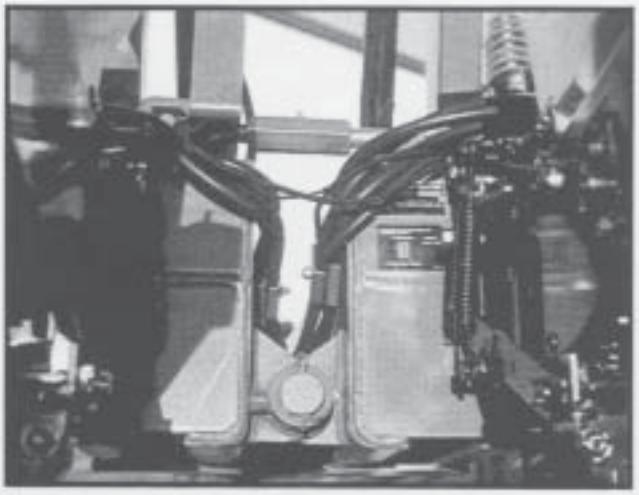

SPECIFICATIONS

TYPE - Pull Type (Two section center flex/ manual horizontal fold)

PLANTING UNIT TYPES -Pull Type Row Units

ROW SPACING
8 Row Narrow - 30" Rows
8 Row Wide - 36" or 38" Rows
12 Row Noarrow - 30" Rows

DRIVE SYSTEM
Two 4.10" x 6" spring-loaded contact drive tires with No. 40 chain.
Two quick-adjust end mounted seed transmissions with machined sprockets.
7/8" hex drive/drill shafts with spring-loaded, hardened wing couplers.
Transport/ground drive tires 7.50" x 20" 6 ply.
Point row clutches optional.

TYPE LIFT
Master/slave rephasing with assist cylinders (6 cylinders)

MARKERS
8 Row Narrow: Low profile two-fold with manual 3rd stage.
8 Row Wide and 12 Row Narrow: Low profile three-fold.
(8 row wide and larger utilize depth band on marker discs.)

HYDRAULICS
Dual SCV for independent operation of lift and markers.
Hydraulic sequence valve with flow controls for markers.

Dimensions/Weights

PLANTER SIZE	8 Row 30"	8 Row 36"/38"	12 Row 30"
Transport Width	11' 9"	13' 9"	16' 4"
Planting Width	21' 6"	26' 3"	31' 6"
Transport Height	9' 1"	9' 1"	9' 1"
*Weight	6109 lbs.	6274 lbs.	7389 lbs.

* Base machine weights include planter frame including row markers, drive components, tires and wheels, hydraulic cylinders and KINZE plateless row units with seed hopper and lid, dual quick adjustable down force springs and KM1000 electronic seed monitor.

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 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.**

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

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

⚠ **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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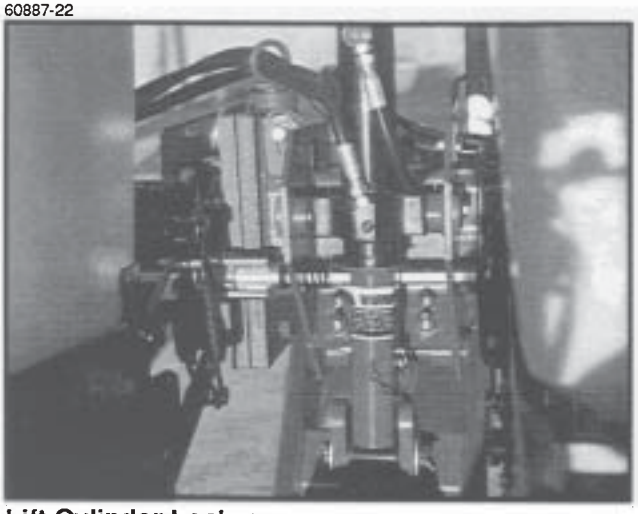

Lift Cylinder Lockups

⚠ **Always install all lift cylinder lockups before towing the planter or working under the unit.**

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

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

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

60887-77

Wing Locking Bolts

⚠ **Always secure wing locking bolts before operating the planter.**

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

SAFETY PRECAUTIONS ⚠

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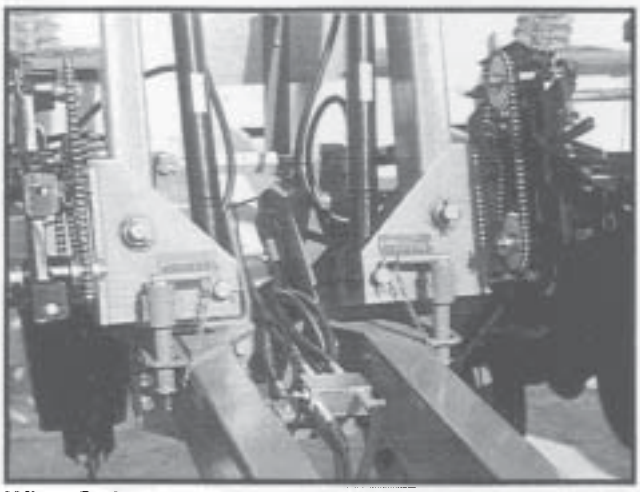

Wing Safety Pin

⚠ Always make sure wings are secured with safety pins before towing planter.

⚠ 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.

⚠ 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.

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 the SMV decal 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.

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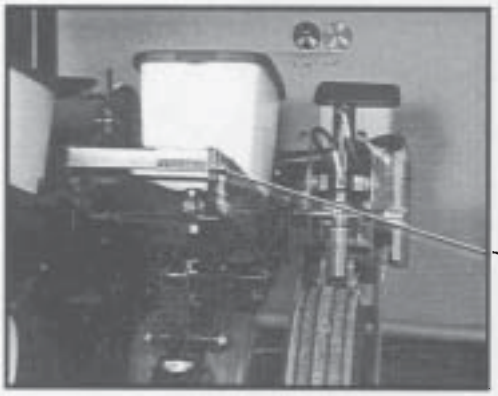

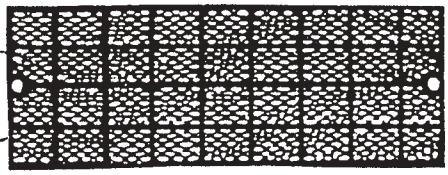

Part No. 7200-03 Red Reflector

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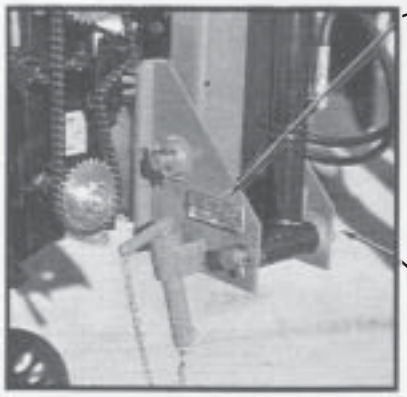

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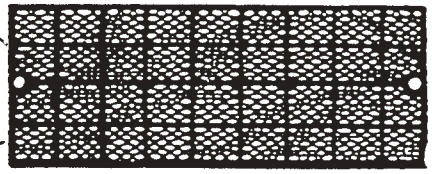

Part No. 7200-04 Amber Reflector

SAFETY WARNING SIGNS ⚠

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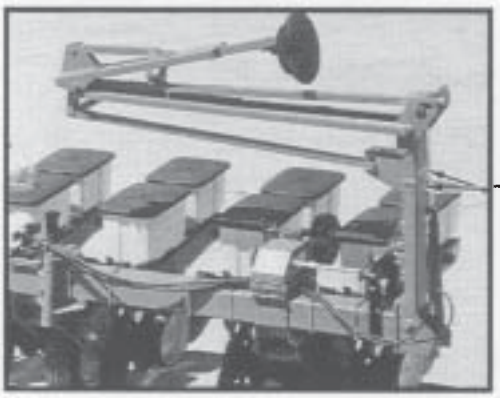

Part No. 7100-42

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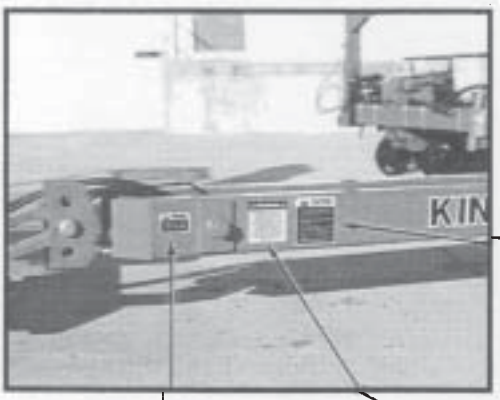

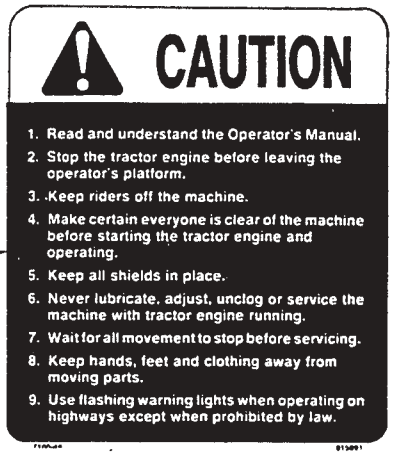

Part No. 7100-46

Part No. 7100-56

Part No. 7100-90

SAFETY WARNING SIGNS ⚠

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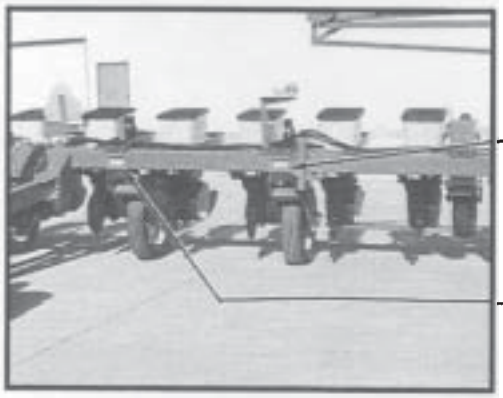


⚠ WARNING ⚠

RAISE PLANTER COMPLETELY AND INSTALL CYLINDER LOCK-UPS BEFORE FOLDING. FOLD ON LEVEL GROUND. SECURE WINGS WITH SAFETY LATCHES BEFORE TOWING IN FOLDED POSITION.

7100-66

Part No. 7100-66

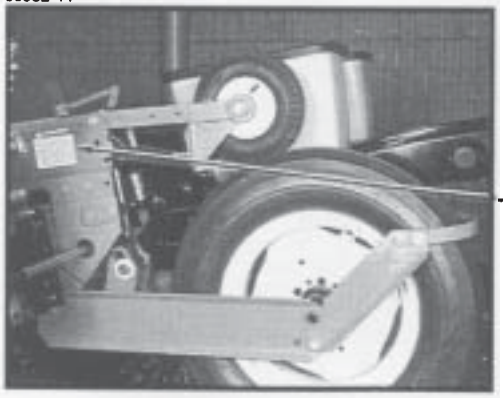
⚠ WARNING ⚠

ALWAYS LATCH WINGS AND INSTALL TRANSPORT PINS IN LATCHES BEFORE TRANSPORTING. WINGS MAY SWING OUT IF NOT PROPERLY LATCHED.

7100-71

Part No. 7100-71

60982-44



⚠ 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

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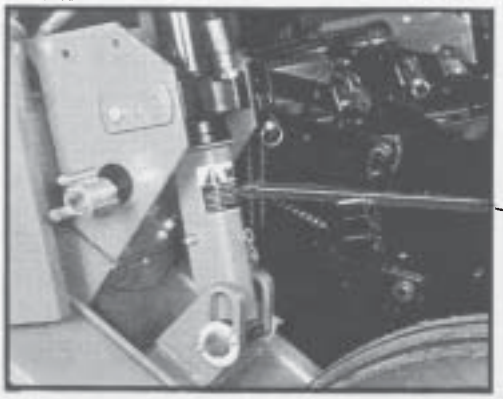

⚠ WARNING

TO AVOID INJURY - -

Always use the hydraulic cylinder *safety lockout channel* when *servicing* planter in raised position or when *transporting* planter on the road. After use return to storage location.

Part No. 7100-47

SAFETY WARNING SIGNS ⚠

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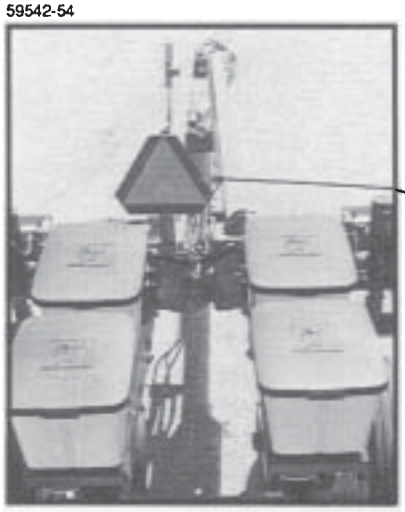

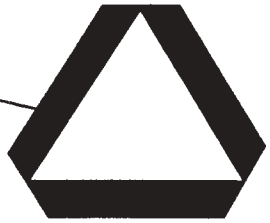

Part No. D2199 SMV Emblem

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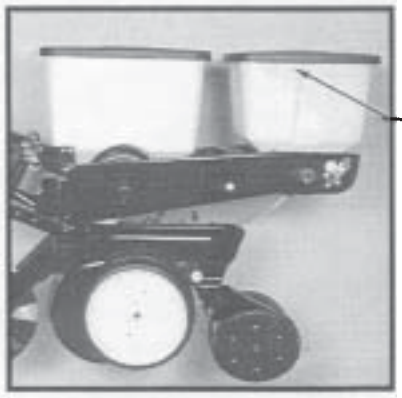

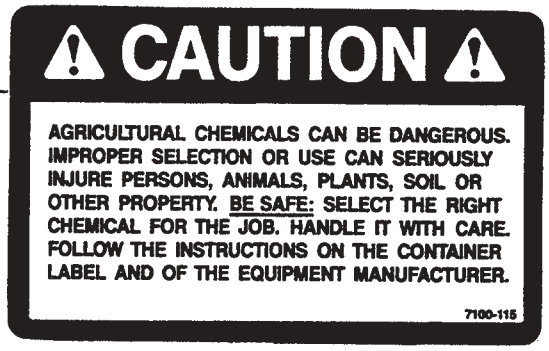

Part No. 7100-115
Located on under side of granular chemical hopper lid.

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. Check all drive chains for proper tension, alignment and lubrication.

TRACTOR REQUIREMENTS

Consult your dealer for information on horsepower requirements and tractor compatibility. Requirements will vary with planter options, tillage and terrain. Two dual remote hydraulic outlets (SCV) are required on all models.

TRACTOR PREPARATION AND HOOKUP

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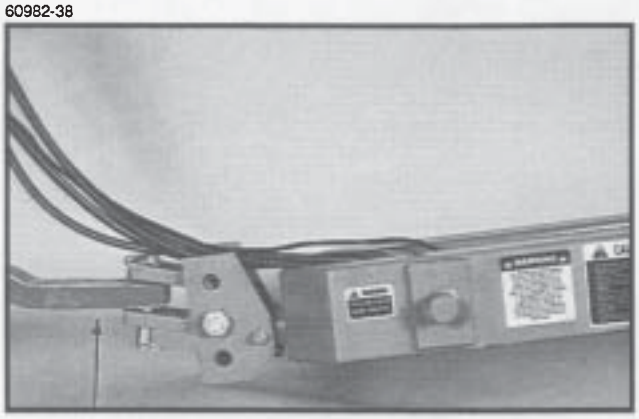

1. Adjust tractor drawbar so it is 13 to17 inches above the ground. Adjust the drawbar so the hitch pin hole is directly below the center line of the PTO shaft. Make sure the drawbar is in a stationary position.

2. Back tractor to planter and connect with hitch pin. Make sure hitch pin is secured with locking pin or cotter pin.

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

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

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

4. Raise jack stand and remount horizontally on storage bracket.

5. Lower planter to the planting position and check to be sure planter is level fore and aft. If hitch height is too high or low, disconnect planter and adjust hitch clevis up or down as necessry.

LEVELING THE PLANTER

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

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

60887-69

With the planter lowered to proper operating depth, check to be sure the frame is level fore and aft. Recheck once planter is in the field.

It is important for the planter to operate level laterally. Tire pressure must be maintained at pressures specified. See "Tire Pressure".

MACHINE OPERATION

TIRE PRESSURE

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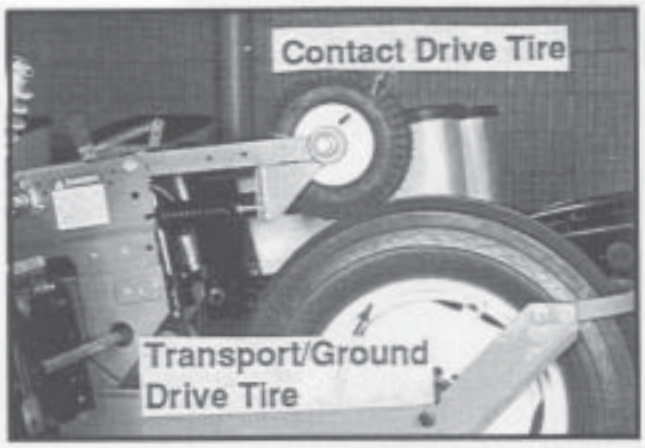
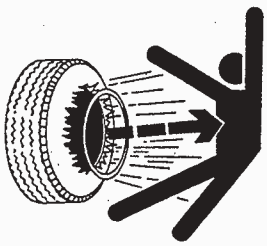


Tire pressure should be checked regularly and maintained as follows:

Transport/Ground Drive 7.50" x 20" .....40 PSI
Contact Drive 4.10" x 6" .....60 PSI



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

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

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.

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

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

TRANSMISSION ADJUSTMENT

Planting population rate changes are made at each end of the planter. 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 on each side of the planter.

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

The planting rate charts found at the back of this section will aid you in selecting the correct sprocket combinations.

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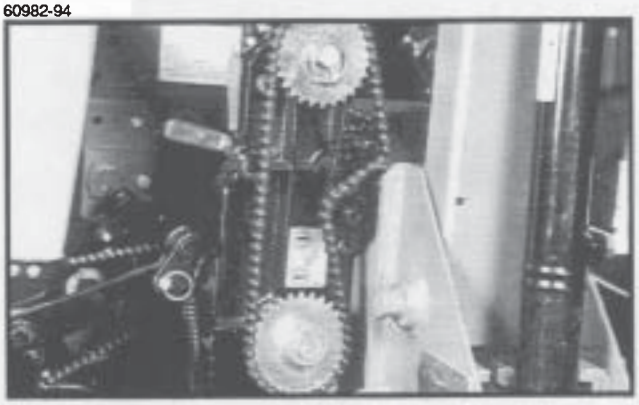

2 TO 1 DRIVE REDUCTION

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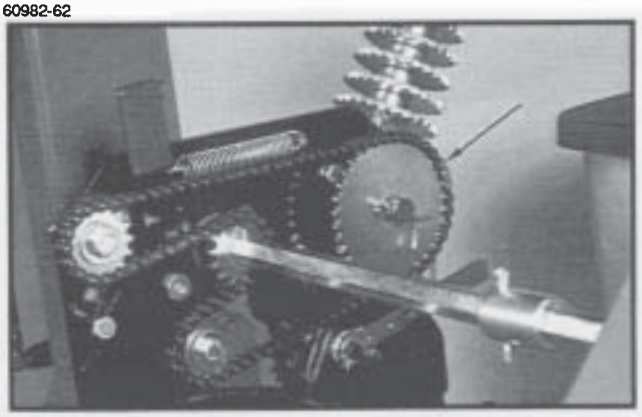


Replacing the 17 tooth drive sprocket located on the inner side of the top transmission shaft, with the 34 tooth 2 to 1 drive reduction sprocket will reduce the planter transmission speed and reduce planting rates by 1/2.

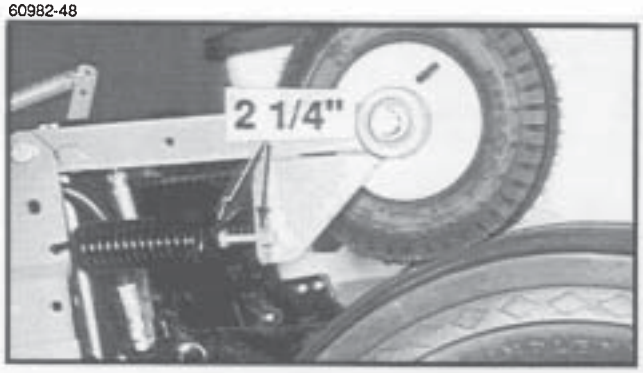
IMPORTANT: After each sprocket combination adjustment, make a field check to be sure you are planting at the desired rate.

CONTACT DRIVE WHEEL SPRING ADJUSTMENT

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

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

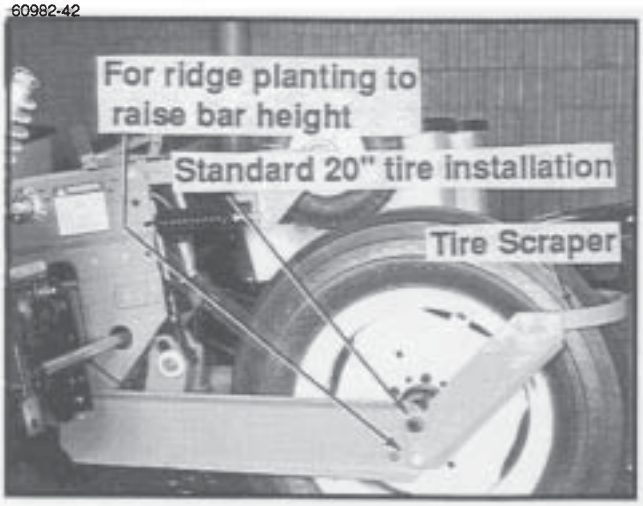
60982-48



TIRE SCRAPER

Due to the clearance between the wheel assembly and the transport tire when a planter is equipped with the 20" transport tire, a tire scraper should always be used. This will prevent a buildup of dirt/mud between the wheel arm assembly and the tire. Adjust the scraper so it does not contact the tire.

60982-42



Shown with row unit removed.

RIDGE PLANTING

For ridge planting to raise the bar height 3", mount the 20" tires in the lower rear holes in the ground drive wheel arm. Mount the contact drive wheel arm and springs in the lower set of mounting holes in the wheel module mount and raise the hitch height to maintain fore and aft levelness.

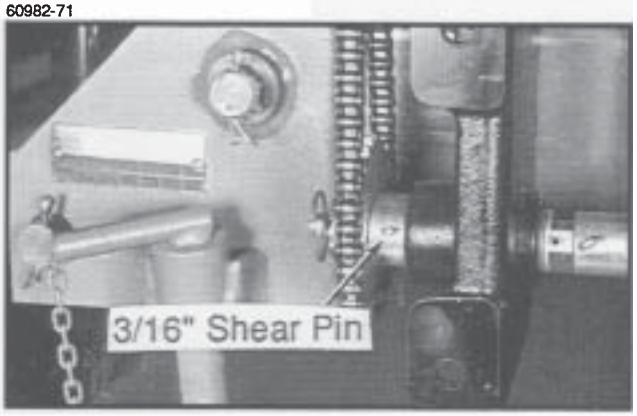
SHEAR PROTECTION

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

61658-27

Row unit seed meter drive

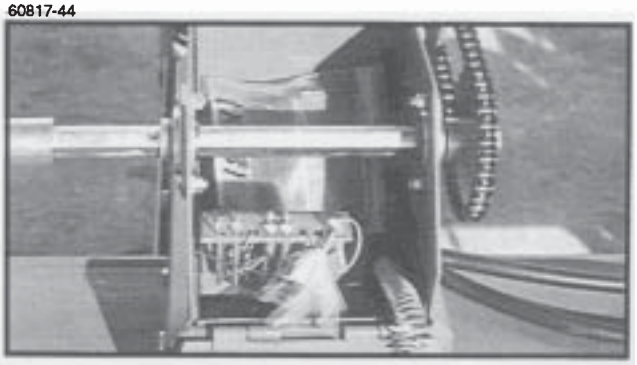
60982-71



Transmission shaft

If excessive load should cause a pin to shear, it is important to determine where binding has occurred before replacing the pin. Turn the shaft by hand, checking for misalignment and for the possibility of seized parts. When the shaft can be turned by hand (with the aid of a wrench) replace shear pins with same size and type. To prevent future binding or breakage of components, check drive line alignment and follow prescribed lubrication schedules.

60817-44



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

MACHINE OPERATION

HYDRAULIC MARKER OPERATION

All 2200 Planters are equipped with a dual valve hydraulic system. The dual valve system allows the markers to be operated independently of the planter lift cylinders. Each time a marker is raised, the sequencing valve will direct flow to lower the opposite marker.

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

WARNING: Always stand clear of the marker assemblies and blades when planter is in operation.

HYDRAULIC PLANTER LIFT OPERATION

The planter lift system consists of one master, one lift assist and one slave cylinder on each side of the planter.

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

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

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

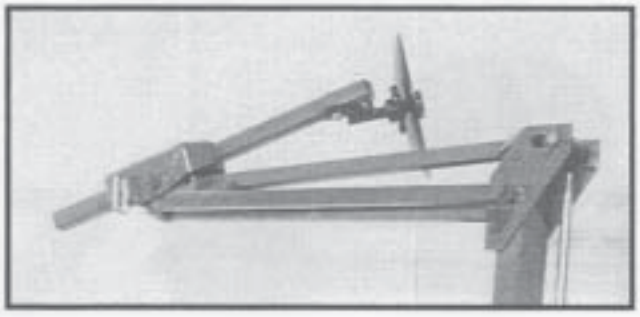
FIELD TO TRANSPORT OPERATION

WARNING: Be sure the planter is on a level surface, fore and aft and side to side. Avoid standing between the wing and main frame when folding the planter. Wing may swing suddenly.

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

2. (8 Row 30" Models Only) Remove the locking pin and fold the third stage of each marker manually. Store the locking pin in the marker bracket as shown.

00135-3



DANGER: The 3rd stage of the marker on 8 row 30" planters must be folded manually for transport or the markers will extend beyond the planter frame.

3. Swing the center turnbuckle into position to lock the planter frame rigid and tighten slightly.

65909-46

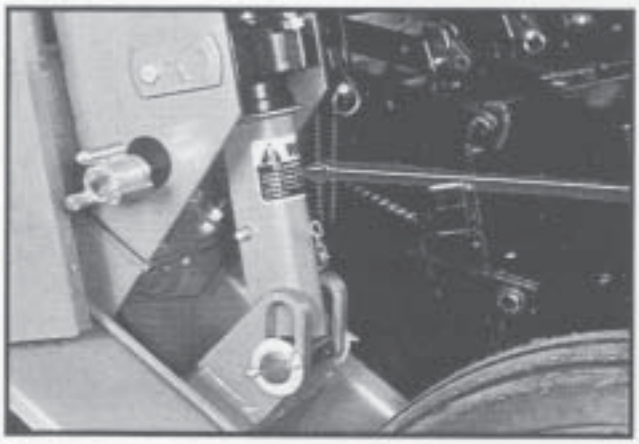
4. Using the special wrench which is stored on the hitch of the planter, loosen the 1 1/4" hex nut which secures the wing locking bolt.

60887-75

5. Raise the planter.

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

60982-13



7. Place the tractor hydraulic lever in the lowering position and hold until the wing cylinders are fully retracted.

8. Swing the wing locking bolt over to release the planter wing.

9. Swing the wing forward into transport position and lock wing in place at the marker support and hitch.

65959-4

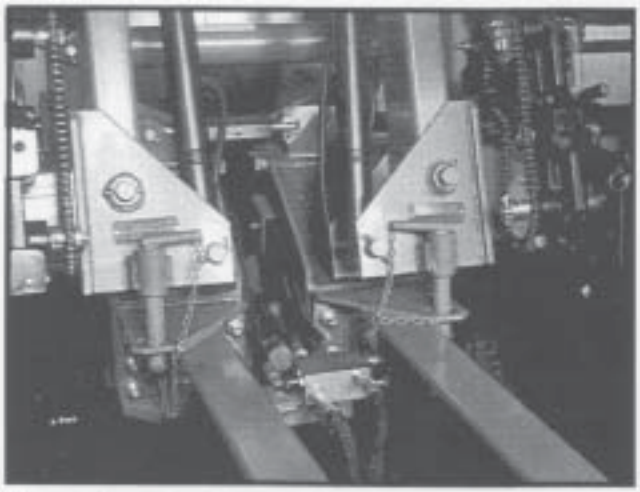


Photo shows both wings locked in place

10. Repeat steps 8 and 9 on opposite planter wing.

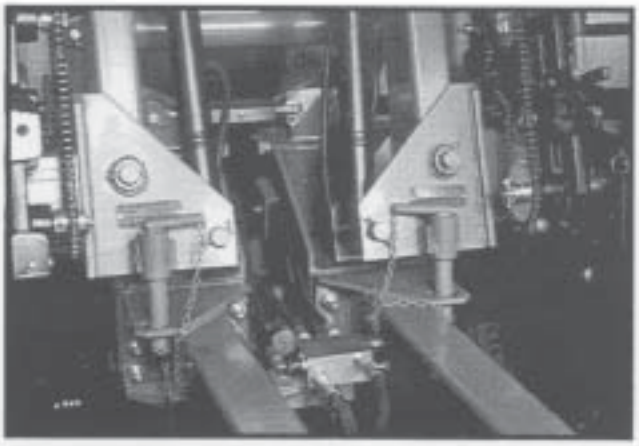
TRANSPORT TO FIELD OPERATION

WARNING: Be sure the planter is on a level surface, fore and aft and side to side. Avoid standing between the wing and main frame when folding the planter. Wing may swing suddenly.

1. If the wing lift wheel cylinders are not retracted, with the cylinder lockups in place on the four center section lift cylinders move the tractor hydraulic lever to the lowering position until the cylinders are fully retracted.

2. With the planter raised and the cylinder lockups in place, release the wing lock pins at the marker support and hitch. Swing the wings out to operating position.

65959-4



3. Swing the wing locking bolt into position to lock each wing.

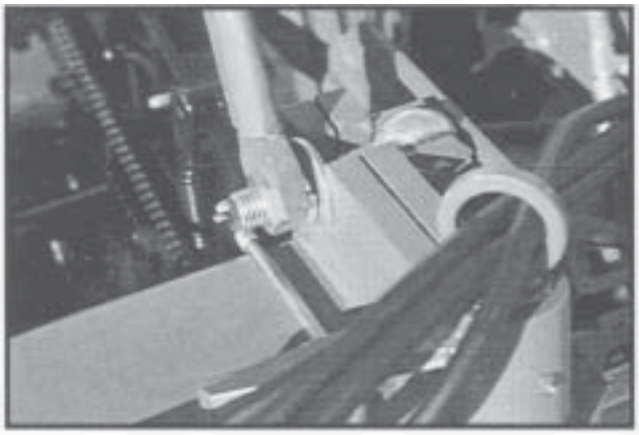
4. Operate the hydraulic lever to extend all the lift cylinders.

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

6. Lower the planter.

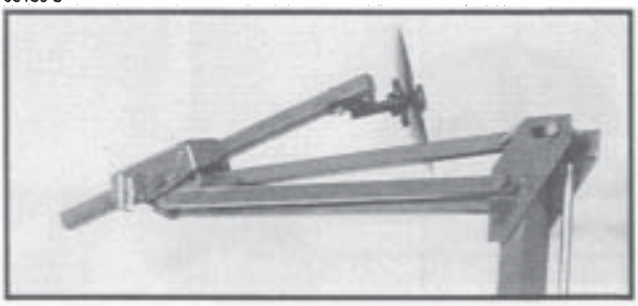
7. Using the special wrench which is stored on the hitch of the planter, tighten the 1 1/4" hex nut to secure the wing locking bolt.

60887-76



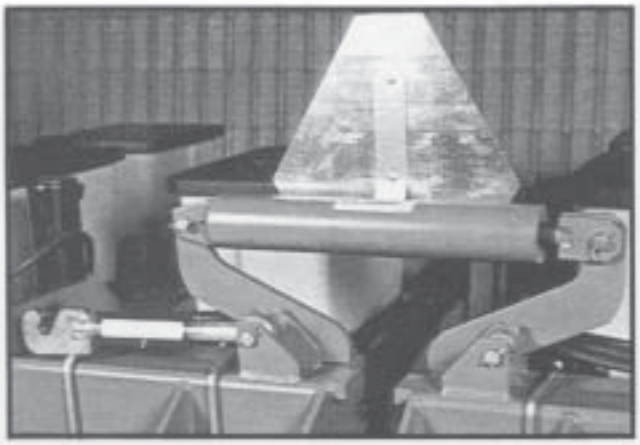
8. (8 Row 30" Models Only) Remove the locking pin from its stored position in the marker bracket and extend the third stage of each marker manually. Secure the third stage in place using the locking pin and a lynch pin.

00135-3



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

65909-48

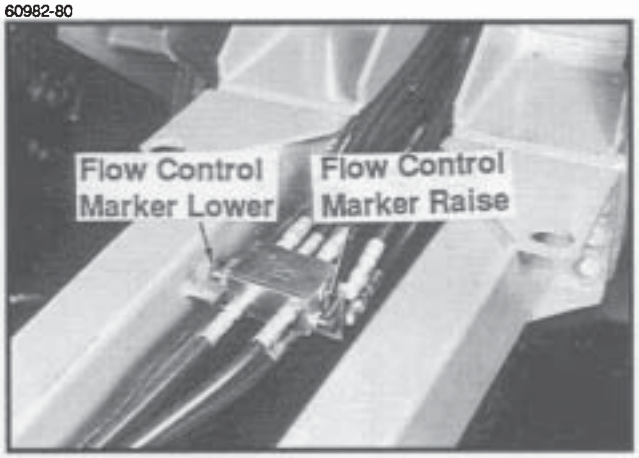


10. Raise the planter. If the planter does not raise even, lower the planter and hold the tractor remote in the lowering position for an additional few seconds.

