MODEL 2300
TWIN-LINE® PLANTER

OPERATOR & PARTS MANUAL

M0148 Rev. 10/92

This manual is applicable to: Model: 2300 Twin-Line® Planters

Serial Number: 600000 and on

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

Model Number _____

Serial Number _____

Date Purchased _____

PREDELIVERY/DELIVERY CHECK LIST

TO THE DEALER

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

PREDELIVERY CHECK LIST

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

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

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

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

❑ Check all drive chains for proper tension and alignment.

❑ Check for oil leaks and proper hydraulic operation.

❑ 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.

❑ Be sure all hydraulic cylinder lockups are on the planter and correctly located.(If applicable)

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 _____

Rev. 10/91

Tear Along Perforation

DELIVERY CHECK LIST

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

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

❑ Tell the customer about all the safety precautions.

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

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

❑ Read warranty to customer.

❑ Complete Warranty And Delivery Report Form.

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

_____

(Signature of Delivery Person/Date)

AFTER DELIVERY CHECK LIST

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

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

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

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

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

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

_____

(Signature of Follow-up Person/Date)

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

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TO THE OWNER

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

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

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

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

NOTE: Indicates a special point of information.

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

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

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

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

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

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

WARRANTY

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

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

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

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

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

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

INTRODUCTION

The Model 2300 Twin-Line® planter is available in various configurations and row spacings. Optional interplant row spacing is obtainable with the addition of push type row units.

The Model 2300 Twin-Line® planter permits installation of liquid or dry fertilizer application equipment and various row unit attachments.

60620-63

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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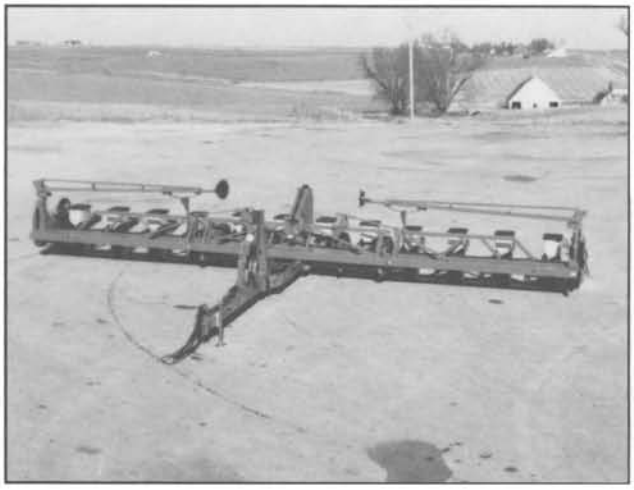


SERIAL NUMBER

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.

48618-29

SPECIFICATIONS

TYPE - Pull Type (Hydraulically rotates endwise to transport)

PLANTING UNIT TYPES - Push and Pull Type Row Units

ROW SPACING

Standard	Interplant
8 Row Narrow - 30" Rows	15 - 15" Rows
8 Row Wide - 36"or 38" Rows	15 - 18" or 19" Rows
12 Row Narrow - 30" Rows	23 - 15" Rows
12 Row Wide - 36" Rows	23 - 18" Rows
12 Row Wide - 38" Rows	23 - 19" Rows
16 Row Narrow - 30 " Rows	31 - 15" Rows

DRIVE SYSTEM

Spring-loaded contact drive system.
7.50 x 20, 6 ply, rib implement wing tire - two on 8 and 12 row, four on 16 row.
4.8 x 8, 6 ply, rib implement contact drive tire - two on 8 and 12 row, four on 16 row.
No. 40 roller chain and spring-loaded idlers.
Point row clutches standard on 12 and 16 row models and optional on 8 row models.
7/8" hex drill and drive shafts and end mounted seed transmissions.

TRANSPORT TIRES

8 and 12 row models are equipped with four 7.50 x 20, load rated D, bias ply tires.
16 row model is equipped with four 7.50 x 20, load rated E, bias ply tires.
Adjustable height wheels for ridge planting.

TYPE LIFT

Master/slave hydraulics.
8 and 12 row - 2 master cylinders, 1 slave cylinder per wing wheel module (2 slave).
16 row - 2 slave cylinders, 1 master cylinder per wing wheel module (4 master).

MARKERS - Independently controlled. 8 row wide and larger utilize depth band on marker disc.

Dimensions/Operating

PLANTER SIZE	8 Row 30"	8 Row 36"/38"	12 Row 30"	12 Row 36"	12 Row 38"	16 Row 30"
WIDTH	21' 2	26' 6"	31' 2"	37' 2"	39' 2"	41' 2"
LENGTH* "Y" Hitch	19' 3"	20' 3"	21' 11"	25' 3"	25' 3"	25' 3"
LENGTH* Narrow "T" Hitch	17' 3"	18' 3"	19' 11"	23' 3"	23' 3"	23' 3"

SPECIFICATIONS

Dimensions/Transport

PLANTER SIZE	8 Row 30"	8 Row 36"/38"	12 Row 30"	12 Row 36"	12 Row 38"	16 Row 30"
WIDTH Std., fertilizer or push units	11' 2"	13' 4"	11' 2"	13' 4"	13' 4"	11' 2"
WIDTH Push unit with no-till coulters	12' 4"	13' 4"	12' 4"	13' 4"	13' 4"	12' 4"
LENGTH	26' 9"	31' 8"	37' 10"	43' 1"	44' 4"	47' 10"
HEIGHT	10' 4"	10' 4"	10' 4"	10' 8"	10' 8"	11' 0"

PLANTER SIZE	8 Row 30"	8 Row 36"/38"	12 Row 30"	12 Row 36"	12 Row 38"	16 Row 30"
*WEIGHT	10,478 lbs.	11,136 lbs.	12,206 lbs.	12,844 lbs.	12,884 lbs.	14,940 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 or when rotating the planter.**

60355-50

Tongue Safety Pin

48496-11

Manual Safety Lockup

⚠ **Always install tongue safety pin and manual safety lockup before transporting planter.**

⚠ **Never work under the planter while in raised position without using manual safety lockup.**

⚠ **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.**

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

60355-10

⚠ **Install lockup brackets on markers prior to towing the planter or working around the unit.**

⚠ **Limit towing speed to 15 MPH. Tow only with farm tractor of at least 90 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.**

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

⚠ **On wide row models the two outer transport wheels are bolt-on to allow legal width truck shipment. Install outer transport wheel assemblies prior to unloading. DO NOT REMOV E THESE ASSEMBLIES AFTER PLANTER IS ASSEMBLED FOR USE. DO NOT fold planter or tow planter while the two outer transport wheels are removed. Tipping may occur because of narrow wheel base.**

SAFETY PRECAUTIONS ⚠

⚠ Avoid transporting planter with hoppers loaded whenever possible. When it is necessary to transport the planter with the hoppers loaded, the added weight should be distributed evenly on the planter frame before rotating the 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!

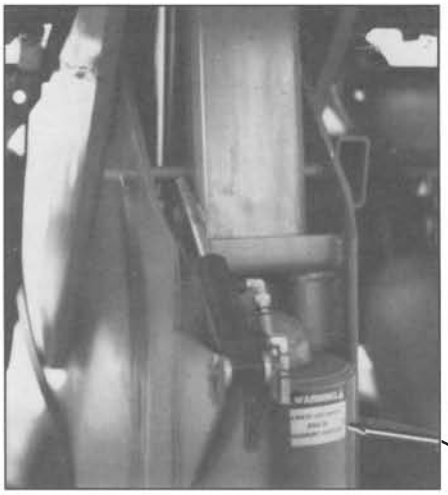
• Keep these signs clean so they can be readily observed. Wash with soap and water or cleaning solution as required.

• 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.

48496-11



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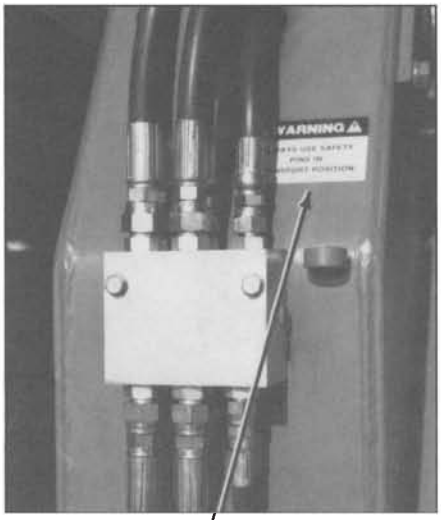


60355-24

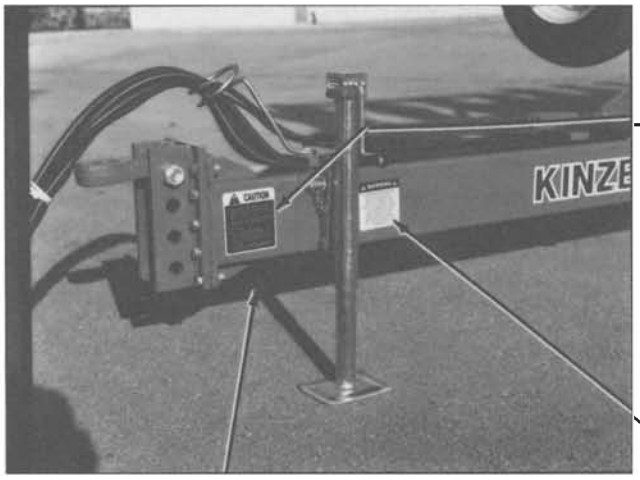
⚠ WARNING ⚠

ALWAYS USE SAFETY
PINS IN
TRANSPORT POSITION

Part No. 7100-02

SAFETY WARNING SIGNS ⚠

60355-49



⚠ CAUTION

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

Part No. 7100-46

⚠ WARNING

TOW ONLY WITH FARM TRACTOR.

Part No. 7100-56

⚠ WARNING ⚠

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

7100-90

Part No. 7100-90

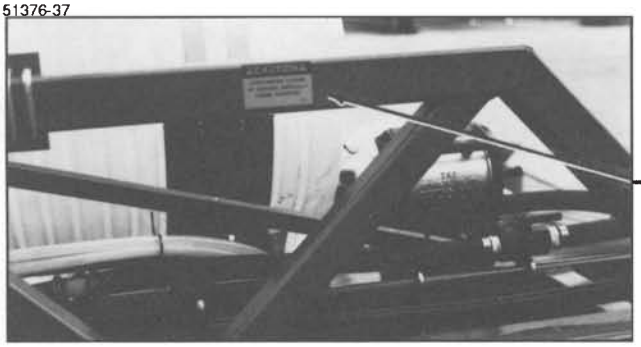
48618-27

⚠ WARNING ⚠

NEVER WALK UNDER OR WORK ON PLANTER WHEN IT IS RAISED WITHOUT SUPPORTING THE FRAMES WITH ADDITIONAL SUPPORTS.

Part No. 7100-68

51376-37

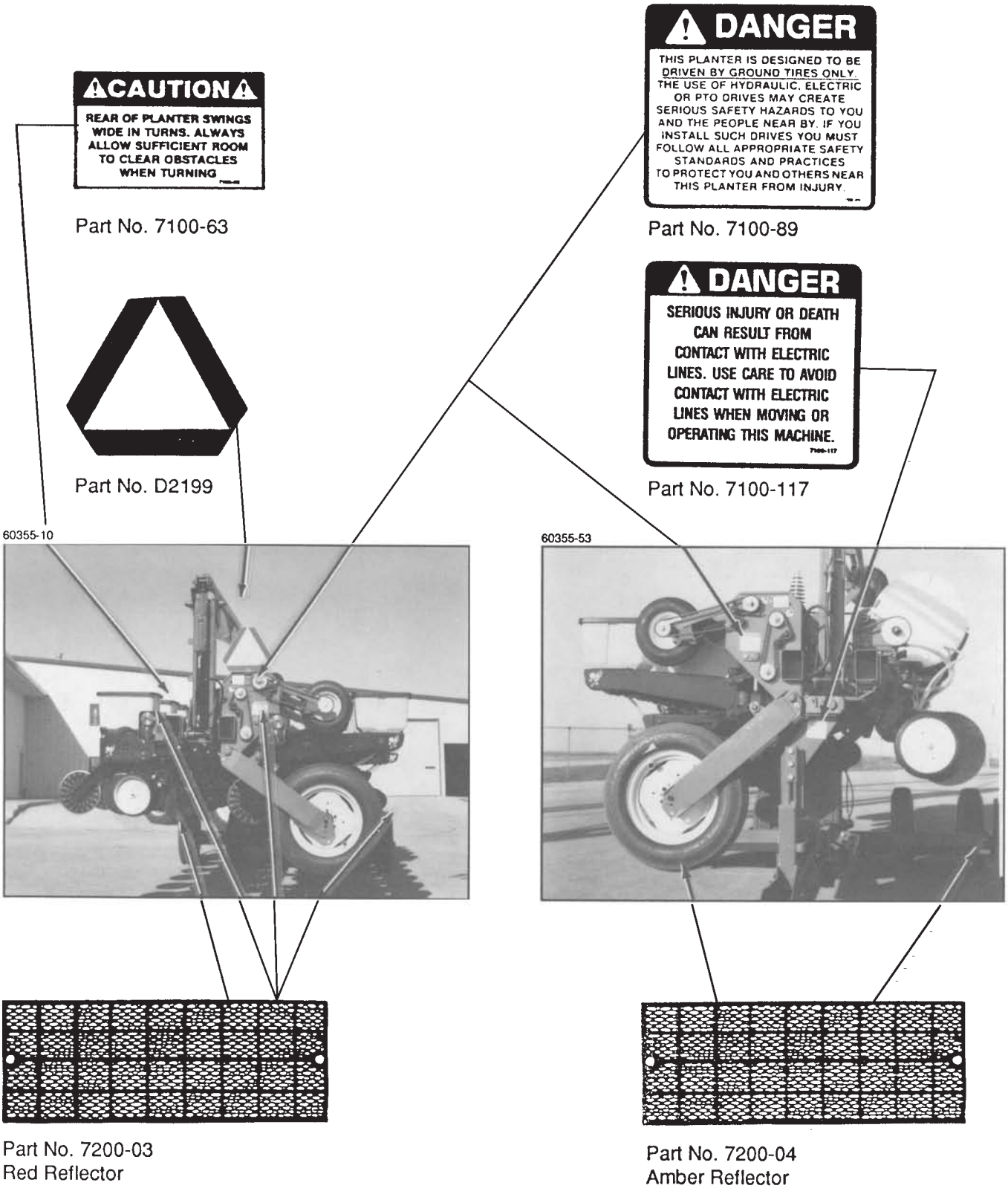


⚠CAUTION⚠

AVOID UNEVEN LOADING OF HOPPERS, ESPECIALLY DURING TRANSPORT

Part No. 7100-75

SAFETY WARNING SIGNS ⚠



Part No. 7100-63

Part No. 7100-89

Part No. D2199

Part No. 7100-117

Part No. 7200-03
Red Reflector

Part No. 7200-04
Amber Reflector

SAFETY WARNING SIGNS ⚠

60355-60

⚠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.

Part No. 7100-42

⚠ WARNING ⚠

— TO AVOID INJURY —
ALWAYS USE HYDRAULIC CYLINDER SAFETY LOCKOUT CHANNELS WHEN TRANSPORTING PLANTER ON THE ROAD. AFTER USE RETURN TO STORAGE LOCATION.

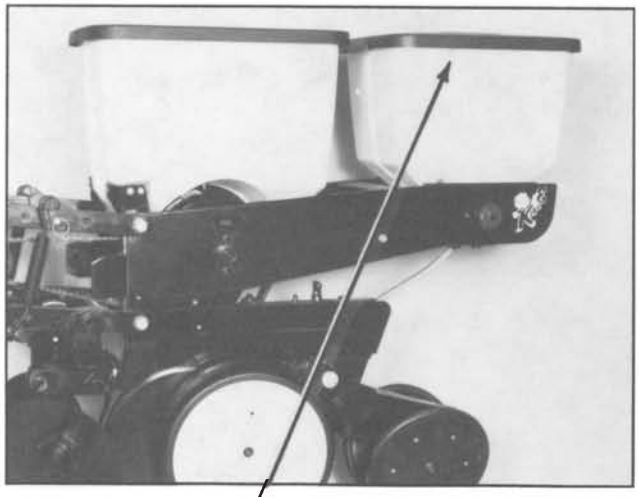
Part No. 7100-83

51052-19

DANGER

Part No. 7100-129
Located on axle on wide row models only.

59386-16



⚠ CAUTION ⚠

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

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

60569-14

⚠ DANGER
- ROTATING AUGER -
KEEP CLOTHING, YOURSELF AND OTHERS WELL CLEAR WHEN OPERATING

Part No. 7100-103

⚠ WARNING ⚠

ALWAYS INSTALL HYDRAULIC CYLINDER LOCKOUT CHANNELS ON MARKER CYLINDERS BEFORE OPERATING THIS CROSS-FILL AUGER

7100-163

Part No. 7100-163

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.

DANGER: The outer transport wheels on wide row models are bolted on to allow legal width truck shipment. DO NOT REMOVE THESE ASSEMBLIES AFTER PLANTER IS ASSEMBLED FOR USE. DO NOT fold planter or tow planter while the two outer transport wheels are removed. Tipping may occur because of narrow wheel base.

TRACTOR REQUIREMENTS

Consult your dealer for information on horsepower requirements and tractor compatibility. Requirements will vary with planter options, tillage and terrain. Three dual remote hydraulic outlets (SCV) are required on all models. 12 volt DC electrical system is required on all models.

TRACTOR PREPARATION AND HOOKUP

60355-43

1. Adjust tractor drawbar so it is 13-17 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. Install control console on tractor in a convenient location to the right of the operator and close to the hydraulic controls. Mount control console securely and route power cord to the power source.

The control console operates on 12 volt DC only. The console battery lead has two wires, a BLACK wire and a RED wire (tagged with "+"), each is terminated in a ring terminal. The RED wire must always be connected to the positive (+) battery terminal and the BLACK wire should always be connected to the negative (-) battery terminal.

The RED lead must be connected to the positive battery terminal regardless of whether the batteries use a positive ground (positive battery terminal connected to tractor chassis) or a negative ground (negative battery terminal connected to tractor chassis).

If two 12 volt batteries are connected in series, ALWAYS make power connection on battery which is grounded to tractor chassis.

If two 6 volt batteries are connected in series, make sure power connection at battery terminals ARE NOT connected to each other.

3. 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.

5. Connect cable on planter to control console cable on tractor. Connect ASAE Standards 7-pin connector for warnings lights on planter to ASAE Standards receptacle on tractor. If your tractor is not equipped with an ASAE Standards receptacle, check with your tractor manufacturer for availability. Check to be sure warning lights on planter are working in conjunction with warning lights on tractor.

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

7. Lower planter to the planting position and check to be sure the hitch is level. If hitch slopes up or down, disconnect planter and adjust hitch clevis up or down as necessary.

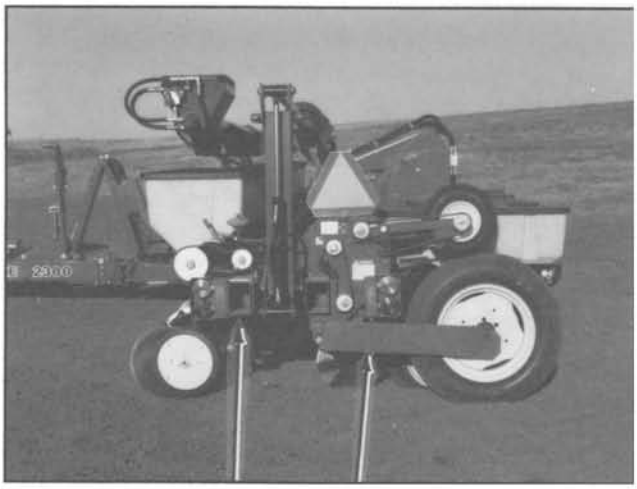
LEVELING THE PLANTER

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

60355-43

Four holes in the hitch bracket allow the clevis to be raised or lowered. In addition, the clevis may be turned over for a finer adjustment between mounting holes. When installing clevis mounting bolt, make sure lock nut is tightened to proper torque setting.

60389-9



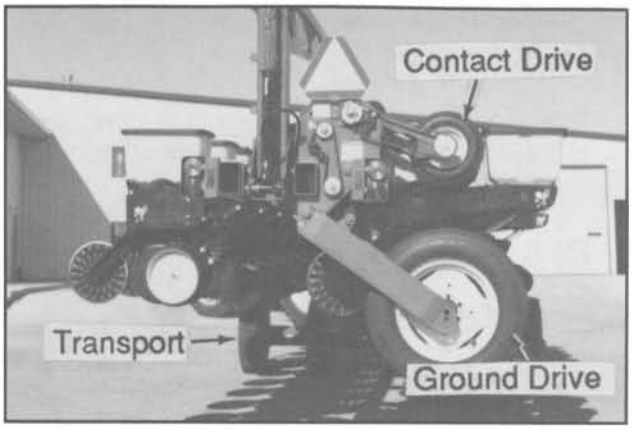
With the planter lowered to proper operating depth, check to be sure the frame is level fore and aft. Recheck once planter is in the field.

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

Once the planter has been fully loaded with seed, granular chemicals, fertilizer, etc.; a field check should be made to be sure the wings are level with the center frame. See "Leveling The Planter Wings".

TIRE PRESSURE

60355-11



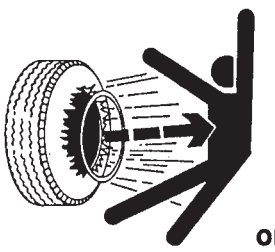
Tire pressure should be checked regularly and maintained as follows:

8 & 12 Row Models

7.50 x 20, Transport (Center Section)	65 PSI
7.50 x 20, Ground Drive (Wings)	40 PSI
4.8 x 8, Contact Drive	50 PSI

16 Row Model

7.50 x 20, Transport (Center Section)	90 PSI
7.50 x 20, Ground Drive (Wings)	40 PSI
4.8 x 8, Contact Drive	50 PSI



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

The multipiece rim used on the on the 16 Row 2300 Planter requires that specific procedures and safety instruction be followed in mounting and demounting of the tires.

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

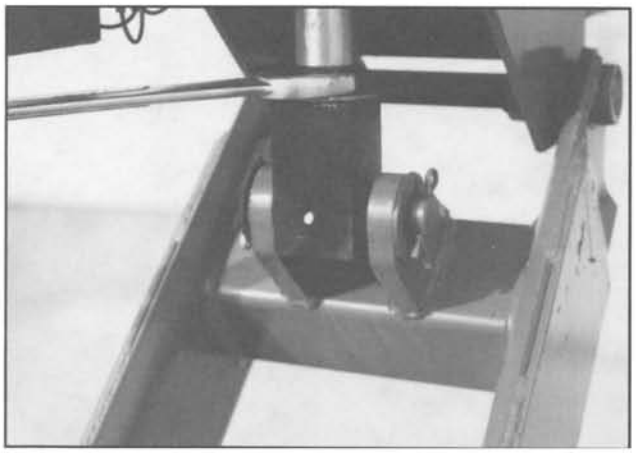
LEVELING THE PLANTER WINGS

If after the planter is loaded with seed, chemicals, fertilizer, etc.; the wings appear to be lower than the center frame, the following adjustment should be made.

1. Raise planter to raised transport position.

2. Install manual safety lockup pin.

51502-1



3. Using a 1 1/2" wrench on the cylinder rod, turn the rod to loosen the clevis enough to install the desired number of split washers. A supply of split washers can be found in the storage area on the wheel module.

4. Loosen set screw in cylinder clevis on wing lift cylinder. There is one cylinder on each wing on 8 and 12 row models and two cylinders on each wing on the 16 row model.

5. Install the washer(s) and tighten the rod against the cylinder clevis.

6. Remove the manual safety lockup pin and lower the planter to planting position. Recheck levelness of planter frame.

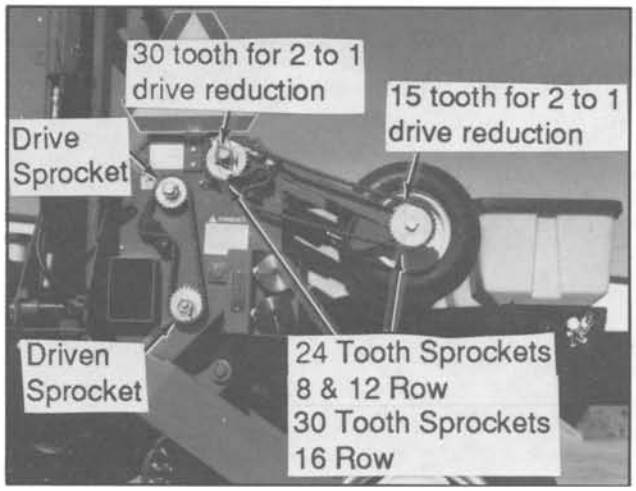
TRANSMISSION ADJUSTMENT

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 wheel module 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.

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

60355-12

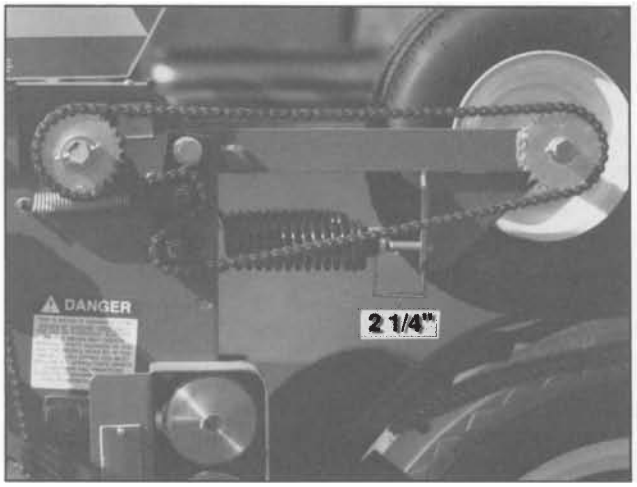


2 TO 1 DRIVE REDUCTION

A 2 to 1 drive reduction is recommended when interplant push units are used. On 8 and 12 Row Models replace the two 24 tooth sprockets(1:1) on each contact wheel drive with a 15 tooth sprocket on each contact wheel and a 30 tooth sprocket(2:1) on each driven shaft. On the 16 Row Models replace the 30 tooth sprocket(1:1) on each contact wheel with a 15 tooth sprocket(2:1). This will reduce the planter transmission speed and reduce planting rates by 1/2.

CONTACT DRIVE WHEEL SPRING ADJUSTMENT

60355-68



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.

SHEAR PROTECTION

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

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

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

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

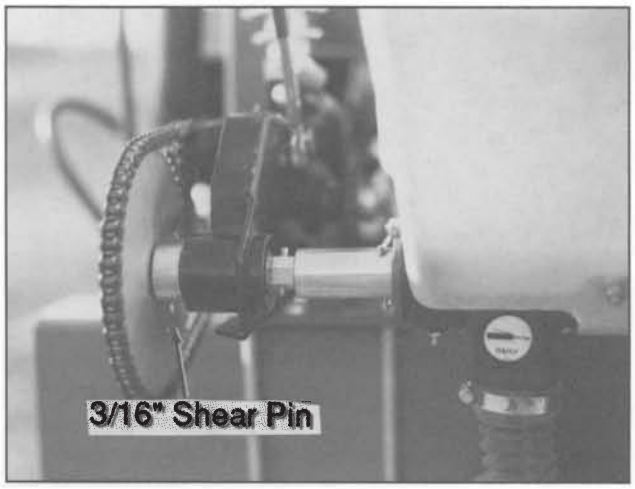
61658-27

Row Unit Seed Meter Drive

50981-10

Transmission Shaft

60389-44



Dry Fertilizer Attachment Transmission

MACHINE OPERATION

CONTROL CONSOLE

60448-1

Switches on the control console located on the tractor in conjunction with the hydraulic levers are used to raise the planter to transport position, operate the rotate and tongue extension functions, lock and release the planter wings, and raise and lower the row markers.

If the planter is equipped with point row wrap spring clutches, the switch to operate the engage and disengage function of the point row clutches is located on the control console.

If the planter is equipped with the dry fertilizer quick fill option, a switch installed in the auxiliary position on the console console in conjunction with the hydraulic marker control lever is used for operation of that option. The marker switch must be in the OFF position when the auxiliary switch is used.

The main fuse (15 amp) for the control console is located on the rear of the console. The two 8 amp slow blow fuses on the front panel of the control console are for the point row clutches.

NOTE: The indicator light on the front panel of the control console will light if the marker switch or point row clutch switch is ON. Make sure this light is OFF before leaving the tractor. If left in ON position it will drain the tractor battery.

HYDRAULIC OPERATION

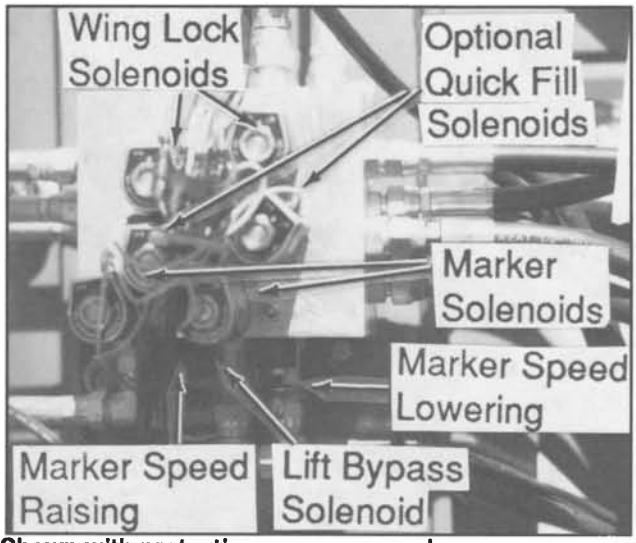
All 2300 Planters are equipped for operation from three dual remote hydraulic outlets.

One set of outlets is used to raise and lower the planter, one set is used to operate the markers and wing locks, and one set is used to operate the rotate and tongue extension functions.

⚠ WARNING: Make sure all hydraulic hoses are properly connected before operating the planter. Never connect or disconnect hydraulic hoses without first stopping the tractor engine and moving the hydraulic operating levers in both directions to relieve any pressure in the system.

VALVE BLOCK LOCATED ON FRONT SIDE OF MAIN FRAME

48837-9



Shown with protective cover removed.

The valve block assembly located on the front side of the main frame of the planter is made up of the marker solenoids and flow controls, the lift bypass solenoid and check valves, and the wing lock solenoids.

The two solenoids, located to the front lower portion of the block, control which marker will operate when the tractor hydraulic lever is moved. See "Marker Operation".

The speed at which the markers will travel is controlled by the knurled adjustment knob or flow control on the bottom side of the valve block. The knob on the right side of the block will control the speed of the marker raising. The knob on the left side of the block will control the speed of the marker lowering.

NOTE: Right and left is determined by facing in the direction the machine will travel when in use.

Screw the knobs all the way in and turn back out about 1 1/2 turns and check marker speed. Travel time should be approximately 6 seconds. To increase speed of the marker, turn the knob out. To decrease speed of the marker, turn the knob in. Temperature of the hydraulic oil will effect the marker speed so an additional adjustment may be necessary. Once marker adjustment has been made, tighten the lock nut against the valve block.

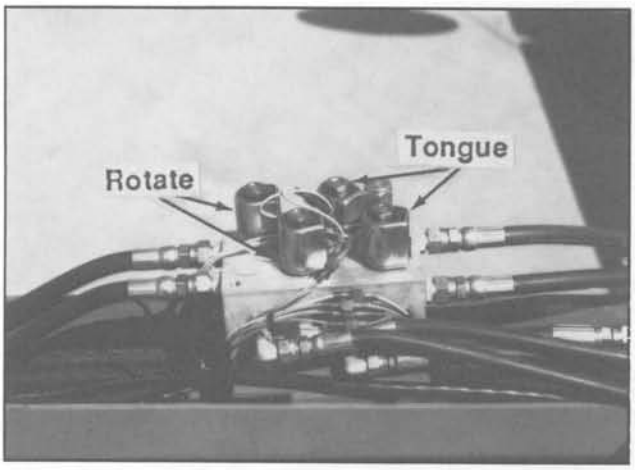
The solenoid valves located to the front upper portion of the block are used in conjunction with the planter lift system to lock the wings when the planter is being raised to transport position. See "Planter Lift System Operation".

NOTE: These solenoids operate in pairs.

The solenoid valve and pair of check valves located on the bottom side of the block are used in conjunction with the planter lift system when the planter is being raised to transport position. See "Planter Lift System Operation"

VALVE BLOCK LOCATED ON HITCH

48630-7



Shown with protective cover removed.

The valve block assembly located on the hitch of the planter is made up of two pairs of solenoid valves. Each pair is controlled by a momentary contact selector toggle switch on the control panel on the tractor. One pair rotates the planter to the transport or plant position and one pair extends or retracts the planter tongue. The switch must be held in contact when operated. See "Planter Operation Procedures".

CAUTION: Valve block shown with cover removed for illustration purposes only. Cover should always be in place during operation.

TONGUE LOCK OPERATION

60355-22

A tongue lock is located on the rear section of the tongue. The purpose of the lock is to take pressure off the tongue cylinder and to lock the tongue into the planting position. The lock must release before the tongue will extend. This is accomplished when the 1 1/2" x 2 1/2" tongue lock cylinder raises the lock. A pressure relief valve located on top of the aluminum valve block on the tongue will not allow hydraulic oil to the tongue cylinder until oil pressure is developed at the latch cylinder. This ensures that the latch will release first.

PLANTER LIFT SYSTEM OPERATION

The planter lift system consists of two lift cylinders located at the center of the machine and one lift cylinder on each outer wing on 8 and 12 row models and two lift cylinders on each outer wing on the 16 row model.

NOTE: On all 8 and 12 row models, the lift cylinders located at the center of the machine are referred to as the master cylinders and the lift cylinders located on each outer wing as the slave cylinders. On the 16 row model, the lift cylinders located at the center of the machine are the slave cylinders and the lift cylinders located on each outer wing are the master cylinders.

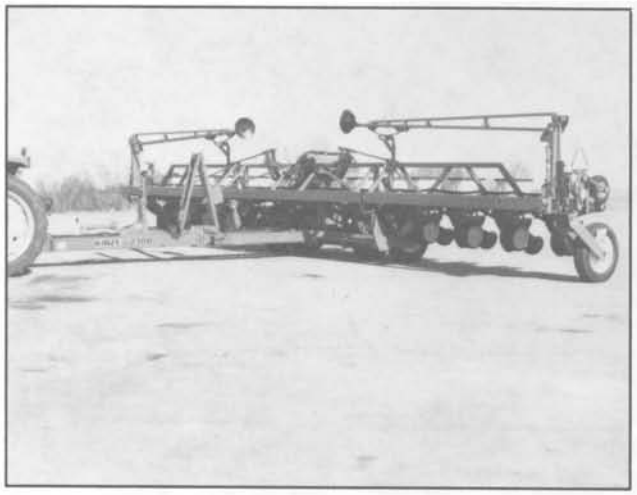
With the master/slave hydraulic lift system, oil is forced into the butt end of the master cylinders when the hydraulic lever on the tractor is moved to the raise position. As the master cylinders are extended, oil from the rod end of the master cylinder is forced into the butt end of the slave cylinders. All cylinders will extend at the same rate.

The slave cylinders and master cylinders include a by-pass valve in the piston which allows oil to bypass the cylinder piston in the lowered position if the system gets out of phase. Rephasing the system is necessary when the planter is taken from the transport position to the planting position. To rephase the system, hold the tractor hydraulic lever in the lowering position for an additional 15 to 20 seconds after all the cylinders are fully retracted.

An electric solenoid valve, located on the main frame valve block, allows oil to bypass the wing cylinders. This valve is controlled by the "raise" toggle switch located on the planter control console. This function is used only when taking the planter from the raised field position to the raised transport position.

Raised Field Position

60620-39



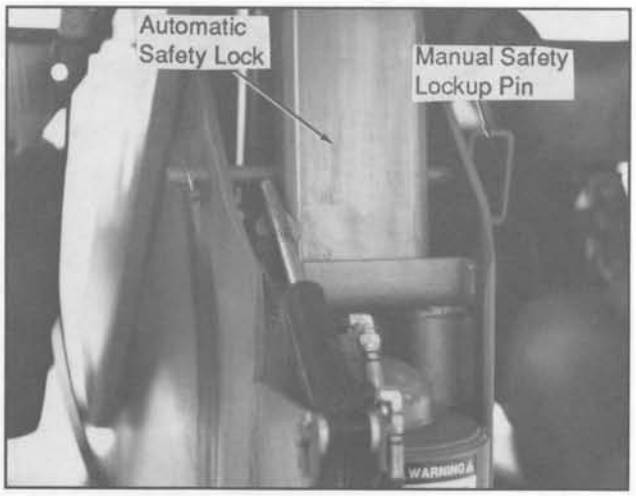
There are two raised positions on the planter. One is the raised field position which is when the planter wing cylinders are fully extended and the lift cylinders in the center are at half stroke, but because the bypass solenoid is not energized the wing cylinders can not bypass oil preventing the planter from raising any higher. This position will raise the row units approximately 14 inches off the ground. This position is used in making turns or passing over waterways during field operation.

Raised Transport Position

60620-49

The other raised position is the raised transport position. In this position the planter must be raised high enough so the row units will clear the transport wheels when the planter is rotated. To do this the planter is first raised to raised field position and the wings locked in the rigid position. See "Transport Operation Procedures". By holding down the "Raise" switch on the control console to energize the bypass solenoid and holding the tractor hydraulic lever in the raise position the planter will continue to raise until the center lift cylinders are fully extended. Near the extreme raise position, an automatic safety lock will swing into the lock position. Release the "Raise" switch and lower the planter onto the safety stand using the hydraulic lift lever. Install manual safety lockup pin to prevent accidental release of safety lock.

48496-11a



TRANSPORT TO PLANT OPERATION PROCEDURE

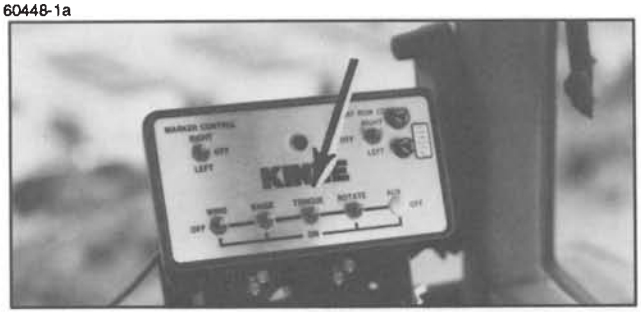
1. Remove safety pins from tongue and center frame. Store safety pins in storage positions provided.