MARKER SPEED ADJUSTMENT

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

60982-80



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

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

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

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

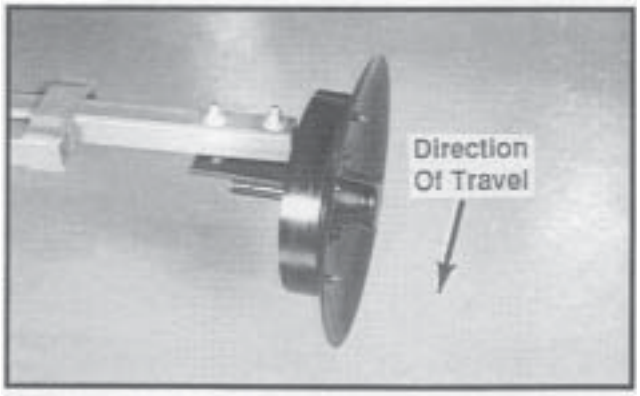
MARKER ADJUSTMENT

To determine the correct length 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 measurements are being taken. The measurement should be taken from the point where the blade contacts the ground. Adjust right and left marker assemblies equally and securely tighten clamping bolts. An example of marker length adjustment follows:

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

8 Rows X 30" Spacing = 240" Marker Dimension

60569-53



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

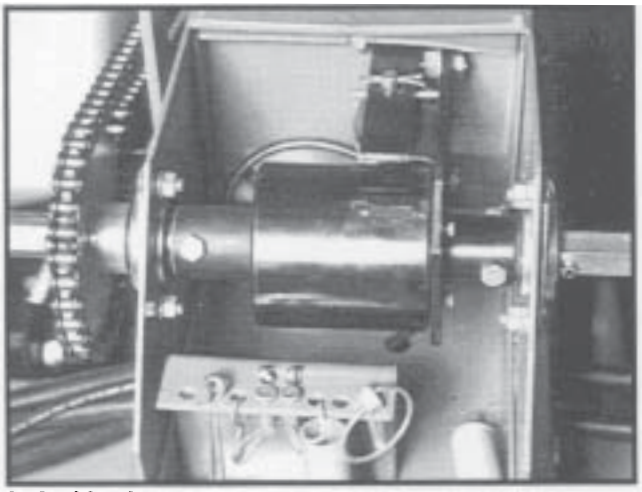
The marker blade is installed so the concave side of the blade is outward to throw dirt away from the grease seals. The spindle bracket is slotted so the hub and blade can be angled to throw more or less dirt. To adjust the hub and spindle, loosen the 1/2" x 3 1/2" cap screws and move the bracket as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

OPTIONAL POINT ROW WRAP SPRING CLUTCH

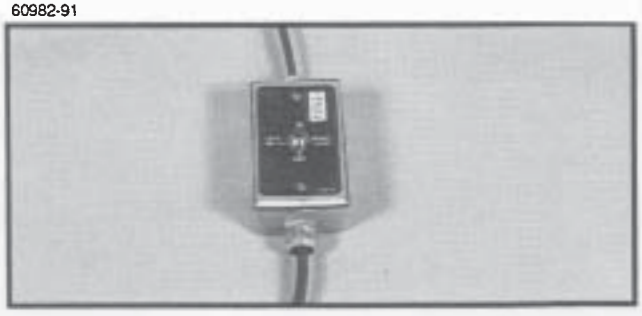
60982-6



Left side shown

With the use of electric wrap spring clutches which disengage the drive, you have the capability to shut off either half of the planter for finishing up fields or for long point row situations.

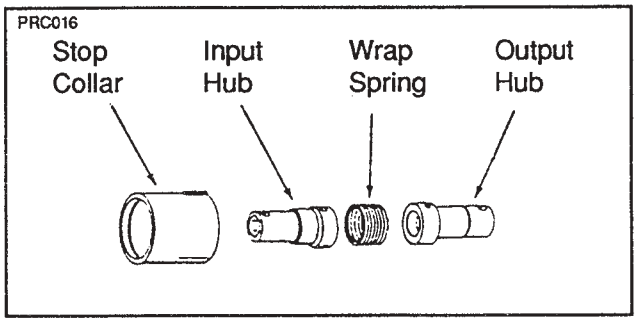
60982-91



The selector switch for the clutches is located on the tractor.

NOTE: Switch should be left in OFF position when planter is not in use. If left in ON (Left or Right) position it will drain the tractor battery.

PRC016



The wrap spring clutch consists of a wrap spring riding on an input hub and an output hub. During operation the wrap spring is wrapped tightly over the hubs connecting them in a positive engagement. The greater the force of rotation the tighter the grip of the spring on the hubs. Rotation in the opposite direction or stopping the spring from rotating prevents the transmission of torque from the input hub to the output hub stopping the planter drive.

The input end of the spring is bent outward and is referred to as the control tang. The control tang fits into a slot in the stop collar that is located between the input and output hubs and over the wrap spring. If the stop collar is allowed to rotate with the input hub, the clutch is engaged. If the stop collar is stopped from rotating the spring tang connected to it is forced back and the spring opens. This allows the input hub to continue rotating without transmitting torque to the output hub; therefore, stopping the planter drive.

The stop collar is controlled by the use of an electric solenoid and an actuator arm. When the selector switch on the tractor control panel is in the OFF position the solenoid coil is NOT ENERGIZED and the actuator arm will not contact the stop on the stop collar allowing it to rotate with the hubs and drive the planter.

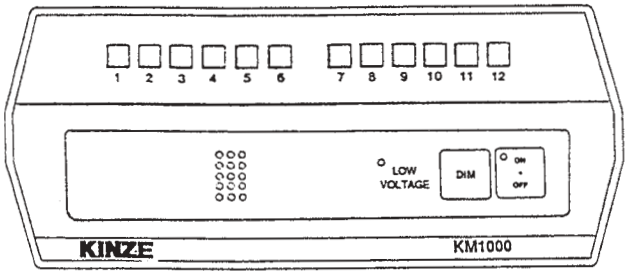
When the operational switch is in the "DISENGAGE" (Right or Left) position the solenoid coil IS ENERGIZED and the plunger in the solenoid coil pulls the actuator arm against the stop on the stop collar, disengaging the wrap spring and stopping the planter drive.

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.

3/91

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
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	12	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.

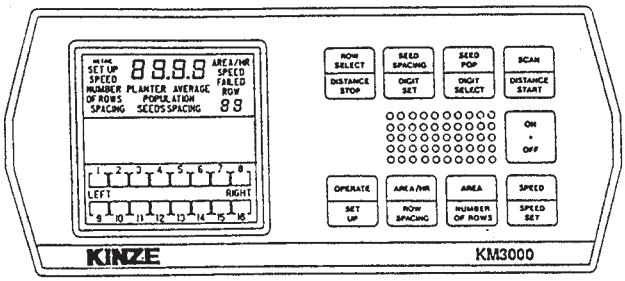
* With "Y" connector.

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.

MACHINE OPERATION

KM3000 MONITOR

D-0841-0001



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.

TRANSPORTING THE PLANTER

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

WARNING: Always install lockups on lift cylinders and make sure wing lockup pins are in place to secure wings at hitch.

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. Finger pickup 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

With any change of field and/or planting conditions or seed size, we recommend a field test be made to ensure proper seed placement and operation of row units. See "Rate Charts", "Checking Seed Population", and "Checking Granular Chemical Application Rate" at end of this section.

❒ 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" and "Marker Speed Adjustment".

❒ 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 spring pins

❒ Drive chain alignment

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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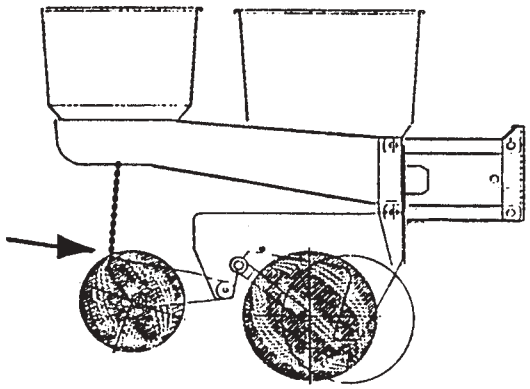

2. Plant a short distance and check to see if seed is visible in the seed trench. Adjust planting depth to a shallower setting if seed is not visible and recheck.

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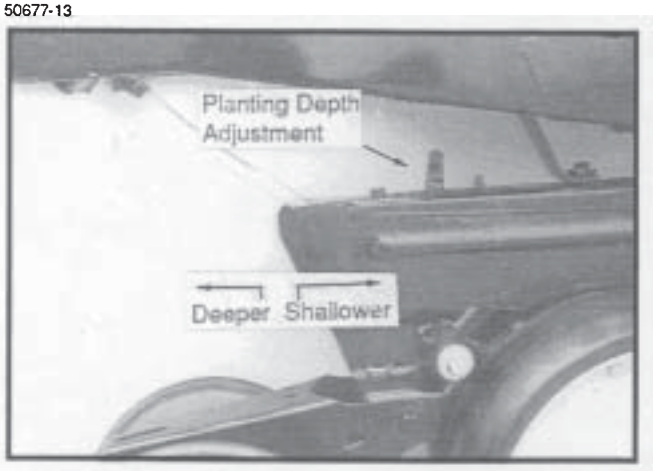

3. Measure 1/1000 of an acre. See chart for correct distance for row width spacing being planted. For example, if planting 30" rows 1/1000 of an acre would be 17'5".

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

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 metering.

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

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 2200 Flex Econo-Fold® 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	Transmission Sprockets Drive	Transmission Sprockets Driven	Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
16,186	13,488	12,778	17	28	4 to 8	12.9
16,785	13,988	13,251	17	27	4 to 8	12.5
17,431	14,526	13,761	17	26	4 to 8	12.0
18,090	15,075	14,281	19	28	4 to 8	11.6
18,128	15,107	14,312	17	25	4 to 8	11.5
18,760	15,633	14,810	19	27	4 to 8	11.1
18,883	15,736	14,908	17	24	4 to 8	11.1
19,481	16,234	15,380	19	26	4 to 8	10.7
19,704	16,420	15,556	17	23	4 to 8	10.6
20,261	16,884	15,995	19	25	4 to 8	10.3
21,104	17,587	16,662	19	24	4 to 8	9.9
21,898	18,249	17,288	23	28	4 to 8	9.5
22,022	18,352	17,386	19	23	4 to 8	9.5
22,709	18,924	17,928	23	27	4 to 8	9.2
22,850	19,042	18,040	24	28	4 to 8	9.2
23,583	19,652	18,618	23	26	4 to 8	8.9
23,697	19,747	18,708	24	27	4 to 8	8.8
23,802	19,835	18,791	25	28	4 to 8	8.8
23,853	19,877	18,831	17	19	4 to 7.5	8.8
24,526	20,438	19,363	23	25	4 to 7.5	8.5
24,608	20,507	19,427	24	26	4 to 7.5	8.5
24,684	20,570	19,487	25	27	4 to 7.5	8.5
24,755	20,629	19,543	26	28	4 to 7.5	8.4
25,548	21,290	20,169	23	24	4 to 7.5	8.2
25,592	21,327	20,205	24	25	4 to 7.5	8.2
25,633	21,361	20,237	25	26	4 to 7.5	8.2
25,671	21,393	20,267	26	27	4 to 7.5	8.1
25,707	21,422	20,295	27	28	4 to 7.5	8.1
26,659	22,216	21,046	23	23	4 to 7	7.8
27,646	23,038	21,826	28	27	4 to 7	7.6
27,684	23,070	21,856	27	26	4 to 7	7.6
27,770	23,141	21,923	25	24	4 to 7	7.5
27,818	23,181	21,961	24	23	4 to 7	7.5
28,709	23,924	22,665	28	26	4 to 6.5	7.3
28,791	23,993	22,730	27	25	4 to 6.5	7.3
28,977	24,147	22,876	25	23	4 to 6.5	7.2
29,795	24,829	23,522	19	17	4 to 6.5	7.0
29,858	24,881	23,572	28	25	4 to 6.5	7.0
29,991	24,993	23,677	27	24	4 to 6.5	7.0
30,136	25,113	23,792	26	23	4 to 6.5	7.0
31,102	25,918	24,554	28	24	3 to 6	6.7
31,295	26,079	24,707	27	23	3 to 6	6.7
32,271	26,893	25,477	23	19	3 to 5.5	6.5
32,454	27,045	25,622	28	23	3 to 5.5	6.5
33,674	28,062	26,585	24	19	3 to 5.5	6.2
35,077	29,231	27,693	25	19	3 to 5	6.0
36,068	30,056	28,474	23	17	3 to 5	5.8
36,480	30,400	28,800	26	19	3 to 5	5.7
37,636	31,363	29,713	24	17	3 to 5	5.6
37,883	31,570	29,908	27	19	3 to 5	5.5
39,204	32,670	30,951	25	17	3 to 4.5	5.3
39,287	32,739	31,016	28	19	3 to 4.5	5.3
40,772	33,977	32,189	26	17	3 to 4.5	5.1
42,340	35,284	33,427	27	17	3 to 4.5	4.9
43,908	36,590	34,665	28	17	3 to 4.5	4.8

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		30 Inch	36 Inch	38 Inch		
17	28	80,928	67,440	63,891	2.6	64,742	53,952	51,113	3.2	2 to 8
17	27	83,926	69,938	66,257	2.5	67,141	55,950	53,006	3.1	2 to 8
17	26	87,154	72,628	68,805	2.4	69,723	58,102	55,044	3.0	2 to 8
19	28	90,449	75,374	71,407	2.3	72,359	60,299	57,126	2.9	2 to 8
19	27	93,799	78,166	74,052	2.2	75,039	62,533	59,242	2.8	2 to 8
17	24	94,416	78,680	74,539	2.2	75,533	62,944	59,631	2.8	2 to 8
17	23	98,521	82,101	77,780	2.1	78,817	65,681	62,224	2.7	2 to 8
19	25	101,303	84,419	79,976	2.1	81,042	67,535	63,981	2.6	2 to 8
19	24	105,524	87,937	83,309	2.0	84,419	70,350	66,647	2.5	2 to 8
23	28	109,491	91,243	86,440	1.9	87,593	72,994	69,152	2.4	2 to 8
19	23	110,112	91,760	86,931	1.9	88,090	73,408	69,545	2.4	2 to 8
24	28	114,252	95,210	90,199	1.8	91,402	76,168	72,159	2.3	2 to 8
24	27	118,483	98,736	93,539	1.8	94,786	78,989	74,831	2.2	2 to 8
17	19	119,263	99,386	94,155	1.8	95,410	79,509	75,324	2.2	2 to 8
24	26	123,040	102,534	97,137	1.7	98,432	82,027	77,710	2.1	2 to 8
26	28	123,773	103,144	97,715	1.7	99,018	82,515	78,172	2.1	2 to 8
24	25	127,962	106,635	101,023	1.6	102,370	85,308	80,818	2.0	2 to 8
26	27	128,357	106,964	101,334	1.6	102,686	85,571	81,067	2.0	2 to 8
23	23	133,294	111,078	105,232	1.6	106,635	88,862	84,186	2.0	2 to 8
27	26	138,420	115,350	109,279	1.5	110,736	92,280	87,423	1.9	2 to 8
24	23	139,089	115,907	109,807	1.5	111,271	92,726	87,846	1.9	2 to 8
25	23	144,884	120,737	114,382	1.4	115,907	96,590	91,506	1.8	2 to 8
19	17	148,975	124,146	117,612	1.4	119,180	99,317	94,090	1.8	2 to 8
27	24	149,955	124,963	118,386	1.4	119,964	99,970	94,709	1.7	2 to 8
28	24	155,509	129,591	122,770	1.3	124,407	103,673	98,216	1.7	2 to 8
23	19	161,355	134,463	127,386	1.3	129,084	107,570	101,909	1.6	2 to 8
28	23	162,270	135,225	128,108	1.3	129,816	108,180	102,486	1.6	2 to 8
24	19	168,371	140,309	132,924	1.2	134,696	112,247	106,339	1.6	2 to 8
25	19	175,386	146,155	138,463	1.2	140,309	116,924	110,770	1.5	2 to 8
23	17	180,338	150,282	142,372	1.2	144,270	120,226	113,898	1.5	2 to 8
26	19	182,402	152,001	144,001	1.1	145,922	121,601	115,201	1.4	2 to 7
27	19	189,417	157,848	148,540	1.1	151,534	126,278	118,832	1.4	2 to 7
28	19	196,433	163,694	155,078	1.1	157,146	130,955	124,062	1.3	2 to 7
26	17	203,861	169,884	160,943	1.0	163,089	135,907	128,754	1.3	2 to 7
27	17	211,702	176,418	167,133	0.9	169,362	141,134	133,706	1.2	2 to 7
28	17	219,542	182,952	173,323	0.9	175,634	146,362	138,658	1.2	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		30 Inch	36 Inch	38 Inch		
17	28	48,557	40,464	38,335	4.3	40,464	33,720	31,945	5.2	2 to 8
17	27	50,356	41,963	39,754	4.2	41,963	34,969	33,129	5.0	2 to 8
17	26	52,292	43,577	41,283	4.0	43,577	36,314	34,403	4.8	2 to 8
19	28	54,269	45,224	42,844	3.9	45,225	37,687	35,704	4.6	2 to 8
19	27	56,279	46,900	44,431	3.7	46,900	39,083	37,026	4.5	2 to 8
17	24	56,650	47,208	44,723	3.7	47,208	39,340	37,270	4.4	2 to 8
17	23	59,113	49,261	46,668	3.5	49,261	41,051	38,890	4.2	2 to 8
19	25	60,782	50,651	47,986	3.4	50,652	42,210	39,988	4.1	2 to 8
19	24	63,314	52,762	49,985	3.3	52,762	43,968	41,654	4.0	2 to 8
23	28	65,695	54,746	51,864	3.2	54,746	45,621	43,220	3.8	2 to 8
19	23	66,067	55,056	52,159	3.2	55,056	45,880	43,465	3.8	2 to 8
24	28	68,551	57,126	54,119	3.0	57,126	47,605	45,099	3.7	2 to 8
24	27	71,090	59,242	56,123	2.9	59,242	49,368	46,770	3.5	2 to 8
17	19	71,558	59,632	56,493	2.9	59,631	49,693	47,077	3.5	2 to 8
24	26	73,824	61,520	58,282	2.8	61,520	51,267	48,569	3.4	2 to 8
26	28	74,264	61,886	58,629	2.8	61,886	51,572	48,858	3.4	2 to 8
24	25	76,772	63,981	60,614	2.7	63,981	53,317	50,511	3.3	2 to 8
26	27	77,014	64,178	60,800	2.7	64,178	53,482	50,667	3.3	2 to 8
23	23	79,976	66,647	63,139	2.6	66,647	55,539	52,616	3.1	2 to 8
27	26	83,052	69,210	65,567	2.5	69,210	57,675	54,640	3.0	2 to 8
24	23	83,453	69,544	65,884	2.5	69,544	57,954	54,904	3.0	2 to 8
25	23	86,930	72,442	68,629	2.4	72,442	60,368	57,191	2.9	2 to 8
19	17	89,385	74,488	70,567	2.3	74,488	62,073	58,806	2.8	2 to 8
27	24	89,973	74,978	71,032	2.3	74,978	62,481	59,193	2.8	2 to 8
28	24	93,305	77,755	73,662	2.2	77,755	64,796	61,385	2.7	2 to 8
23	19	96,813	80,678	76,432	2.2	80,678	67,231	63,693	2.6	2 to 8
28	23	97,362	81,135	76,864	2.1	81,135	67,613	64,054	2.6	2 to 8
24	19	101,023	84,185	79,754	2.1	84,185	70,155	66,462	2.5	2 to 8
25	19	105,232	87,693	83,078	2.0	87,693	73,078	69,231	2.4	2 to 8
23	17	108,233	90,169	85,423	1.9	90,169	75,141	71,186	2.3	2 to 8
26	19	109,441	91,201	86,401	1.9	91,201	76,001	72,001	2.3	2 to 7
27	19	113,650	94,709	89,124	1.8	94,709	78,924	74,770	2.2	2 to 7
28	19	117,860	98,216	93,047	1.8	98,216	81,847	77,539	2.1	2 to 7
26	17	122,317	101,930	96,566	1.7	101,930	84,942	80,471	2.1	2 to 7
27	17	127,021	105,851	100,280	1.6	105,851	88,209	83,566	2.0	2 to 7
28	17	131,725	109,771	103,994	1.6	109,771	91,476	86,661	1.9	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		
17	28	16,186	13,488	12,778	12.9	2 to 8
17	27	16,785	13,988	13,251	12.5	2 to 8
17	26	17,431	14,526	13,761	12.0	2 to 8
19	28	18,090	15,075	14,281	11.6	2 to 8
19	27	18,760	15,633	14,810	11.1	2 to 8
17	24	18,883	15,736	14,908	11.1	2 to 8
17	23	19,704	16,420	15,556	10.6	2 to 8
19	25	20,261	16,884	15,995	10.3	2 to 8
19	24	21,105	17,587	16,662	9.9	2 to 8
23	28	21,898	18,249	17,288	9.5	2 to 8
19	23	22,022	18,352	17,386	9.5	2 to 8
24	28	22,850	19,042	18,040	9.2	2 to 8
24	27	23,697	19,747	18,708	8.8	2 to 8
17	19	23,853	19,877	18,831	8.8	2 to 8
24	26	24,608	20,507	19,427	8.5	2 to 8
26	28	24,755	20,629	19,543	8.4	2 to 8
24	25	25,592	21,327	20,205	8.2	2 to 8
26	27	25,671	21,393	20,267	8.1	2 to 8
23	23	26,659	22,216	21,046	7.8	2 to 8
27	26	27,684	23,070	21,856	7.6	2 to 8
24	23	27,818	23,181	21,961	7.5	2 to 8
25	23	28,977	24,147	22,876	7.2	2 to 8
19	17	29,795	24,829	23,522	7.0	2 to 8
27	24	29,991	24,993	23,677	7.0	2 to 8
28	24	31,102	25,918	24,554	6.7	2 to 8
23	19	32,271	26,893	25,477	6.5	2 to 8
28	23	32,454	27,045	25,622	6.5	2 to 8
24	19	33,674	28,062	26,585	6.2	2 to 8
25	19	35,077	29,231	27,693	6.0	2 to 8
23	17	36,068	30,056	28,474	5.8	2 to 8
26	19	36,480	30,400	28,800	5.7	2 to 7
27	19	37,883	31,570	29,908	5.5	2 to 7
28	19	39,287	32,739	31,016	5.3	2 to 7
26	17	40,772	33,977	32,189	5.1	2 to 7
27	17	42,340	35,284	33,427	4.9	2 to 7
28	17	43,908	36,590	34,665	4.8	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.

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

Meter Setting	30 Inch	36 Inch	38 Inch
CLAY GRANULES			
10	4.9	4.1	3.9
11	5.4	4.5	4.3
12	6.1	5.1	4.8
13	6.9	5.7	5.4
14	7.7	6.4	6.0
15	8.5	7.1	6.7
16	9.6	8.0	7.6
17	10.7	8.9	8.4
18	11.4	9.5	9.0
19	13.1	10.9	10.3
20	14.2	11.8	11.2
21	15.5	12.9	12.3
22	16.4	13.7	12.9
23	17.2	14.3	13.6
24	18.8	15.7	14.9
25	20.9	17.4	16.5
26	23.0	19.2	18.1
27	24.1	20.0	19.0
28	25.4	21.2	20.1
29	27.8	23.2	22.0
30	29.6	24.7	23.4
SAND GRANULES			
5	2.9	2.4	2.3
6	4.9	4.0	3.8
7	5.3	4.4	4.2
8	6.3	5.3	5.0
9	7.8	6.5	6.1
10	8.9	7.4	7.0
11	10.2	8.5	8.0
12	11.2	9.3	8.8
13	12.6	10.5	10.0
14	14.1	11.7	11.1
15	15.5	12.9	12.3
16	17.5	14.6	13.8
17	19.4	16.2	15.3
18	21.8	18.2	17.2
19	24.3	20.2	19.1
20	25.7	21.4	20.3
21	27.6	23.0	21.8
22	29.6	24.7	23.4
23	32.0	26.7	25.3
24	34.4	28.7	27.2
25	36.9	30.7	29.1

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 affect 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
10	4.7	3.9	3.7
11	5.2	4.4	4.1
12	5.8	4.9	4.6
13	6.5	5.4	5.1
14	7.3	6.1	5.7
15	8.2	6.9	6.5
16	9.0	7.5	7.1
17	9.9	8.2	7.8
18	10.7	8.9	8.4
19	11.6	9.7	9.2
20	12.6	10.5	10.0
21	13.6	11.3	10.7
22	14.6	12.1	11.5
23	15.7	13.1	12.4
24	17.0	14.1	13.4
25	18.1	15.1	14.3
26	19.4	16.2	15.3
27	20.9	17.4	16.5
28	22.6	18.8	17.8
29	24.3	20.2	19.1
30	26.7	22.2	21.1

IMPORTANT: The above chart represents average values and should be used only as a starting point. Th 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 plan 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 an population at which you will be planting.

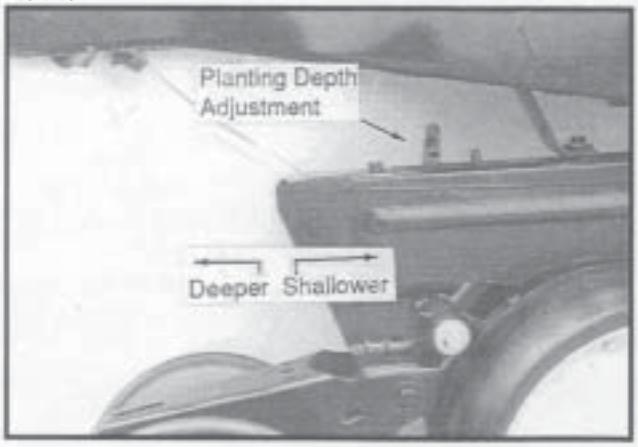
ROW UNIT OPERATION

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.

50677-13



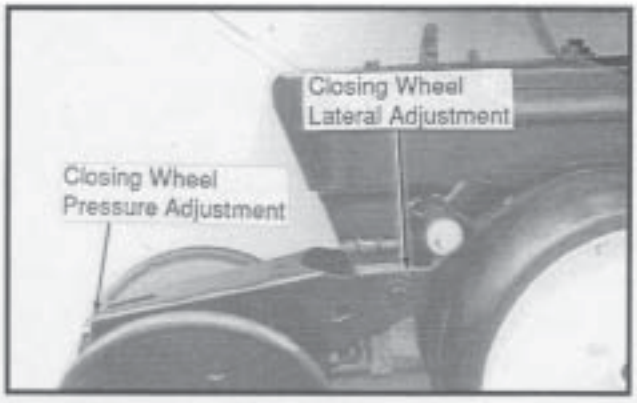
CLOSING WHEEL PRESSURE

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.

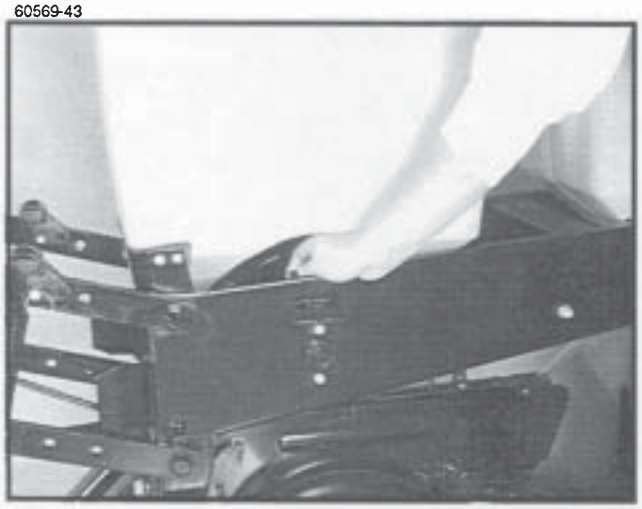
WARNING: Raise planter and install cylinder lockups before making closing wheel adjustments.

ROW UNIT OPERATION

SEED METER DRIVE RELEASE

The 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



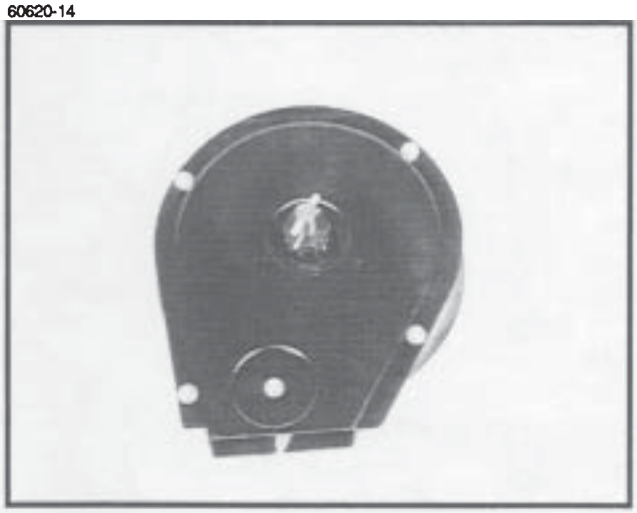
To disengage the drive, lift the release handle and pull outward until the handle locks in the slot in the side of the hopper side panel. To engage the row unit, lift and unlatch the handle. Spring tension will return the mechanism to the drive position.

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.

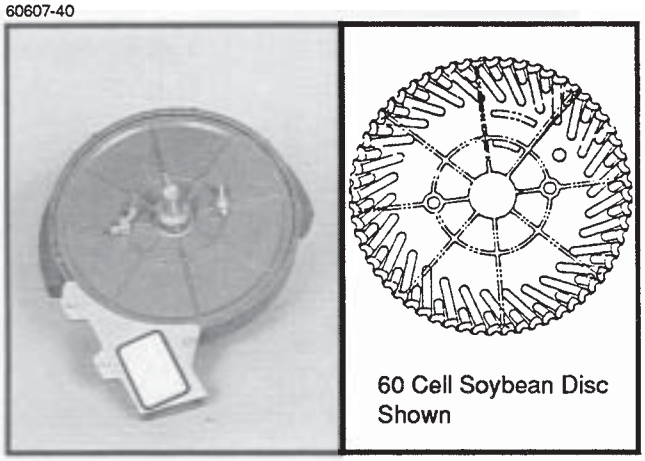
53761-1

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

ROW UNIT OPERATION

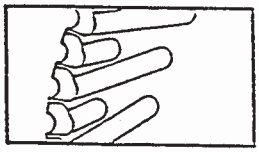
BRUSH-TYPE SEED METER

60607-40

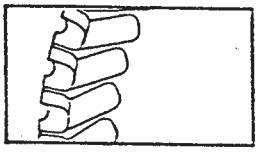


60 Cell Soybean Disc Shown

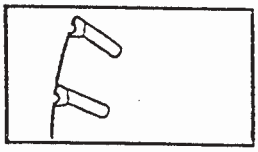
The following seed discs are available for use with the brush-type seed meter:



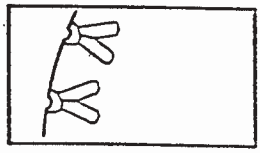
Soybean: *60 cells to meter seed sizes from 2200 to 4000 seeds per pound (Black color-coded).*



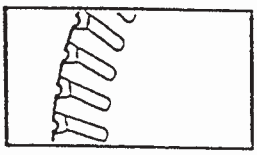
Specialty soybean: *48 cells to meter seed sizes from 1400 to 2200 seeds per pound (Dark blue color-coded).*



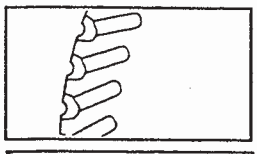
Small milo/grain sorghum: *30 cells to meter seed sizes from 14,000 to 20,000 seeds per pound (Red color-coded).*



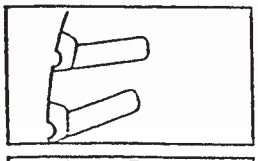
Large milo/grain sorghum: *30 cells to meter seed sizes from 10,000 to 16,000 seeds per pound (Light blue color-coded).*



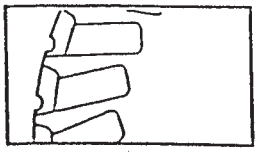
High rate milo/grain sorghum: *60 cells to meter seed sizes from 12,000 to 18,000 seeds per pound (Red color-coded).*



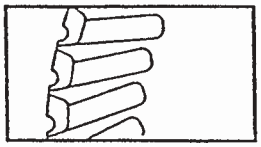
High rate large milo/grain sorghum: *60 cells to meter seed sizes from 10,000 to 14,000 seeds per pound (Yellow color-coded).*



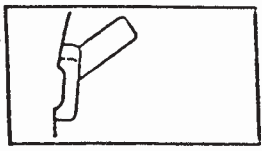
Cotton, acid-delinted: *30 cells to meter seed sizes from 4200 to 5200 seeds per pound (White color-coded).*



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 cause 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 meter drive transmission sprocket combinations.

SEED HOPPER

60620-69

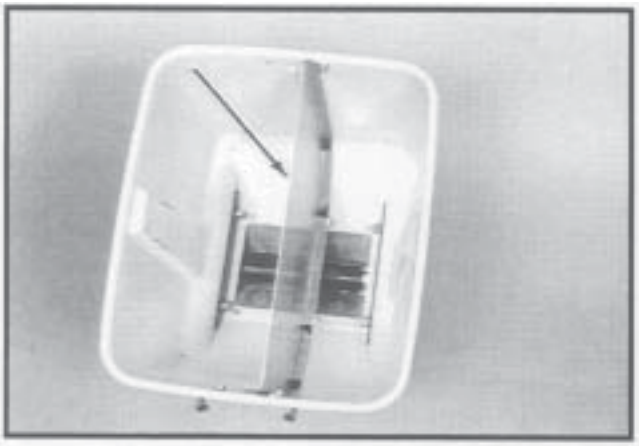
The seed hopper has a capacity of 1.6 bushels.

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

61766-2



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.

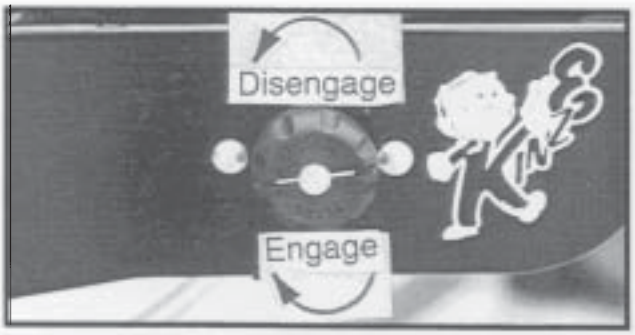
Be sure no foreign objects get into the hopper when it is being filled. Replace the hopper lids after filling the hoppers to prevent the accumulation of dirt and moisture.

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 manufacturers' 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

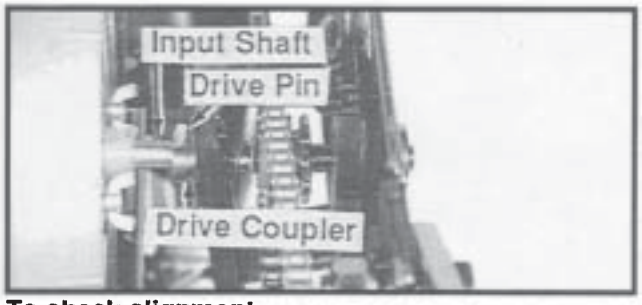


SEED METER DRIVE ADJUSTMENT

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



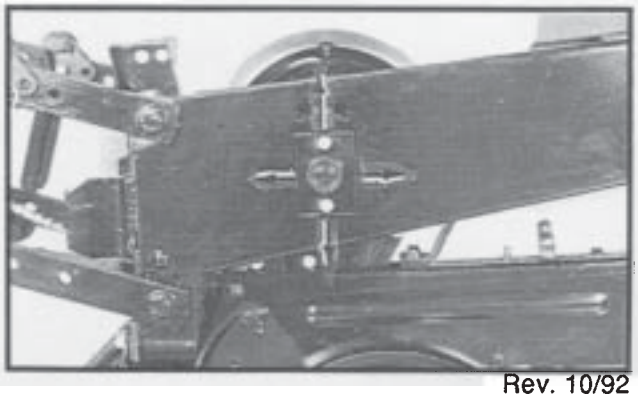
To check alignment:

- 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



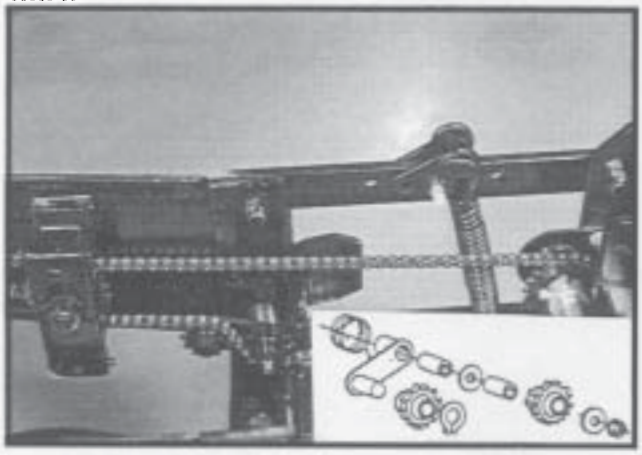
ROW UNIT OPERATION

ROW UNIT CHAIN ROUTING

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

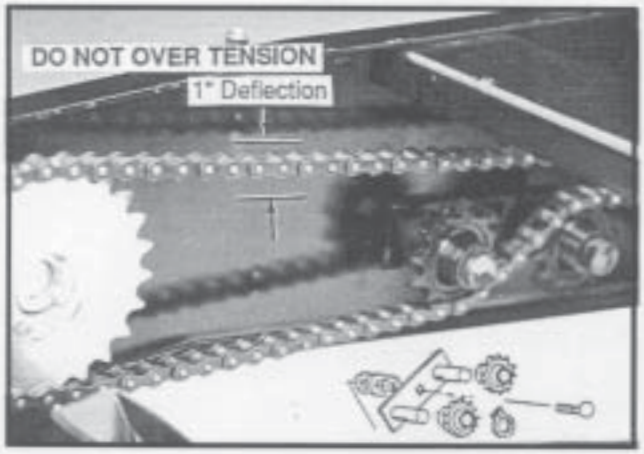
Inspect and replace weak, worn or broken springs and/or idlers and idler bushings.