60355-50

48496-11

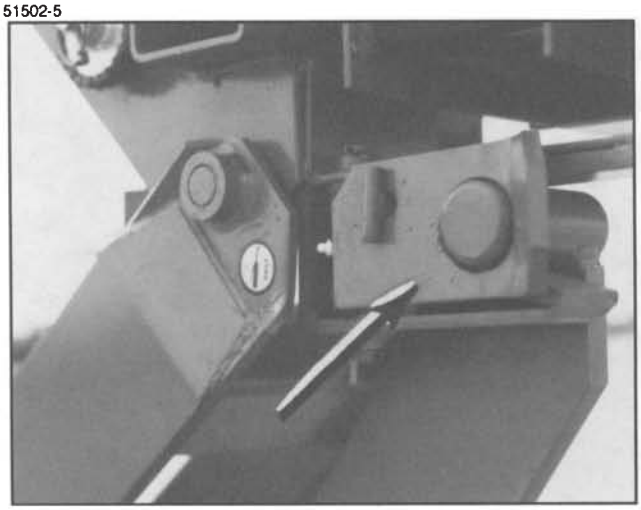
2. Release transport latch.
   A. Press "Tongue" switch and hold.

60448-1a



   B. Engage hydraulic tongue/rotation lever until tongue is retracted approximately 1" or only enough to release latch.

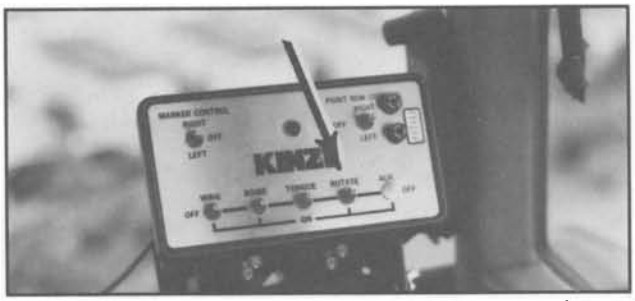
51502-5



CAUTION: Retracting tongue too far at this point can cause the latch post on the tongue to strike attachments on the front tool bar.

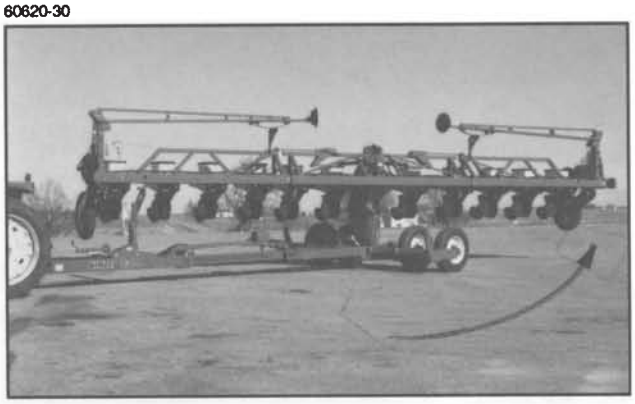
3. Rotate planter to field position.
   A. Press "Rotate" switch and hold.

60448-1b



   B. Engage and hold hydraulic tongue/rotation lever until rotation cylinder is fully retracted.

60620-30



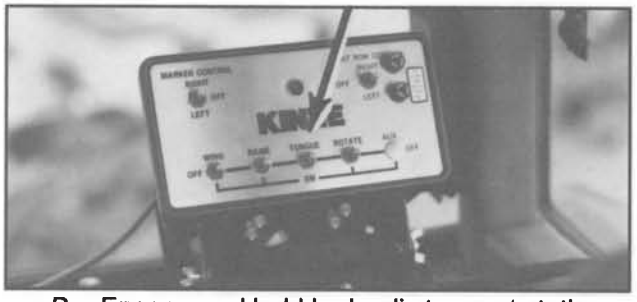
48618-9

CAUTION: To prevent damage to the frame, units or tires, make sure the frame has been completely rotated to planting position so that the cams on the center section are tracking properly over the guides on the axle.

NOTE: During operation if the planter should get out of phase the center frame will raise too high in raised field position. This will allow the cams to raise above the cam guides. Without the support of the cams, damage to the planter may occur if operated in this condition. If this condition should occur, lower the planter and rephase the system.

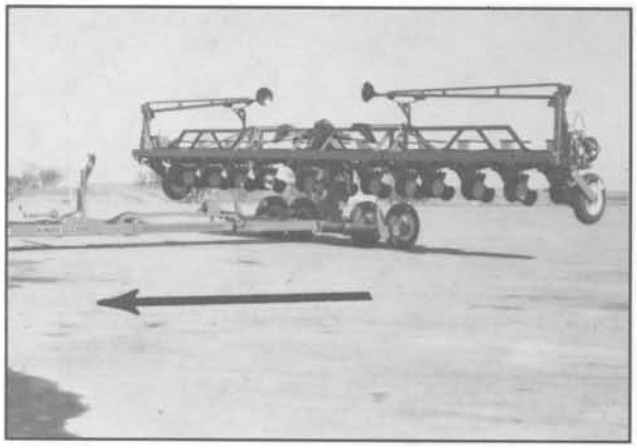
4. Retract tongue.
   A. Press "Tongue" switch and hold.

60448-1a



   B. Engage and hold hydraulic tongue/rotation lever until tongue is fully retracted and tongue lock hook drops into place.

60620-46



5. Release automatic safety lift lock.
   A. Engage and hold hydraulic lift lever in down position momentarily to allow safety lock release cylinder to move into release position as shown.

48618-17

   B. Engage hydraulic lift lever to raise planter and allow release cylinder to release safety lock.
   C. Lower planter to plant position.

NOTE: It may be necessary to hold "Raise" switch down to allow the planter to raise high enough to release the lock.

6. Rephase hydraulic lift system.
   A. Hold the hydraulic lift lever in the down position for several more seconds until the master/slave cylinders are completely re-phased. See "Phasing The Hydraulic System".

7. Release wing locks so wings may flex.
   A. Press "Wing" switch and hold.

60448-1c

   B. Engage and hold hydraulic marker/wing lock lever until wing lock cylinders are fully retracted.

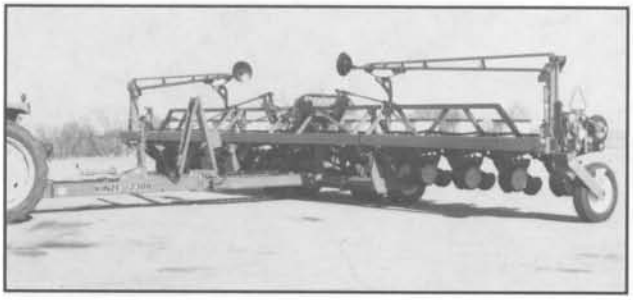
48618-23

Unlocked For Planting

PLANT TO TRANSPORT OPERATION PROCEDURE

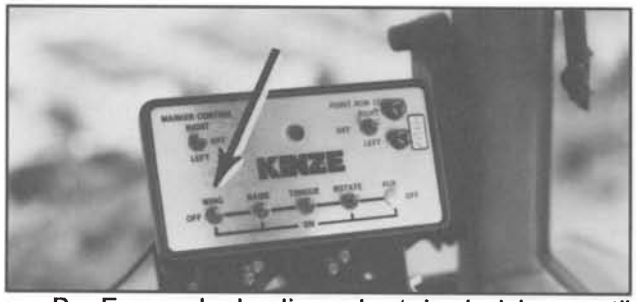
1. Raise planter to raised field position.

60620-39



2. Lock wings in transport position.
   A. Press "Wing" switch down and hold.

60448-1c



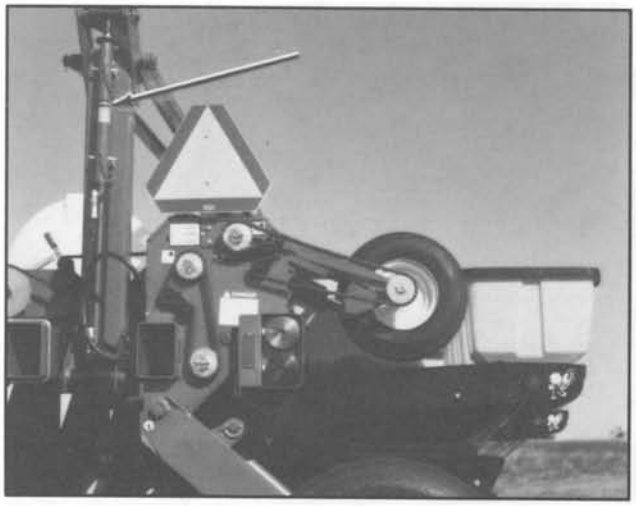
   B. Engage hydraulic marker/wing lock lever until wing lock cylinders are fully extended and wing locks are locked over center.

48618-26

Locked For Transport

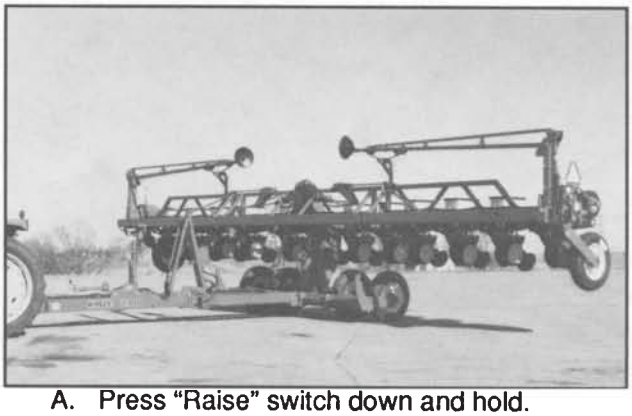
   C. Install marker lockups.

60355-14



3. Raise planter to transport position.

60620-49

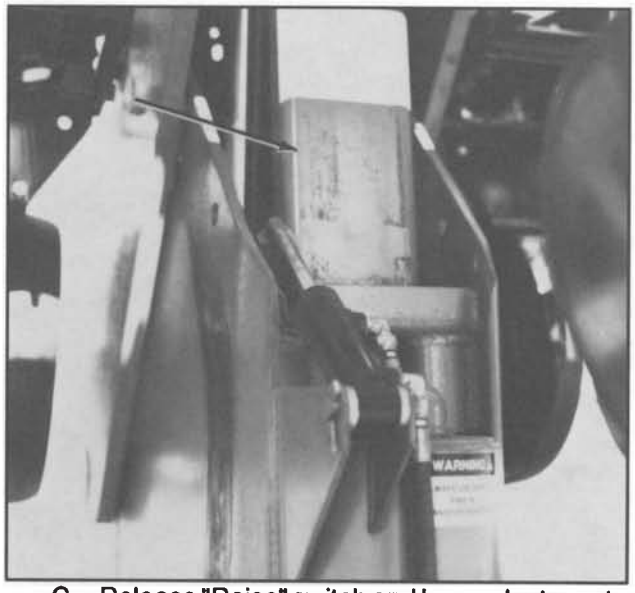


   A. Press "Raise" switch down and hold.

60448-1d

   B. Engage hydraulic lift lever until master cylinders are fully extended and the automatic safety lock is secured. Observe to be sure lock is secured.

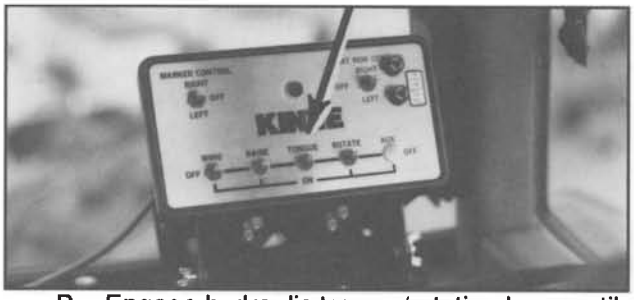
48618-15



   C Release "Raise" switch and lower planter onto safety stand using hydraulic lift lever.

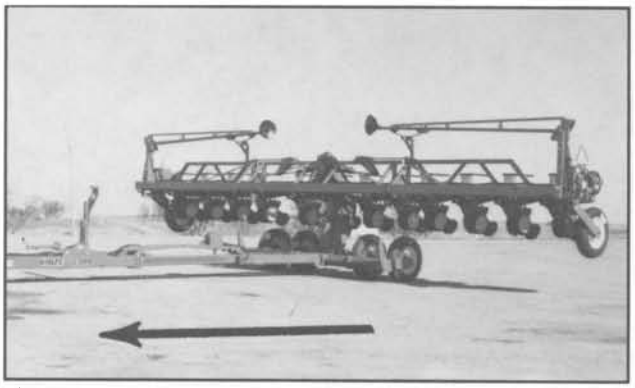
4. Extend tongue.
   A. Press "Tongue" switch down and hold.

60448-1a



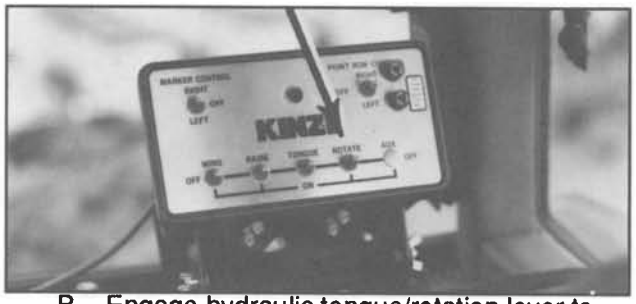
   B. Engage hydraulic tongue/rotation lever until tongue is fully extended. Tongue lock latch will automatically release.

60620-46



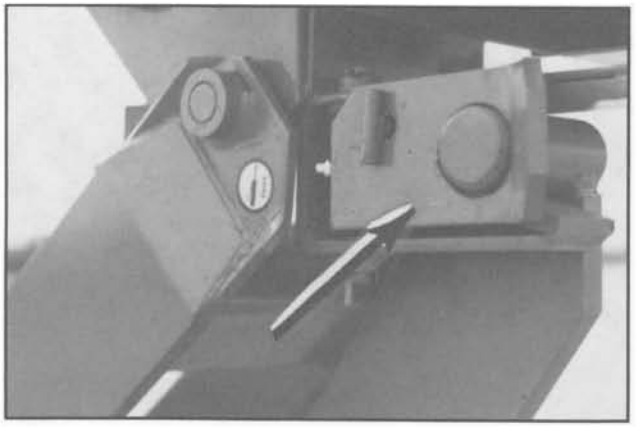
5. Rotate frame.
   A. Press "Rotate" switch and hold.

60448-1b



   B. Engage hydraulic tongue/rotation lever to rotate the planter until the transport latch is secured.

51502-5



6. Install safety pins in tongue and center frame.

60355-50

48496-11

PHASING THE HYDRAULIC SYSTEM

The master/slave hydraulic lift system must be kept in phase or "time" in order for the planter to raise and lower properly.

When the "Raise" switch on the control panel is used to raise the planter to the "raised transport position" the planter is taken out of phase. The system must then be rephased when it is lowered back to the planting position.

To rephase the system after raising to "transport position" or any time the planter hydraulic system should get out of phase, lower the planter to the ground and hold the tractor hydraulic control lever in the down position. This will allow the cylinders to bypass oil through the built-in bypass valve in the pistons and allow all the cylinders to fully retract. Raise the planter and check to see if it is raising evenly. If not, lower the planter again and allow more time for the cylinders to bypass. Ten to fifteen seconds is usually sufficient.

MARKER OPERATION

60448-1e

Two solenoid valves along with a three position selector switch permits the operator to raise or lower the desired marker. See "Valve Block Located On Front Of Main Frame" for marker speed adjustment.

1. On the control panel, select which marker you want lowered.
2. Operate hydraulic control lever to lower marker.
3. If opposite marker is to be used next, change control switch to other side.
4. At end of field, using hydraulic control lever raise the down marker.
5. After making the turn; using the hydraulic lever, lower the pre-selected marker.
6. Continue to follow this procedure.

NOTE: Both markers can be lowered at the same time by operating the switch in each position and operating the hydraulic lever twice. The markers will raise simultaneously with the switch in the OFF position.

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

If the electrical system fails to operate properly:

Check fuse.
Check wiring connections.
Check control switch.
Check solenoid. SOLENOID HOUSING WILL BE MAGNETIZED WHEN ENERGIZED.

MARKER LOCKUP ⚠

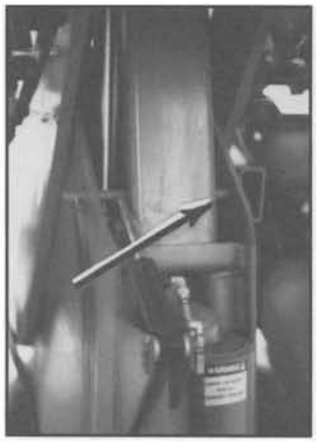
Install marker lockups over marker cylinder rods when transporting the planter or working around the planter. When not in use, store in the storage position provided on the first stage marker arm.

⚠ **DANGER: To avoid serious injury, keep others away when raising or lowering markers.**

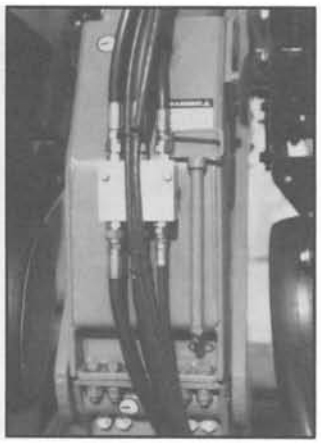
MANUAL SAFETY LOCKUP ⚠

The manual safety lockup located on the front side of the center pivot assembly is an added safety device. Never allow anyone to work around or under the planter without first securing the manual safety lock in the locked position. When transporting the planter use the manual safety lockup for added safety.

48496-11



48496-57



For normal operation remove the safety lockup pin and store it in the bracket provided on the rear side of the center pivot post.

TONGUE SAFETY PIN ⚠

The tongue safety pin when installed will prevent the tongue cylinder from retracting far enough to release the transport latch should hydraulic pressure leak off or a sudden stop be made when transporting the planter. Never transport the planter without installing the tongue safety pin.

60355-50

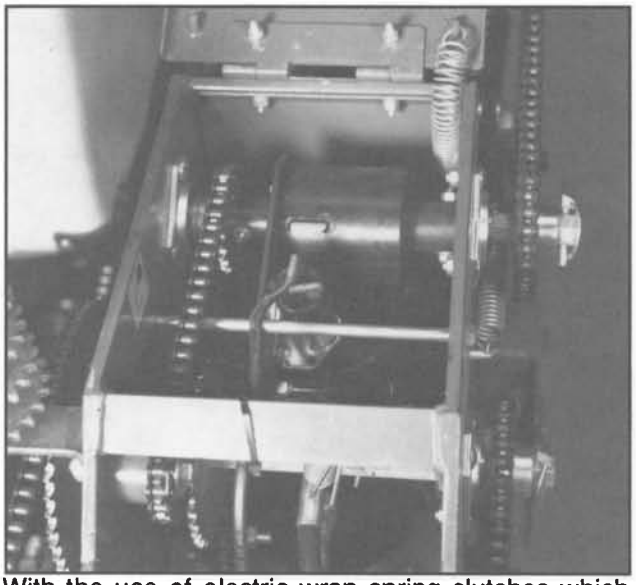
60355-24

For normal operation remove the tongue safety pin and store in the bracket provided on the transport support post.

POINT ROW WRAP SPRING CLUTCH

(Standard on 12 and 16 Row/Optional on 8 Row)

60569-50



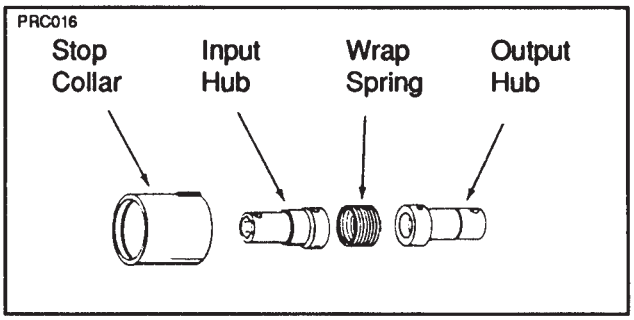
With the use of electric wrap spring clutches which disengage the drive, you have the capability to shut off either half of the planter for finishing up fields or for long point row situations.

60448-1f

The selector switch for the clutches is located on the planter control panel.

NOTE: Switch should be left in OFF position when planter is not in use. If left in ON 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.

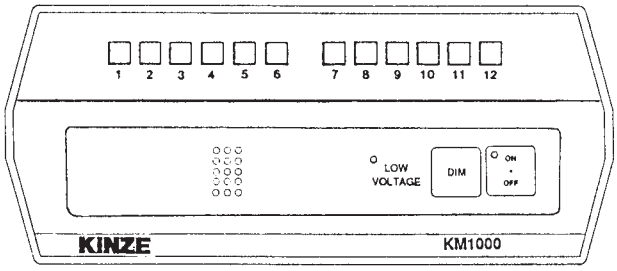
When the operational switch is in the "DISENGAGE" (Right or Left) position the solenoid coil IS ENERGIZED and the plunger in the solenoid coil pulls the actuator arm against the stop on the stop collar, disengaging the wrap spring and stopping the planter drive.

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.

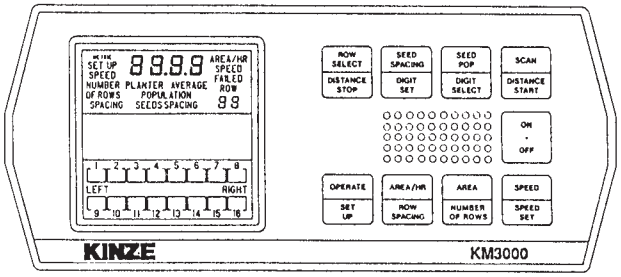
* With "Y" connector.

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.

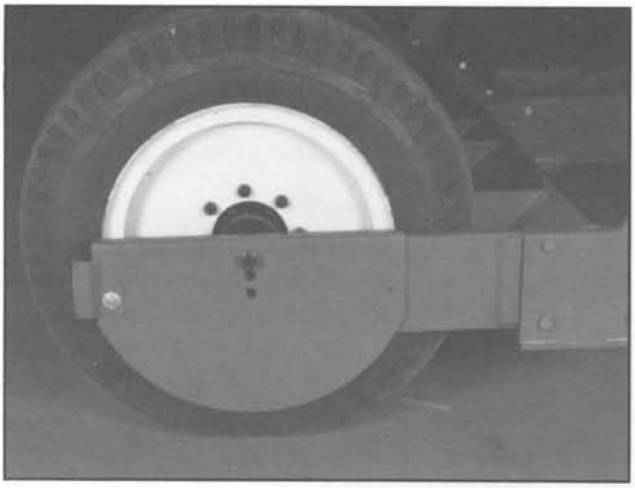
INTERPLANT ROWS

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.

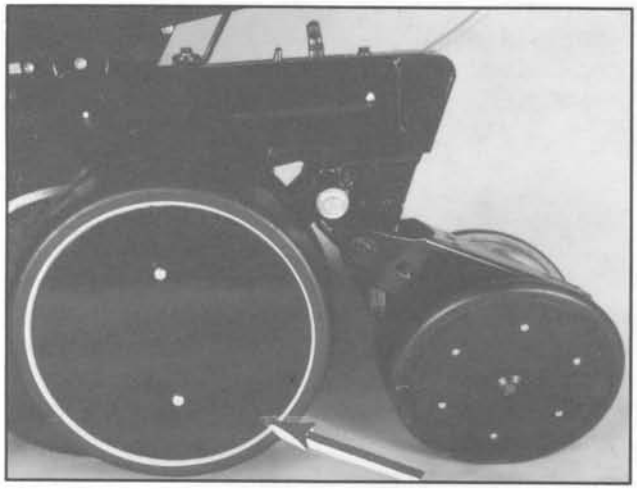
ROCK GUARDS

56249-6



Transport wheel rock guards are designed for use on both sides of each of the four center transport wheels when the planter is used in rocky conditions. Rock guards will help prevent rocks from being picked up by the wheel causing damage to the row unit.

60607-37

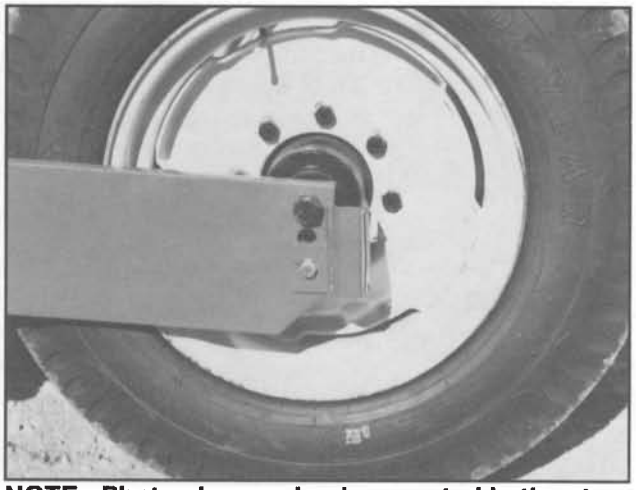


Row unit gauge wheel covers may be used in conjunction with transport wheel rock guards on row unit guage wheels next to transport wheels.

RIDGE PLANTING

When ridge planting, the drive wheels and transport wheels can be lowered 2" or 4" to the lower mounting holes in the wheel arms to increase the planter bar height. The contact drive tire must be lowered also. Hitch height should be raised accordingly to ensure level operation.

60607-35



NOTE: Photo shows wheels mounted in the standard position.

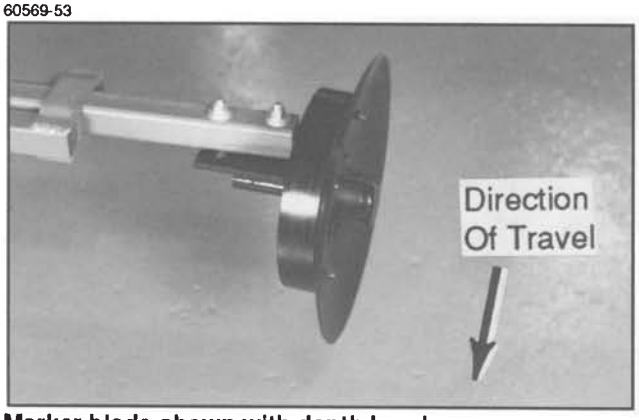
MARKER ADJUSTMENT

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.

12 Rows X 30" Spacing = 360" 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.

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.

CAUTION: Avoid transporting planter with hoppers loaded whenever possible. When it is necessary to transport the planter with the hoppers loaded, the added weight should be distributed evenly on the planter frame before rotating the planter.

Install all safety lockups and safety lock pins.

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.

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.

Also check for any marker adjustment that may be needed.

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

- Hoses - Fittings
- Bolts - Nuts
- Drive Chains

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.)

DOUBLE DISC FERTILIZER OPENER

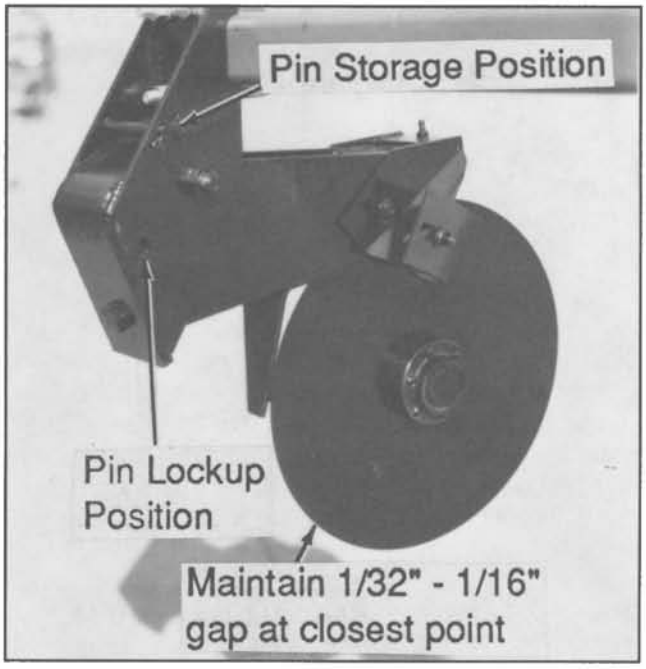
The double disc fertilizer openers should be positioned during assembly to place the fertilizer no closer than 2" to either side of the row. If planter frame is level and at proper planting height, fertilizer depth will be approximately 4". Soil conditions can affect depth slightly.

The down pressure spring is factory preset at 250 pounds down pressure but may be adjusted for various soil conditions. To adjust spring tension, loosen the jam nut with 15/16" wrench and use a 1" wrench to turn the adjustment bolt clockwise to increase tension or counterclockwise to decrease tension. Securely tighten the jam nut upon completion of tension adjustment. Do not attempt to set opener depth with spring pressure. The opener is designed to operate against depth stop and spring up when encountering a foreign object or hard ground.

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

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

60389-23



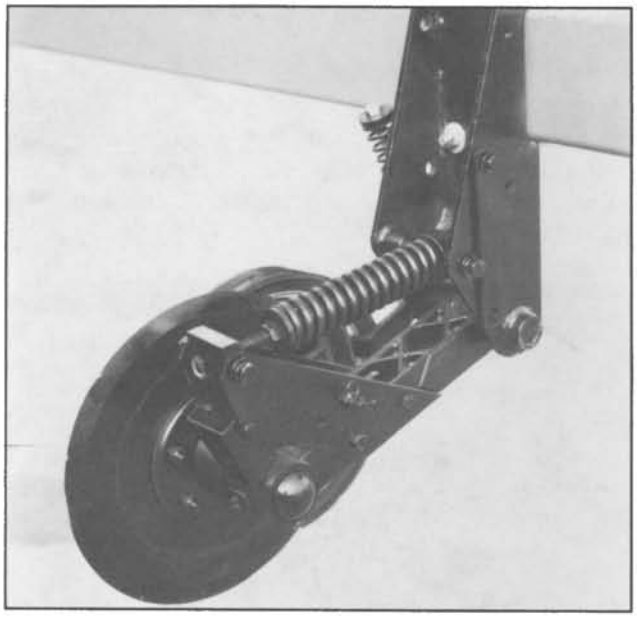
The outer scrapers on each blade may also be adjusted to make up for wear that may occur. Make sure the scraper is adjusted to allow only slight contact with the blade.

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

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

SINGLE DISC FERTILIZER OPENER

60389-49

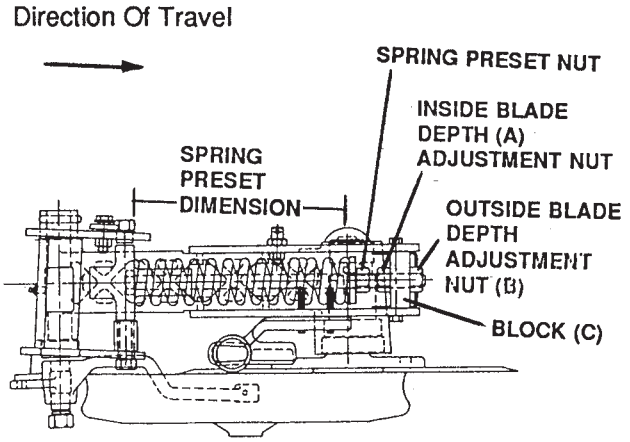


Placement of fertilizer with the single disc fertilizer opener is recommended at 3 1/2" - 4" from the row. **Never locate the opener to place fertilizer closer than 3".** With the single disc fertilizer opener mount located centered ahead of the row unit and the rear of the blade angled away from the row, the opener will place the fertilizer 3 1/2" beside the row.

If planter frame is level and at approximately 20" planting height, maximum blade depth for placement of fertilizer is approximately 5". Soil conditions can affect depth slightly.

To adjust blade depth, raise planter to remove weight from the fertilizer opener. Loosen inside adjustment nut (A) with 1 1/8" wrench. Turn outside nut (B) clockwise to decrease blade depth or counterclockwise to increase blade depth. One full turn of blade depth adjustment nuts changes blade depth 3/8". Tighten inside nut tight against block (C). Adjust all fertilizer openers to the same depth.

L0114 (Overhead View)



R.H. Configuration Shown

Fertilizer opener down pressure can be adjusted from 250 pounds to 640 pounds. **To make down pressure adjustments,** raise planter to remove weight from the fertilizer opener and turn spring preset nut clockwise to increase down pressure and counterclockwise to decrease down pressure. Adjust all rows to a similar setting. Minimal spring pressure for acceptable operation is recommended. See chart for setting spring length specifications.

SPRING PRESET DIMENSION	DOWN PRESSURE
11"	250 Pounds
10 3/4"	320 Pounds
*10 1/2"	370 Pounds
10 1/4"	450 Pounds
10"	520 Pounds
9 3/4"	580 Pounds
9 1/2"	640 Pounds

* Suggested initial setting.

CAUTION: DO NOT adjust spring preset dimension to less than 9 1/2"

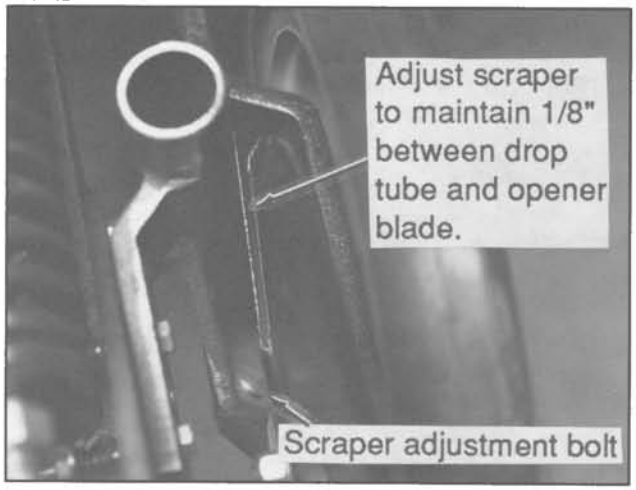
IMPORTANT: Excessive down pressure can cause up-lift on the planter frame and affect performance of the machine. When lowered to planting position, planter frame should be at a height of approximately 20". In loose ground conditions, excesssive down pressure can cause openers to run to deep and push dirt ahead of opener and may stop soil press wheel and/or opener blade from turning.

DANGER: Always install all lockup brackets before working under the machine.

CAUTION: Do not operate the single disc openers at full down pressure tension when planting in rocky ground. Chipping or breakage of the blade will occur.

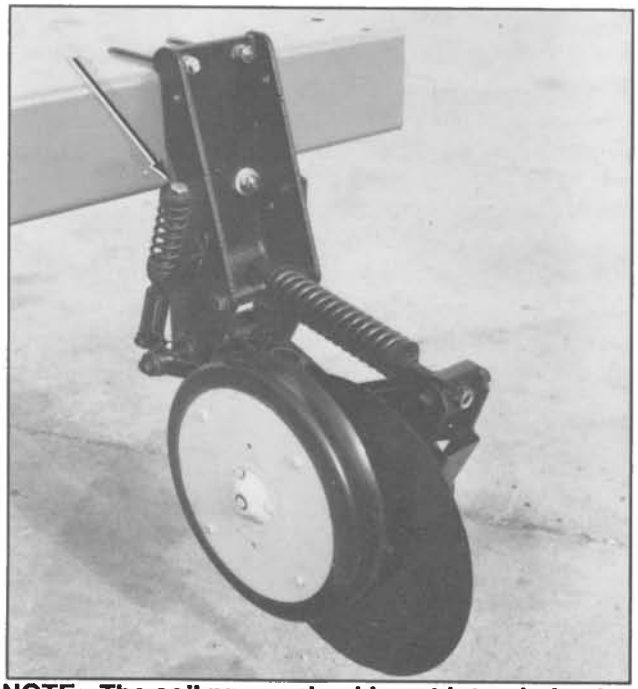
The spring loaded scraper should be adjusted periodically to maintain 1/8" between drop tube and opener blade. If this dimension is not maintained the fertilizer may not drop into the proper location.

60607-32



Additional press wheel down pressure may be desirable in heavy moist soils. **To increase press wheel spring pressure** turn press wheel spring adjustment bolt clockwise.

60389-63

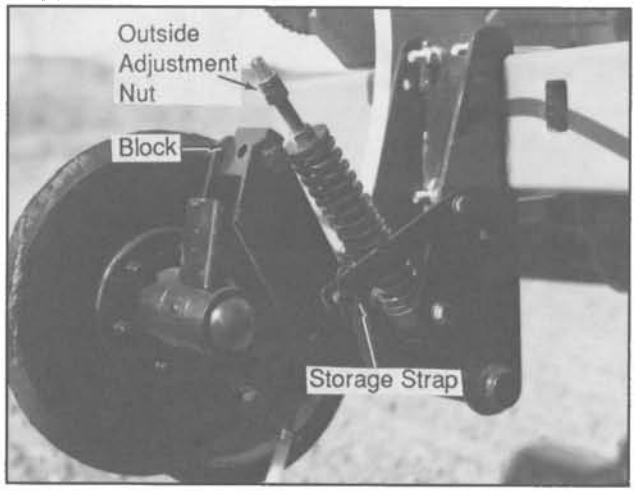


NOTE: The soil press wheel is not intended to be used for gauging fertilizer opener operating depth.

The single disc fertilizer opener is designed to be locked in a raised position when the fertilizer attachment is not in use or during storage. To accomplish this the fertilizer opener blade is raised out of the ground and the soil press wheel locked up as instructed in the following procedures:

Step 1. With the planter in the planting position, remove outside blade depth adjustment nut.
Step 2. Raise planter until adjustment bolt clears adjustment block.
Step 3. Raise spring to clear blade assembly and at the same time raise blade assembly until storage strap can be positioned onto lockup pin and install hair pin clip.
Step 4. Re-install depth adjustment nut and tighten.

60356-4



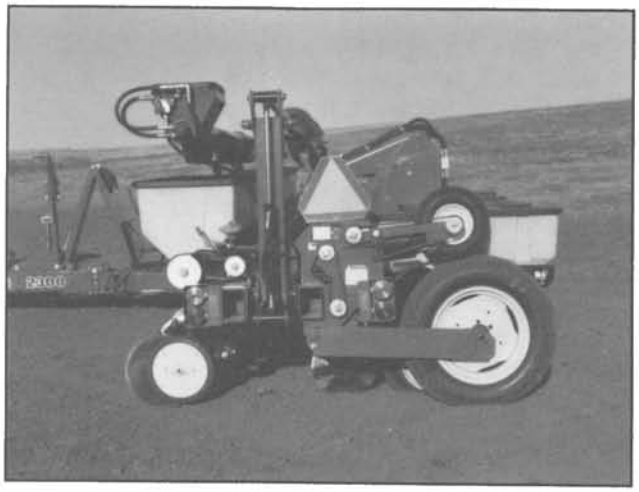
Step 5. Raise soil press wheel until lockup hole in soil press wheel spring adjustment bolt is visible. Remove hair pin clip from storage position and install in lockup hole.