60569-56



Row Unit Meter Drive

54948-12



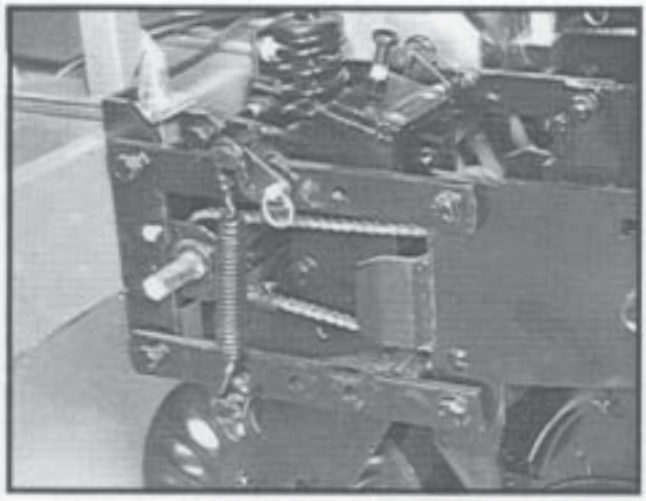
Row Unit Granular Chemical Drive

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.

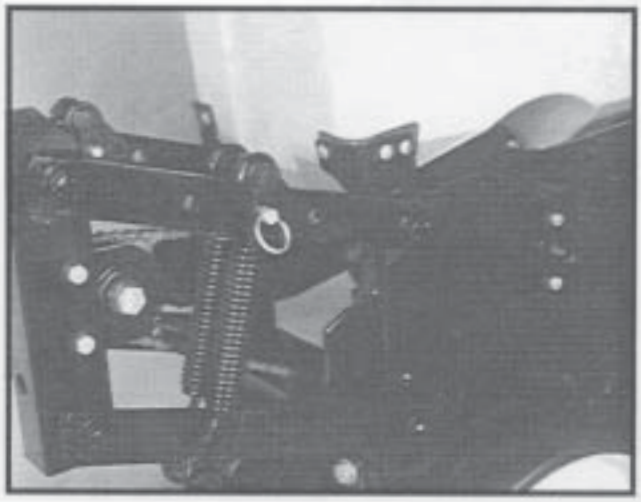
Two springs per row, one on the L.H. parallel arms and one on the R.H. parallel arms, are used unless equipped with row unit mounted no till coulters. Four springs per row are used with row unit mounted no till coulters. Two springs per row are used with frame mounted coulters, row unit mounted and frame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

61703-4



Two Springs Per Row (Dual)

60569-33

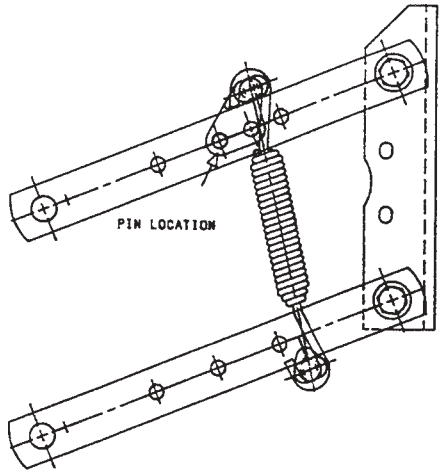


Four Springs Per Row (Quad)
(Used only in conjunction with row unit mounted no till coulters)

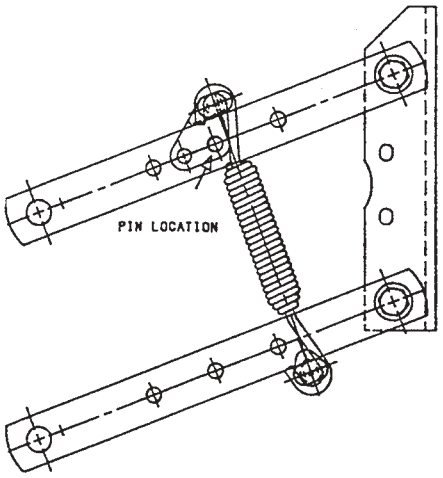
ROW UNIT OPERATION

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

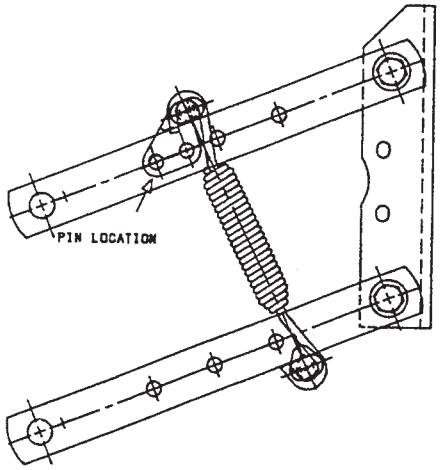
L0096



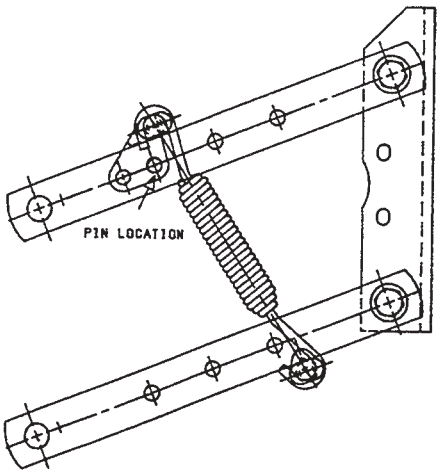
Position 1



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.

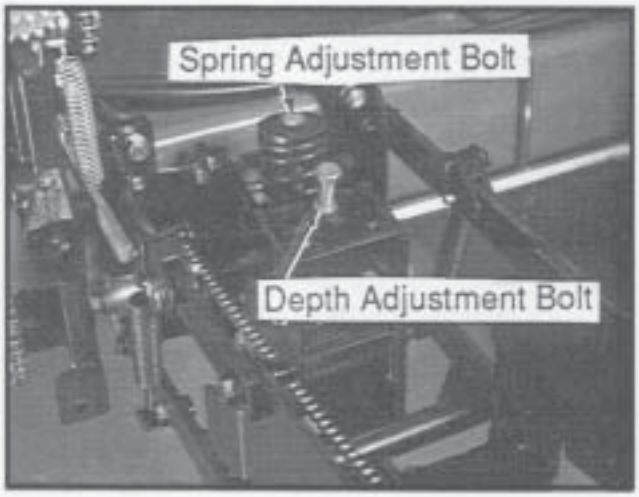
NOTE: Springs must always be installed with open side of spring hooks toward seed hopper to prevent binding on spring mount adjustment pin.

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.

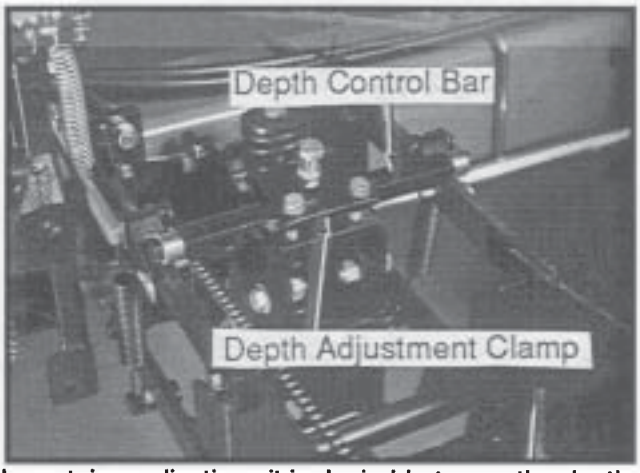
56314-14



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

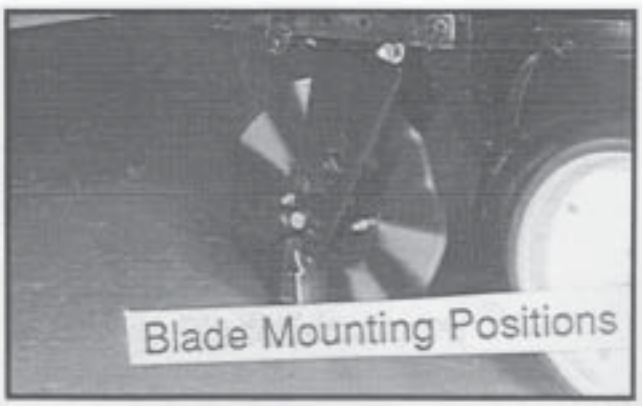


In certain applications it is desirable to use the depth control bar. In uneven terrain, use of the depth control bar allows greater depth control. The up and down movement of the row unit allows the coulter to move up and down at a rate of approximately 1/2 that of the row unit, maintaining a more uniform 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.

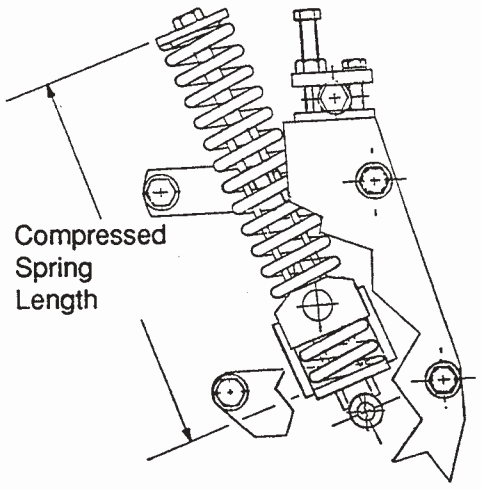
56314-1



Down force adjustment is made by tightening or loosening the spring adjustment bolt. With the planter in the 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

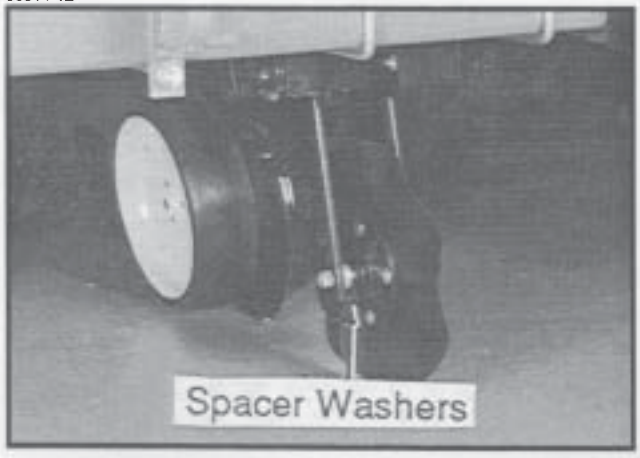
A5649rev



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.

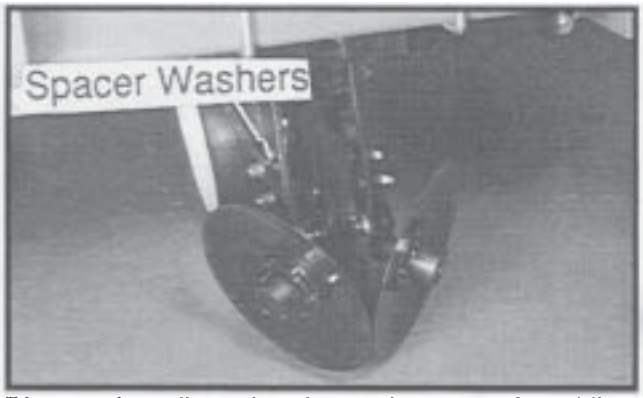
DISC FURROWERS

(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.

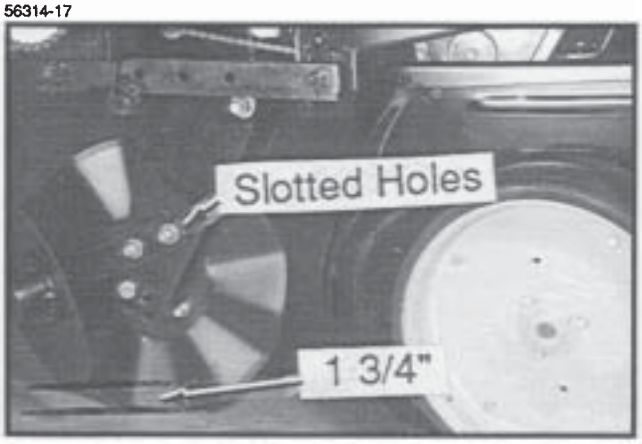
56314-19



Disc 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.

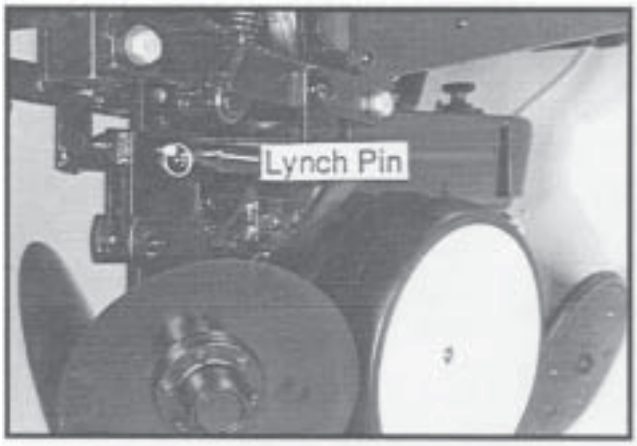
ROW UNIT OPERATION

ROW UNIT MOUNTED DISC FURROWER

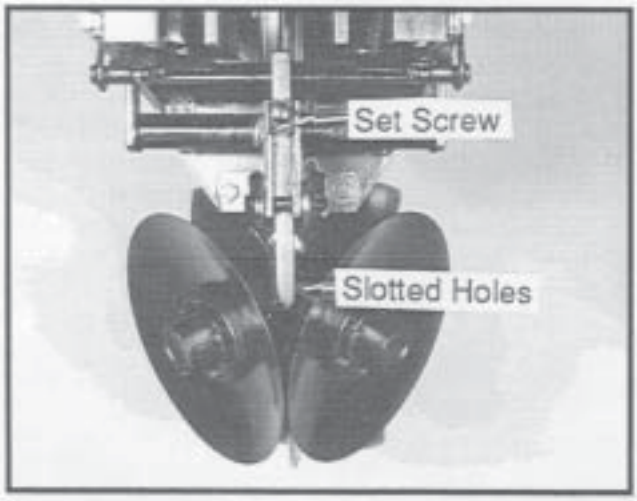
The row unit mounted disc furrower may be equipped with either 12" solid blades or 12" notched blades.

Disc 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.

59386-23



59386-20

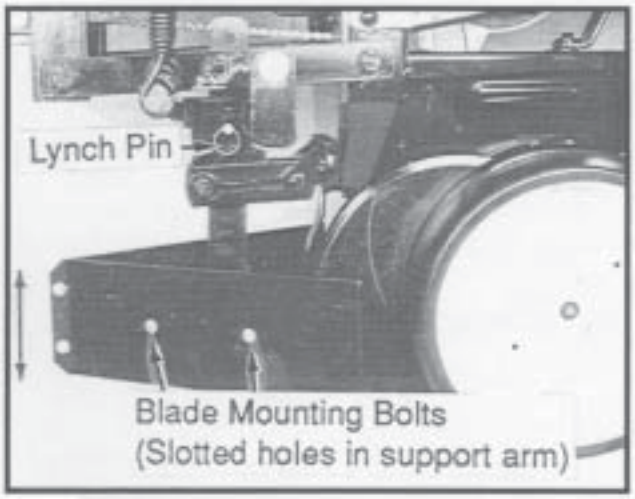


Vertical adjustment in 1/3" increments is possible by removing the lynch pin which secures the vertical support arm and moving the support arm up or down as required. Re-install lynch pin. Finer adjustment can be attained by removing the lynch pin and using the 5/8" x 2 1/4" set screw to clamp the support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

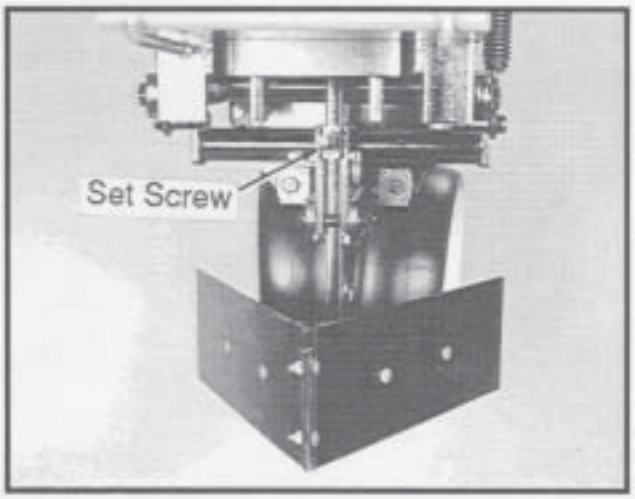
Slotted holes in the support arm where the discs are mounted allow fore and aft adjustment of the discs. Discs can be adjusted so the front edges meet or one disc can be moved to the rear and the other to the front of the slot so cutting edge of one disc overlaps the edge of the other disc. The dust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

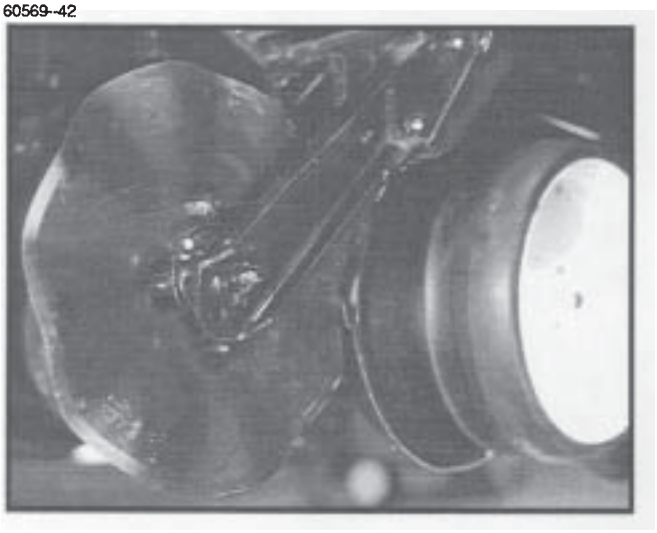
Slotted holes in the support arm where the blades are mounted allow tilting of the blades. The blades can be tilted up or down at the front for desired adjustment.

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

ROW UNIT OPERATION

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.

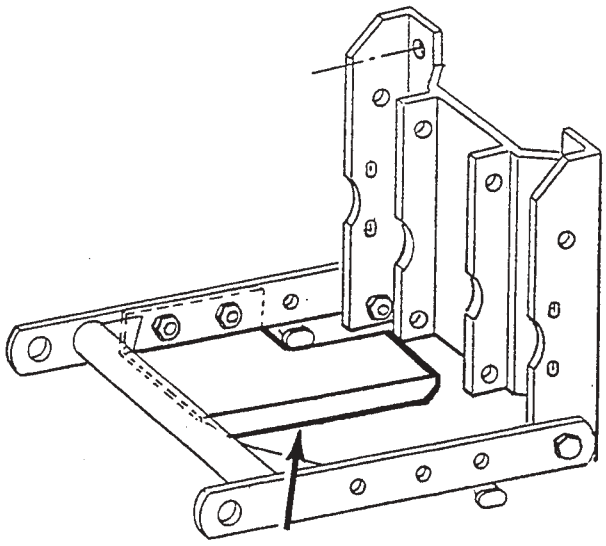
It is most desirable to run the coulter blade 1/4" shallower than the row unit disc opener so it won't disturb the seed bed below the seed trench opened by the double disc opener.

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



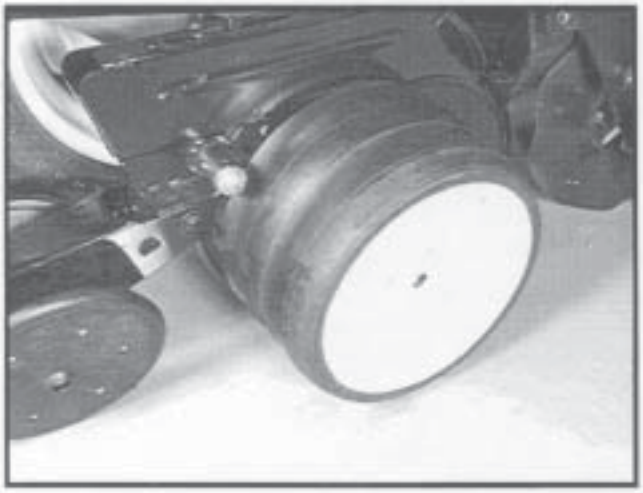
Row unit chain shields are designed for use on conventional row units when row unit mounted no till coulters are used. The shields CAN NOT BE USED on interplant push units or row units equipped with frame mounted coulters, row unit mounted disc furrowers or row unit mounted bed levelers.

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

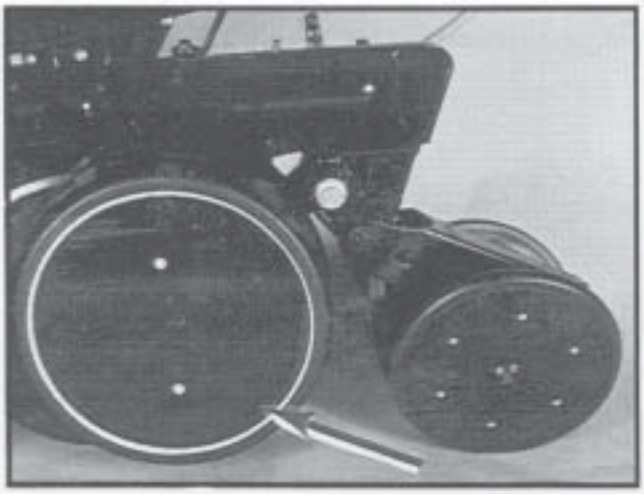


A dual gauge wheel is used to provide added width for additional row unit flotation in light sandy soil.

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

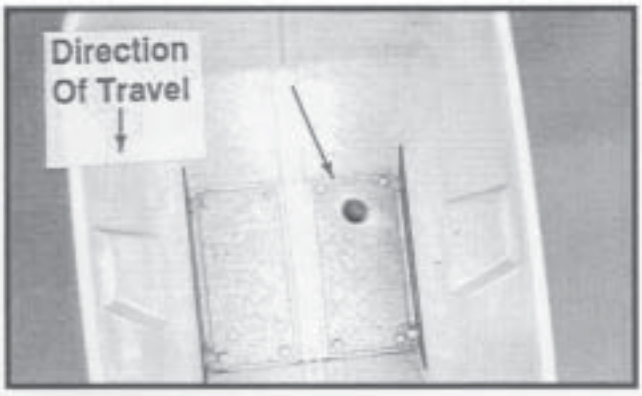


The row unit gauge wheel cover when installed on the gauge wheel next to the transport and/or drive wheels of the planter will aid in protecting the row unit from rock damage.

GRANULAR CHEMICAL RESTRICTOR PLATE

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

65249-18



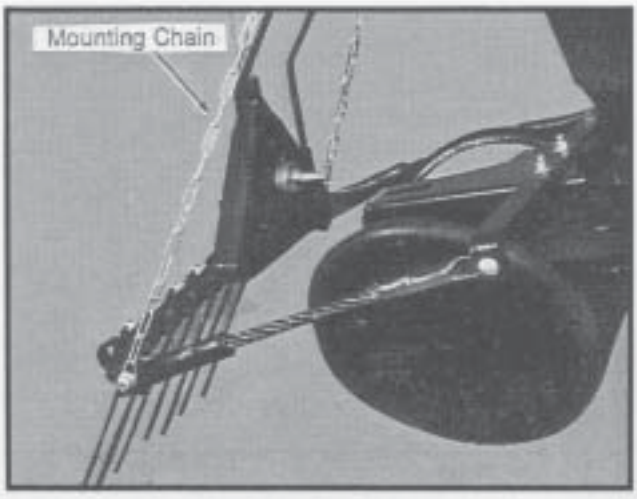
IMPORTANT: Check application rate of all rows in the field with the granular chemical you are using and at the speed and population at which you will be planting. See "Checking Granular Chemical Application Rate".

⚠ 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 RPMs.	Foreign material lodged 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.

ROW UNIT OPERATION

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.

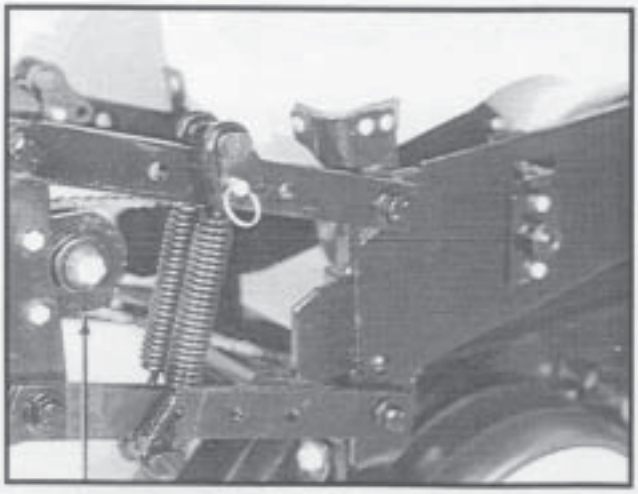
LUBRICATION SYMBOLS

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

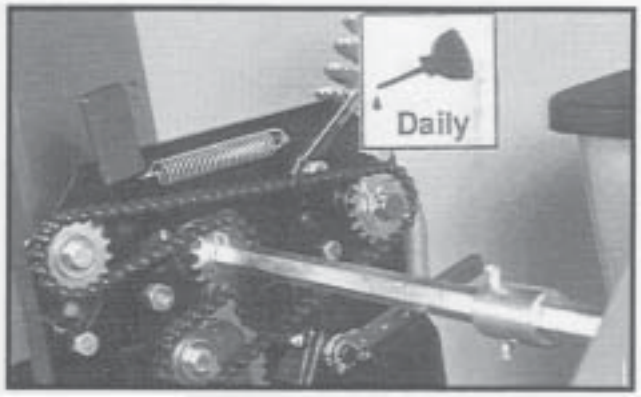
60569-33



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

60982-58



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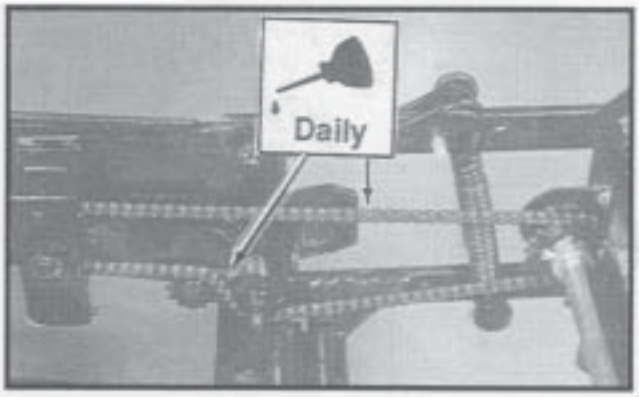
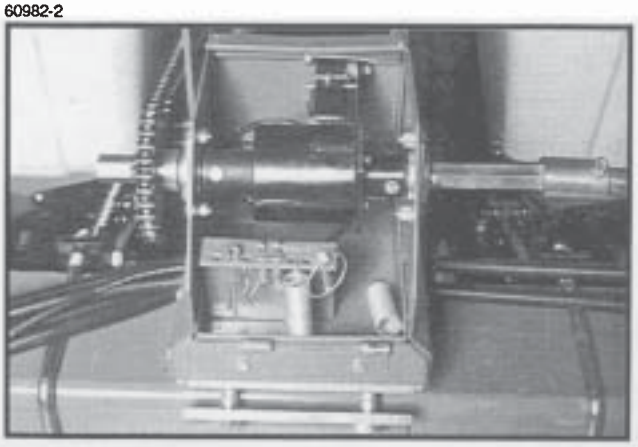


All transmission and drive chains should be lubricated daily with a high quality SAE 10 weight oil or a quality spray lubricant. Extreme operating conditions such as dirt, temperature or speed may require more frequent lubrication. If a chain becomes stiff, it should be removed, soaked and washed in 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.

POINT ROW WRAP SPRING CLUTCHES

60982-2



The point row wrap spring clutches are permanently lubricated and require no periodic maintenance. DO NOT LUBRICATE. KEEP CLUTCHES CLEAN.

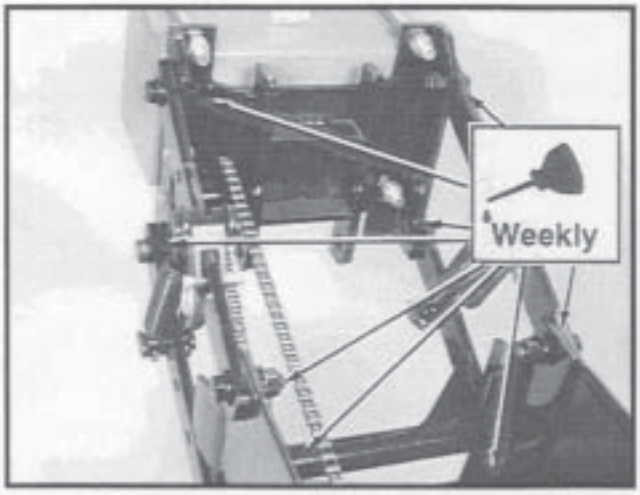
LUBRICATION

BUSHINGS

Lubricate bushings at the frequency indicated.

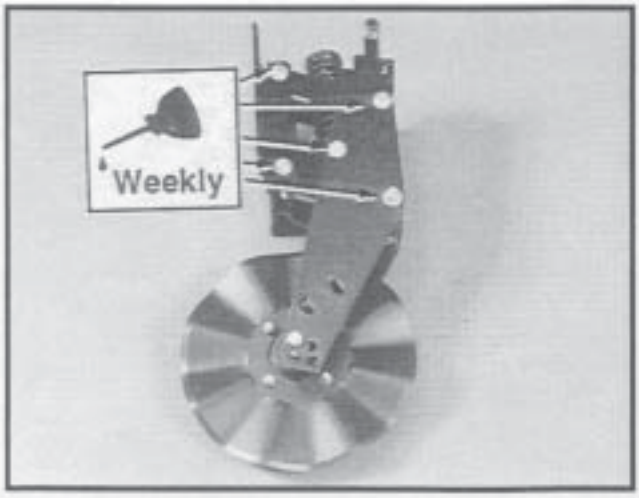
Using a wrench, check each bolt for proper torque. If bolt is loose, it should be removed and the bushing inspected for cracks and wear. Replace bushing if necessary. **Only hardened flat washers should be used. Replace damaged flat washers with proper part. Torque bolts to 130 ft. lbs.**

59386-43



Row Unit and/or Push Unit Parallel Arms (8 per row)

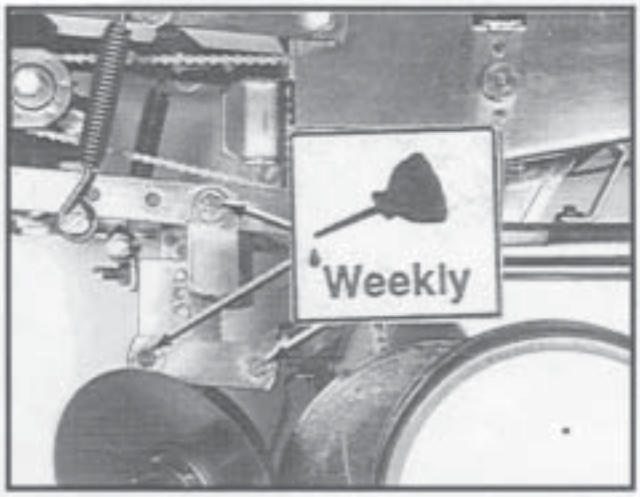
56314-8



Frame Mounted Coulter Parallel Linkage (10 per row)

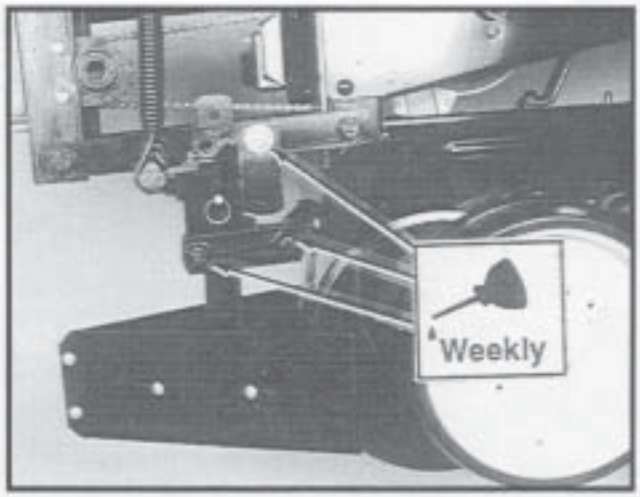
Shown not installed on row unit for visual clarity.

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

WHEEL BEARINGS

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

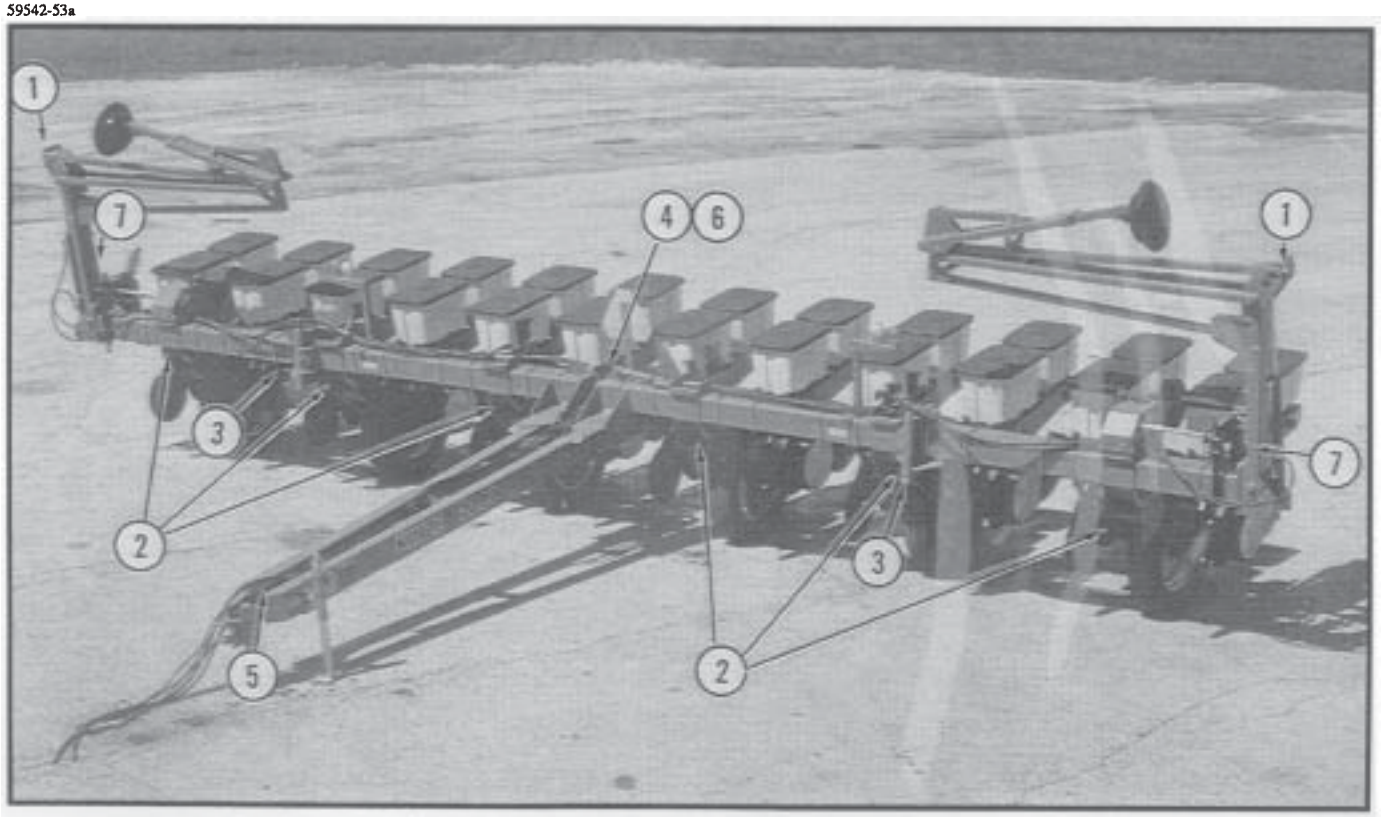
GREASE FITTINGS

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

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

12 Row Shown

59542-53a

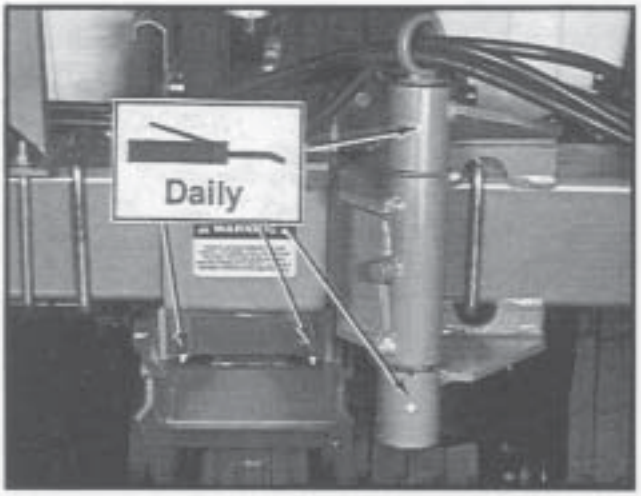


LUBRICATION

59542-53a

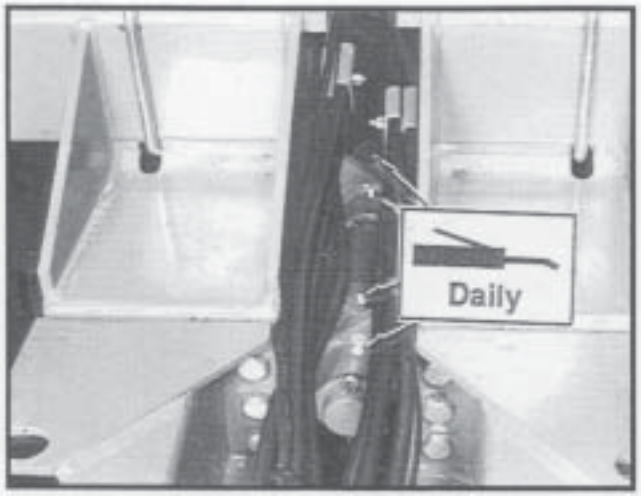
1. Marker Assemblies - 3 Zerks Per Assembly On 8 Row 30. 4 Zerks Per Assembly On 8 Row Wide & 12 Row 30. (12 row shown)

60982-24



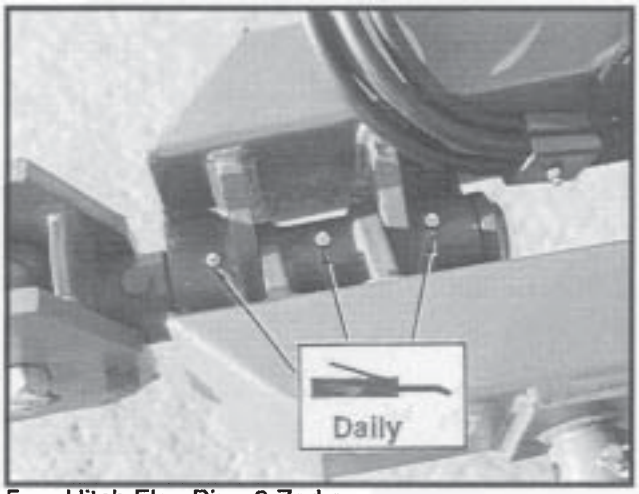
2. Wheel Pivot - 2 Zerks Per Wheel Module
3. Wing Hinges - 2 Zerks Per Wing

60982-10



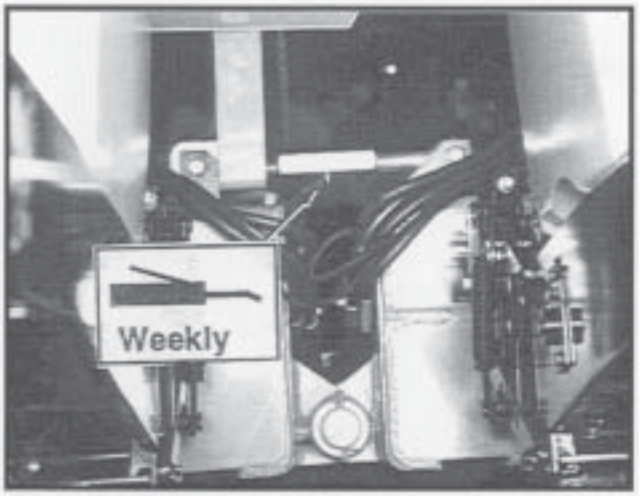
4. Center Frame Flex Pin - 4 Zerks

60887-15



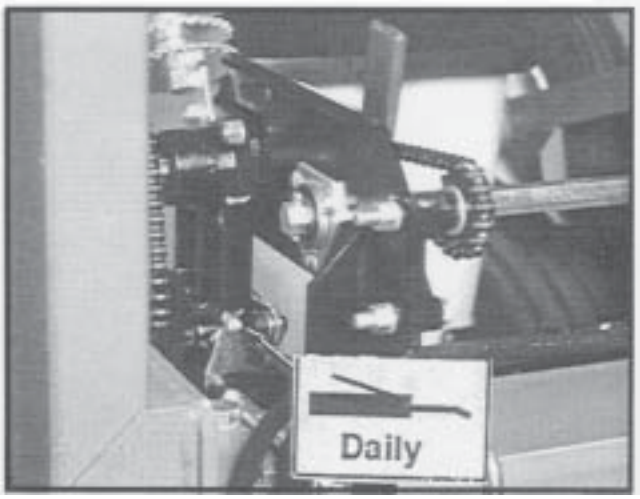
5. Hitch Flex Pin - 3 Zerks

60982-15



6. Turnbuckle - 1 Zerk

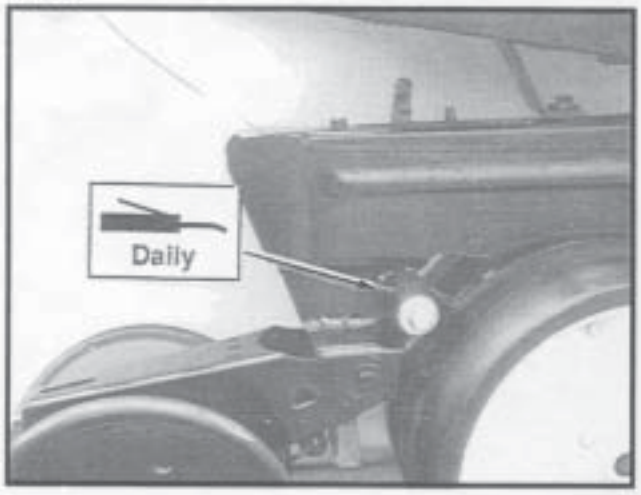
60982-56



7. Transmission Assembly - 1 Zerk (Idler)

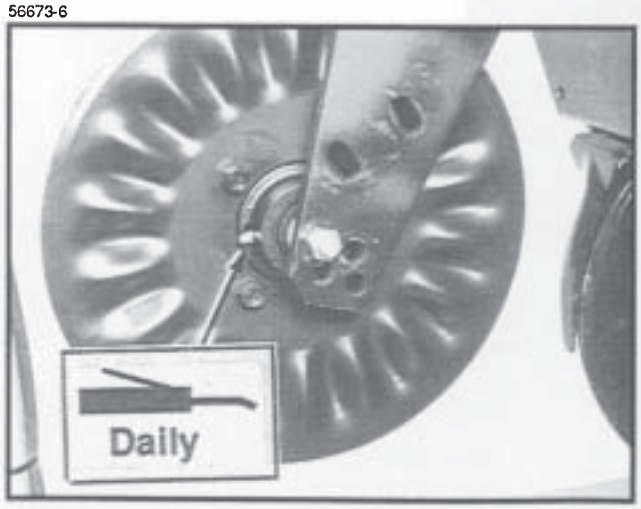
Row Unit

50677-13



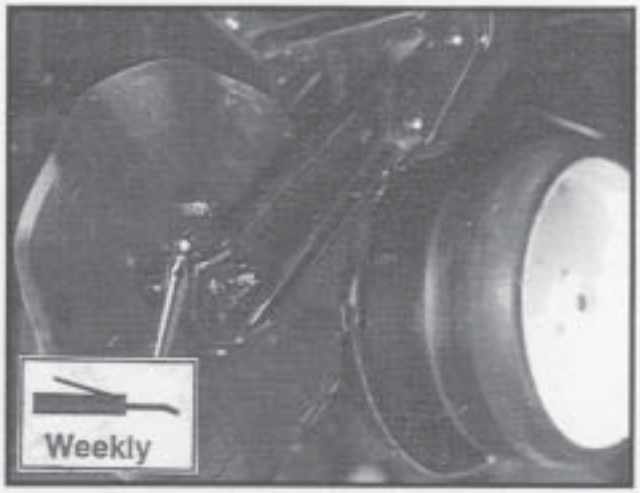
Gauge Wheel Arm - 1 Zerk Per Arm

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.

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

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

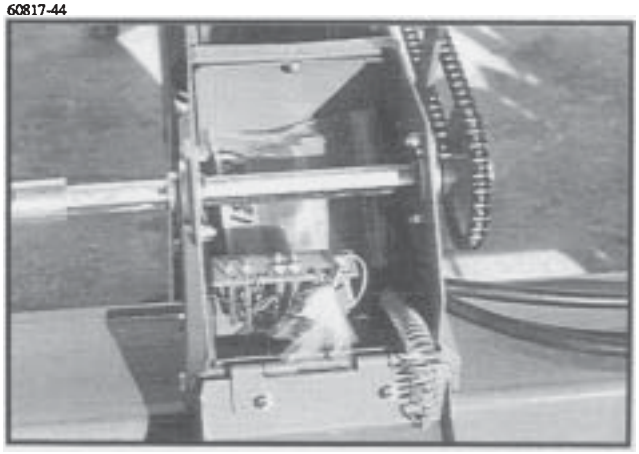
GRADE 8
6 Marks

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.

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

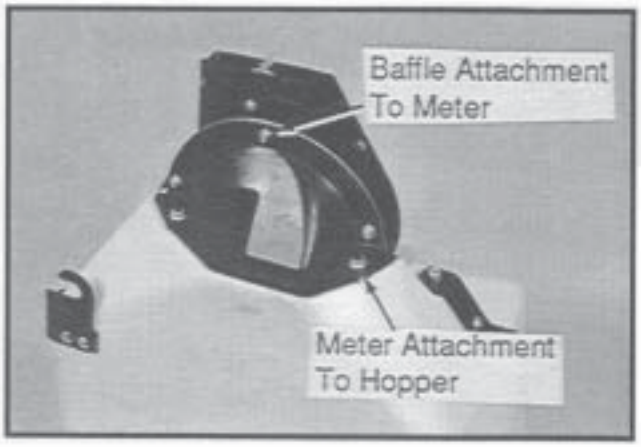
60817-44



FINGER PICKUP CORN METER INSPECTION/ADJUSTMENT

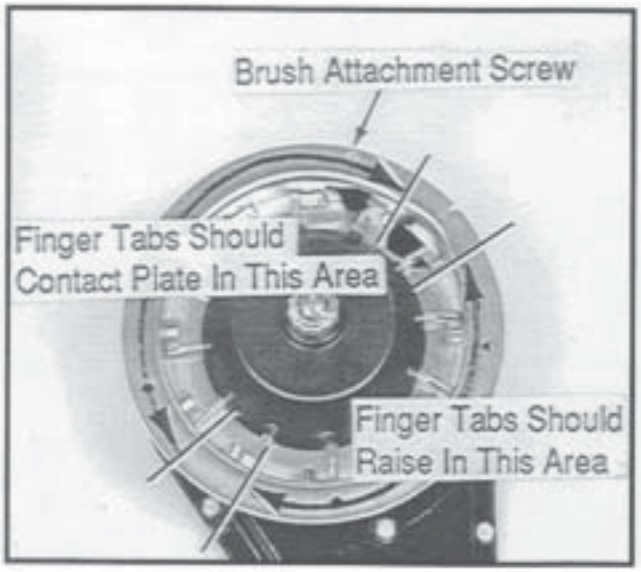
To inspect or service the finger pickup corn meter, remove the meter from the seed hopper by removing the two nuts which secure the mechanism to the hopper. Remove the baffle from the meter assembly by removing three cap screws. This will permit access to the finger pickup.

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

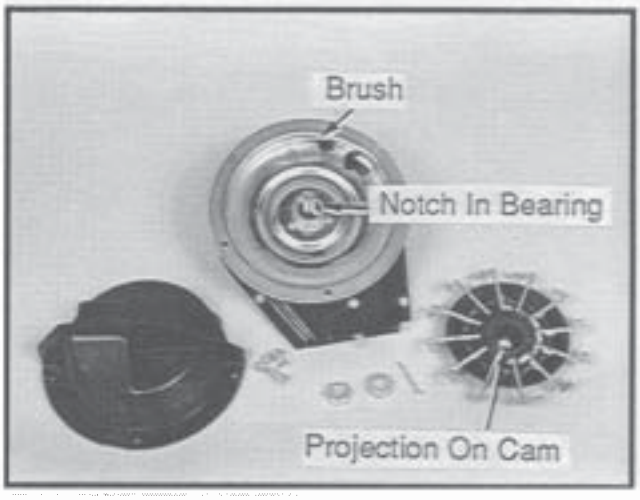


A build-up of debris or chaff may prevent proper finger operation and will require disassembly and cleaning of the corn meter as follows:

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

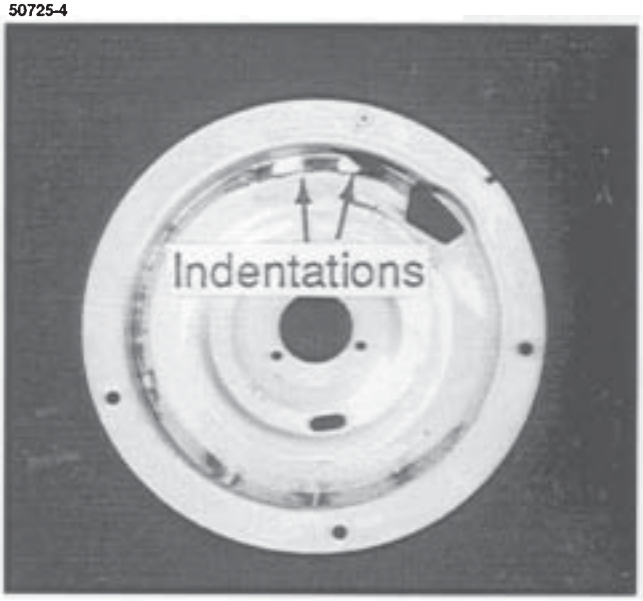


Photo shows worn plate

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.

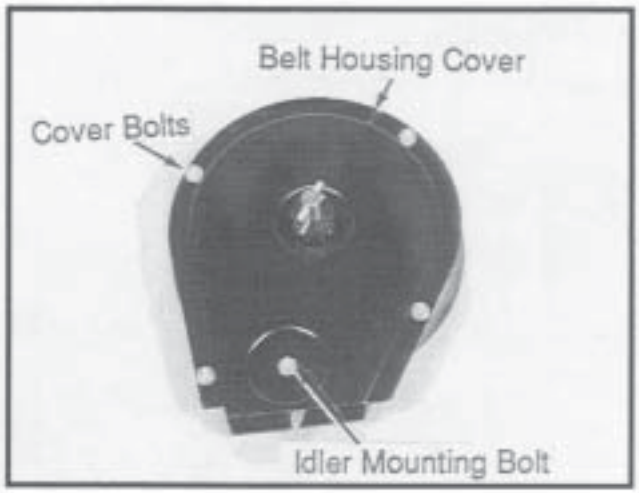
9. Turn finger holder by hand to make sure it is positioned firmly against the carrier, but is not over tightened and can be rotated with moderate force.

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

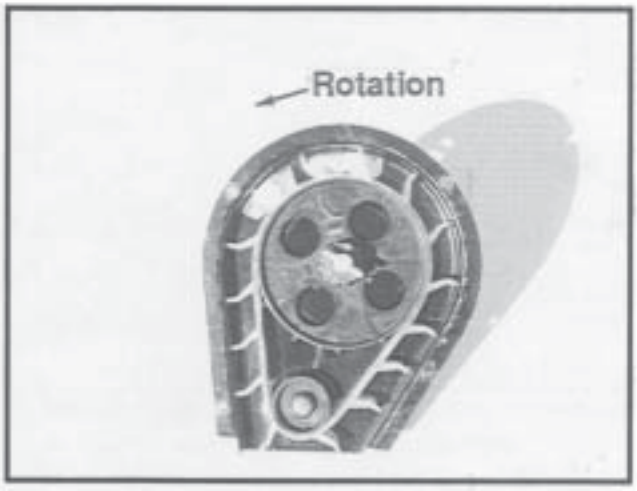
NOTE: Check tightness of adjusting nut on each unit after first day of use and periodically thereafter.

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.

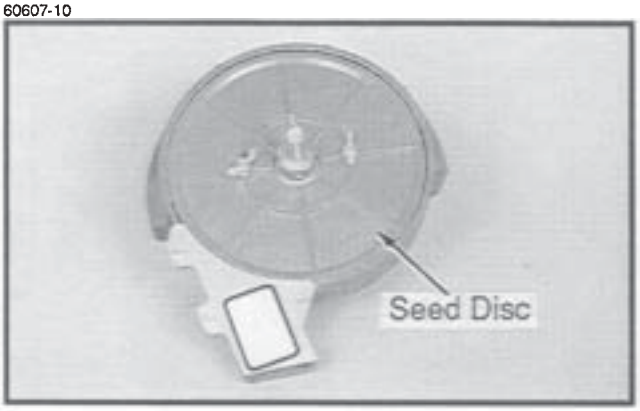
CAUTION: Do not over tighten hardware.

FINGER PICKUP CORN METER CLEANING

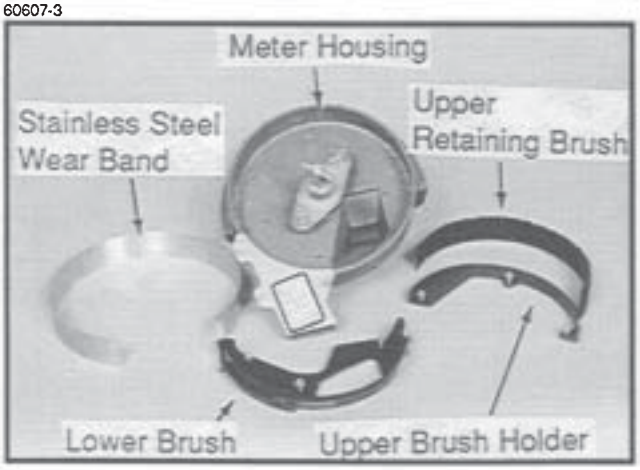
1. Disassemble meter.
2. Blow out any foreign material present in the meter mechanism.
3. Wash in mild soap and water. DO NOT USE GASOLINE, KEROSENE OR ANY OTHER PETROLEUM BASED PRODUCT.
4. Dry thoroughly.
5. Coat lightly with a rust inhibiter.
6. Store in a dry place.

BRUSH-TYPE SEED METER MAINTENANCE

60607-10

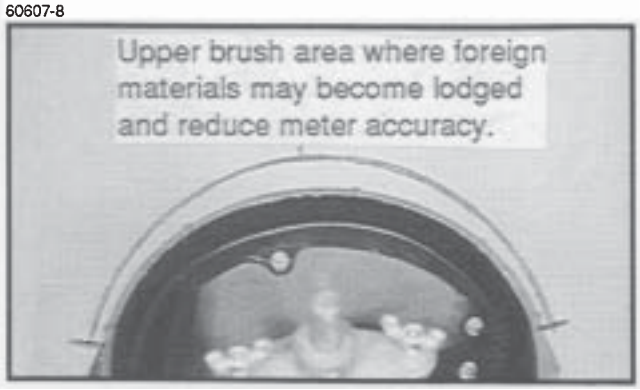


60607-3



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:

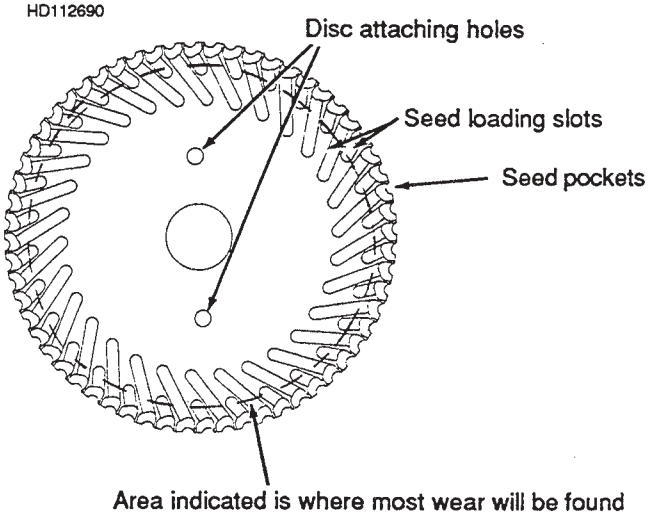
1. Remove meter from seed hopper by removing the two nuts which secure the meter to the hopper.
2. Remove seed disc and wash with soap and water and dry thoroughly.
3. Remove upper retaining brush by removing the three hex head screws from the brush holder and removing brush holder and retaining brush.
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.

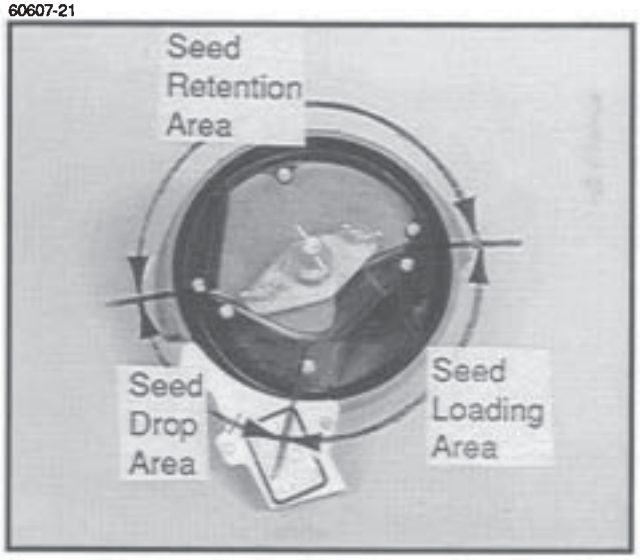
Stainless Steel Wear Band

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.

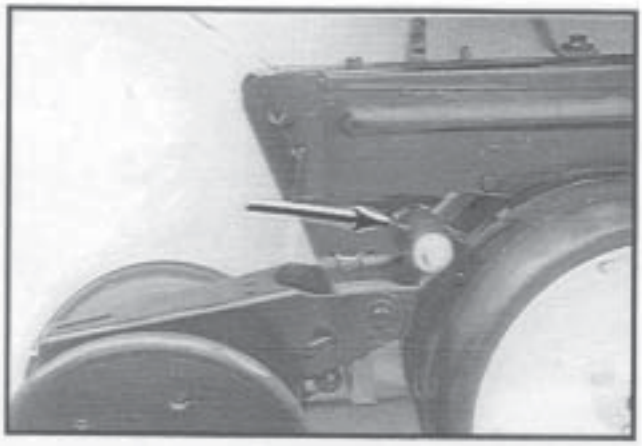
The retaining brush must apply enough pressure against the seed in the disc seed pocket as the disc rotates through the seed retention area to prevent the seed from dropping out of the disc pocket. A damaged spot, excessive wear on the brush or foreign material lodged in the brush may greatly reduce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

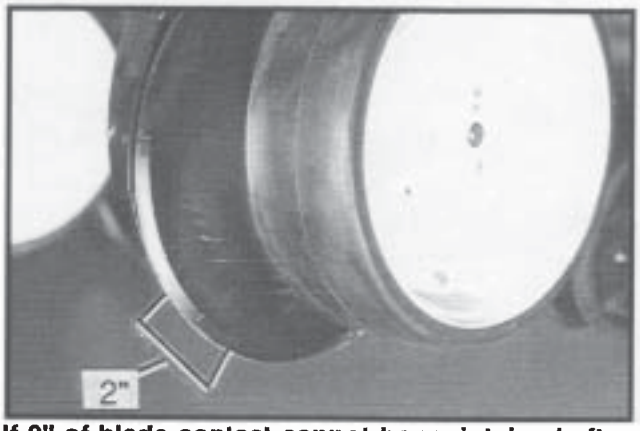


To adjust clearance between gauge wheels and opener blades, add or remove 1 1/64" spacer washers between the shank and gauge wheel arm. Store remaining spacer washers between gauge wheel arm and flat washer on outer side of gauge wheel arm.

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:

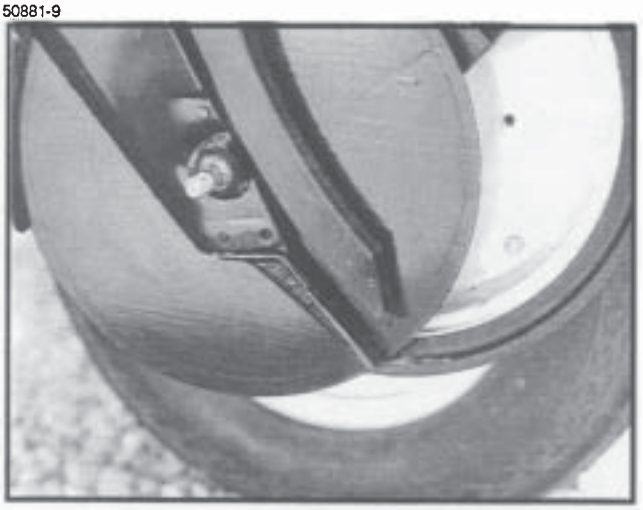
1. Remove gauge wheel, bearing cap, jam nut, washer and disc/bearing assembly.
2. Remove 1/4" rivets from bearing housing to expose bearing.
3. After installing new bearing, install three evenly spaced 1/4" bolts into three of the six holes in the bearing housing to hold the bearing and bearing housing 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

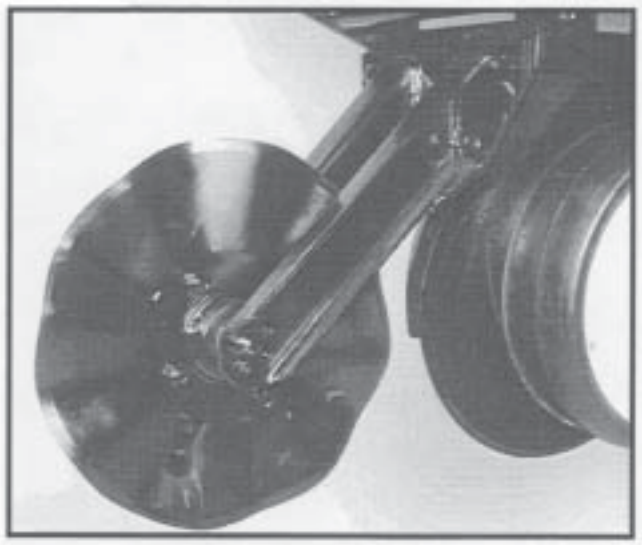


No till planting or planting in hard ground conditions will increase seed tube guard wear and necessitate more frequent inspection.

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.

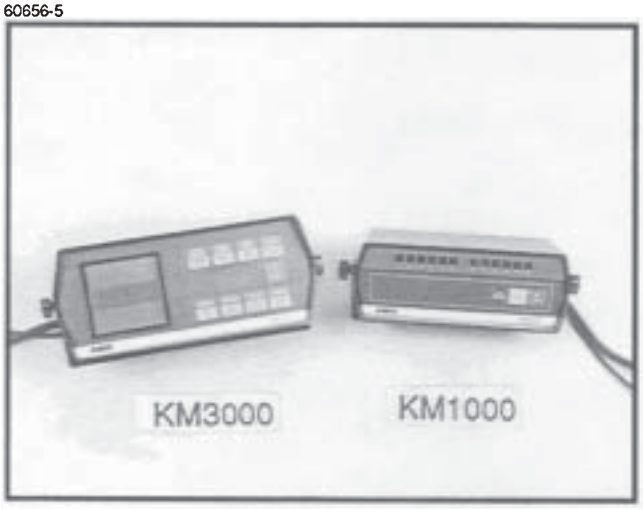
The coulter blade can be adjusted to one of four settings. Initially the blade is set in the highest position. As the blade wears it can be adjusted to one of the three lower settings. See "Row Unit Mounted No Till Coulter" in Operation Section of this manual.

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)

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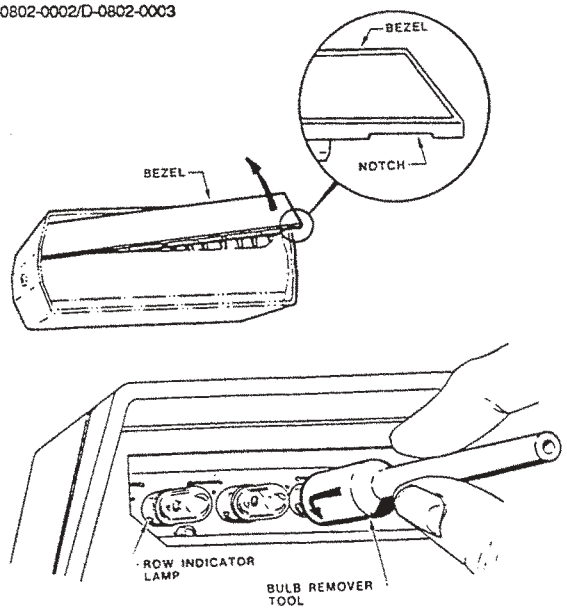
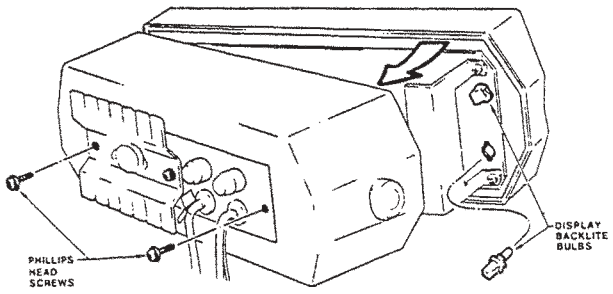


Carefully remove the row indicator bezel as shown. Use your fingernail to pry up along the lower outside edge of the bezel. Remove bezel. Remove burned out bulb using a bulb remover tool. Press in on bulb, turn 1/4 turn counterclockwise and remove bulb. Replace bulb with a No. 1892 (Part No. R0595) only.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

POINT ROW WRAP SPRING CLUTCH INSPECTION

The point row wrap spring clutch is permanently lubricated and requires no periodic maintenance.

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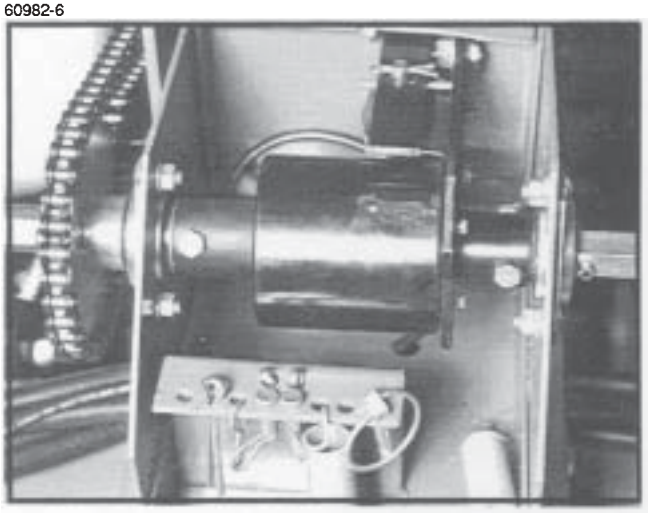

The right hand clutch operates clockwise and the left hand clutch operates counterclockwise. Therefore, some of the parts of the clutch such as the wrap spring differ from one side of the planter to the other. Be sure to use the correct repair part if a clutch must be repaired.

If the clutches fail to operate, check to see if the fuse in the wiring harness is blown. See "Point Row Clutch Troubleshooting".

NOTE: Always replace fuse with MDL-8 amp slow blow fuse when replacing fuse.

If the fuse in the wiring harness is not blown, determine if the problem is electrical or mechanical. Place the operational switch in the RIGHT or LEFT position. Check the clutch and wiring harness for power with a test light or volt meter. If the solenoid is operating properly, the plunger on the solenoid will retract causing a clicking sound. The plunger will also be magnetized which can be checked by touching the plunger with a metal object.