60389-63

60355-32

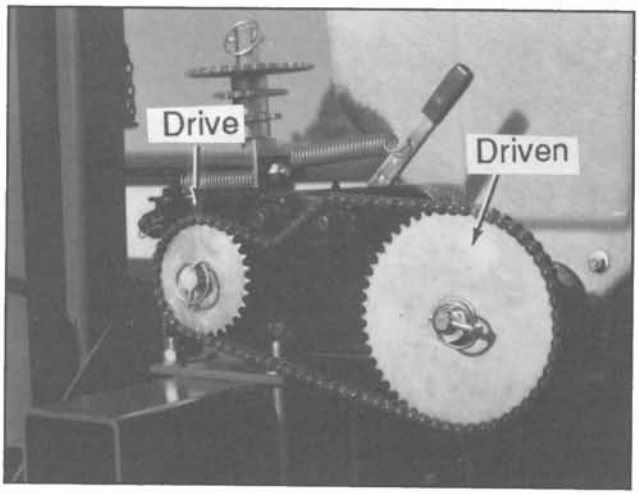
DRY FERTILIZER ATTACHMENT

60389-9

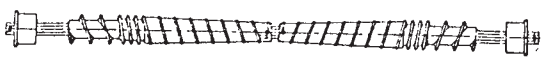


The rate of fertilizer application is determined by the drive/driven sprocket combination on the fertilizer drive and by the auger position in the hopper.

60389-39



Shown with augers positioned for low rate delivery



Shown with augers positioned for high rate delivery

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

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

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

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

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

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

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

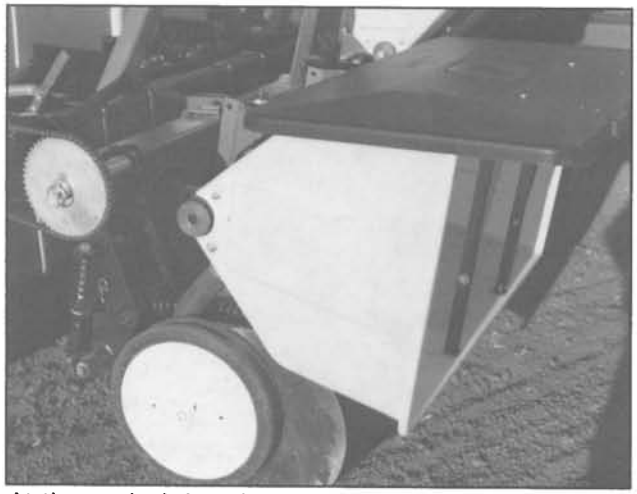
⚠ WARNING: Agricultural chemicals can be dangerous if not selected and handled with care. Always read and follow directions supplied by the chemical manufacturer.

CLEANING

The dry fertilizer hoppers are designed to tip forward for dumping and ease of cleaning. To dump hoppers, first disconnect the drive shaft from the transmission or adjacent hopper. LOOSEN HOSE CLAMP AND REMOVE HOSES FROM EACH HOPPER. Remove the two rear 1/2" x 1 1/4" cap screws from between hopper support and opener mounting bar. Loosen the two front 1/2" x 1 1/4" cap screws. Rotate hopper lids to the back side of the hopper and carefully tip hopper forward. After dumping contents, flush all loose fertilizer from the hopper and hoses.

48837-29

60389-30

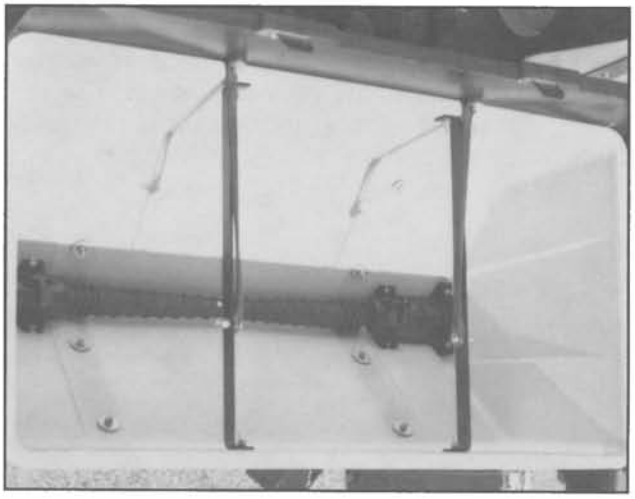


At the end of the planting season, or when fertilizer attachment is not going to be used for a period of time, the hoppers should be disassembled, cleaned and coated with a rust preventative.

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

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

59542-38



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

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

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

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

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

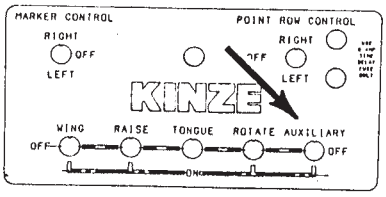
DRY FERTILIZER QUICK FILL ATTACHMENT

The quick fill attachment allows one point filling of all dry fertilizer hoppers. Located near the fill hopper is the hydraulic motor which drives the attachment and the flow control valve which controls the speed of the auger and also works as a safety valve for shutting off the auger. A pair of specially installed solenoid valves, controlled by the auxiliary switch on the control panel, operates the auger.

60389-65

WARNING: Always install hydraulic cylinder lockout channels on marker cylinders before operating quick fill attachment.

NOTE: The quick fill attachment can be equipped for use with a closed center hydraulic system or open center hydraulic system. See Illustrations 1 and 2.



1. Be sure marker switch on control console is in OFF position.
2. Move auxiliary switch on control console to ON position.
3. Operate hydraulic (marker) control lever to engage quick fill auger.

At the end of each season or if the quick fill attachment is not being used for a period of time, pull the augers from the quick fill tubes and thoroughly clean the augers and tubes and treat with a rust preventative.

DANGER: Keep clothing, yourself and others well clear when augers are in operation.

Illustration #1
Closed Center System

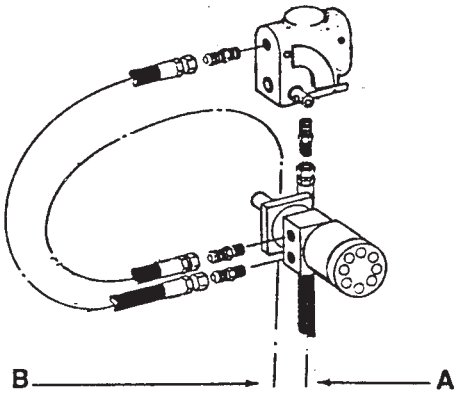
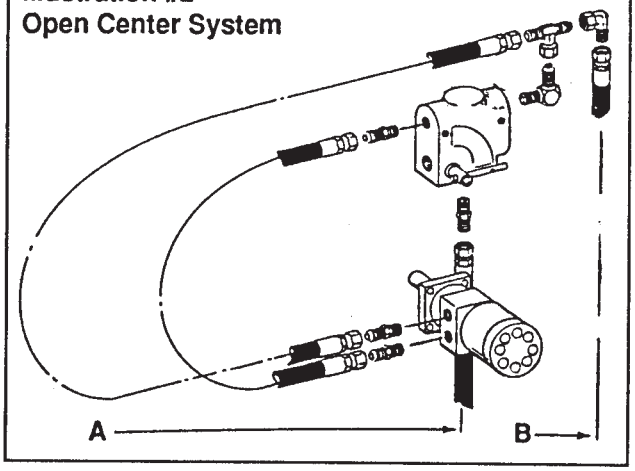
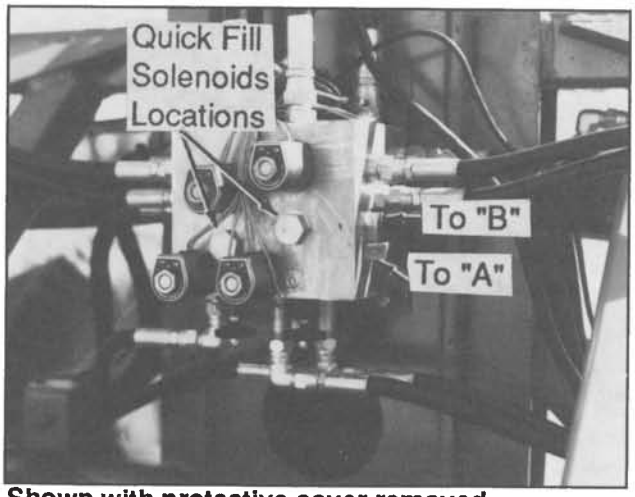


Illustration #2
Open Center System



48630-6

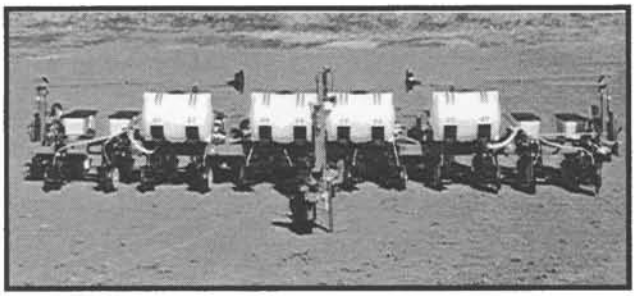


Shown with protective cover removed.

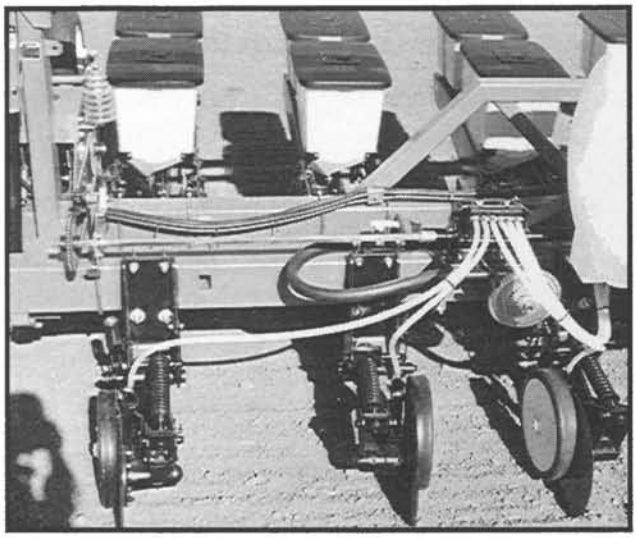
LIQUID FERTILIZER ATTACHMENT

OPTIONAL SQUEEZE PUMP

60355-18



60355-63



Shown with single disc fertilizer openers installed.

On machines equipped with the squeeze pump option, the rate of liquid fertilizer application is determined by the combination of sprockets on the squeeze pump driven and drive shafts. When changing sprocket combinations, make sure sprockets are in alignment, sprocket retaining collars are tight and chain tension is sufficiently restored.

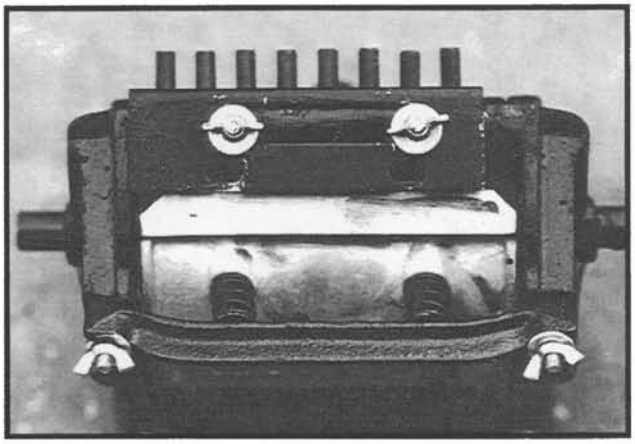
The delivery rate chart found at the end of this section provides an approximate application rate only. Actual delivery will vary with temperature and the particular fertilizer being used.

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

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

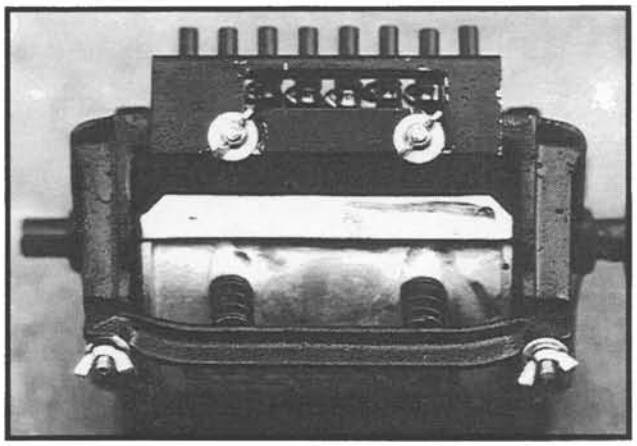
Shut-off valves provided at various locations should be closed to shut off flow when the planter sets overnight or for extended periods of time. It is also important to close the tank valves whenever service on the pump or hoses is being performed. To prolong the life of the hoses in the squeeze pump, the discharge manifold must be repositioned to the rearward position when not in use to prevent hose distortion.

00137-6



Discharge Manifold Rearward

00137-7



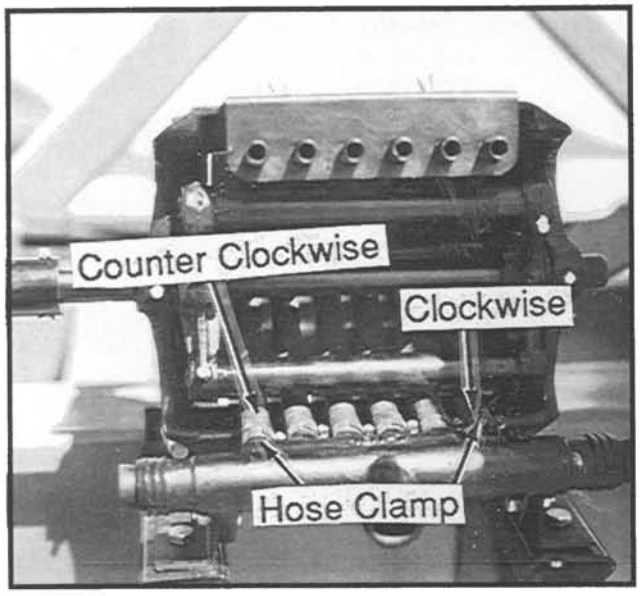
Discharge Manifold Forward

The discharge manifold must be in the forward position when the pump is in operation. To reposition the manifold, loosen the wing nuts and slide the manifold forward and sideways or rearward as required and retighten nuts.

CAUTION: Avoid excessive pressure when using the quick fill attachment. The rubber plugs installed in the manifold may be forced out under pressure.

If either of the end pump hoses should run off the back plate, loosen the hose clamp on the intake manifold and rotate the hose as follows.

48931-2



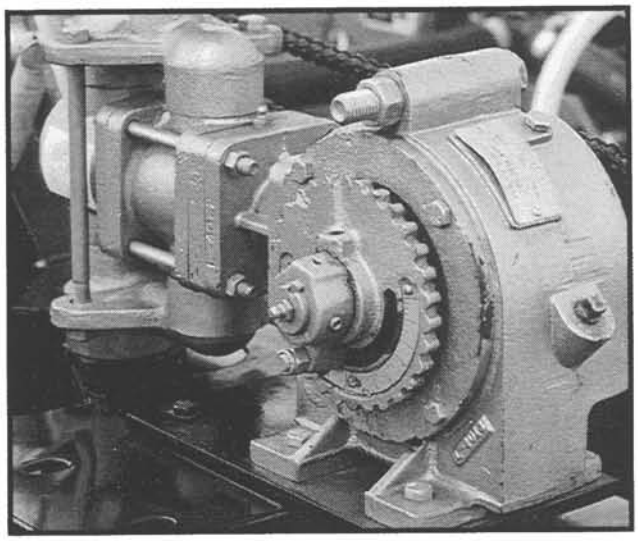
For the right hand hose (facing the pump from front of planter) twist the hose 1/4 turn in the clockwise direction.

For the left hand hose (facing front of pump) twist the hose 1/4 turn in the counter-clockwise direction.

Retighten hose clamp.

OPTIONAL PISTON PUMP

69045-6



If the machine is equipped with the piston pump option, the rate of liquid fertilizer application is determined by the piston pump settings.

The delivery rate chart found at the end of this section provides an approximate application rate only. Actual delivery will vary with temperature and the particular fertilizer being used.

The operator and instruction manual shipped with the pump and flow divider should be kept and stored with this manual for future reference.

NOTE: Periodically check flow to all rows. If one or more lines are plugged, set rate will be delivered to remaining rows.

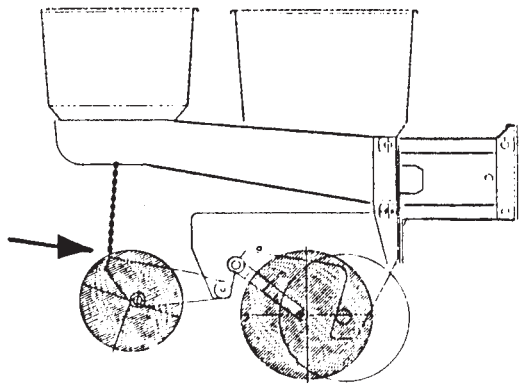
CLEANING

The tanks and all hoses are made of sturdy plastic and rubber to resist corrosion. However, the tanks, hoses and metering pump should be thoroughly cleaned with water at the end of the planting season or prior to an extended period of non-use. Do not allow fertilizer to crystalize due to cold temperature or evaporation.

CHECKING SEED POPULATION

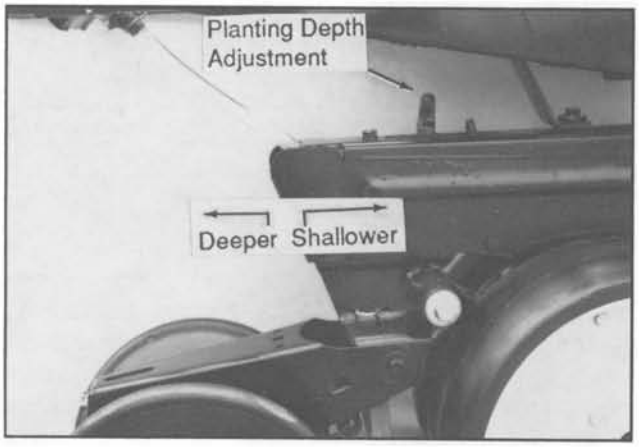
1. Tie up one or more sets of closing wheels by running a light chain between the hopper support panel and closing wheels. It may be necessary to decrease closing wheel arm spring tension.

L0069



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.

50677-13



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

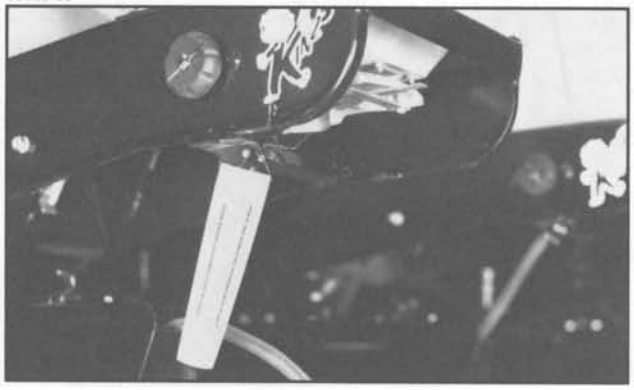
If seed check shows planting rate is significantly different than seed rate chart shows or if a particular meter is not planting accurately, remove seed disc and check meter for buildup of foreign material in the meter or the brush. Check the brush for damaged bristles. Remove foreign material from meter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

A field check is important to determine correct application rates.