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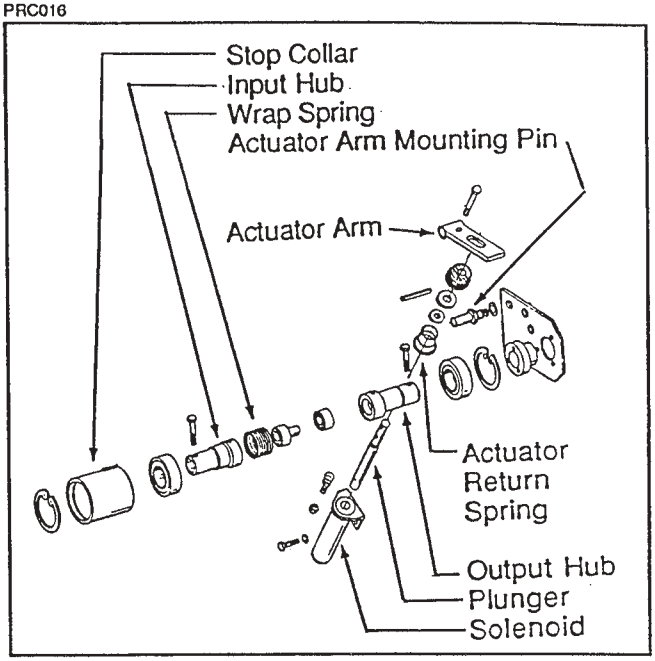
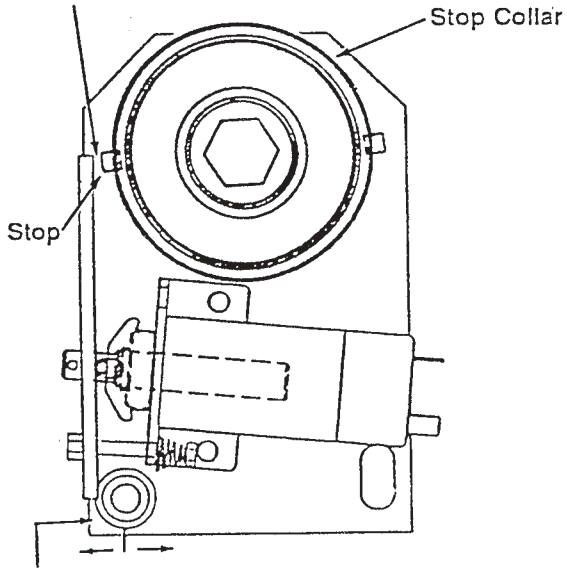


ACTUATOR ARM ADJUSTMENT

NOTE: Gap between actuator arm and stop on stop collar should be not less than 1/16" (.063) when the solenoid is NOT energized.



NOTE: To adjust gap between actuator arm and stop, loosen nut on pilot pin and move pilot pin in slot until there is at least 1/16" gap between arm and stop on stop collar. Retighten nut.

POINT ROW WRAP SPRING CLUTCH TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Neither clutch will disengage.	Fuse blown.	Replace fuse in wiring harness with 8 amp slow blow fuse.
	Poor terminal connection in wiring harness.	Repair or replace.
	Wiring damage in wiring harness.	Repair or replace.
	Low voltage at coil. (12 volts required)	Check battery connections.
One side of planter will not re-engage.	Shear pin in row unit transmission sheared.	Replace with one of equal size and grade.
One clutch will not engage.	Actuator arm and plunger stuck in disengaged position.	Remove, free up and reinstall.
	Actuator arm out of adjustment	Adjust actuator arm mounting pin in slot so that actuator arm clears stop on stop collar by approximately 1/16" when clutch is rotated.
	Wrap spring broken or stretched.	Disassemble clutch and replace spring.
	Foreign substance such as oil or grease on the input or output hubs.	Disassemble clutch. Clean hubs and spring and reassemble.
	Something touching the stop collar.	Check to ensure collar is free to turn with clutch.
	Clutch assembled incorrectly.	Check clutch and diagram for correct assembly.
Clutch slipping.	Wrap spring stretched.	"Lock" clutch output shaft from turning. Place torque wrench on input shaft and rotate in direction of drive. After input shaft has rotated a short distance the wrap spring should tighten onto the input hub. If slippage occurs at less than 100 ft. lbs. replace spring. If spring still slips after installing new spring, replace input hub.
Planter will not re-engage while planter is moving forward.	Spring in actuator arm not strong enough to push arm away from stop collar when operational switch is turned to the ON position.	Remove spring and stretch spring slightly or replace. Reinstall spring. If that fails, file the stop on the stop collar slightly so that the stop is not as aggressive.
Frequent solenoid burnout.	Fuse too large.	Replace fuse in wiring harness with 8 amp slow blow fuse.
Frequent fuse burnout.	Low voltage (12 volts required).	Check power source voltage for partically discharged battery, etc.
	Damage to wiring harness.	Locate damage and repair or replace harnesss.

VALVE BLOCK ASSEMBLY INSPECTION

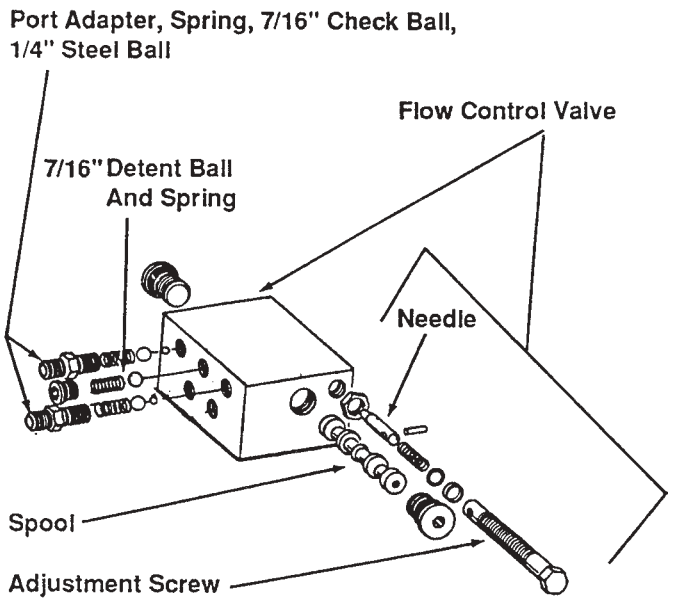
The valve block assembly consists of the marker sequencing and flow control valves in one assembly.

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 reinstall. Check to be sure spool moves freely in valve body.

IMPORTANT: Made 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 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.

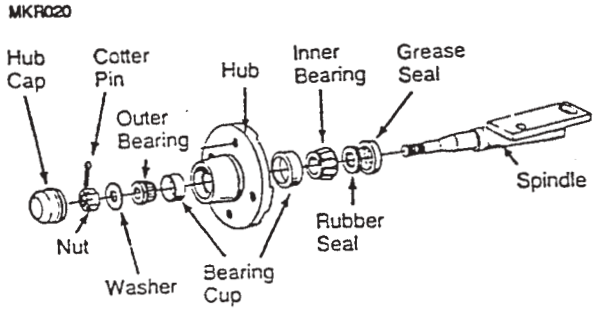
8. Place inner bearing in place and press in new rubber seal and grease seal.

9. Clean spindle and install hub.

10. Install outer bearing, washer 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 if repacking.

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

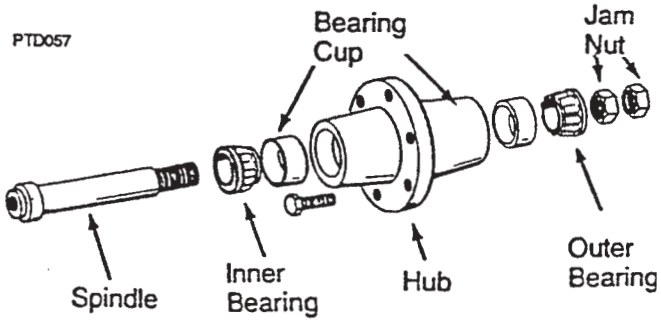
5. Pack bearings with heavy duty wheel bearing grease thoroughly forcing grease between roller cone and bearing cage. Also fill the space between the bearing cups in the hub with grease.

6. Place inner bearing in place.

7. Clean spindle and install hub.

8. Install outer bearing and nut. Tighten 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.



MAINTENANCE

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 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.

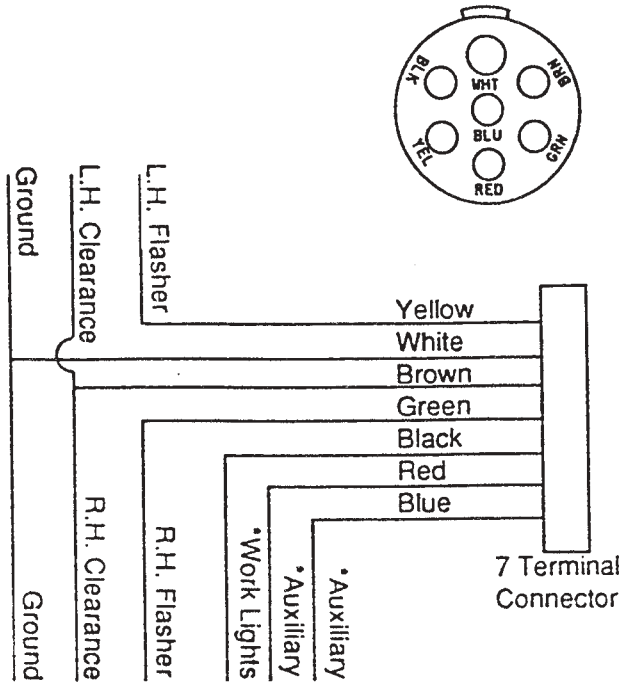
Clean seed meters and store in a dry area.

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 2200 planter meets ASAE standards. For the correct wiring harness to be wired into the lights on your tractor, check with the tractor manufacturer.

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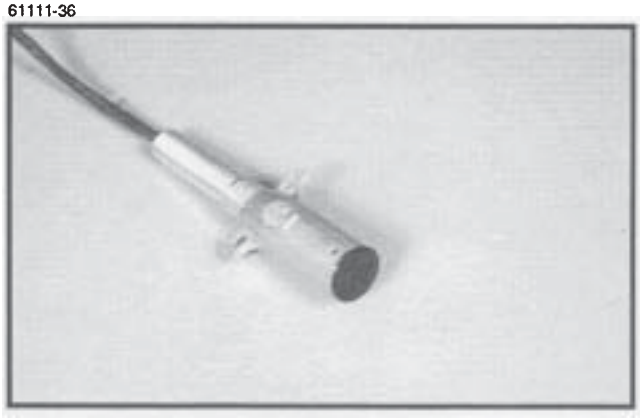
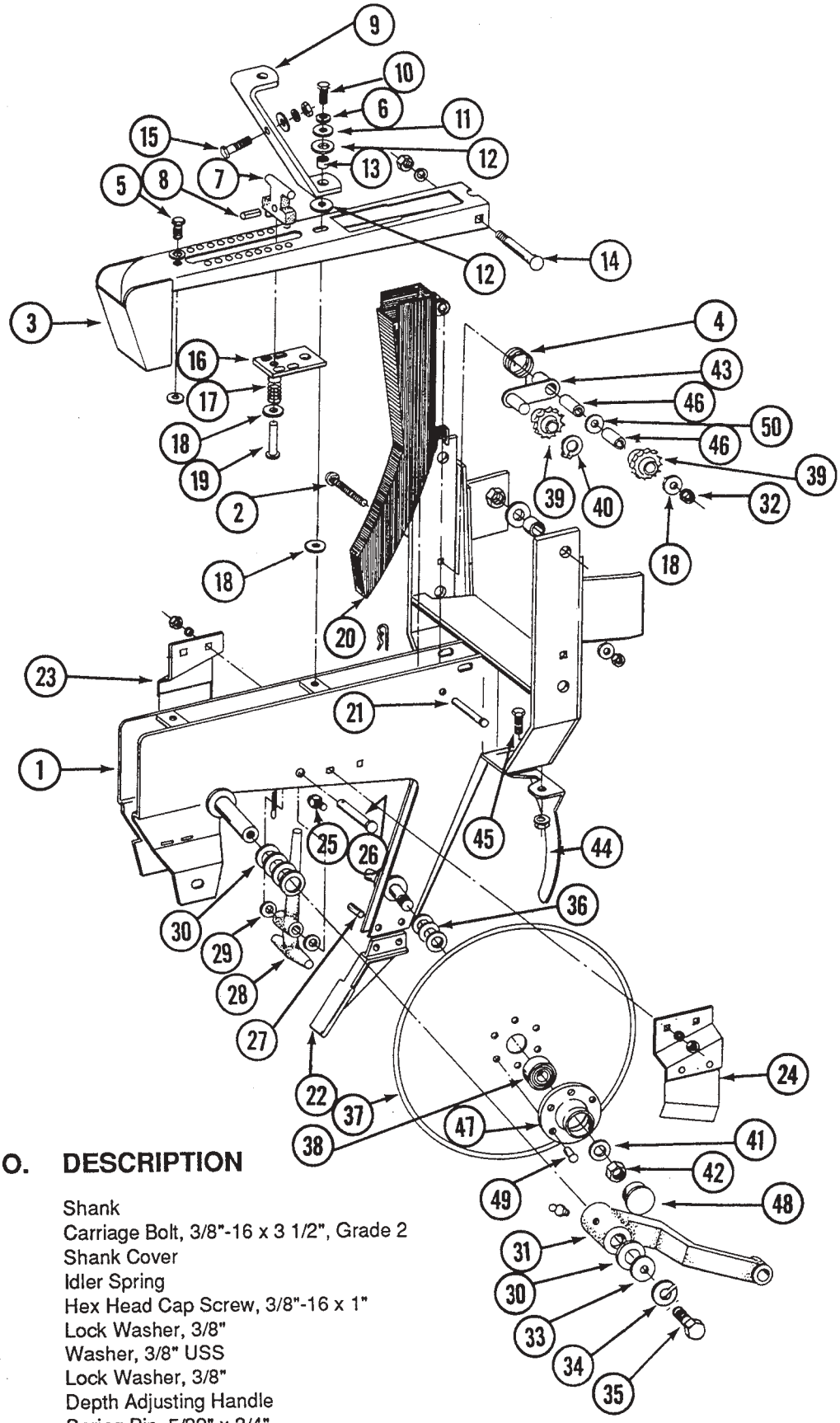


PARTS LIST INDEX

SHANK ASSEMBLY

RUB006/RUA004



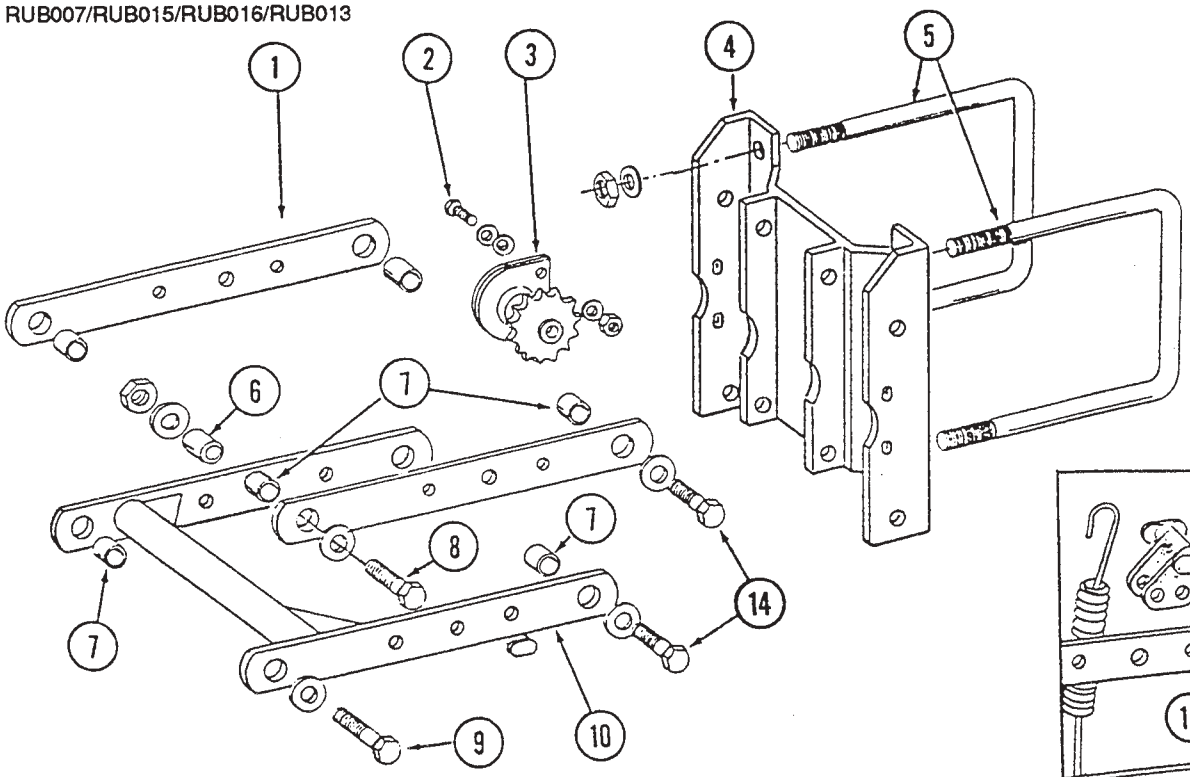
ITEM	PART NO.	DESCRIPTION
1.	A0860	Shank
2.	10307	Carriage Bolt, 3/8"-16 x 3 1/2", Grade 2
3.	A0811	Shank Cover
4.	D1065	Idler Spring
5.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
	10210	Washer, 3/8" USS
6.	10229	Lock Washer, 3/8"
7.	B0102	Depth Adjusting Handle
8.	10605	Spring Pin, 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

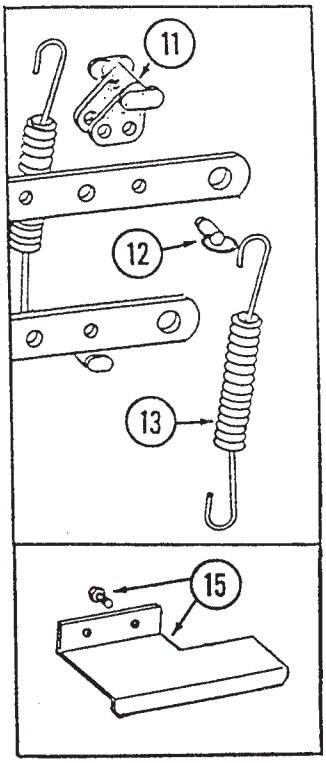
SHANK ASSEMBLY

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

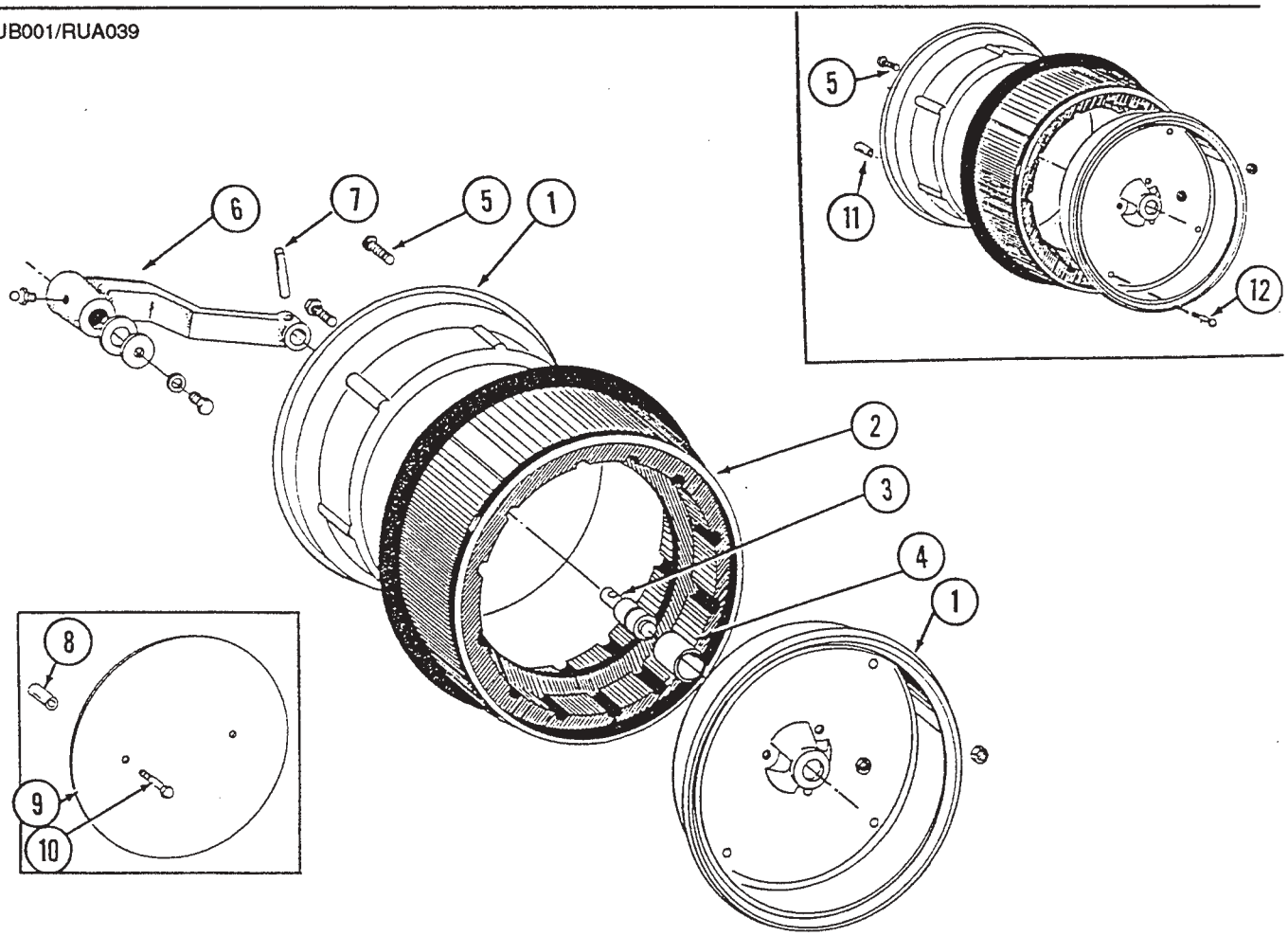




ITEM	PART NO.	DESCRIPTION
1.	D7619	Upper Arm
2.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10210	Washer, 3/8" USS (As Required)
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
3.	A1720	Bearing/Sprocket, 7/8" Bore
4.	A5798	Support Plate
5.	D1114	U-Bolt, 7" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	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

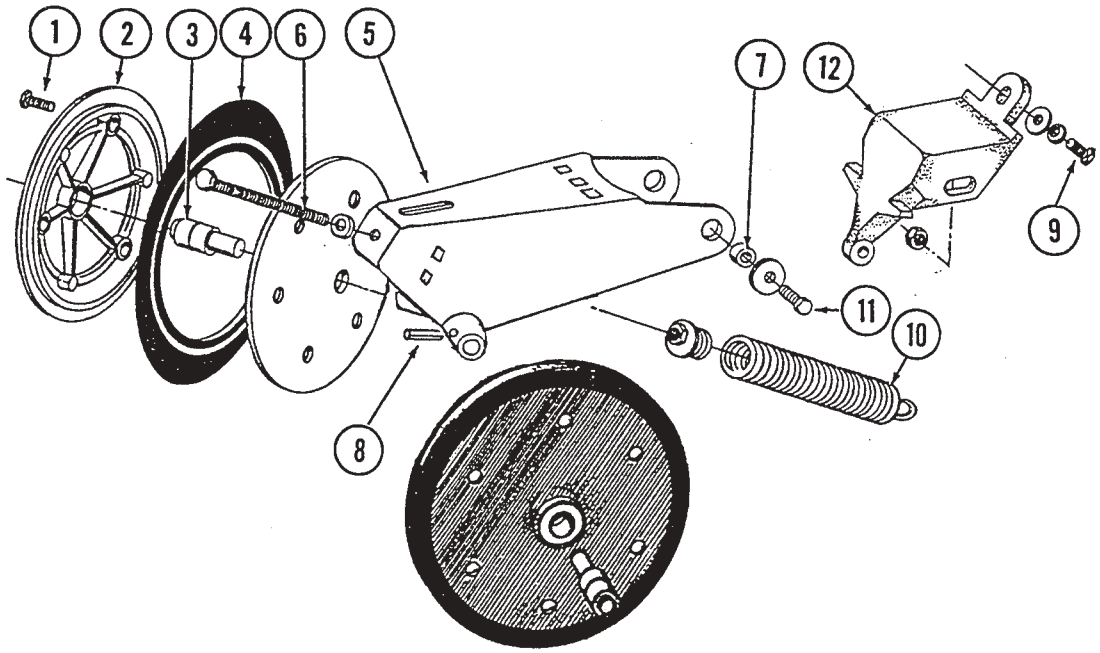
RUB001/RUA039



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

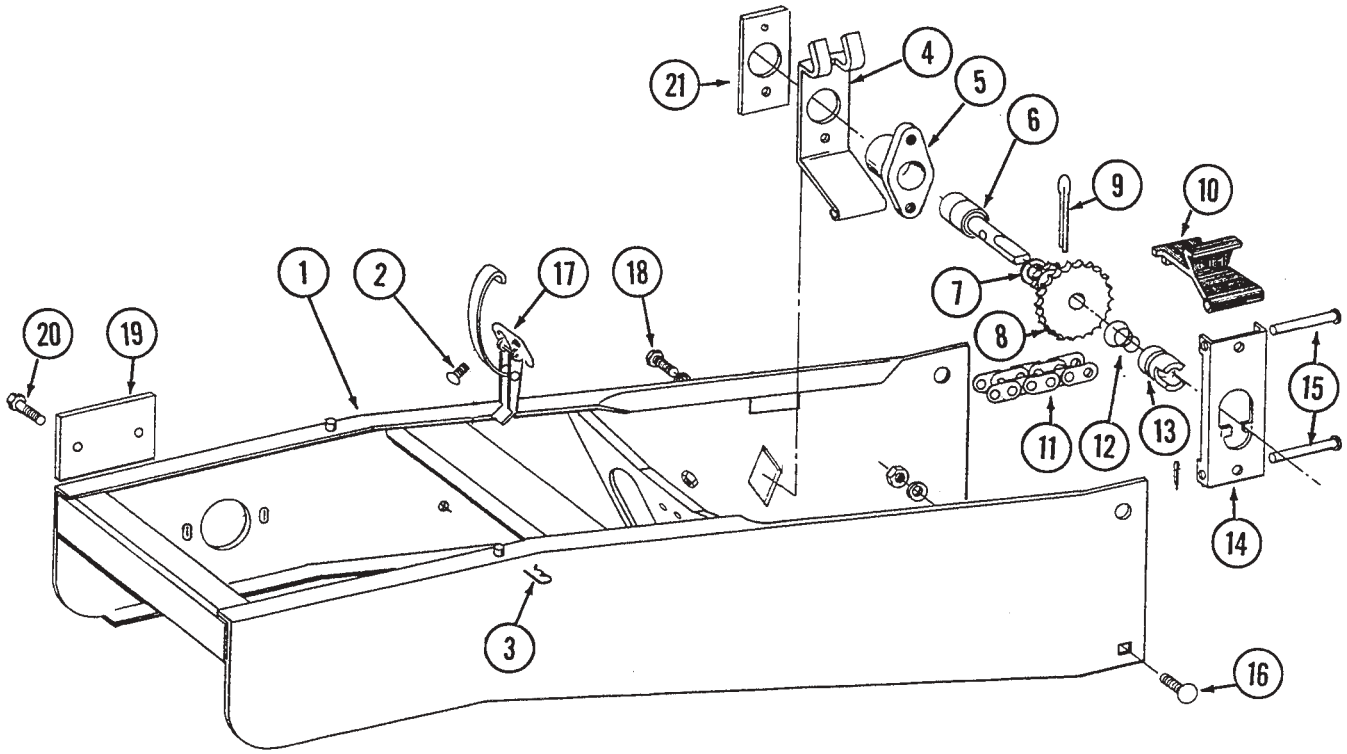
RUB004



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

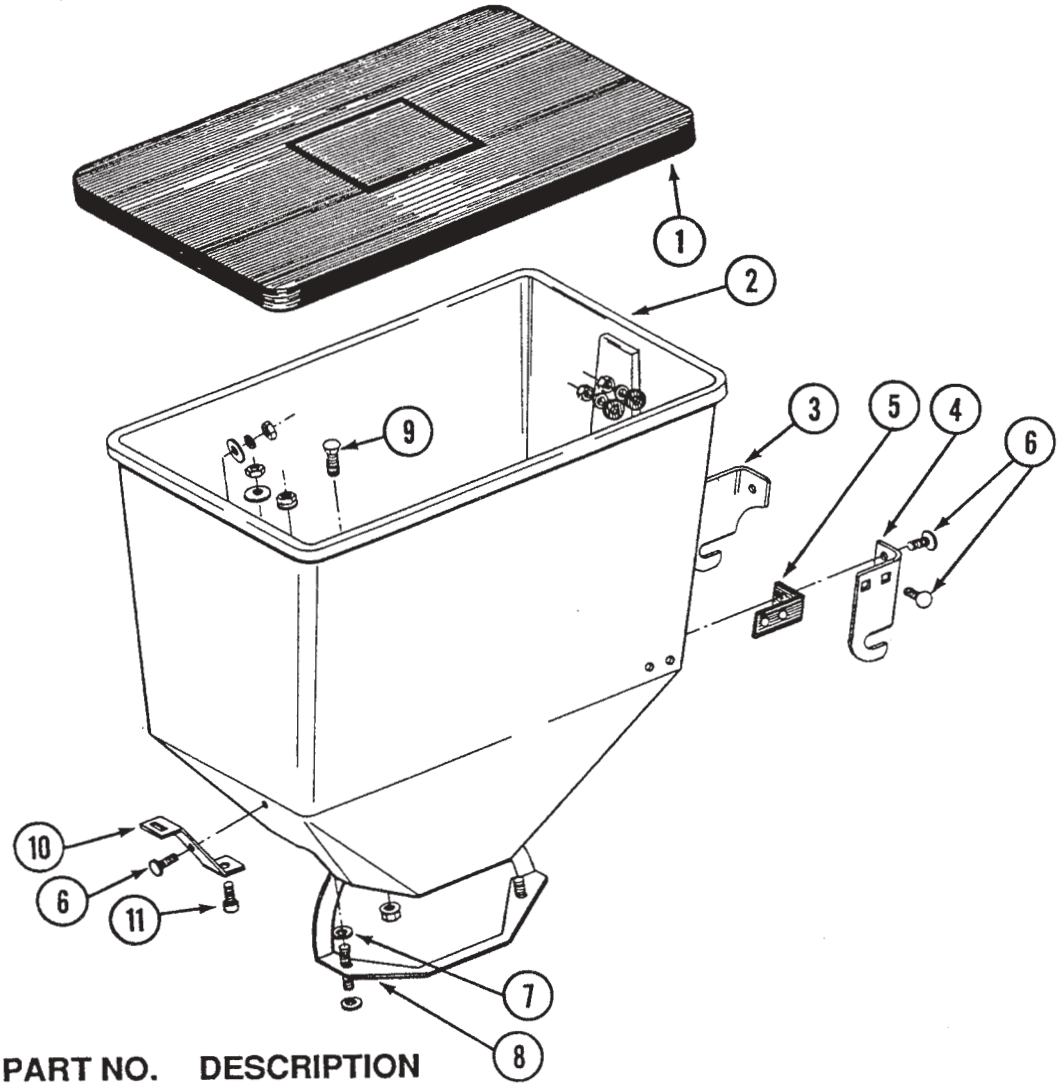
RUB005



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

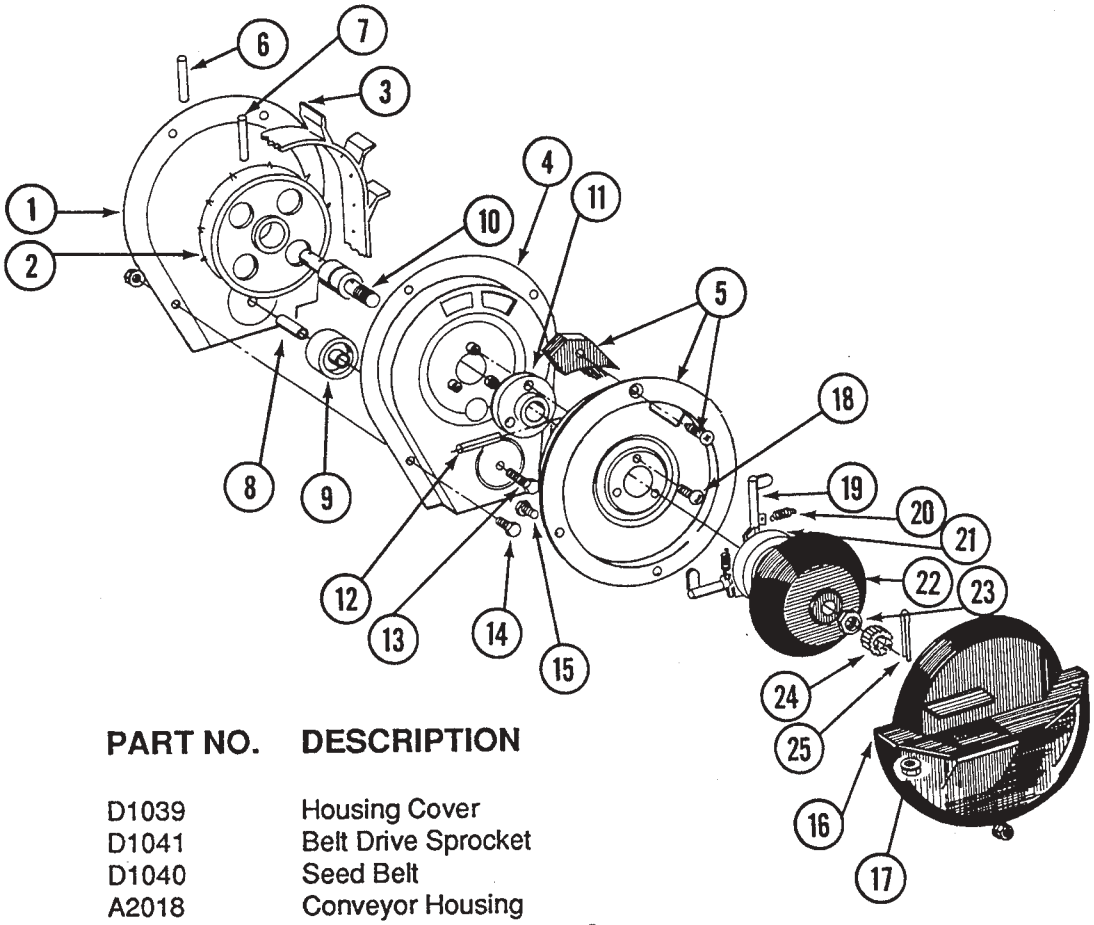
RUA015



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

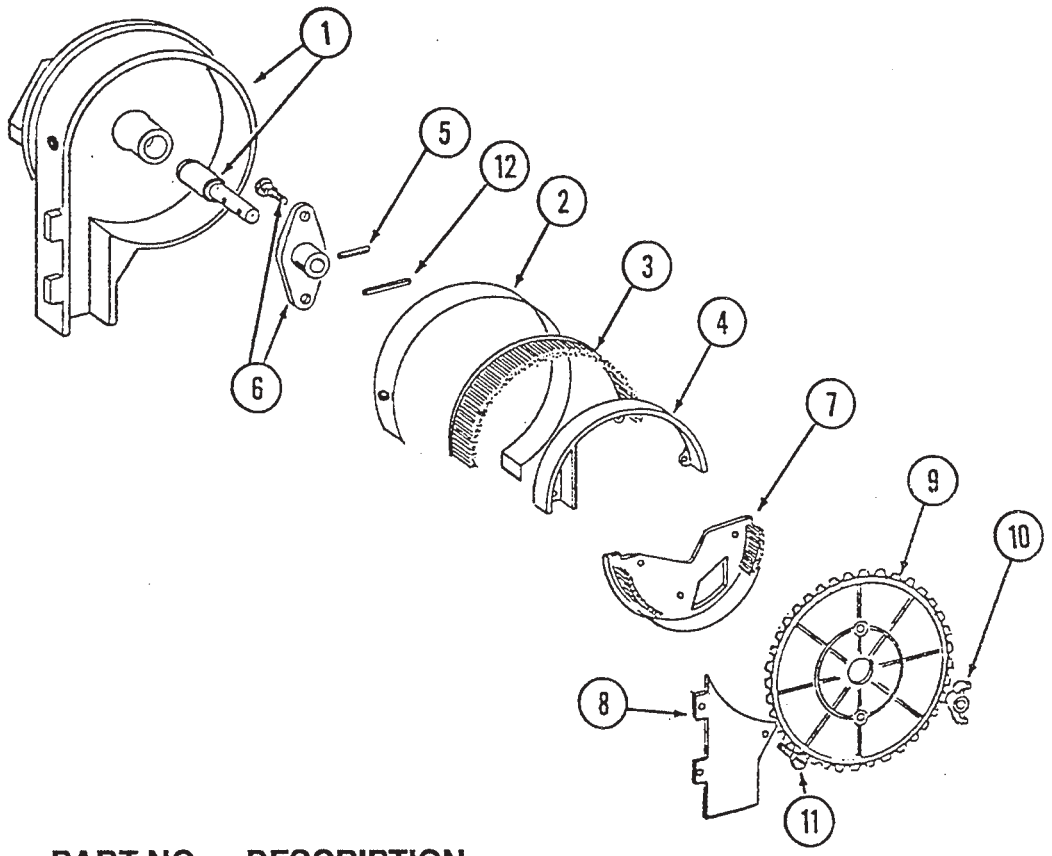
RUA015



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

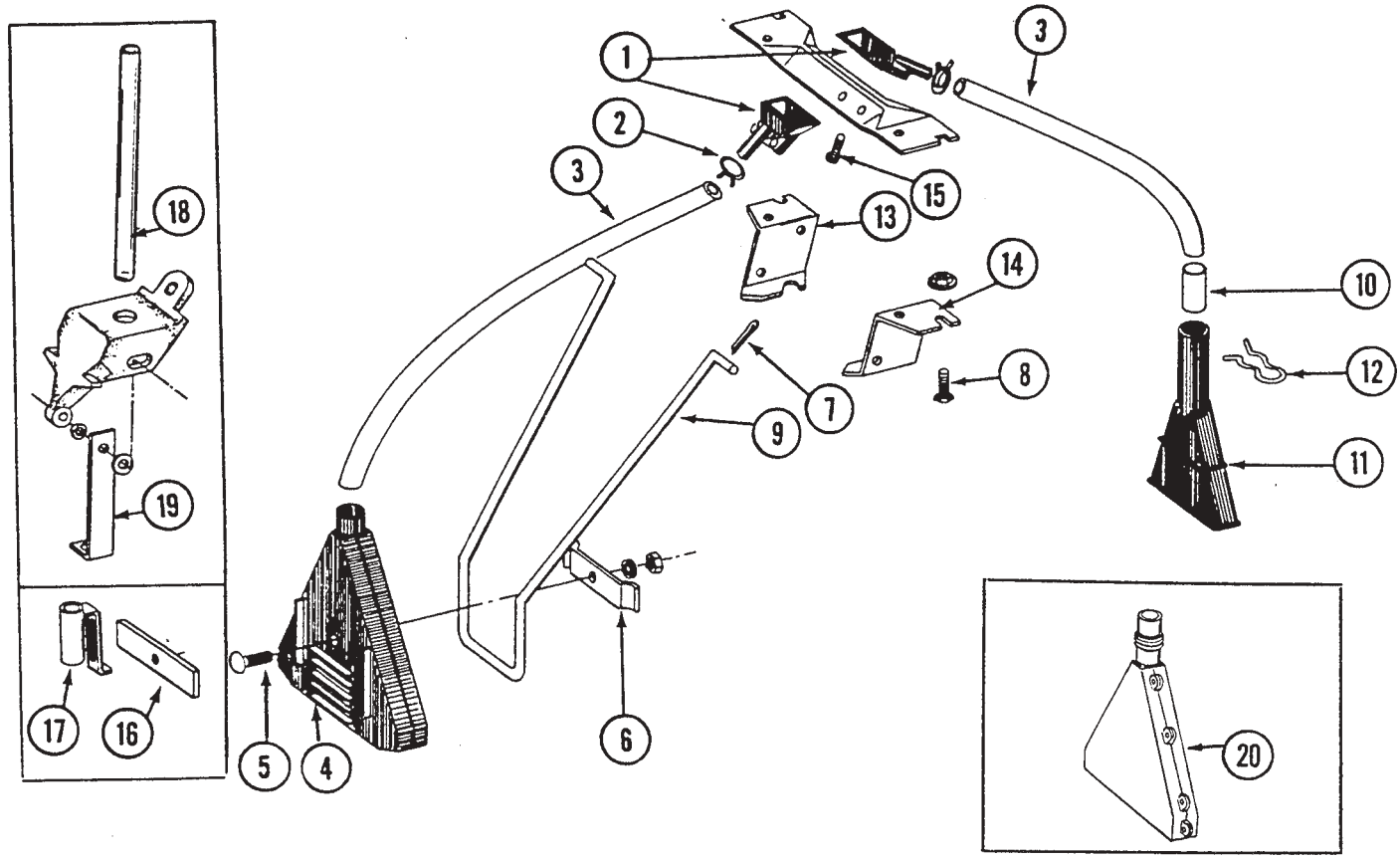
RUA037



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

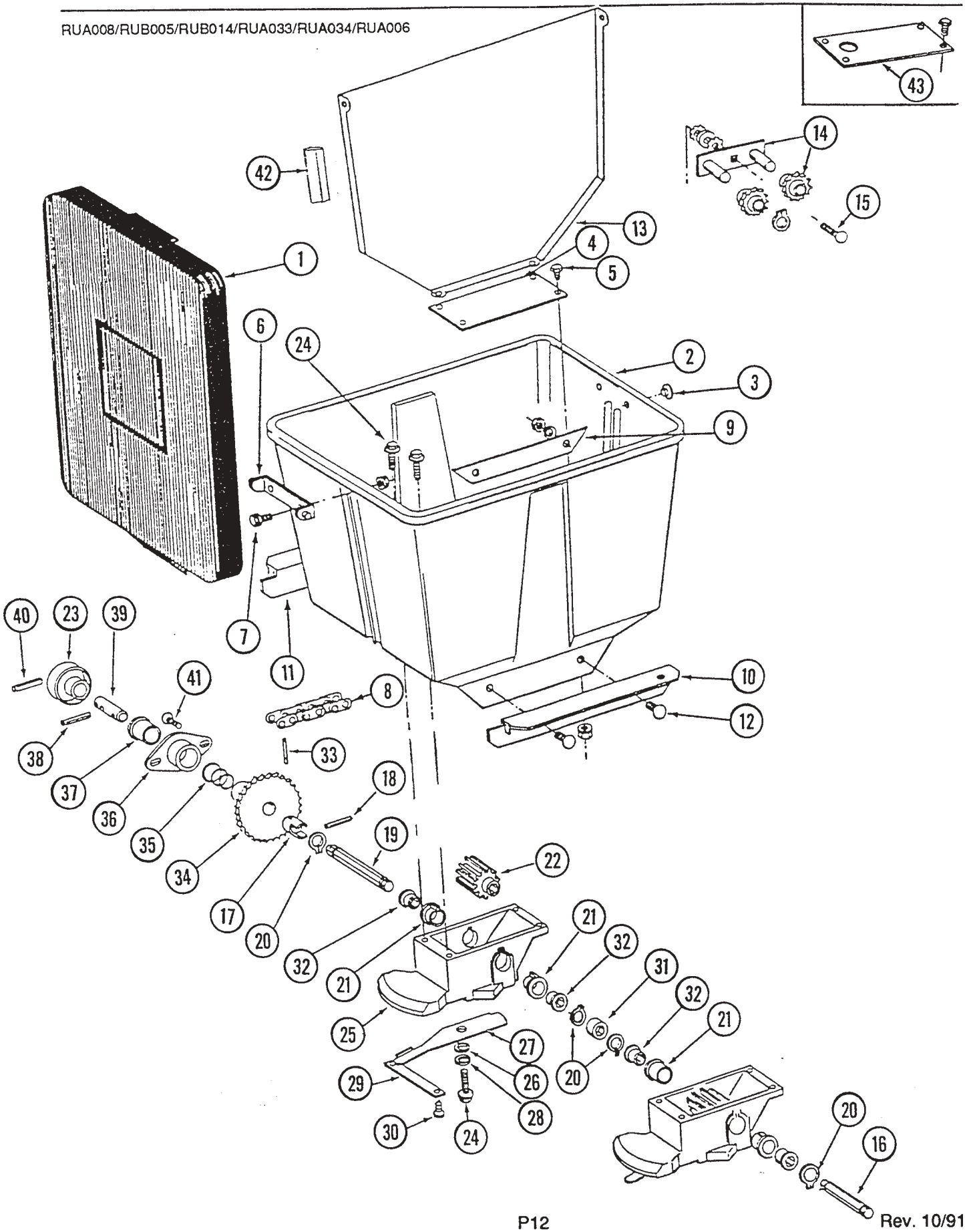
RUA013/RUA012/RUA016



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

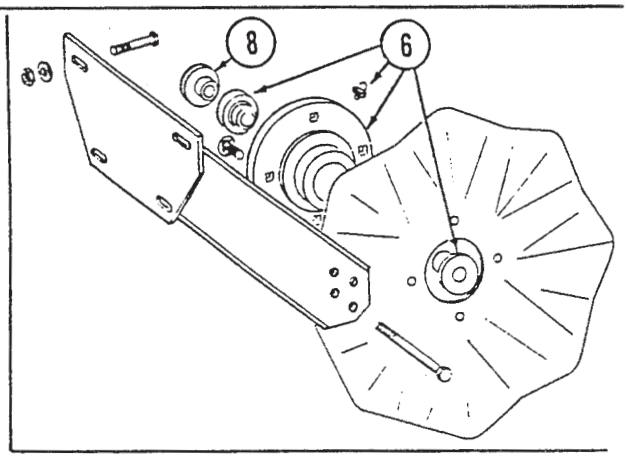


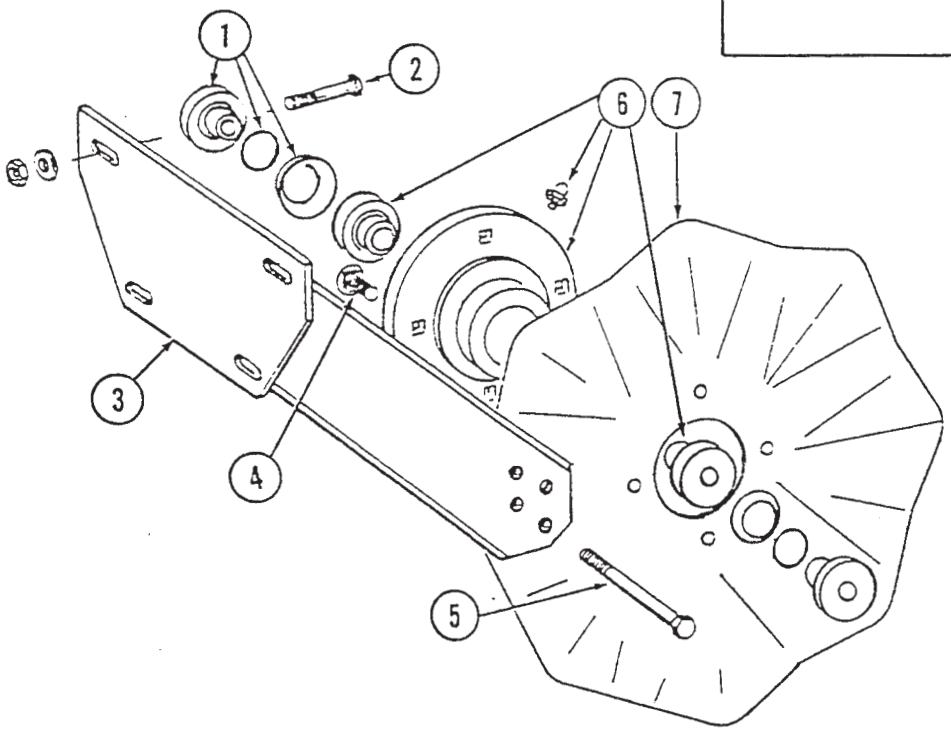
GRANULAR CHEMICAL HOPPER WITH METER(S) & THROWOUT

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

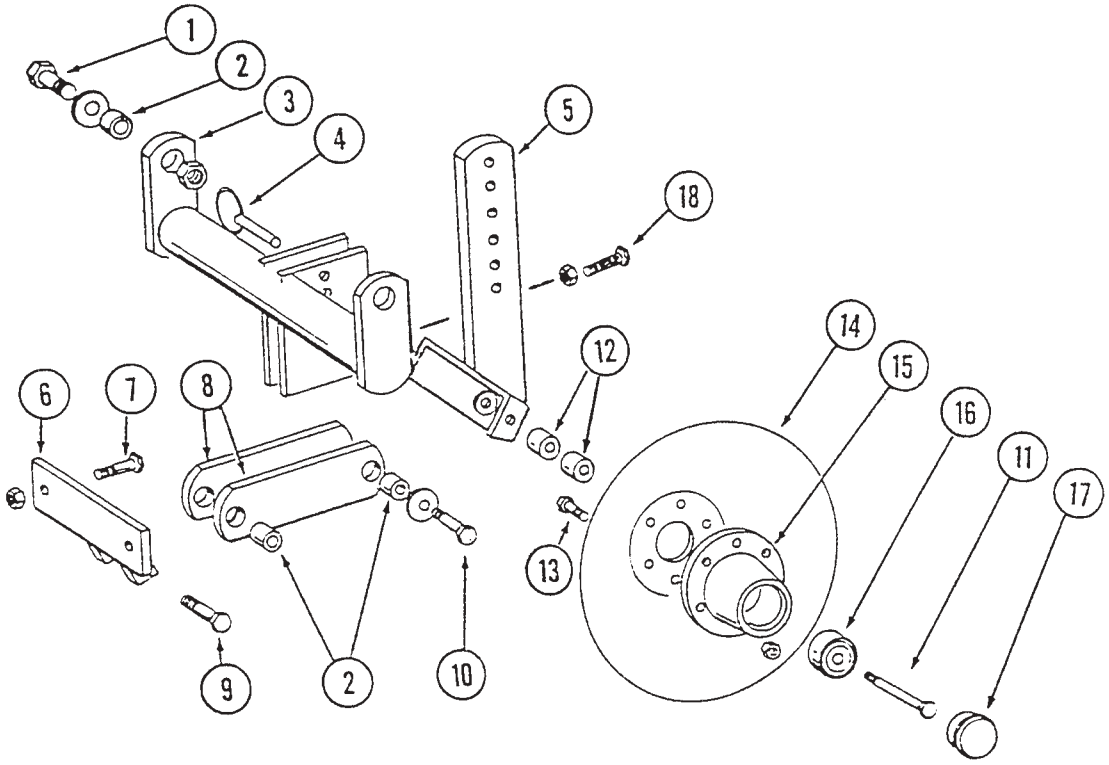




ITEM	PART NO.	DESCRIPTION
1.	GB0227	Adapter W/O-Ring And Spring Washer
	D8844	O-Ring
	D8843	Spring Washer
2.	10574	Carriage Bolt, 1/2"-13 x 1 1/4"
	10216	Washer, 1/2" USS
	10111	Lock Nut,1/2"-13
3.	A5625	Arm
4.	10574	Carriage Bolt, 1/2"-13 x 1 1/4"
	10111	Lock Nut, 1/2"-13
5.	10036	Hex Head Cap Screw, 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

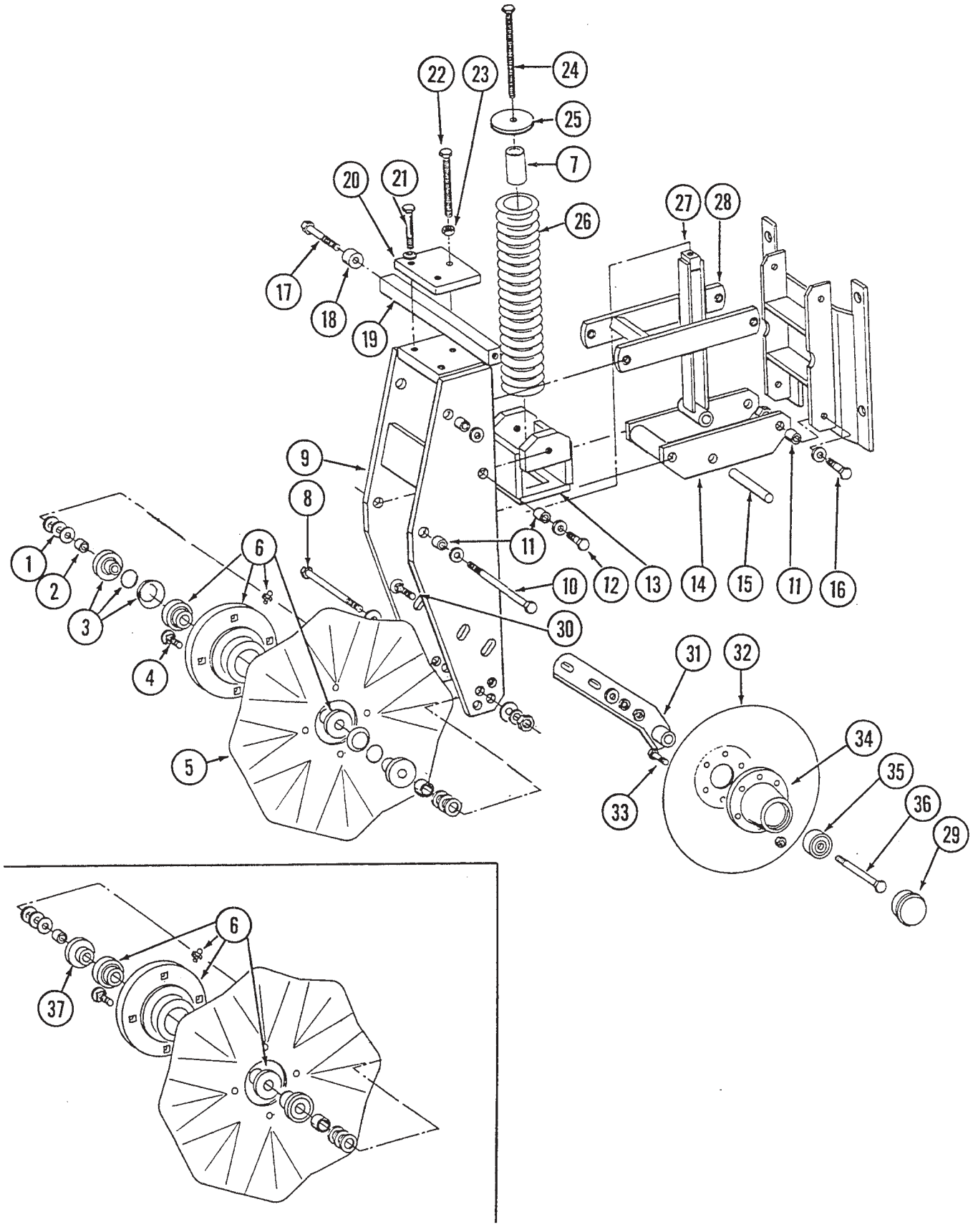
RUA038



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

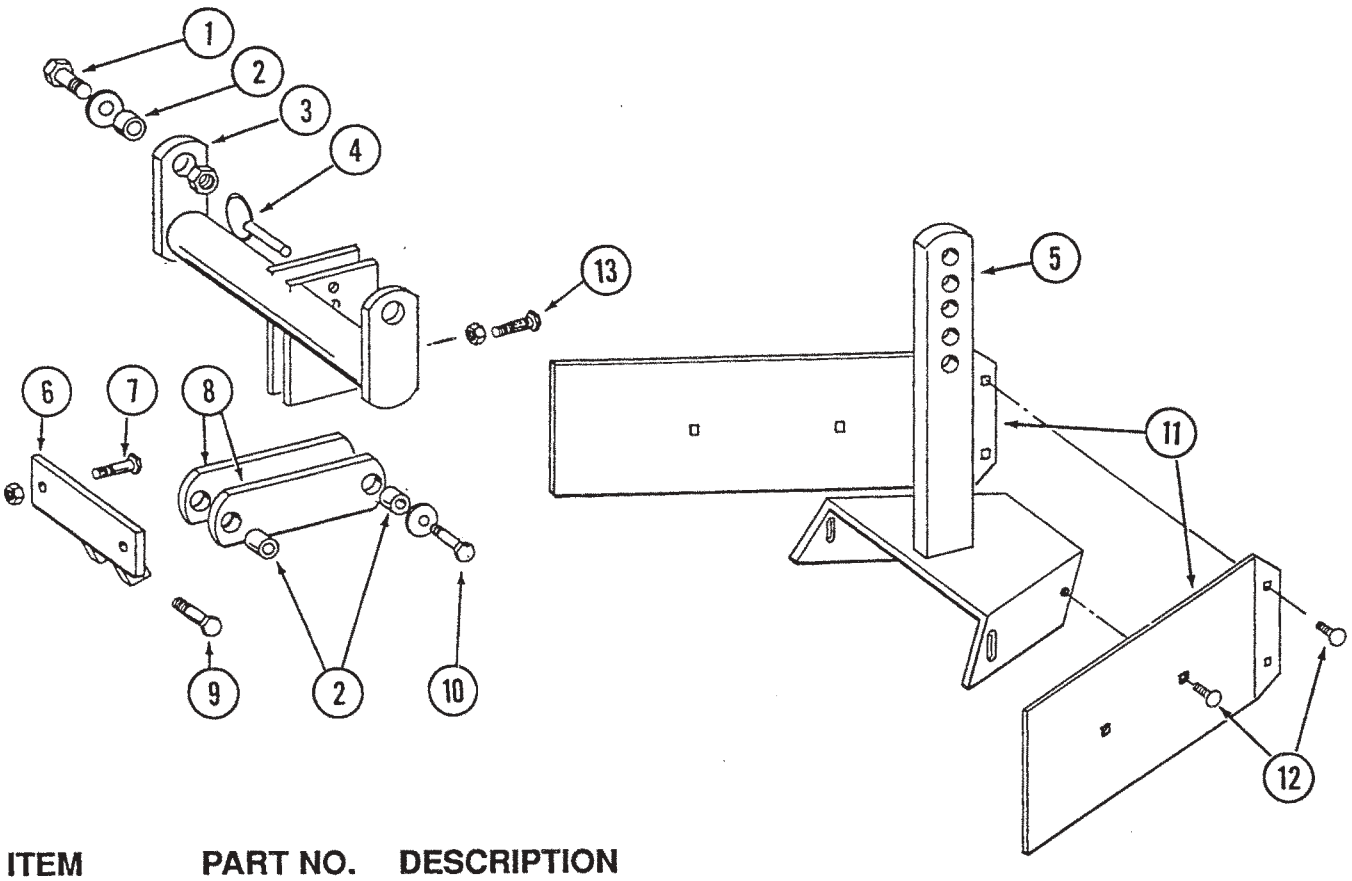


FRAME MOUNTED COULTER W/DISC FURROWER

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"
	D9254	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

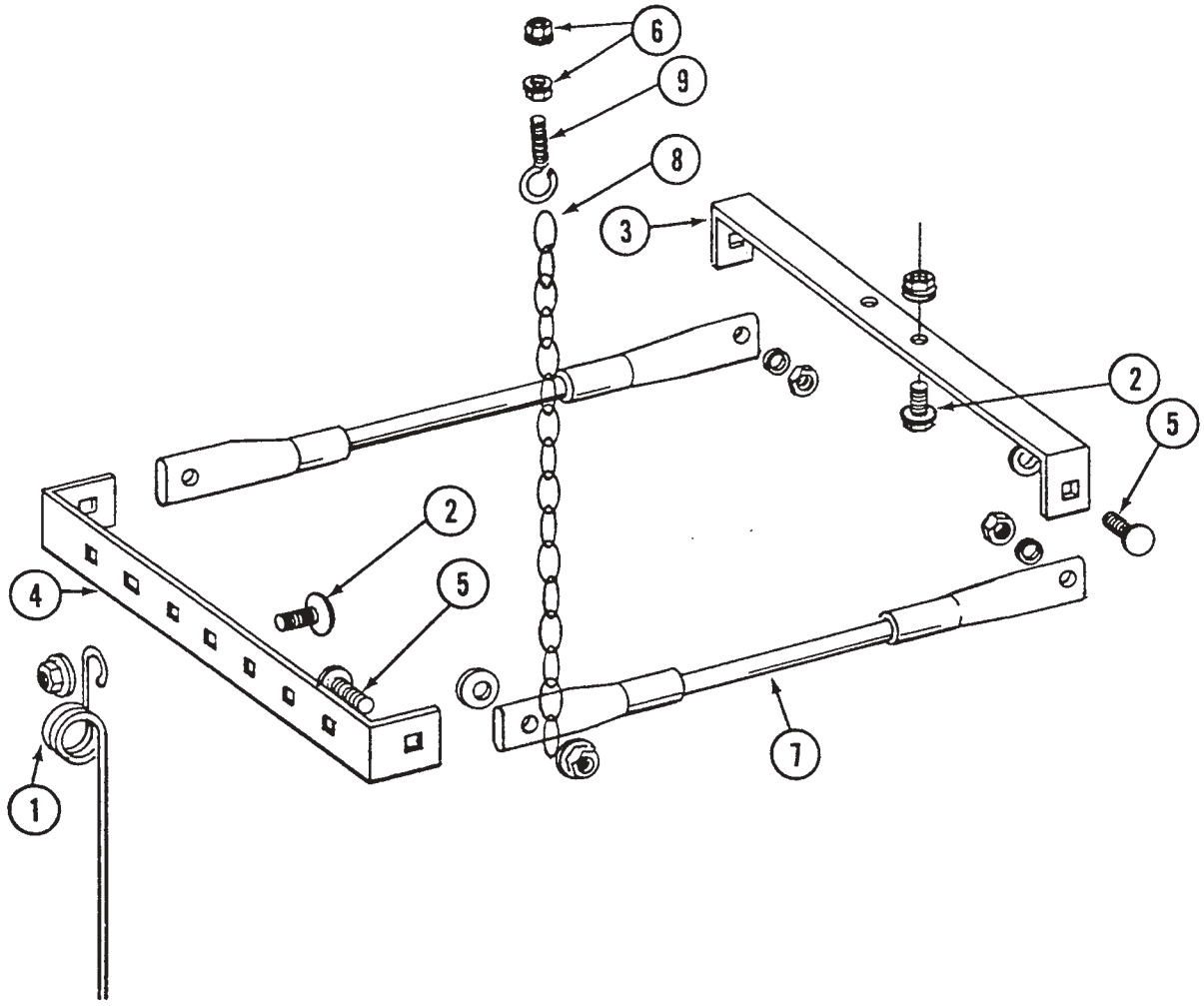
RUA038/RUA040



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

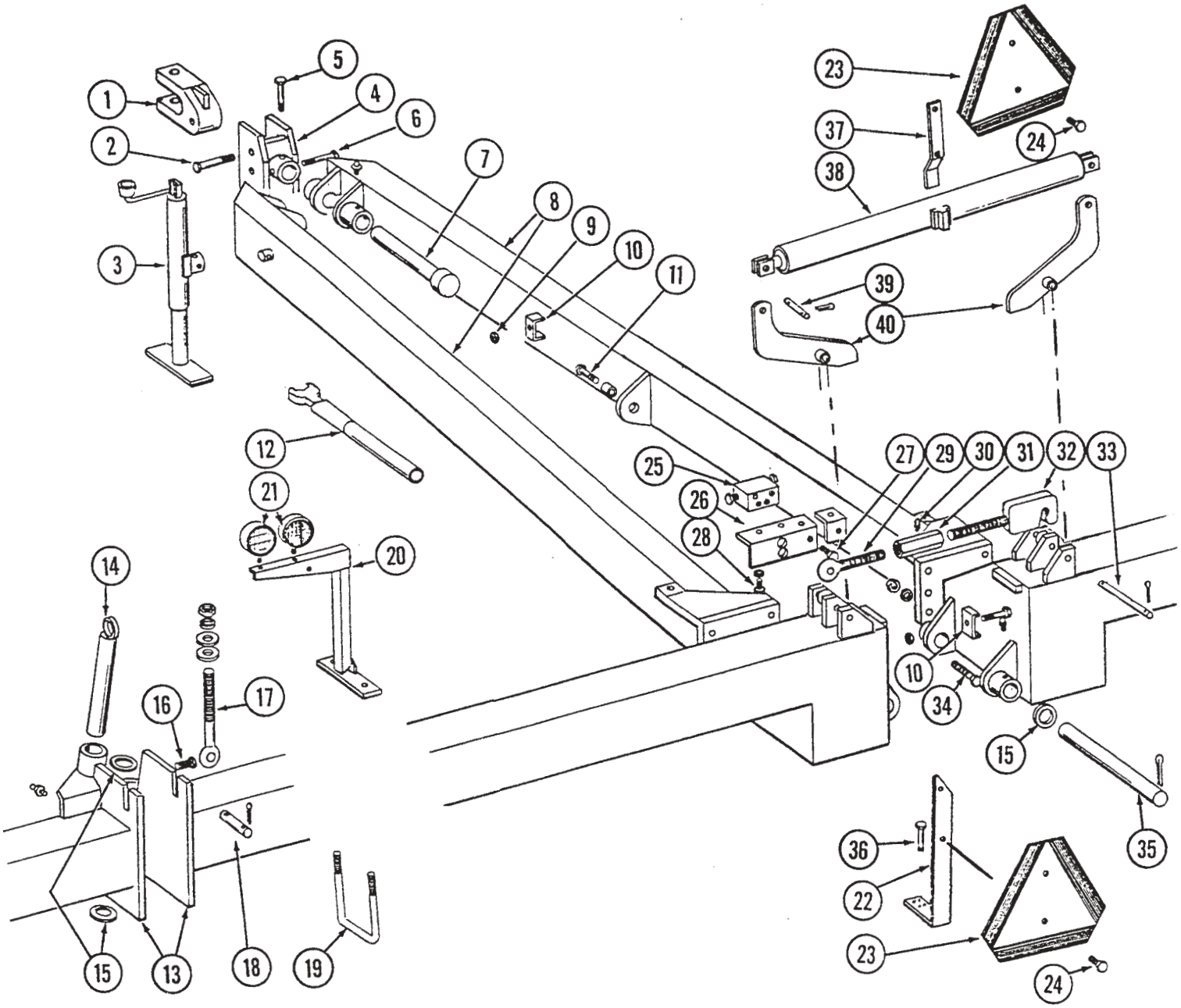
RUA011



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

HITCH AND FRAME ASSEMBLY

PHA024/PFA050/PFA052/PHA026/PHA027



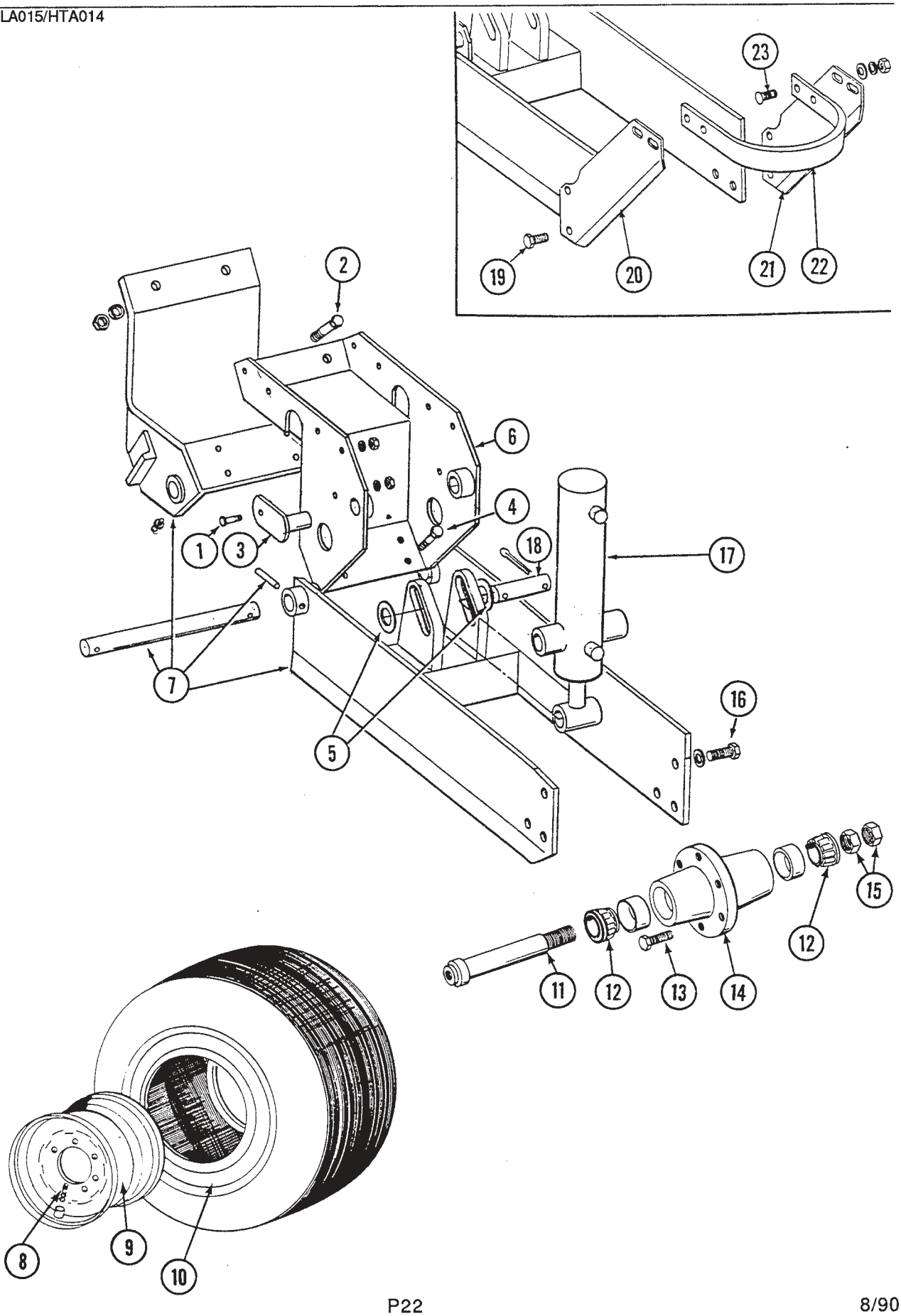
ITEM	PART NO.	DESCRIPTION
1.	B0156	Clevis
2.	10169	Hex Head Cap Screw, 1 1/4"-7 x 6"
	10157	Lock Nut, 1 1/4"-7
3.	4100-02	Jack Assembly
	R0255	Repair Kit (Chain And Pin)
4.	A5745	Hitch Cap
5.	10036	Hex Head Cap Screw, 5/8"-11 x 4"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
6.	10011	Hex Head Cap Screw, 5/8"-11 x 5 1/2"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
7.	A5755	Pin, 2 1/8" x 14"
8.	A5748	Hitch W/Grease Fittings (Includes Items 4 And 7)
	10641	Grease Fittings