60569-39



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 applicable to KINZE Model 2300 Twin-Line® 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 versus 36" rows and 19" rows versus 38" rows, at the listed sprocket combination.

In some cases when planting 15" row soybeans or milo/grain sorghum, a 2 to 1 drive reduction package 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.

MACHINE OPERATION

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

30 Inch	36 Inch	38 Inch	Transmission Sprockets Drive	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.

MACHINE OPERATION

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. The granular chemical flows through the given meter opening at a nearly uniform rate regardless of roller speed. Your actual rate will vary depending upon the herbicide you are using, your planting speed and your plant population. Planting speed/ground speed has the greatest affect on application rate.

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

DRY FERTILIZER APPLICATION RATES

APPROXIMATE RATE IN POUNDS PER ACRE

Drive Sprocket	Driven Sprocket	Low Rate Setting			High Rate Setting		
		30" Rows	36" Rows	38" Rows	30" Rows	36" Rows	38" Rows
15	35	29	24	23	86	71	68
15	33	33	27	26	98	82	78
15	30	36	30	28	109	90	86
19	33	41	34	33	124	104	98
19	30	45	38	36	138	114	108
15	19	52	43	41	158	132	125
30	35	56	47	44	172	143	136
30	33	60	50	47	182	152	144
33	35	63	53	50	189	158	149
35	33	70	58	56	212	177	168
33	30	73	60	57	220	184	174
19	15	84	70	66	272	227	215
30	19	104	87	82	316	263	250
33	19	115	96	91	347	290	275
35	19	122	102	97	368	307	291
30	15	132	110	104	400	334	316
33	15	145	121	115	440	367	348
35	15	154	129	122	467	389	369

NOTE: Uneven delivery may result in attempting to use lower rates than indicated by the chart.

Direction Of Rotation

High Rate Position

Low Rate Position

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

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

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

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

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

36" multiply by 0.83
38" multiply by 0.79

LIQUID FERTILIZER SQUEEZE PUMP APPLICATION RATES

GALLONS PER ACRE

Drive	Driven	30 Inch Rows	36 Inch Rows	38 Inch Rows	Drive	Driven	30 Inch Rows	36 Inch Rows	38 Inch Rows
16	62	6.2	5.0	4.9	46	44	25.3	20.2	20.0
16	*60	6.4	5.1	5.1	20	18	26.8	21.4	21.2
18	62	7.0	5.6	5.5	18	16	27.2	21.7	21.5
18	*60	7.2	5.8	5.7	52	46	27.3	21.8	21.6
16	52	7.4	5.9	5.9	*60	52	27.9	22.4	22.0
20	62	7.8	6.2	6.2	52	44	28.5	22.8	22.5
18	52	8.4	6.7	6.6	62	52	28.8	23.1	22.7
16	46	8.4	6.7	6.6	20	16	30.2	24.1	23.8
16	44	9.2	7.0	7.0	*60	46	31.5	25.2	24.9
20	52	9.3	7.5	7.3	62	46	32.6	26.0	25.7
18	46	9.4	7.6	7.5	*60	44	32.9	26.3	26.0
18	44	9.9	7.9	7.8	62	44	34.1	27.3	26.8
20	46	10.5	8.4	8.3	44	30	35.5	28.3	28.0
20	44	11.0	8.8	8.7	30	20	36.3	29.0	28.6
30	62	11.7	9.3	9.2	46	30	37.0	29.7	29.2
30	*60	12.1	9.7	9.5	30	18	40.3	32.2	31.8
16	30	12.8	10.3	10.2	52	30	41.9	33.5	33.1
30	52	13.9	11.1	11.0	30	16	45.3	36.3	35.7
18	30	14.5	11.6	11.4	*60	30	48.3	38.6	38.2
30	46	15.8	12.6	12.4	62	30	49.9	40.0	39.4
20	30	16.1	12.8	12.8	44	20	53.2	42.5	42.0
30	44	16.5	13.2	13.0	46	20	55.5	44.4	43.9
44	62	17.2	13.7	13.6	44	18	59.0	47.3	46.6
44	*60	17.7	14.2	14.0	46	18	61.8	49.5	48.8
46	62	18.0	14.3	14.2	52	20	62.8	50.2	49.6
46	*60	18.5	14.8	14.6	44	16	66.4	52.8	52.4
16	20	19.4	15.5	15.2	46	16	69.4	55.5	54.8
52	62	20.2	16.2	16.0	52	18	69.8	55.8	55.1
44	52	20.4	16.4	16.1	*60	20	72.5	58.0	57.2
52	*60	20.9	16.7	16.5	62	20	74.9	60.0	59.1
46	52	21.4	17.1	16.9	52	16	78.5	62.8	62.0
16	18	21.5	17.2	17.0	*60	18	80.5	64.4	63.6
18	20	21.7	17.4	17.2	62	18	83.2	66.6	65.7
44	46	23.1	18.5	18.2	*60	16	90.6	72.5	71.5
*60	62	23.4	18.7	18.5	62	16	93.6	74.9	73.9
62	*60	25.0	20.0	19.7					

***Optional sprocket.**

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

This chart was calculated based on a solution weighing ten pounds per gallon.

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

LIQUID FERTILIZER PISTON PUMP APPLICATION RATES

GALLONS PER ACRE

Pump Setting	1	2	3	4	5	6	7	8	9	10
8 Row 30	9.2	18.4	27.5	36.7	45.9	55.1	64.2	73.4	82.6	91.8
8 Row 36	7.7	15.3	22.9	30.6	38.2	45.9	53.5	61.2	68.8	76.5
8 Row 38	7.2	14.5	21.7	29.0	36.2	43.5	50.7	58.0	65.2	72.4
12 Row 30	6.1	12.2	18.4	24.5	30.6	36.7	42.8	48.9	55.1	61.2
12 Row 36	5.1	10.2	15.3	20.4	25.5	30.6	35.7	40.8	45.9	51.0
12 Row 38	4.8	9.7	14.5	19.3	24.2	29.0	33.8	38.6	43.5	48.3
16 Row 30	4.6	9.2	13.8	18.4	22.9	27.5	32.1	36.7	41.3	45.9

Above chart for planters equipped with contact drive and 50 tooth drive sprocket and 23 tooth driven sprocket. See "Tire Pressure" for recommended tire pressures. Chart is based on average wheel slippage and liquid viscosities.

Measure and weigh one gallon of actual fertilizer solution to determine exact application rate. This chart was calculated based on a solution weighing ten pounds per gallon.

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

NOTE: Flow to all rows should be checked periodically. If one or more lines are plugged, the desired rate will be delivered to the remaining rows keeping total application rate at desired rate.

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.

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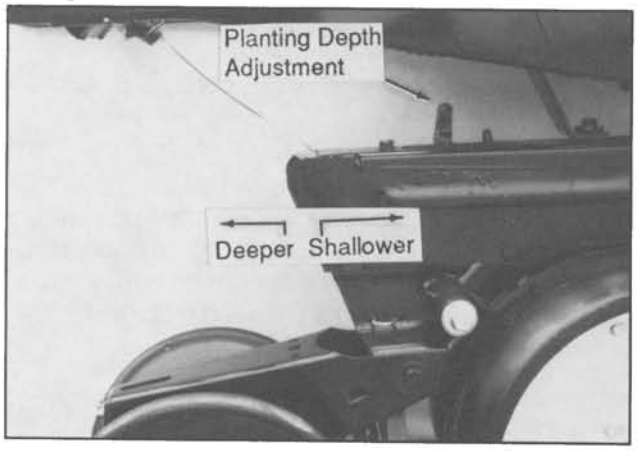


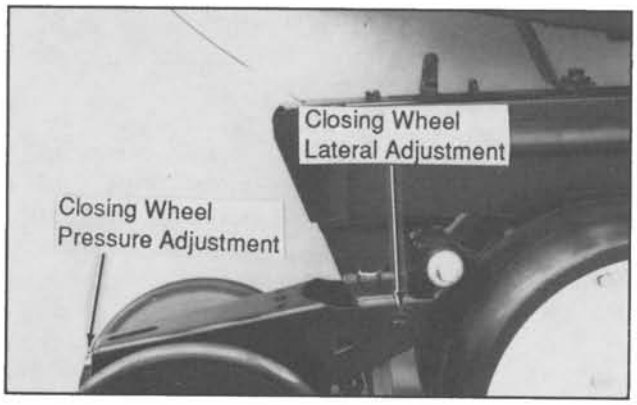
CLOSING WHEEL PRESSURE

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.

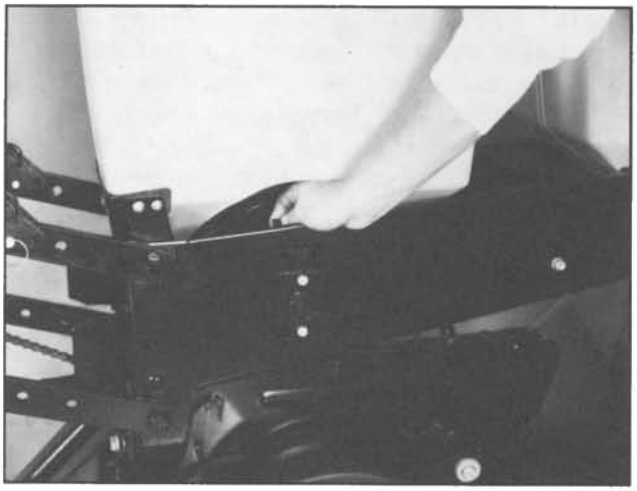
WARNING: Raise planter and install cylinder lockups before making closing wheel adjustments.

ROW UNIT OPERATION

SEED METER DRIVE RELEASE

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

60569-43



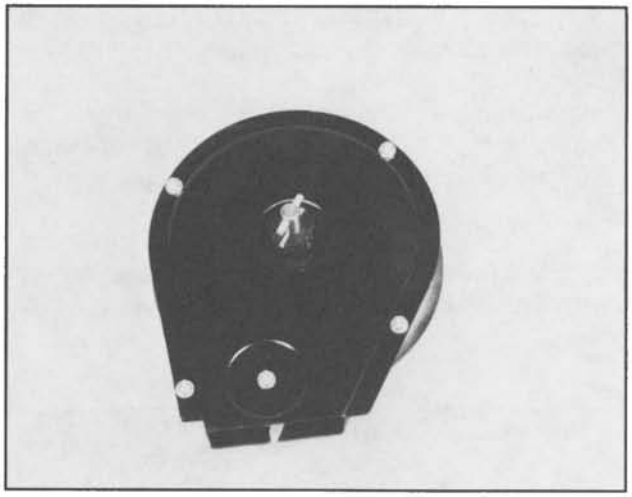
To disengage the drive, lift the release handle and pull outward until the handle locks in the slot in the side of the hopper side panel. To engage the row unit, lift and unlatch the handle. Spring tension will return the mechanism to the drive position.

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

FINGER PICKUP CORN METER

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

60620-14



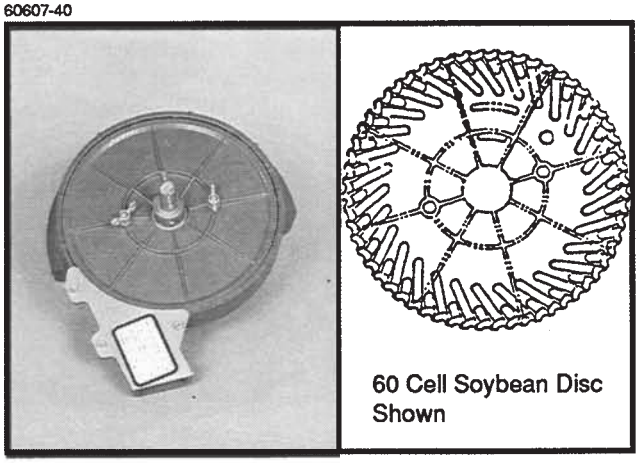
IMPORTANT: To provide efficient operation of the finger pickup corn meters and extend the life of components, sprinkle a teaspoon of powdered graphite over the top of the seed twice daily. The graphite will filter down into the seed pickup mechanism and provide lubrication.

53761-1

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

BRUSH-TYPE SEED METER

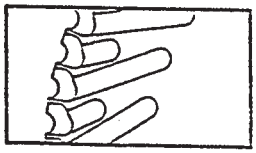
60607-40



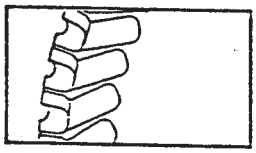
60 Cell Soybean Disc Shown

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

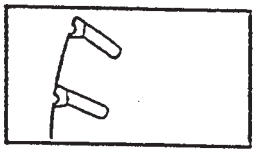
Soybean: *60 cells to meter seed sizes from 2200 to 4000 seeds per pound (Black color-coded).*



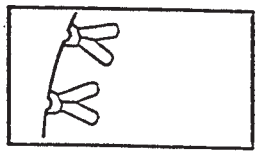
Specialty soybean: *48 cells to meter seed sizes from 1400 to 2200 seeds per pound (Dark blue color-coded).*



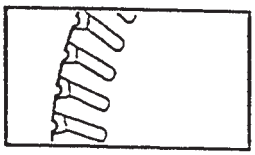
Small milo/grain sorghum: *30 cells to meter seed sizes from 14,000 to 20,000 seeds per pound (Red color-coded).*



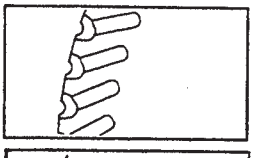
Large milo/grain sorghum: *30 cells to meter seed sizes from 10,000 to 16,000 seeds per pound (Light blue color-coded).*



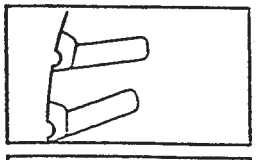
High rate milo/grain sorghum: *60 cells to meter seed sizes from 12,000 to 18,000 seeds per pound (Red color-coded).*



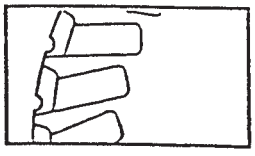
High rate large milo/grain sorghum: *60 cells to meter seed sizes from 10,000 to 14,000 seeds per pound (Yellow color-coded).*



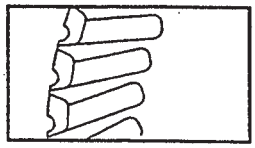
Cotton, acid-delinted: *30 cells to meter seed sizes from 4200 to 5200 seeds per pound (White color-coded).*



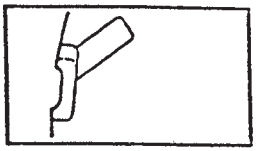
Large cotton, acid-delinted: *36 cells to meter seed sizes 3800 to 4400 seeds per pound (Tan color-coded).*



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.

ROW UNIT OPERATION

SEED HOPPER

60620-69

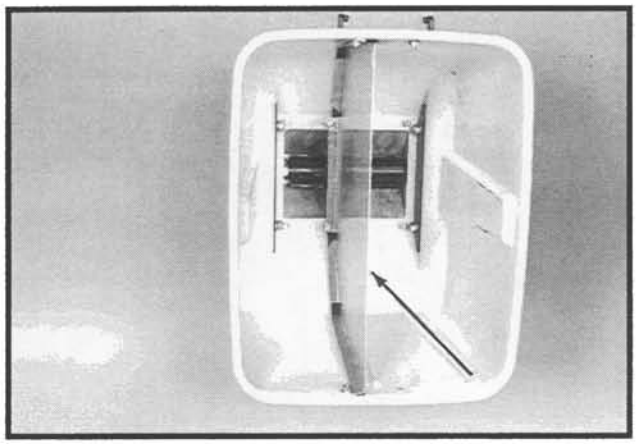
The seed hopper has a capacity of 1.6 bushels.

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.

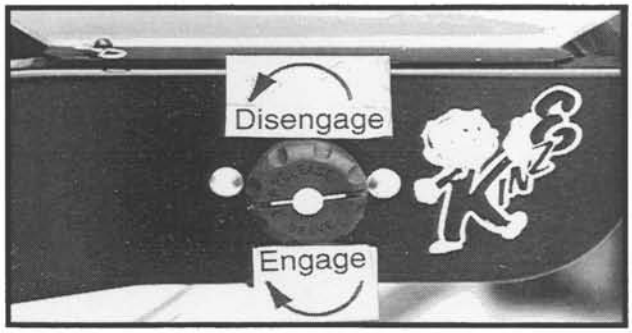
Be sure no foreign objects get into the hopper when it is being filled. Replace the hopper lids after filling the hoppers to prevent the accumulation of dirt and moisture buildup.

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

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

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

54948-18



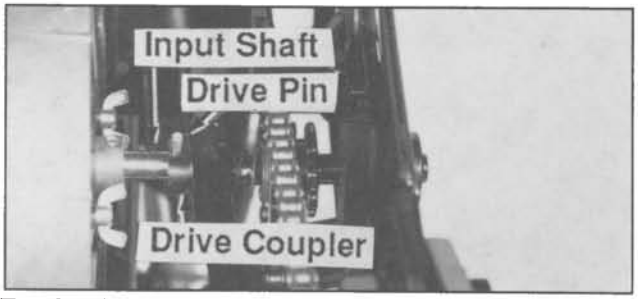
ROW UNIT OPERATION

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



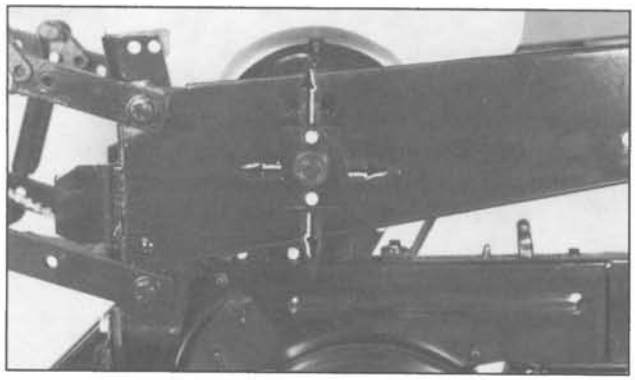
To check alignment:

- 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.

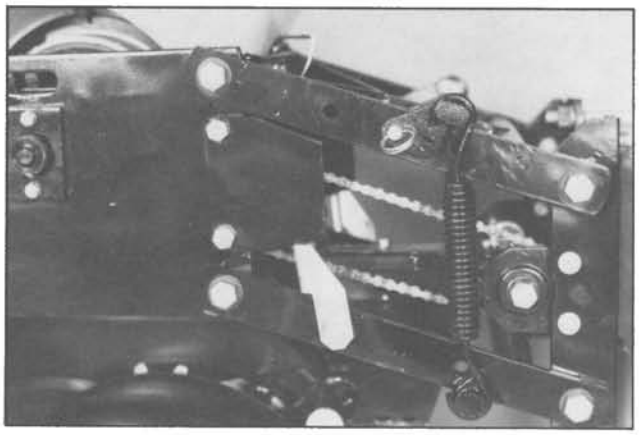
60569-12



PUSH UNIT LOCKUPS

Push unit lockups are designed to allow the push units to be locked in the raised position.