HITCH AND FRAME ASSEMBLY

ITEM	PART NO.	DESCRIPTION
9.	10108	Lock Nut, 3/8"-16
10.	D5875	Clamp, 2" x 2 1/2"
	D0740	Clamp, 3 1/2" x 4"
11.	10027	Hex Head Cap Screw, 3/4"-10 x 2 1/2"
	B0126	Bushing
	10112	Lock Nut, 3/4"-10
12.	A2460	Wrench
13.		Frame W/Grease Fittings, 237 1/2", 8 Row 30 (Non-stock Item)
		Frame W/Grease Fittings, 294", 8 Row 36/38 (Non-stock Item)
		Frame W/Grease Fittings, 357 1/2", 12 Row 30 (Non-stock Item)
	10641	Grease Fitting, 1/8" NPT
14.	A2493	Pin
15.	10404	Machine Bushing
16.	10007	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	10230	Lock Washer, 5/8"
17.	D3373	Eye Bolt
	10139	Washer, 1 1/4" USS
	10236	Lock Washer, 1 1/4"
	10239	Hex Nut, 1 1/4"-7
18.	D3311	Pin, 7/8" x 3 1/8"
	10457	Cotter Pin, 5/32" x 1 1/2"
19.	D7145	U-Bolt, 7" x 7" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
20.	A4775	Bracket, L.H. (Shown)
	A4776	Bracket, R.H.
21.	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
	10266	Female Terminal
	10269	Male Terminal
22.	D7152	Bracket
23.		See "SMV Sign, Decals, Reflectors And Tie Straps"
24.	10023	Hex Head Cap Screw, 1/4"-20 x 3/4"
	10110	Lock Nut, 1/4"-20
25.		See "Marker Sequencing/FLow Control Valve"
26.	D7976	Bracket
27.	10019	Hex Head Cap Screw, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
28.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10210	Washer, 3/8" USS
29.	D3373	Eye Bolt
30.	10641	Grease Fitting, 1/8" NPT
31.	D7972	Turnbuckle
32.	A5751	Hook
33.	D8769	Pin, 7/8" x 6 1/4"
	D8696	Pin, 7/8" x 5 3/4"
	10459	Cotter Pin, 3/16" x 1 1/2"
34.	10028	Hex Head Cap Screw, 3/4"-10 x 3"
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10
35.	D7948	Shaft, 2 1/8" x 20"
	10461	Cotter Pin, 3/8" x 3"
36.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
37.	D2200	Spade
38.	A5996	Spring Canister
39.	D3311	Pin, 7/8" x 3 1/8"
	10457	Cotter Pin, 5/32" x 1 1/2"
40.	A6055	Arm

TRANSPORT AND GROUND DRIVE WHEEL ASSEMBLY

PLA013/PLA015/HTA014

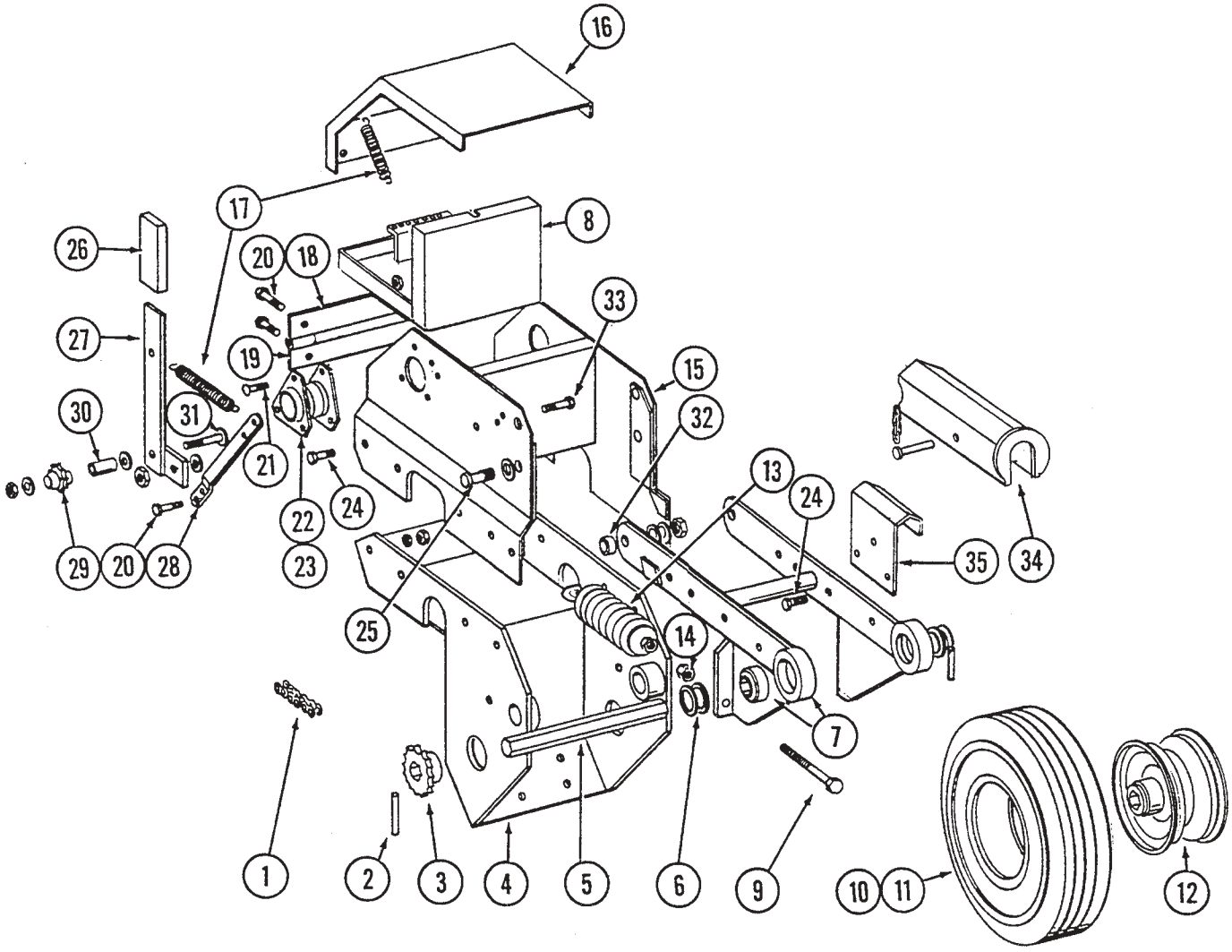


TRANSPORT AND GROUND DRIVE WHEEL ASSEMBLY

ITEM	PART NO.	DESCRIPTION
1.	10037	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
2.	10009	Hex Head Cap Screw, 5/8"-11 x 2 1/2"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
3.	A5121	Pin
4.	10008	Hex Head Cap Screw, 5/8"-11 x 2"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
5.	10139	Washer, 1 1/4" USS
6.	A5122	Wheel Tower Clamp
7.	A5124	Arm W/Pin, Clamp Grease Fittings And Spring Pins
	D5804	Pin, 1 1/4" x 12"
	A5123	Clamp
	10641	Grease Fitting, 1/8" NPT
	10610	Spring Pin, 3/8" x 2"
8.	D1166	Valve Stem
9.	A2142	Rim W/Valve Protector, 20" x 5.50"
10.	D6177	Tire, 7.50" x 20", 6 Ply, Tube Type Less Tube
	D4167	Tube, 7.50" x 20"
11.	A2558	Spindle
12.	A0895	Cone
13.	R0270	Lug Bolt, 9/16"-12
14.	A2148	Hub W/Cups, 6 Bolt
	R0434	Cup
15.	10087	Jam Nut, 1 1/2"-10
16.	10026	Hex Head Cap Screw, 3/4"-10 x 2"
	10231	Lock Washer, 3/4"
17.		See "Lift Cylinders"
18.	D5841	Pin, 1 1/4" x 5 5/8"
	10460	Cotter Pin, 1/4" x 2"
19.	10025	Hex Head Cap Screw, 3/4"-10 x 1 1/2"
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10
20.	D5845	Scraper Mount, L.H.
21.	D5846	Scraper Mount, R.H.
22.	D5847	Scraper Bar
23.	10313	Carriage Bolt, 1/2"-13 x 1 1/2"
	10228	Lock Washer, 1/2"
	10216	Washer, 1/2" USS
	10102	Hex Nut, 1/2"-13
A.	A2147	Hub And Spindle Assembly (Items 11-16)

CONTACT DRIVE WHEEL AND ARM ASSEMBLY

PLA014

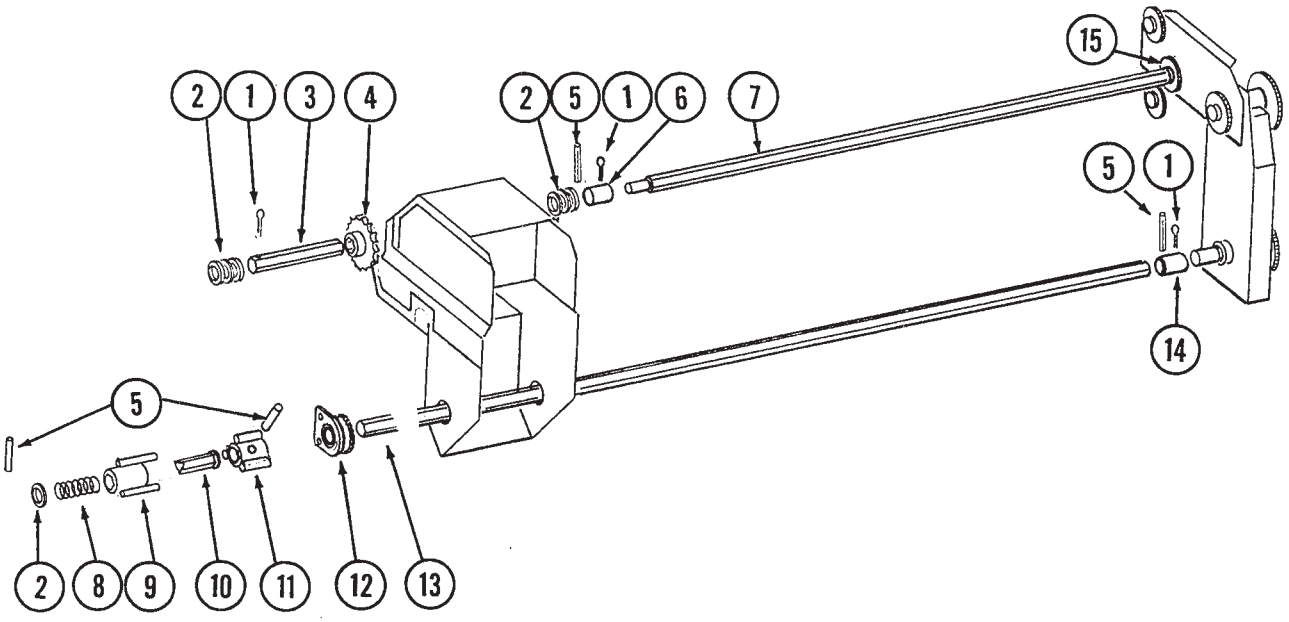


CONTACT DRIVE WHEEL AND ARM ASSEMBLY

ITEM	PART NO.	DESCRIPTION
1.	3310-132	Chain, No. 40, 132 Pitch Including Connector Link
	R0912	Connector Link, No. 40
2.	10602	Spring Pin, 1/4" x 1 1/2"
3.	A5105	Sprocket, 15 Tooth
4.		See "Transport And Ground Drive Wheel"
5.	D5797	Shaft, 7/8" x 10"
6.	10233	Machine Bushing, 1"
7.	A5120	Wheel Arm W/Bearings
	A5116	Bearing, 7/8" Hex Bore Cylindrical
8.	A4308	Tool Box Insert
9.	10051	Hex Head Adjusting Bolt, 1/2"-13 x 3", Grade 2
10.	D5753	Tire, 4.10" x 6"
11.	D5752	Tube
12.	A5089	Rim
13.	A2068	Spring
14.	10501	Jam Nut, 1/2"
15.	A5118	Mount
16.	A5182	Cover
17.	D5857	Spring
18.	D5790	Hinge, Male
19.	D5789	Hinge, Female
20.	10023	Hex Head Cap Screw, 1/4"-20 x 3/4"
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20
21.	10312	Carriage Bolt, 5/16"-18 x 3/4"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
22.	3400-01	Flangette
23.	2100-03	Bearing, 7/8" Hex Bore, Spherical
24.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
25.	10005	Hex Head Cap Screw, 5/8"-11 x 1 3/4"
	10235	Machine Bushing
	10205	Washer, 5/8" SAE
	10107	Lock Nut, 5/8"-11
26.	D5827	Cover
27.	A5157	Idler Arm, L.H.
	A5158	Idler Arm, R.H.
28.	D5860	Bar
29.	D7426	Idler Sprocket, 12 Tooth
30.	D1026	Sleeve
31.	10306	Carriage Bolt, 3/8"-16 x 2"
	10210	Washer, 3/8" USS
	10108	Lock Nut, 3/8"-16
32.	B0123	Bushing
33.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
	D5756	Special Nut
34.	A5761	Lockup W/Pin
35.	D7944	Mount
A.	A5090	Tire And Rim Assembly, Includes: (1)D5753, (1)D5752, (1)A5089

DRIVE LINE

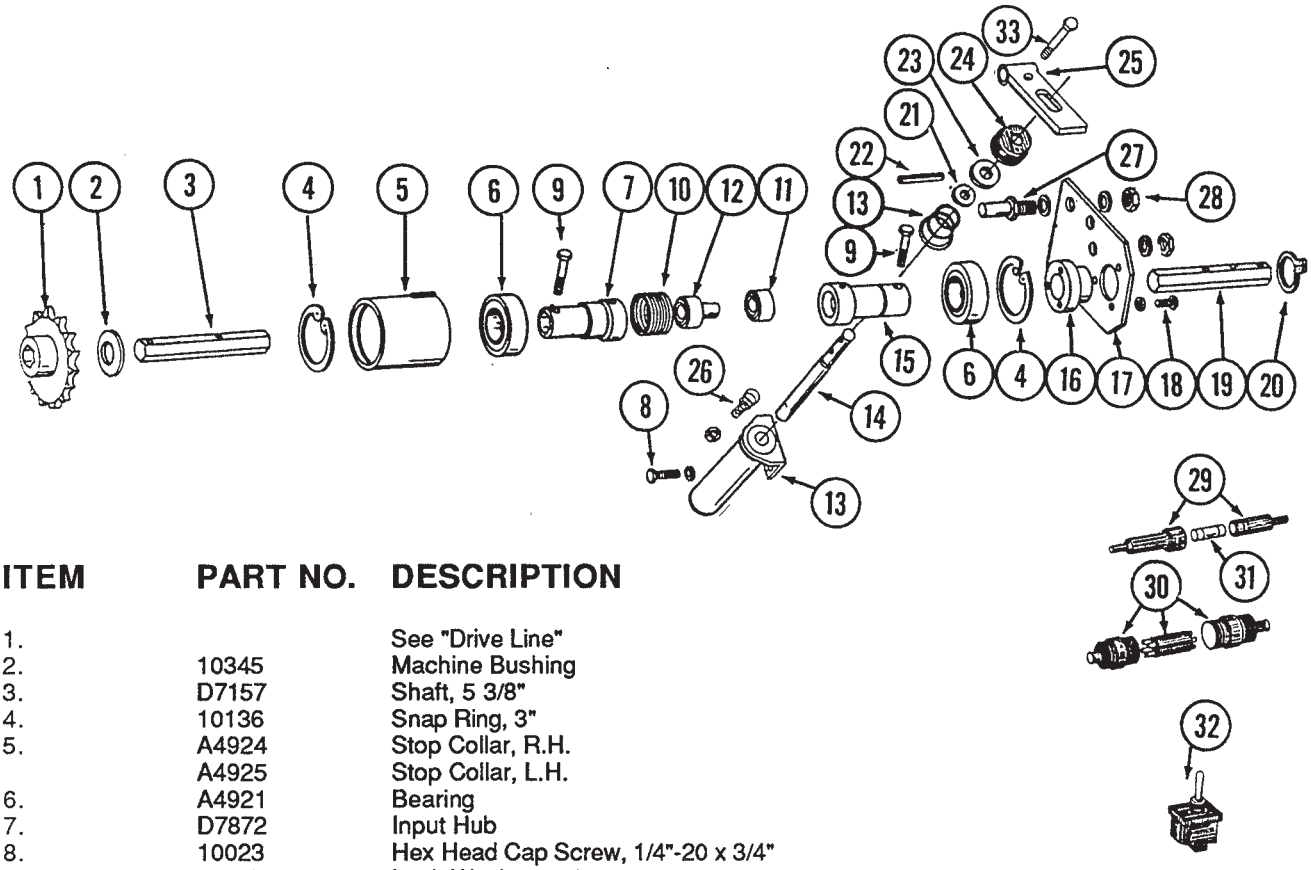
PTD036



ITEM	PART NO.	DESCRIPTION
1.	10460	Cotter Pin, 1/4" x 2"
2.	10233	Machine Bushing (As Required)
3.	D6622	Drive Shaft, 14 7/8"
4.	A5114	Sprocket, 30 Tooth
5.	10602	Spring Pin, 1/4" x 1 1/2"
6.	D5961	Coupler, 2 3/4"
7.	D8052	Drive Shaft, 16 1/2", 8 Row 30 And 12 Row 30
	D7989	Drive Shaft, 20 3/8", 8 Row 36/38
8.	D2962	Spring
9.	A2373	Coupler
10.	A2445	Drill Shaft, Main Frame, 49", L.H., 8 Row 30
	A2446	Drill Shaft, Main Frame, 60", R.H., 8 Row 30
	A2447	Drill Shaft, Main Frame, 63", L.H., 8 Row 36/38
	A2448	Drill Shaft, Main Frame, 73", R.H., 8 Row 36/38
	A2449	Drill Shaft, Main Frame, 79", L.H., 12 Row 30
	A2450	Drill Shaft, Main Frame, 90", R.H., 12 Row 30
11.	A2374	Coupler
12.	A2180	Hanger Bearing, 7/8" Hex
	A1720	Hanger Bearing/Sprocket, 7/8" Hex
13.	D6825-45.375	Drill Shaft, Wing, 8 Row 30
	D6825-59.75	Drill Shaft, Wing, 8 Row 36/38
	D6825-75.375	Drill Shaft, Wing, 12 Row 30
14.	D5886	Coupler
15.		See "Transmission Assembly"

POINT ROW WRAP SPRING CLUTCH (OPTIONAL)

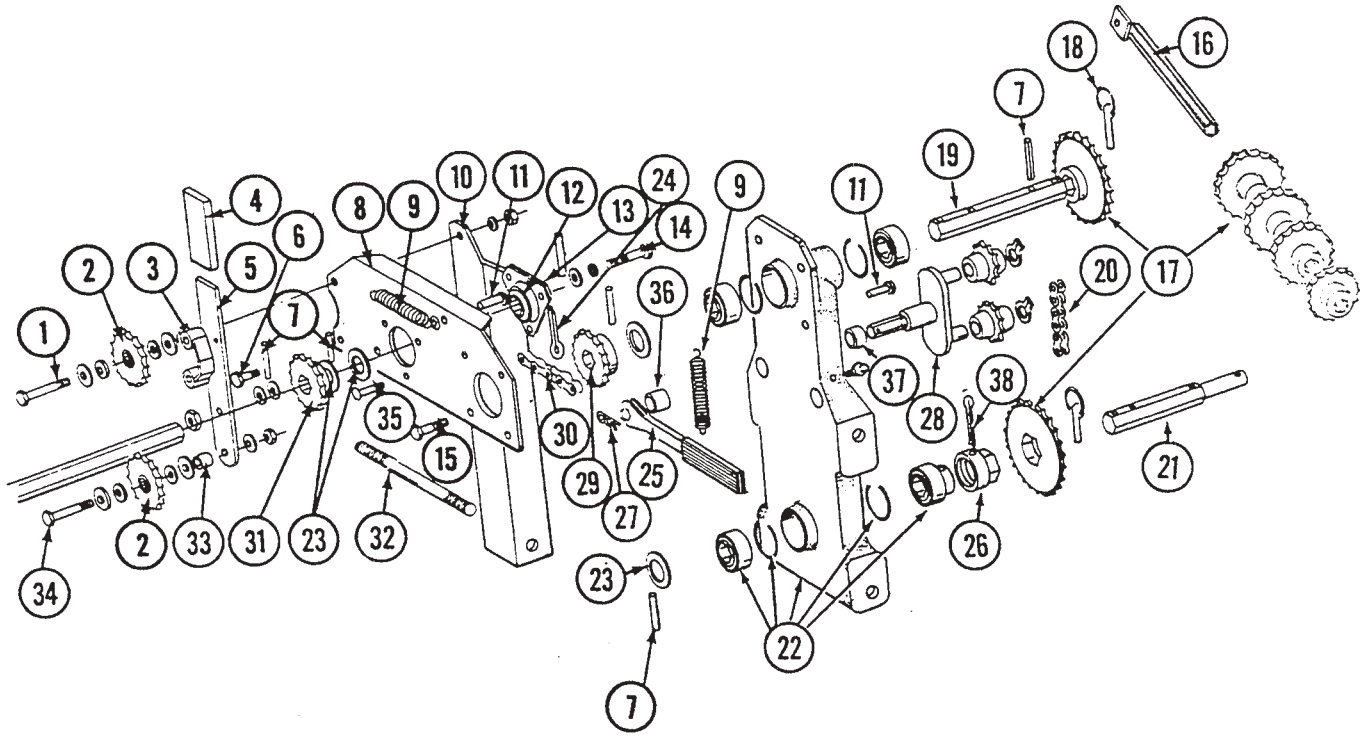
PRC016/ECP013



ITEM	PART NO.	DESCRIPTION
1.		See "Drive Line"
2.	10345	Machine Bushing
3.	D7157	Shaft, 5 3/8"
4.	10136	Snap Ring, 3"
5.	A4924	Stop Collar, R.H.
	A4925	Stop Collar, L.H.
6.	A4921	Bearing
7.	D7872	Input Hub
8.	10023	Hex Head Cap Screw, 1/4"-20 x 3/4"
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20
9.	10041	Hex Head Cap Screw, 5/16"-18 x 2"
	10109	Lock Nut, 5/16"-18
10.	D7306	Wrap Spring, CW, 2"
	D7305	Wrap Spring, CCW, 2"
11.	A4919	Bearing
12.	D8056	Pilot Pin
13.	A6086	Solenoid With Spring
	D8458	Spring
14.	D7623	Plunger
15.	D7873	Output Hub
16.	D7314	Bushing
17.	D7624	Plate
18.	10253	Hex Socket Head Screw, No. 10-32 x 1/2"
	10257	Lock Washer, No. 10
19.	D7339	Shaft, 8"
20.	10496	Snap Ring, External Inverted
21.	D8922	Bushing, .625" O.D. (.047" Thick) (Where Applicable)
22.	10187	Slotted Spring Pin, 5/32" x 2"
23.	10370	Machine Bushing, .812" O.D. (.031" Thick)
24.	R0646	Rubber Boot
25.	A5566	Actuator Arm
26.	D9216	Spring
27.	D7316	Mounting Pin
28.	10203	Washer, 3/8" SAE
	10229	Lock Washer, 3/8"
	10497	Hex Nut, 3/8"-16, Grade 2
29.	A1917	Fuse Holder
30.	A1911	Trailer Connector, 4 Prong
31.	D8253	Fuse, MDL-8
32.	A0533	Toggle Switch
33.	10040	Hex Head Cap Screw, 1/4"-20 x 1 3/4"
	10110	Lock Nut, 1/4"-20

TRANSMISSION ASSEMBLY

PTD040/PTD066/PTD041



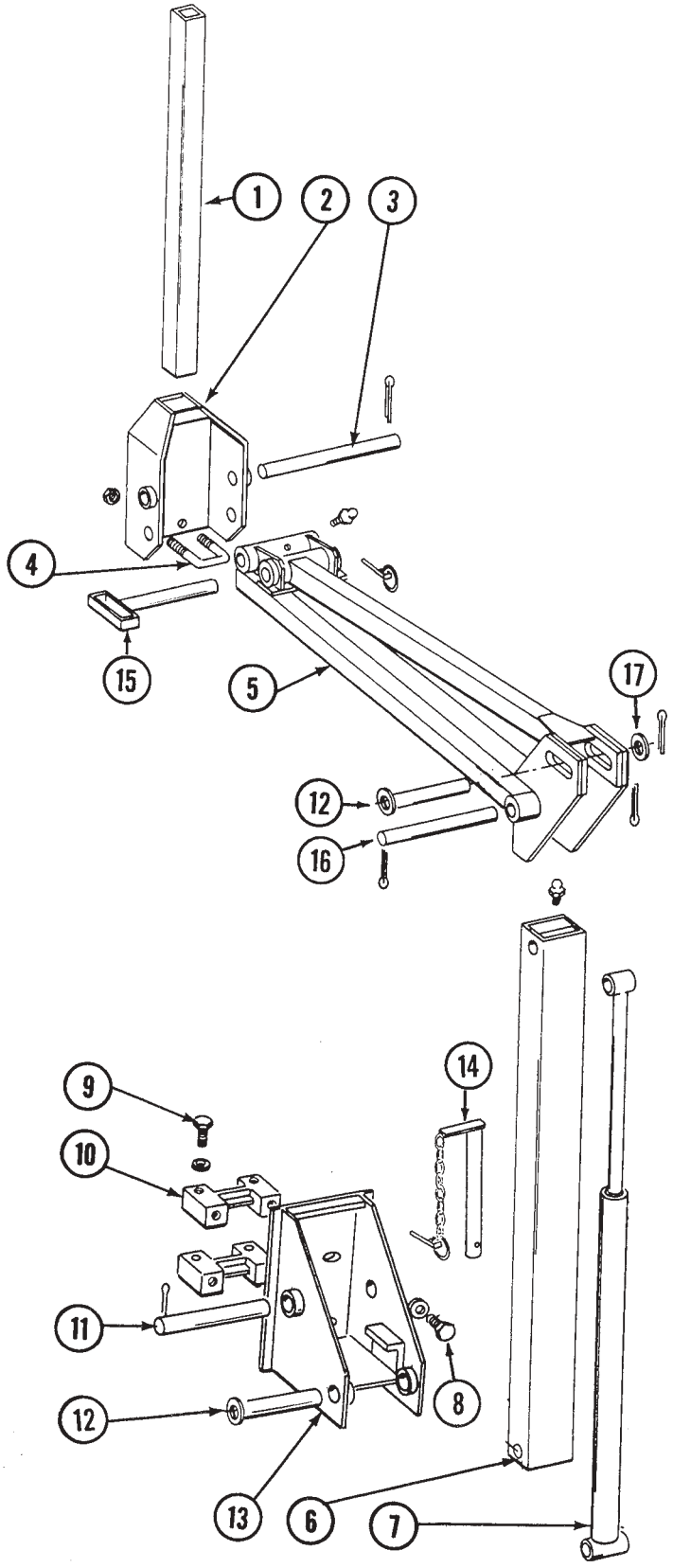
ITEM	PART NO.	DESCRIPTION
1.	10033	Hex Head Cap Screw, 1/2"-13 x 3 1/2"
	10216	Washer, 1/2" USS (Large)
	10128	Machine Bushing, 1/2" (Small)
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
2.	A5103	Idler Sprocket W/Bearing, 15 Tooth
3.	A4470	Idler Mount, R.H.
	A4469	Idler Mount, L.H.
4.	D5827	Cover
5.	D5829	Arm
6.	10053	Hex Head Cap Screw, 1/2"-13 x 2 1/2"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
7.	10602	Spring Pin, 1/4" x 1 1/2"
8.	D5824	Plate, R.H. (Shown)
	D5825	Plate, L.H.
9.	D5857	Spring
10.	D5830	Angle Support, R.H. (Shown)
	D5831	Angle Support, L.H.
11.	10478	Clevis Pin, 5/16" x 1"
	10409	Retaining Ring, 5/16"
12.	2100-03	Bearing, 7/8" Hex Bore, Spherical
13.	3400-01	Flangette

TRANSMISSION ASSEMBLY

ITEM	PART NO.	DESCRIPTION
14.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10210	Washer, 3/8" USS
	10203	Washer, 3/8" SAE
	D5756	Special Nut, 3/8"-16
15.	10037	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
16.	A5146	Sprocket Storage Rod
17.	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
18.	D2558	Lynch Pin, 1/4"
19.	D5835	Shaft, 7/8" x 7"
20.	3310-80	Chain, No. 40, 80 Pitch Including Connector Link
	R0912	Connector Link, No. 40
21.	D7822	Shaft, 7/8" x 7"
22.	A5629	Transmission Plate W/ Bearings, Grease Fittings And Retaining Rings
	A5116	Bearing, 7/8" Hex Bore, Cylindrical
	A5624	Special Bearing, 7/8" Hex Bore x 1.6"
	D6551	Ring
	10641	Grease Fitting, 1/8" NPT
23.	10233	Machine Bushing
24.	10460	Cotter Pin, 1/4" x 2"
25.	A4235	Ratchet Wrench W/Protective Closure
	10445	Protective Closure
26.	D7127	Shear Coupler
27.	10670	Hair Pin Clip, No. 3
28.	A5628	Idler W/Sprockets And Rings
	D7426	Sprocket
	10435	Ring
29.	A5106	Sprocket, 17 Tooth
	A5202	Sprocket, 34 Tooth (2 To 1 Drive Reduction)
30.	3310-89	Chain, No. 40, 89 Pitch Including Connector And Offset Link
	3310-08	Chain, No. 40, Used With 2 To 1 Drive Reduction
	R0911	Offset Link, No. 40
	R0912	Connector Link, No. 40
31.	A5105	Sprocket, 15 Tooth
32.	D6793	Stud, 5/8"-11 x 9 1/2" (Threaded both ends)
	10230	Lock Washer, 5/8"
	10107	Hex Nut, 5/8"-11
33.	D4887-03	Sleeve, 3/4"
34.	10016	Hex Head Cap Screw, 1/2"-13 x 2"
	10216	Washer, 1/2" USS (Large)
	10128	Machine Bushing, 1/2" (Small)
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
35.	10303	Carriage Bolt, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
36.	D6819	Idler Sleeve, 7/16"
37.	D2734-01	Sleeve, 1/2"
38.	10462	Cotter Pin, 3/16" x 2"

LOW-PROFILE TWO-FOLD MARKER ASSEMBLY
8 ROW 30

MKR007/MKR008/MKR011

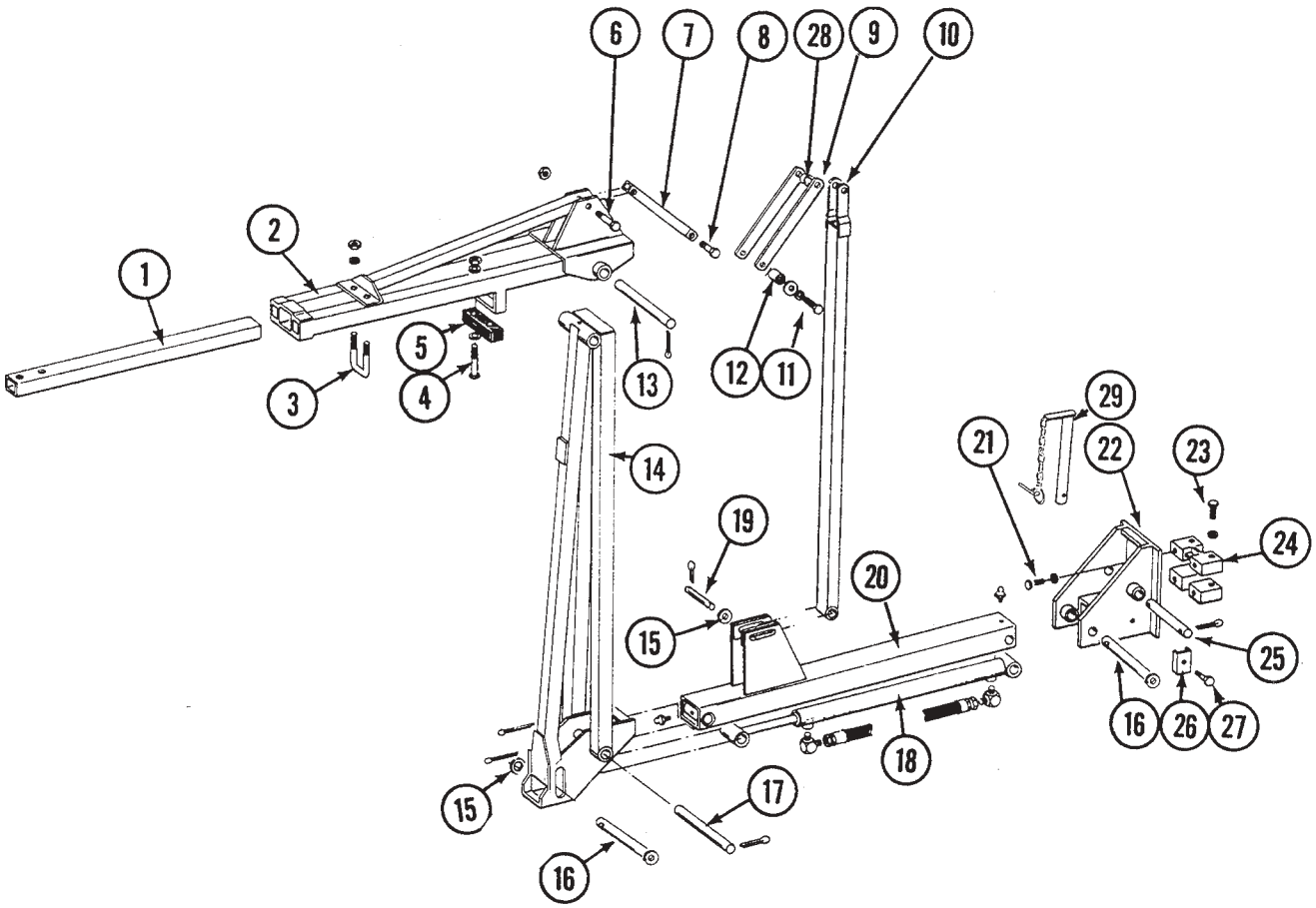


LOW-PROFILE TWO-FOLD MARKER ASSEMBLY
8 ROW 30

ITEM	PART NO.	DESCRIPTION
1.	D0453-03	Extension Tube, 50"
2.	A2492	Bracket
3.	D2697	Pin, 7/8" x 11"
	10463	Cotter Pin, 1/4" x 1 1/2"
4.	D2721	U-Bolt, 2" x 2" x 1/2"-13
	10111	Lock Nut, 1/2"-13
5.	A2487	Arm W/ Grease Fitting, 43"
	10641	Grease Fitting, 1/8" NPT
6.	A2482	Link W/Grease Fittings, First Stage, 44"
	10641	Grease Fitting, 1/8" NPT
7.		See "Marker Cylinder"
8.	10008	Hex Head Cap Screw, 5/8"-11 x 2", Grade 2
	10230	Lock Washer, 5/8"
9.	10026	Hex Head Cap Screw, 3/4"-10 x 2"
	10231	Lock Washer, 3/4"
10.	B0177	Tap Block
11.	D0652	Pin, 1 1/4" x 9 1/2"
	10460	Cotter Pin, 1/4" x 2"
12.	A6532	Pin, 1 1/4" x 7 5/8"
	10460	Cotter Pin, 1/4" x 2"
13.	A5764	Mount, R. H.
	A5765	Mount, L.H.
14.	A5900	Pin W/Split Ring And Pin
	D8280	Split Ring
	D2558	Lynch Pin, 1/4"
15.	A2498	Pin W/Handls
	D2558	Lynch Pin, 1/4"
16.	D3214	Pin, 1 1/4" x 12 1/4"
	10460	Cotter Pin, 1/4" x 2"
17.	10226	Washer, 1 1/4" SAE

LOW-PROFILE THREE-FOLD MARKER ASSEMBLY
8 ROW 36/38 AND 12 ROW 30

MKR008/MKR012/MKR021



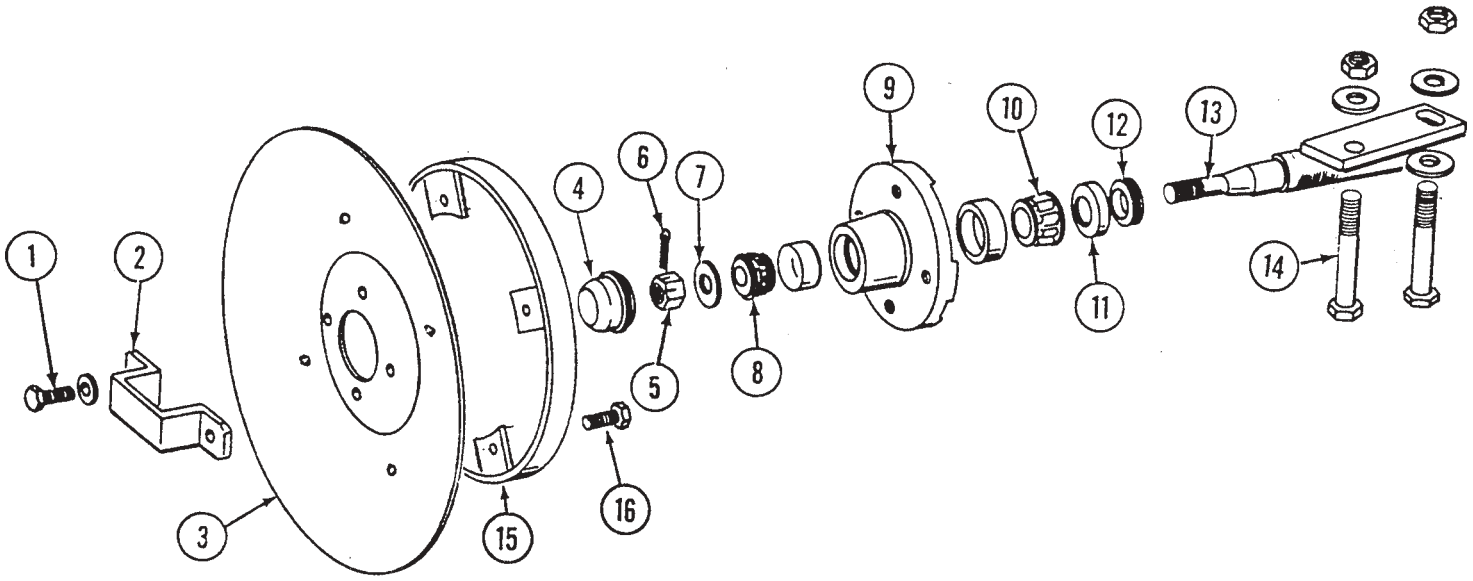
ITEM	PART NO.	DESCRIPTION
1.	D0453-07	Extension Tube, 45", 8 Row 36/38
	D0453-03	Extension Tube, 50", 12 Row 30
2.	A4905	Arm, Third Stage, 19 1/2", 8 Row 36/38
	A4887	Arm, Third Stage, 35", 12 Row 30

LOW-PROFILE THREE-FOLD MARKER ASSEMBLY
8 ROW 36/38 AND 12 ROW 30

ITEM	PART NO.	DESCRIPTION
3.	D2721	U-Bolt, 2" x 2" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
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 Spacer
	D7902	Spacer Bar (Not Shown)
6.	10010	Hex Head Cap Screw, 5/8"-11 x 3"
	10107	Lock Nut, 5/8"-11
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.	D8290	Bar
10.	A4910	Linkage Tube W/Grease Fitting, 54 3/4", 8 Row 36/38
	A4893	Linkage Tube W/Grease Fitting, 72 3/4", 12 Row 30
	10641	Grease Fitting, 1/8" NPT
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 W/Grease Fitting, Second Stage, 60", 8 Row 36/38
	A4885	Arm W/Grease FItting, Second Stage, 78", 12 Row 30
	10641	Grease Fitting, 1/8" NPT
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 "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"
21.	10008	Hex Head Cap Screw, 5/8"-11 x 2", Grade 2
	10230	Lock Washer, 5/8"
22.	A5764	Mount, R.H.
	A5765	Mount, L.H.
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, 1/2"
29.	A5900	Pin W/Split Ring And Lynch Pin
	D8280	Split Ring
	D2558	Lynch Pin, 1/4"

MARKER SPINDLE/HUB/BLADE

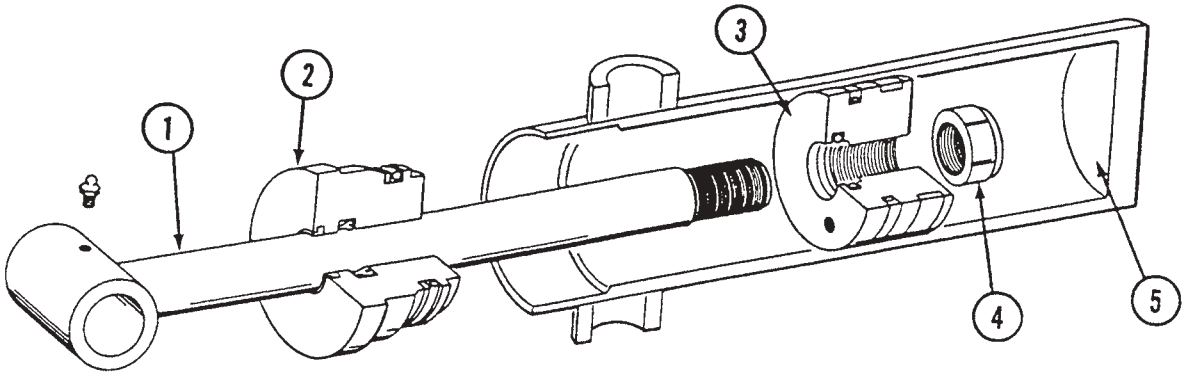
MKR020



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 Row 36/38 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)

MASTER LIFT CYLINDER

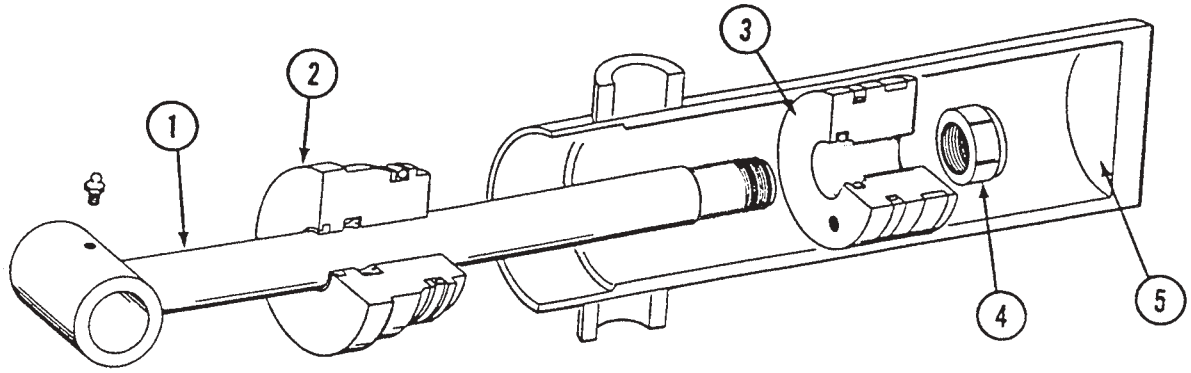
CYL038



ITEM	PART NO.	DESCRIPTION
1.	A4320	Rod Assembly W/Grease Fitting
	10449	Grease Fitting
2.	D5947	Gland
3.	A4296	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacment Kit (Set Screw, Guide, Spring And Ball)
4.	R0983	Lock Nut, 1"-14
5.	A4295	Barrel
A.	A4257	Cylinder Complete, 3 1/2" x 8" (Part No. Stamped On Barrel)
B.	R0982	Seal Kit, Includes: (1)Wear Ring, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper, (1)Uniring

MASTER LIFT CYLINDER

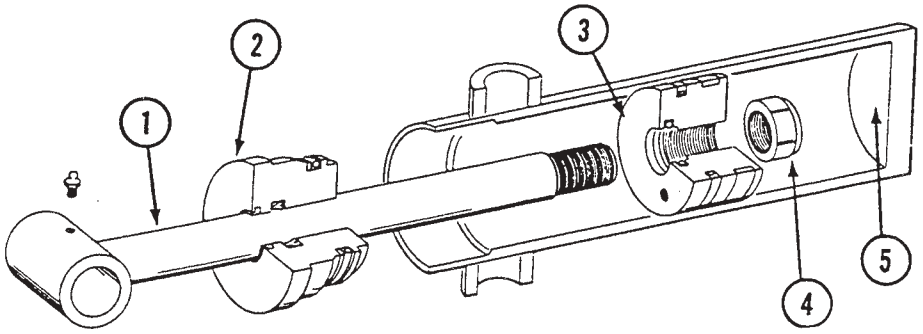
CYL038



ITEM	PART NO.	DESCRIPTION
1.	A6137	Rod Assembly W/Grease Fitting
	10449	Grease Fitting
2.	D5947	Gland
3.	A6135	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacement Kit (Set Screw, Guide, Spring And Ball)
4.	R0983	Lock Nut, 1"-14
5.	A4295	Barrel
A.	A6120	Cylinder Complete, 3 1/2" x 8" (Part No. Stamped On Barrel)
B.	R0982	Seal Kit, Includes: (1)Wear Ring, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper, (1)Uniring

SLAVE LIFT CYLINDER

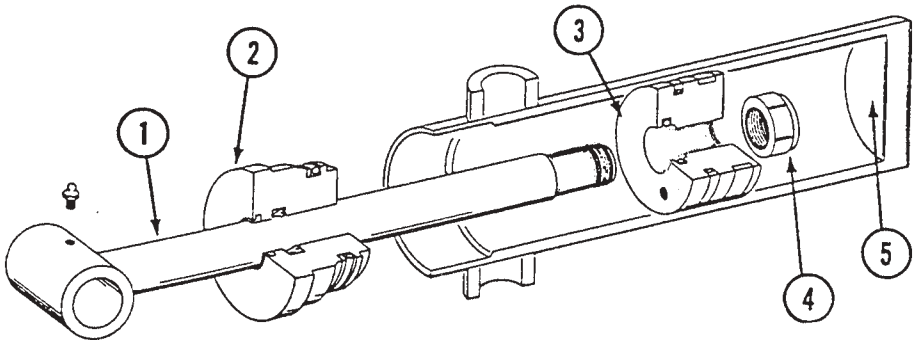
CYL038



ITEM	PART NO.	DESCRIPTION
1.	A4320	Rod Assembly W/Grease Fitting
	10449	Grease Fitting
2.	D5946	Gland
3.	A4298	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacement Kit (Set Screw, Guide, Spring And Ball)
4.	R0983	Lock Nut, 1"-14
5.	A4297	Barrel
A.	A4258	Cylinder Complete, 3 1/4" x 8" (Part No. Stamped On Barrel)
B.	R0984	Seal Kit, Includes: (2)O-Ring, (1)BU Ring, (1)Wear Ring, (1)Rod Wiper, (1)Uniring, (1)U-Cup

SLAVE LIFT CYLINDER

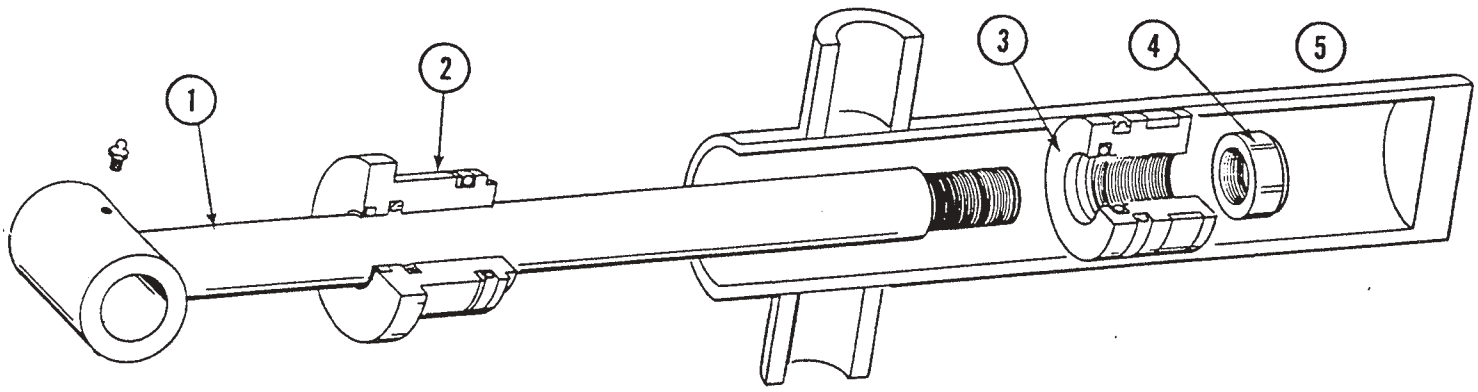
CYL038



ITEM	PART NO.	DESCRIPTION
1.	A6137	Rod Assembly W/Grease Fitting
	10449	Grease Fitting
2.	D5946	Gland
3.	A6134	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacement Kit (Set Screw, Guide, Spring And Ball)
4.	R0983	Lock Nut, 1"-14
5.	A4297	Barrel
A.	A6119	Cylinder Complete, 3 1/4" x 8" (Part No. Stamped On Barrel)
B.	R0984	Seal Kit, Includes: (2)O-Ring, (1)BU Ring, (1)Wear Ring, (1)Rod Wiper, (1)Uniring, (1)U-Cup

LIFT ASSIST CYLINDER

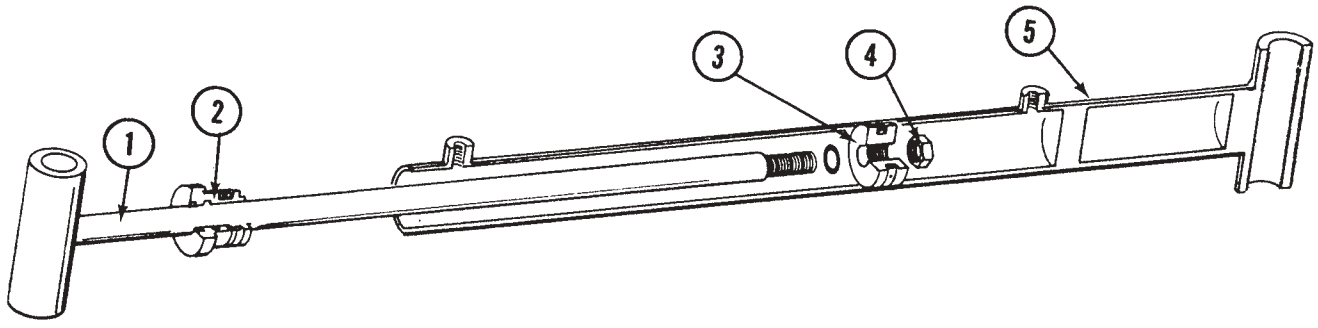
CYL026



ITEM	PART NO.	DESCRIPTION
1.	A4322	Rod Assembly W/Grease Fitting
	10449	Grease Fitting
2.	D5954	Gland
3.	D5956	Piston
4.	R0923	Special Jam Nut, 1"-14
5.	A5455	Barrel
A.	A5093	Cylinder Complete, 2 1/2" x 8"
B.	R0930	Seal Kit, Includes: (1)Wear Ring, (1)T-Seal, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper

MARKER CYLINDER

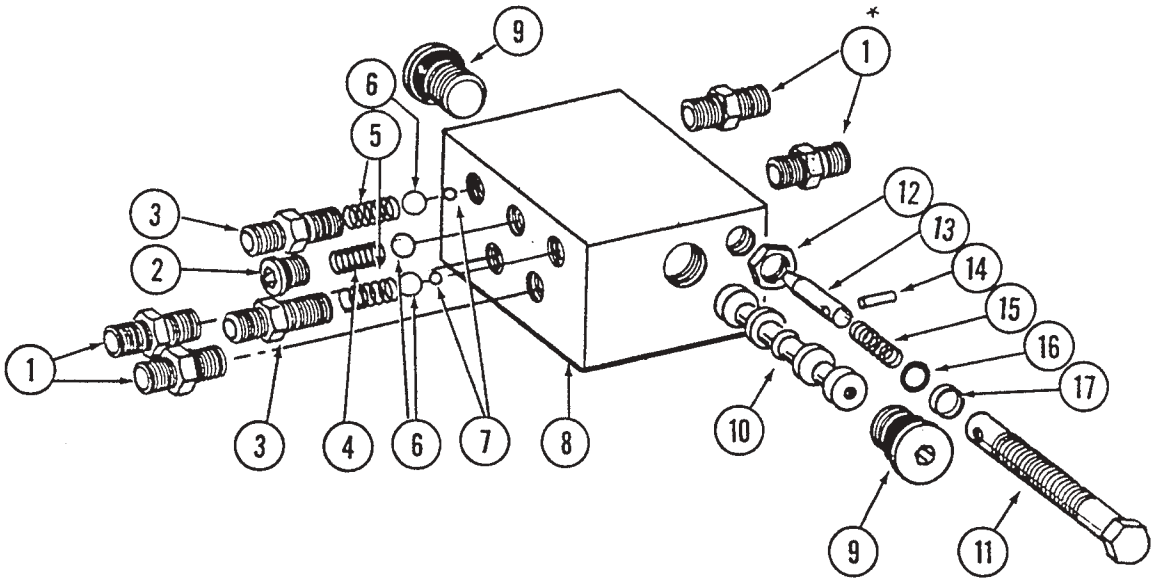
CYL039



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-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper

MARKER SEQUENCING/FLOW CONTROL VALVE

VVB025

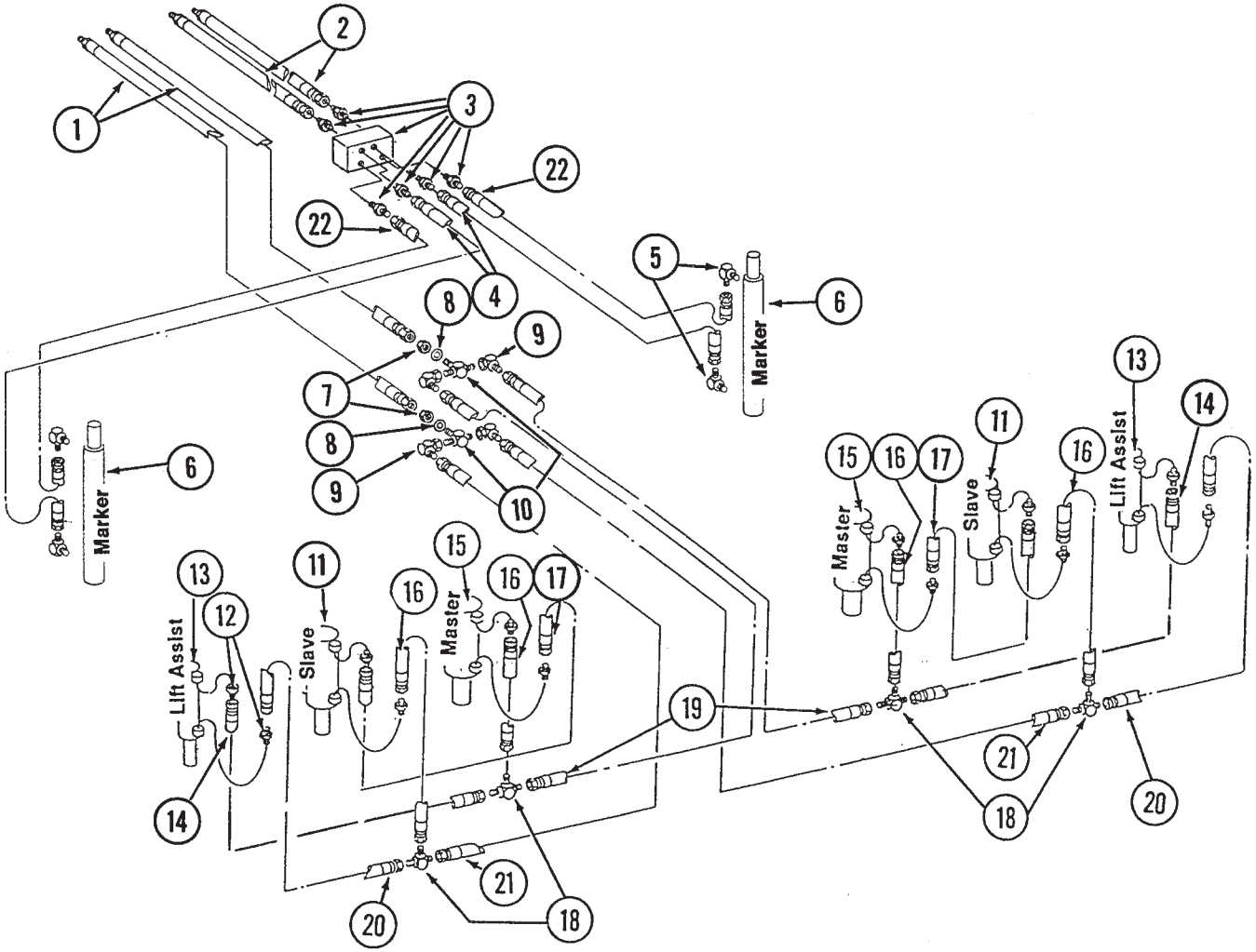


ITEM	PART NO.	DESCRIPTION
1.	6400-06	Connector, 9/16"-18 Male 37° JIC to 9/16"-18 O-Ring *
	R1045	O-Ring
2.	R1034	Hex Socket O-Ring Plug
	R1035	O-Ring
3.	R1032	Port Adapter
	R1045	O-Ring
4.	R1033	Detent Spring
5.	R1036	Spring
6.	R1044	7/16" Check Ball
7.	R1043	1/4" Steel Ball
8.		Valve Body (Non-stock 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.

HYDRAULIC SYSTEM

PHS036

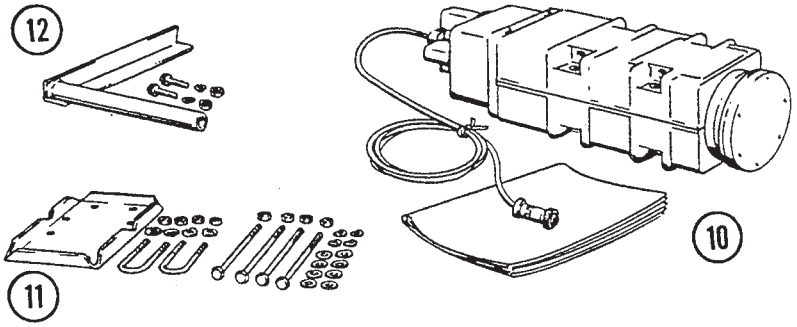


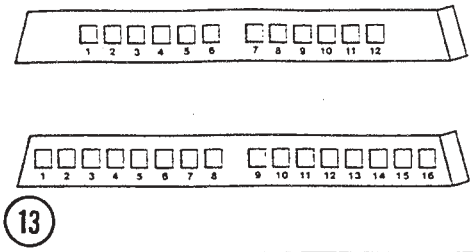
HYDRAULIC SYSTEM

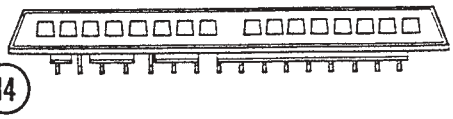
ITEM	PART NO.	DESCRIPTION
1.	A1075	Hose Assembly, 3/8" x 156", 8 Row 30/36/38 And 12 Row 30
2.	A3166	Hose Assembly, 3/8" x 152", 8 Row 30/36/38 And 12 Row 30
3.		See "Marker Sequencing/Flow Control Valve" And "Hitch And Frame Assembly"
4.	A3169	Hose Assembly, 3/8" x 196", 8 Row 30
	A3168	Hose Assembly, 3/8" x 222", 8 Row 36/38
	A3167	Hose Assembly, 3/8" x 255", 12 Row 30
5.	6801-08	Adjustable Elbow, 3/4"-16 Male JIC to 3/4"-16 O-Ring
6.		See "Marker Cylinder"
7.	306-08	Lock Nut, 3/4"-16
8.	10215	Machine Bushing
9.	6500-08	Swivel Elbow, 3/4"-16 Male JIC to 3/4"-16 Female JIC
10.	2703-08	Bulkhead Tee, 3/4"-16 Male JIC
11.		See "Slave Lift Cylinder"
12.	6400-08	Connector, 3/4"-16 Male O-Ring to JIC
13.		See "Lift Assist Cylinder"
14.	A3131	Hose Assembly, 3/8" x 84", 8 Row 30
	A1092	Hose Assembly, 3/8" x 104", 8 Row 36/38
	A3115	Hose Assembly, 3/8" x 146", 12 Row 30
15.		See "Master Lift Cylinder"
16.	A1000	Hose Assembly, 3/8" x 15"
17.	A1022	Hose Assembly, 3/8" x 60", 8 Row 30
	A1055	Hose Assembly, 3/8" x 66", 8 Row 36/38
	A1006	Hose Assembly, 3/8" x 90", 12 Row 30
18.	2603-08	Tee, 3/4"-16 Male JIC
19.	A1022	Hose Assembly, 3/8" x 60", 8 Row 30 And 12 Row 30
	A1055	Hose Assembly, 3/8" x 66", 8 Row 36/38
20.	A3128	Hose Assembly, 3/8" x 52", 8 Row 30
	A3127	Hose Assembly, 3/8" x 58", 8 Row 36/38
	A1006	Hose Assembly, 3/8" x 90", 12 Row 30
21.	A1006	Hose Assembly, 3/8" x 90", 8 Row 30
	A1092	Hose Assembly, 3/8" x 104", 8 Row 36/38
	A1010	Hose Assembly, 3/8" x 120", 12 Row 30
22.	A3172	Hose Assembly, 3/8" x 205", 8 Row 30
	A3174	Hose Assembly, 3/8" x 235", 8 Row 36/38
	A3173	Hose Assembly, 3/8" x 267", 12 Row 30

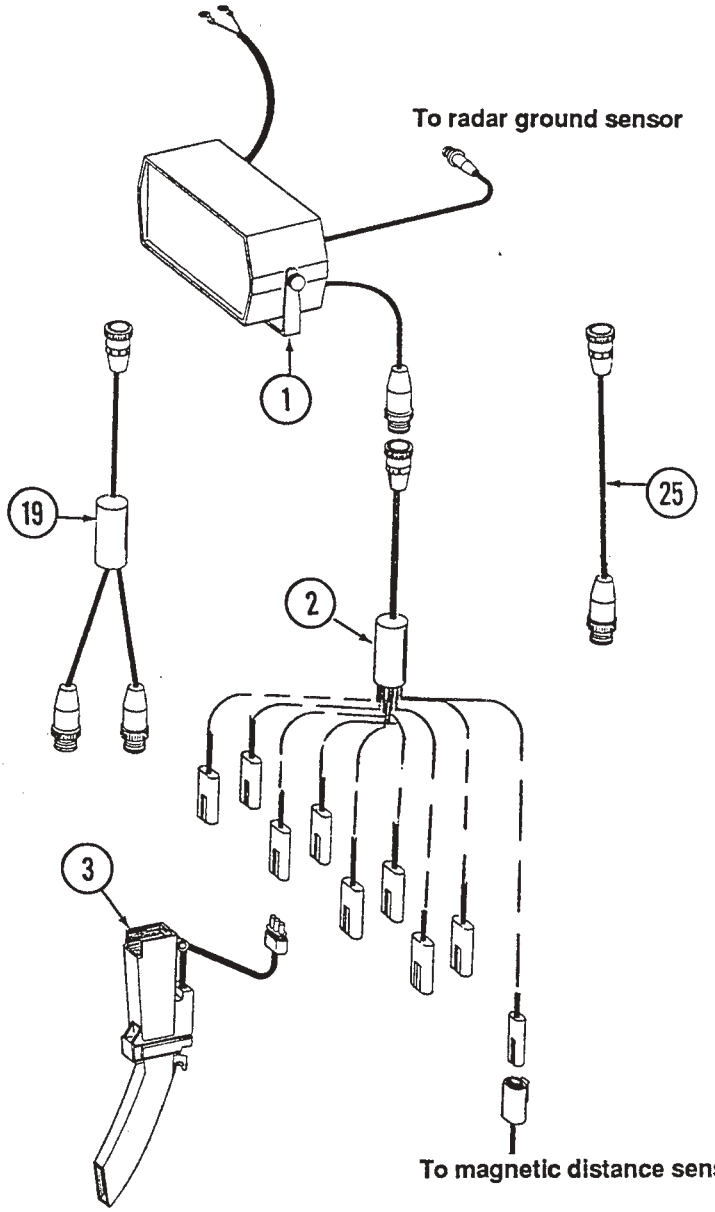
ELECTRONIC SEED MONITOR

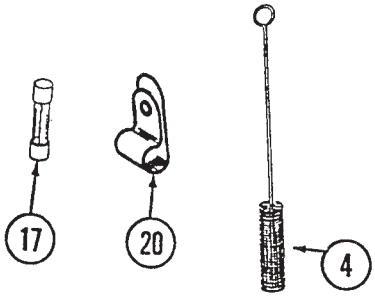
ECP017/D-0640-0001/D-0640-0003/D-0640-0004/D-1172-0001/D-1172-0002/ECP019/ECP020/ECP021/ECP022

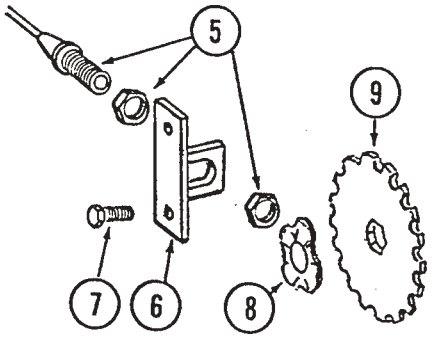


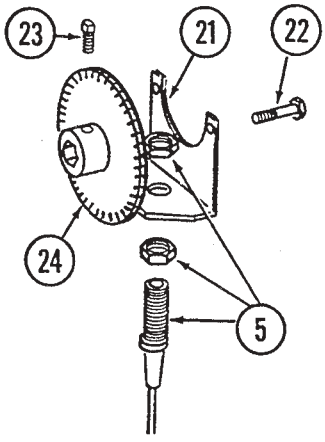










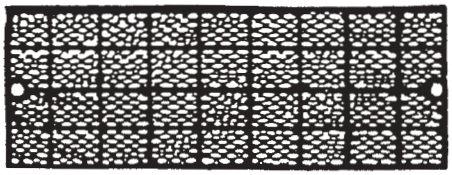


ELECTRONIC SEED MONITOR

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
3.	A5880	Seed Tube W/High Rate Sensor
	R1062	Seed Tube (With holes for high rate sensor installation)
	R1087	Sensor Only (For A5880)
4.	R0594	Brush
5.	A5600	Magnetic Distance Sensor (Used W/KM3000 Console Only)
6.	D8770	Bracket
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.	D8771	Spring Wave Washer
9.	D8751	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.	R1082	KM1000 Bezel Decal, 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)
19.	A6045	Y-Connector, 8 Row
	A5883	Y-Connector, 12 Row
20.	D6291	Insulated Clamp
21.	D7632	Magnetic Distance Sensor Bracket
22.	10171	Hex Head Cap Screw, 5/16"-18 x 1 1/4"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
23.	10145	Set Screw, 5/16"-18 x 1/2"
24.	A5549	Magnetic Distance Sensor Pulse Wheel W/Hub (Used W/KM3000 Console Only)
25.	A5881	Extension Cable, 15', 1-32 Rows

SMV SIGN, DECALS, REFLECTORS AND TIE STRAPS

2



3

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

4

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.

5

WARNING

TO AVOID INJURY- -

Always use the hydraulic cylinder ***safety lockout channel*** when ***servicing*** planter in raised position or when ***transporting*** planter on the road. After use return to storage location.

6

KINZE®

7

WARNING

TOW ONLY WITH FARM TRACTOR.

7100-76

8

WARNING

RAISE PLANTER COMPLETELY AND INSTALL CYLINDER LOCK-UPS BEFORE FOLDING. FOLD ON LEVEL GROUND. SECURE WINGS WITH SAFETY LATCHES BEFORE TOWING IN FOLDED POSITION.

7100-66

9

WARNING

ALWAYS LATCH WINGS AND INSTALL TRANSPORT PINS IN LATCHES BEFORE TRANSPORTING. WINGS MAY SWING OUT IF NOT PROPERLY LATCHED.

7100-71

10

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.

11

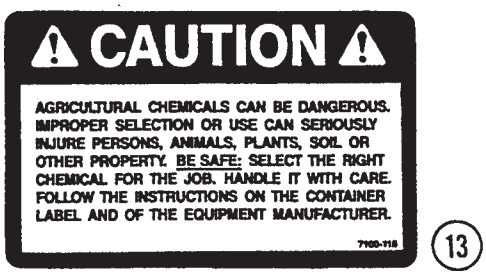
WARNING

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

12

SMV SIGN, DECALS, REFLECTORS AND TIE STRAPS



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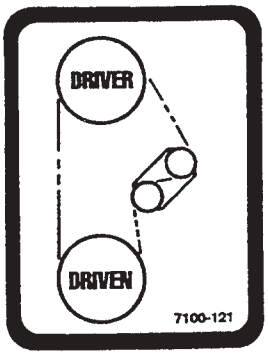

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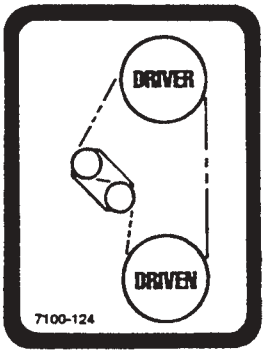

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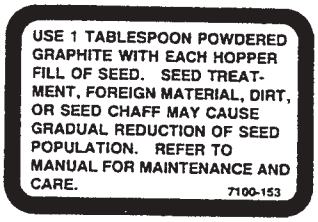

17

18

19

20

ITEM	PART NO.	DESCRIPTION
1.	R0155	Blue Paint, Aerosol (Not Shown)
	R0439	Blue Paint, Quart (Not Shown)
	R0440	Blue Paint, Gallon (Not Shown)
2.	D1162	Tie Strap, 28"
	D1512	Tie Strap, 6"
	D2117	Tie Strap, 14 1/2"
	D2984	Tie Strap, 33"
3.	7200-03	Reflector, Red
	7200-04	Reflector, Amber
4.	7100-42	Decal, Warning
5.	7100-46	Decal, Caution
6.	7100-47	Decal, Warning
7.	7100-54	Decal, KINZE, 4 3/16" x 17 3/16"
8.	7100-56	Decal, Warning
9.	7100-66	Decal, Warning
10.	7100-71	Decal, Warning
11.	7100-89	Decal, Danger
12.	7100-90	Decal, Warning
13.	7100-115	Decal, Caution
14.	7100-121	Decal, Transmission
15.	7100-124	Decal, Transmission
16.	7100-144	Decal, Logo
17.	7100-153	Decal, Information
18.	7100-155	Decal, Instruction
19.	7100-158	Decal, 2200
20.	D2199	SMV Sign
21.	7100-178	Decal, Econo-Fold®, 3/4" x 3"
22.	7100-182	Decal, Meter Alignment

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