60569-6

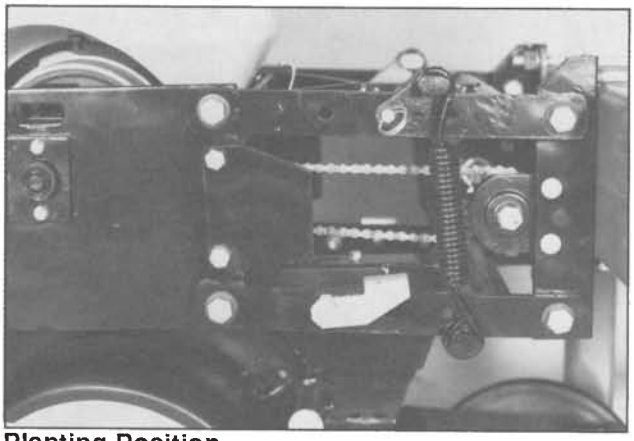


Raised Position

To lock in raised position:

1. With the planter in the raised position, place a wooden (approximately 8")block under the disc opener assembly of each push unit. (Or use other means of raising each push unit.)
2. Lower the planter until the push unit is in the extreme raised position.
3. Rotate both right hand and left hand lockups into place under the push unit stops as shown in the "Raised Position" photo.
4. Raise planter.
5. Remove wooden blocks.

60569-9



Planting Position

To release lockups:

Reverse of above procedure. At Step 3, rotate lockups out from under the push unit stops as shown in "Planting Position" photo.

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

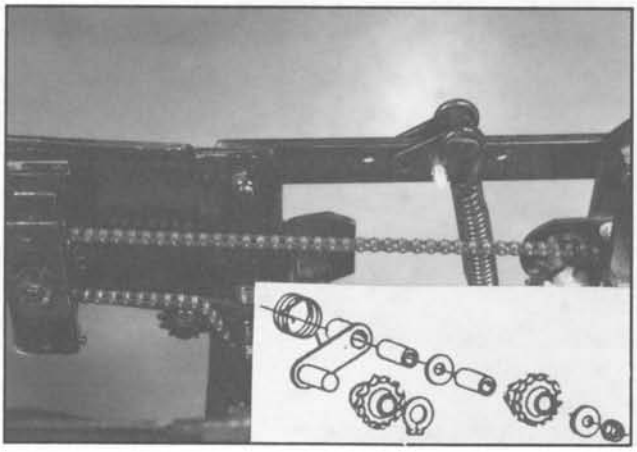
ROW UNIT OPERATION

ROW UNIT CHAIN ROUTING

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

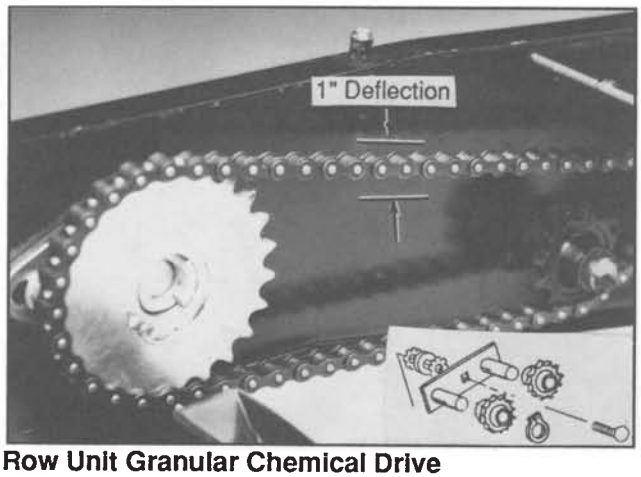
Inspect and replace weak, worn or broken springs and/or idlers and idler bushings.

60569-56



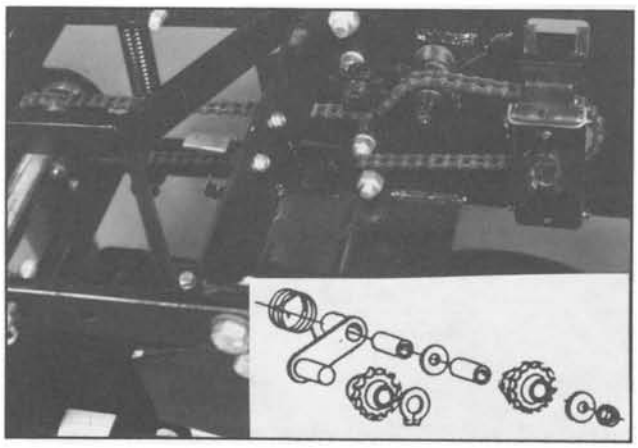
Row Unit Meter Drive

54948-12



Row Unit Granular Chemical Drive

60569-46



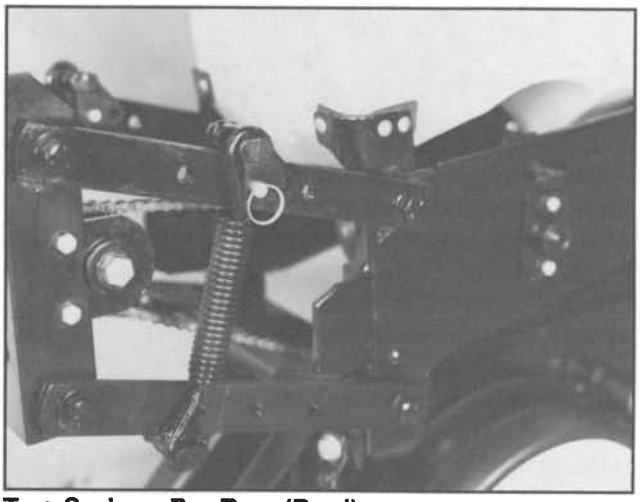
Push Unit Meter Drive

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.

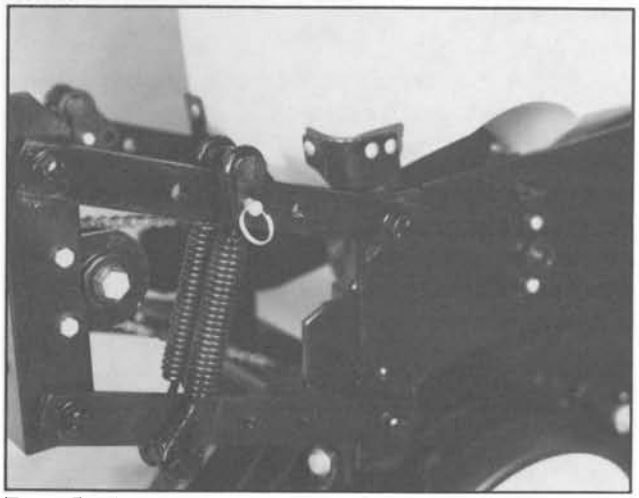
Two springs per row, one on the L.H. parallel arms and one on the R.H. parallel arms, are used unless row unit mounted no till coulters are used. Four springs per row are used with row unit mounted no till coulters. Two springs per row are used with frame mounted coulters, row unit mounted and frame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

60569-36



Two Springs Per Row (Dual)

60569-33

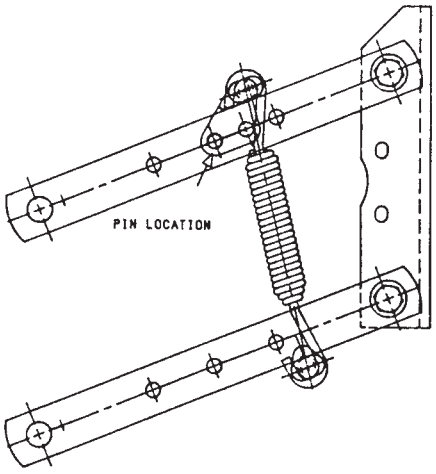


Four Springs Per Row (Quad)
(Used only in conjunction with row unit mounted no till coulters)

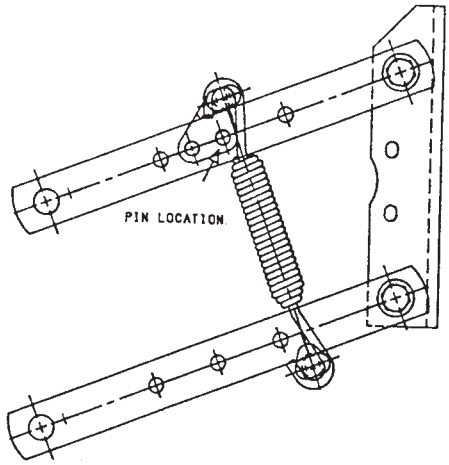
ROW UNIT OPERATION

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

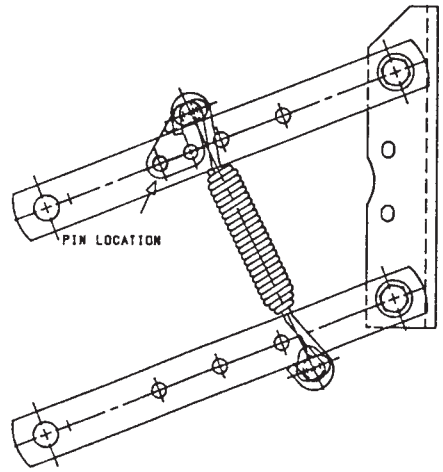
L0096



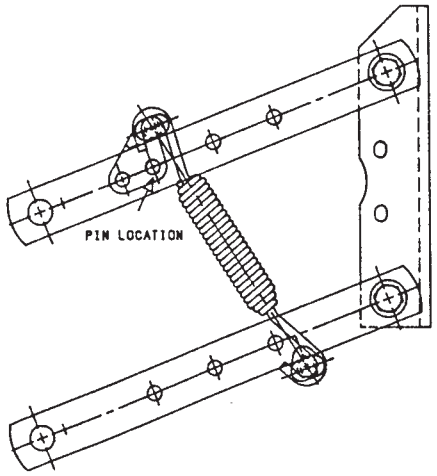
Position 1



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.

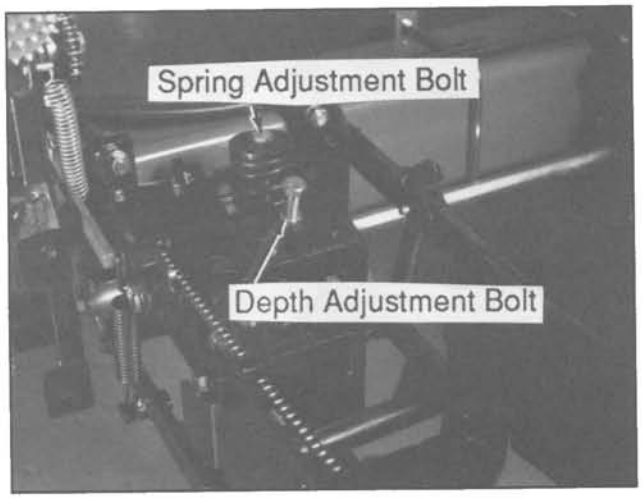
NOTE: Springs must always be installed with open side of spring hooks toward seed hopper to prevent binding on spring mount adjustment pin.

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.

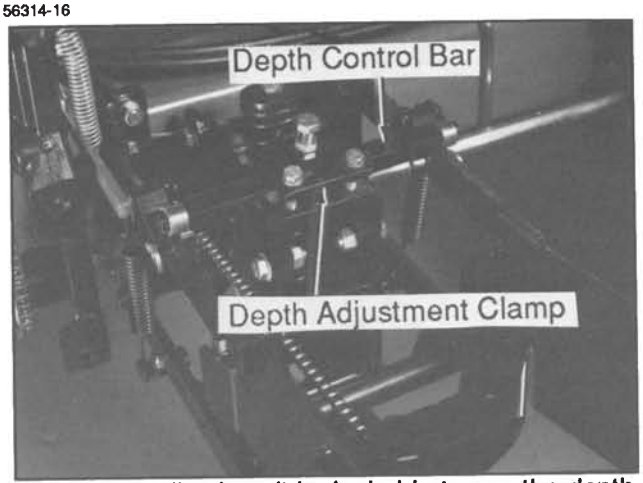
56314-14



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

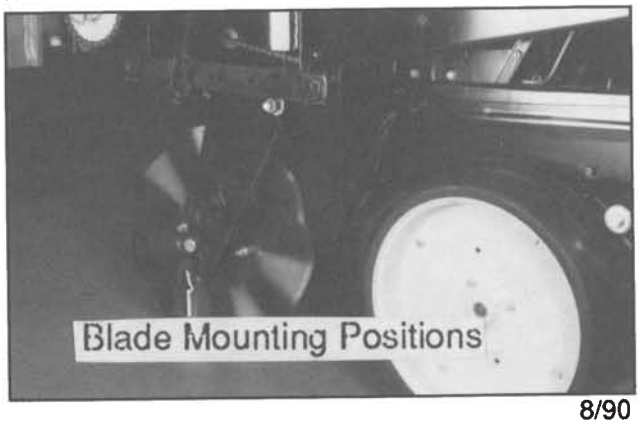


In certain applications it is desirable to use the depth control bar. In uneven terrain, use of the depth control bar allows greater depth control. The up and down movement of the row unit allows the coulter to move up and down at a rate of approximately 1/2 that of the row unit, maintaining a more uniform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

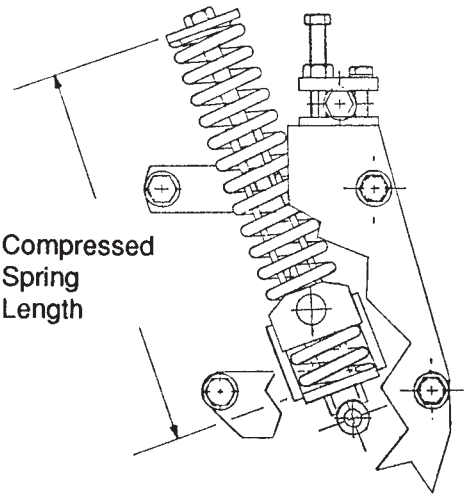
56314-1



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

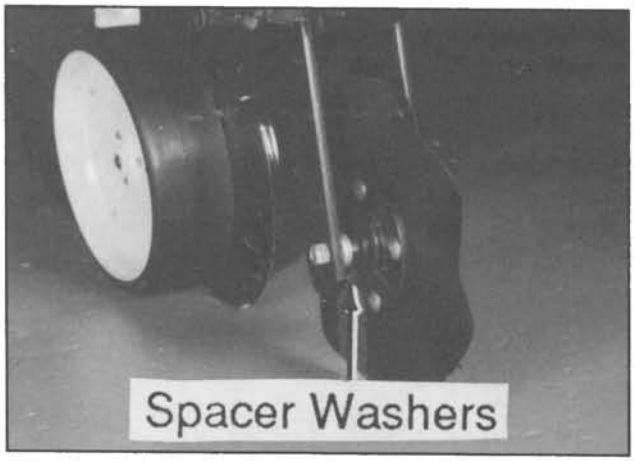
A5649rev



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



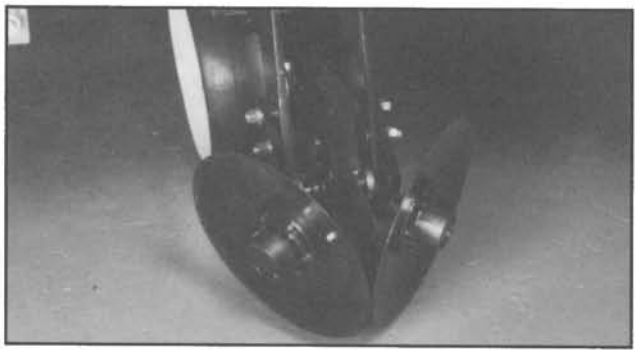
Field adjustment should be made as needed. Operating height of the planter frame will affect operating depth of the frame mounted coulter.

DISC FURROWERS

(For use with Frame Mounted Coulter)

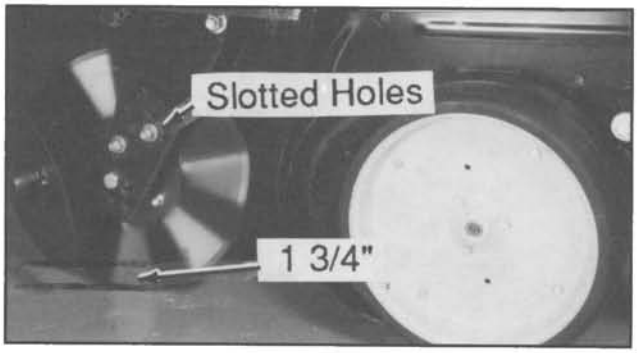
Disc furrowers for use with the frame mounted coulter may be equipped with either 12" solid blades or 12" notched blades.

56314-19



Slotted holes in the frame mounted coulter fork mount and in the disc furrower arm, and positioning of spacers between the arm and the mount allow for disc furrower blade adjustments.

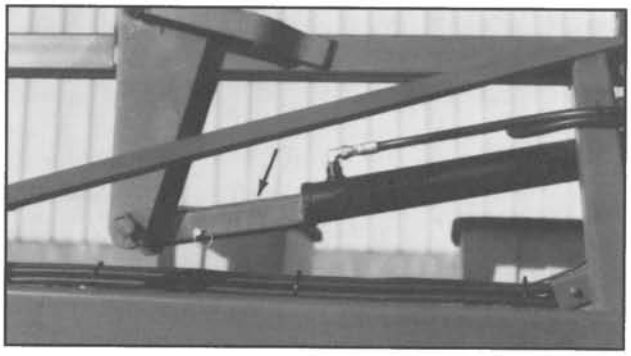
56314-17



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.

64730-10



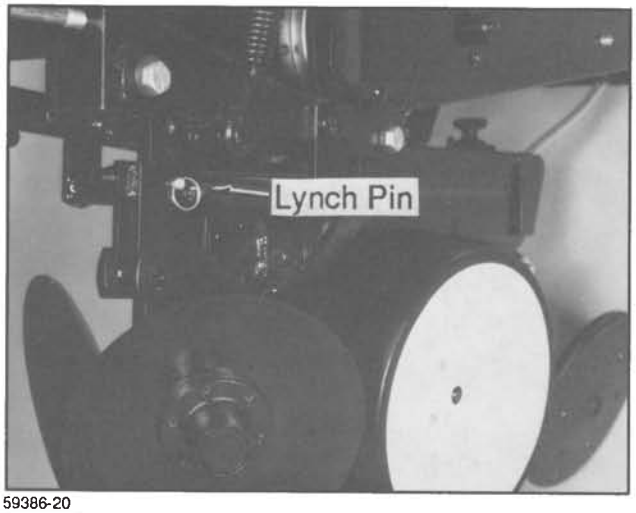
NOTE: A cylinder stop MUST BE used on each wing lock cylinder on all 30" row machines equipped with frame mounted coulters with disc furrowers to limit downward flex of the wing approximately 4% during field operation. (Does not affect upward flex.)

ROW UNIT OPERATION

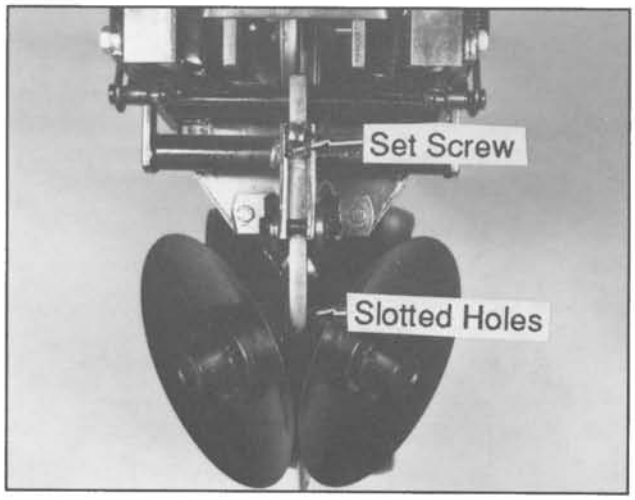
ROW UNIT MOUNTED DISC FURROWER

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

59386-23



59386-20

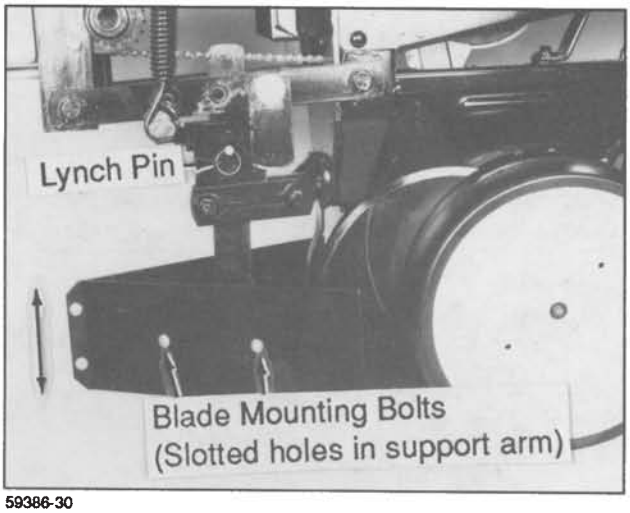


Vertical adjustment in 1/3" increments is possible by removing the lynch pin which secures the vertical support arm and moving the support arm up or down as required. Re-install lynch pin. Finer adjustment can be attained by removing the lynch pin and using the 5/8" x 2 1/4" set screw to clamp the support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

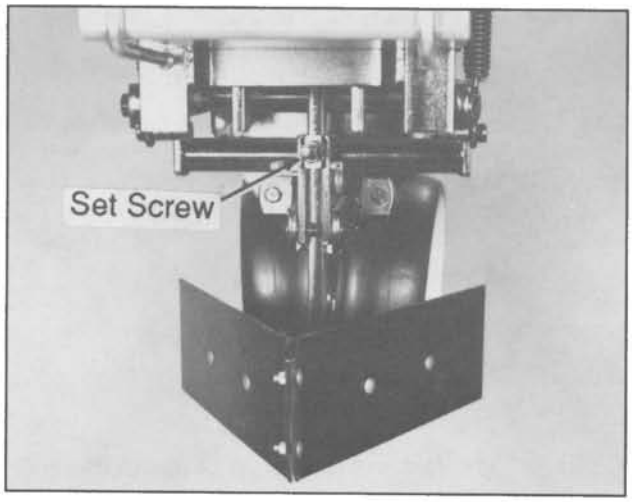
Slotted holes in the support arm where the discs are mounted allow fore and aft adjustment of the discs. Discs can be adjusted so the front edges meet or one disc can be moved to the rear and the other to the front of the slot so cutting edge of one disc overlaps the edge of the other disc. The dust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

ROW UNIT MOUNTED BED LEVELER

59386-26



59386-30

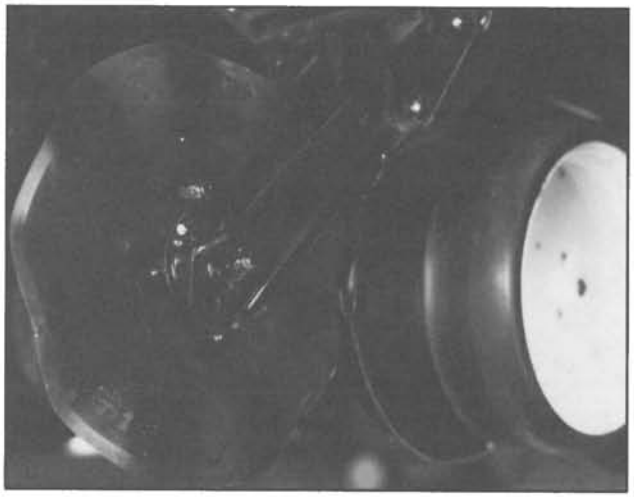


Vertical adjustment in 1/3" increments is possible by removing the lynch pin which secures the vertical support arm and moving the support arm up or down as required. Re-install lynch pin. Finer adjustment can be attained by removing the lynch pin and using the 5/8" x 2 1/4" set screw to clamp the support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

ROW UNIT MOUNTED NO TILL COULTER

60569-42



Row unit mounted no till coulters with 1" rippled or 1" fluted blades may be used on plateless row units and interplant push 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" 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.

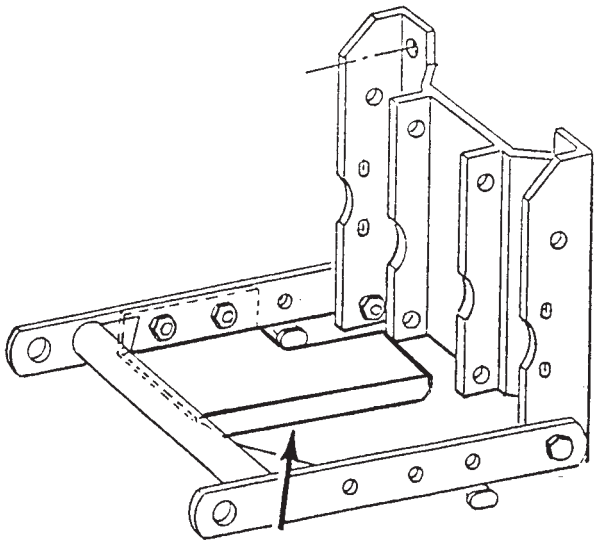
It is most desirable to run the coulter blade 1/4" shallower than the row unit disc opener so it won't disturb the seed bed below the seed trench opened by the double disc opener.

In heavy residue it may be necessary to run 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



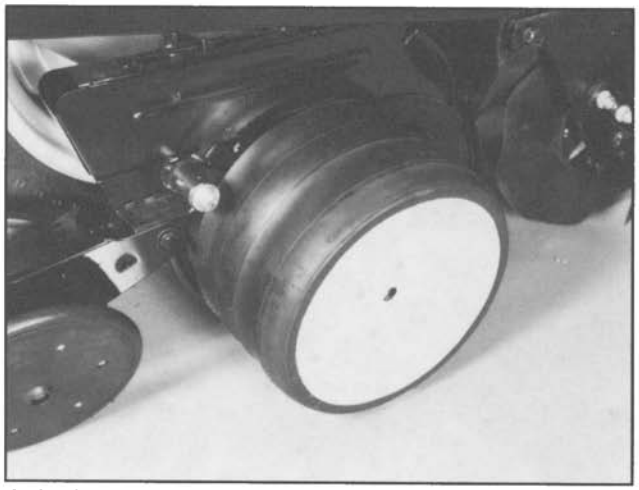
Row unit chain shields are designed for use on conventional row units when row unit mounted no till coulters are used. The shields CAN NOT BE USED on interplant push units or row units equipped with frame mounted coulters, row unit mounted disc furrowers or row unit mounted bed levelers.

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

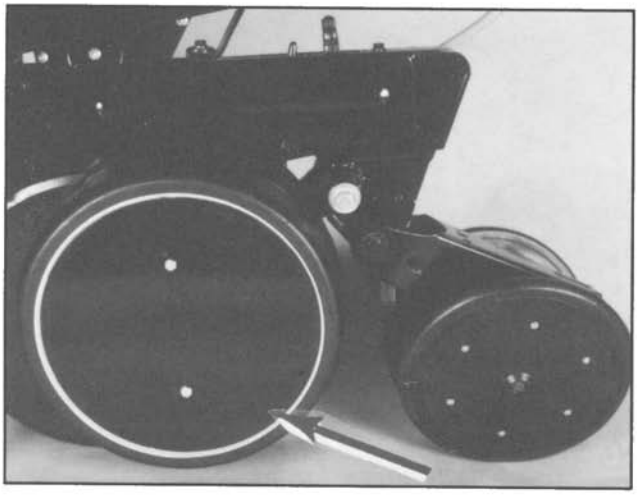


A dual gauge wheel is used to provide added width for additional row unit flotation in light sandy soil.

In some applications such as narrow row widths (below 36") or where clearance with transport and/or drive wheels is a problem, the added width of the dual gauge wheel may prevent its use.

ROW UNIT GAUGE WHEEL COVER

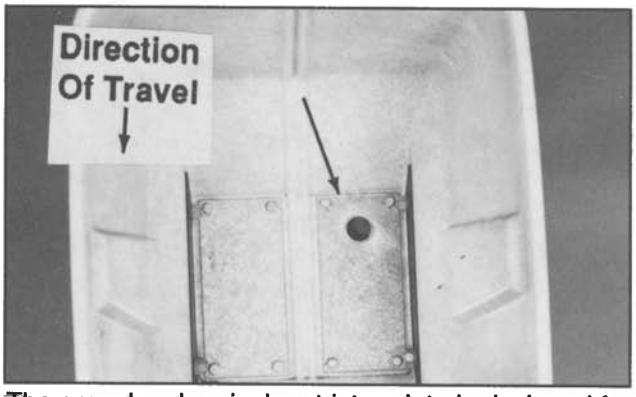
60607-37



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

65249-18



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

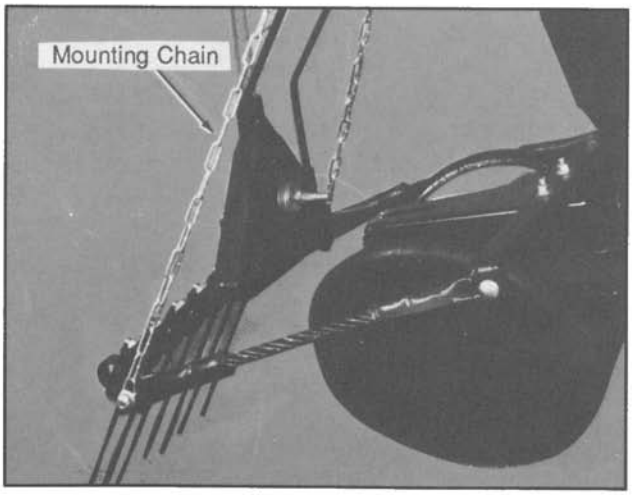
IMPORTANT: Check application rate of all rows in the field with the granular chemical you are using and at the speed and population at which you will be planting. See "Checking Granular Chemical Application Rate".

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

SPRING TOOTH INCORPORATOR

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

00138-17



ROW UNIT OPERATION

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 appropiate 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.

FINGER PICKUP CORN METER TROUBLESHOOTING

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

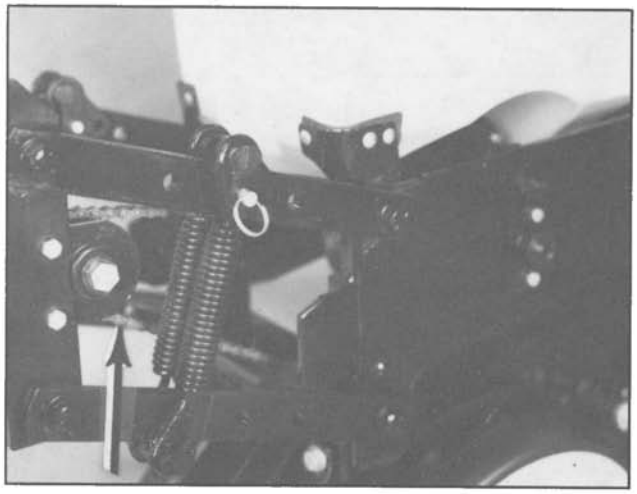
LUBRICATION SYMBOLS

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

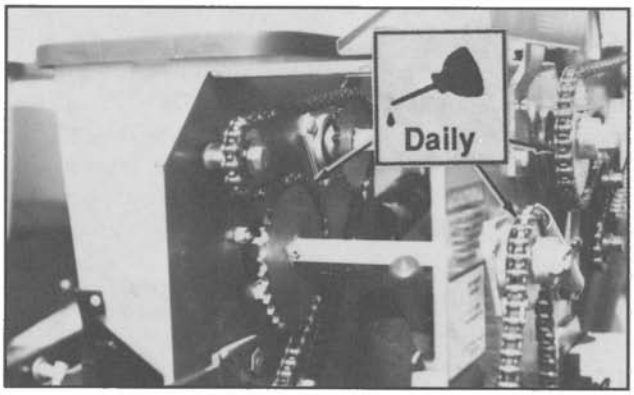
60569-33



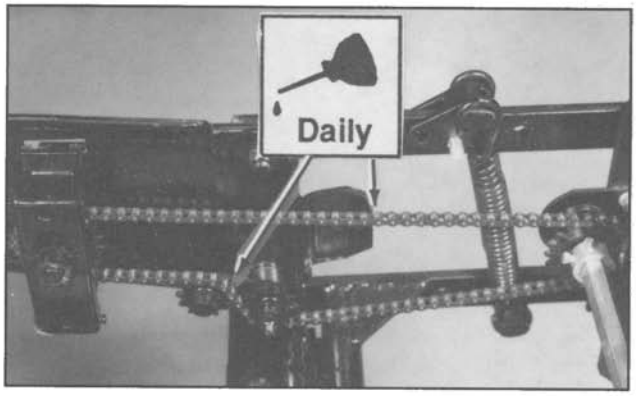
A number of sealed bearings are used on your KINZE planter to provide trouble free operation. These are located in such areas as the drive shaft, row units and transmission bearings. Sealed bearings are lubricated for life, and due to the seals, relubrication is not practical.

DRIVE CHAINS

48618-1



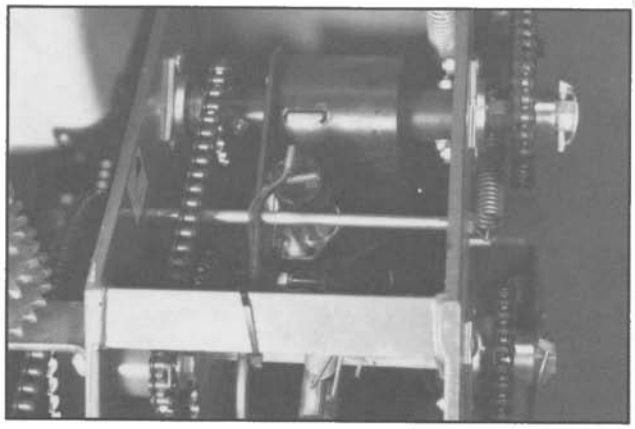
60569-56



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

POINT ROW WRAP SPRING CLUTCHES

60569-50



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

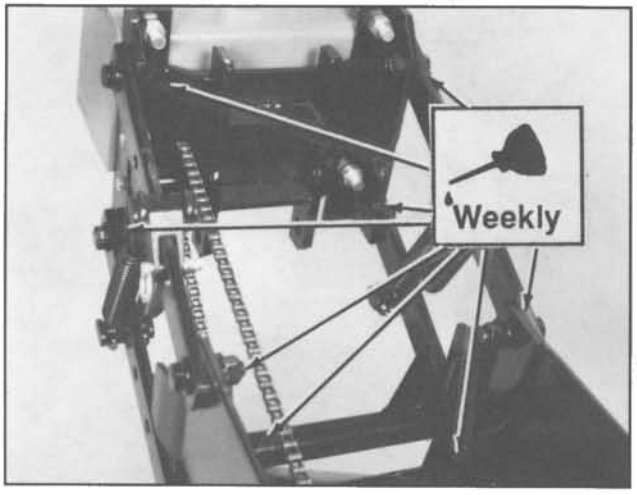
LUBRICATION

BUSHINGS

Lubricate bushings at the frequency indicated.

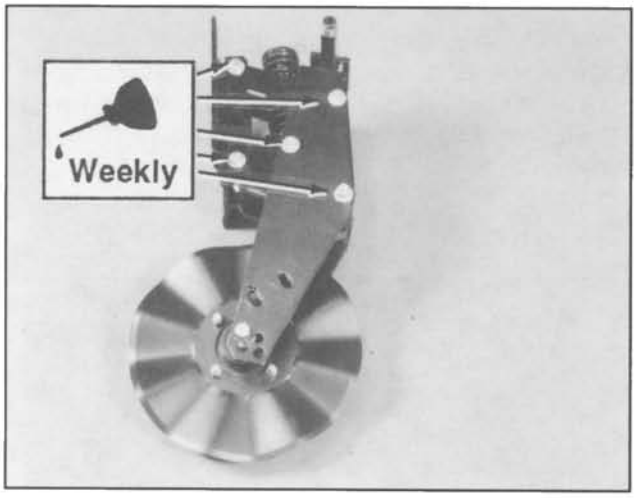
Using a wrench, check each bolt for proper torque. If bolt is loose, it should be removed and the bushing inspected for cracks and wear. Replace bushing if necessary. **Only hardened flat washers should be used. Replace damaged flat washers with proper part. Torque bolts to 130 ft. lbs.**

59386-43



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

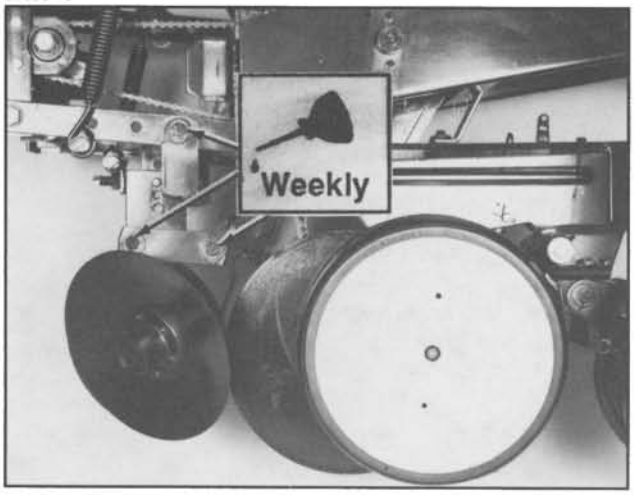
56314-8



Frame Mounted Coulter Parallel Linkage (10 per row)

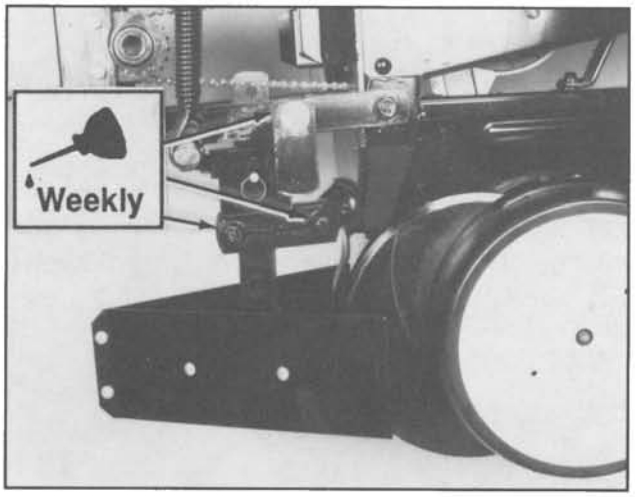
Shown not installed on row unit for visual clarity.

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 checked annually. Inspect for lubrication. The transport wheel hubs are equipped with grease fittings. Pump grease into the hub until grease comes out around the seals. See "Grease Fittings" for lubrication frequency.

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

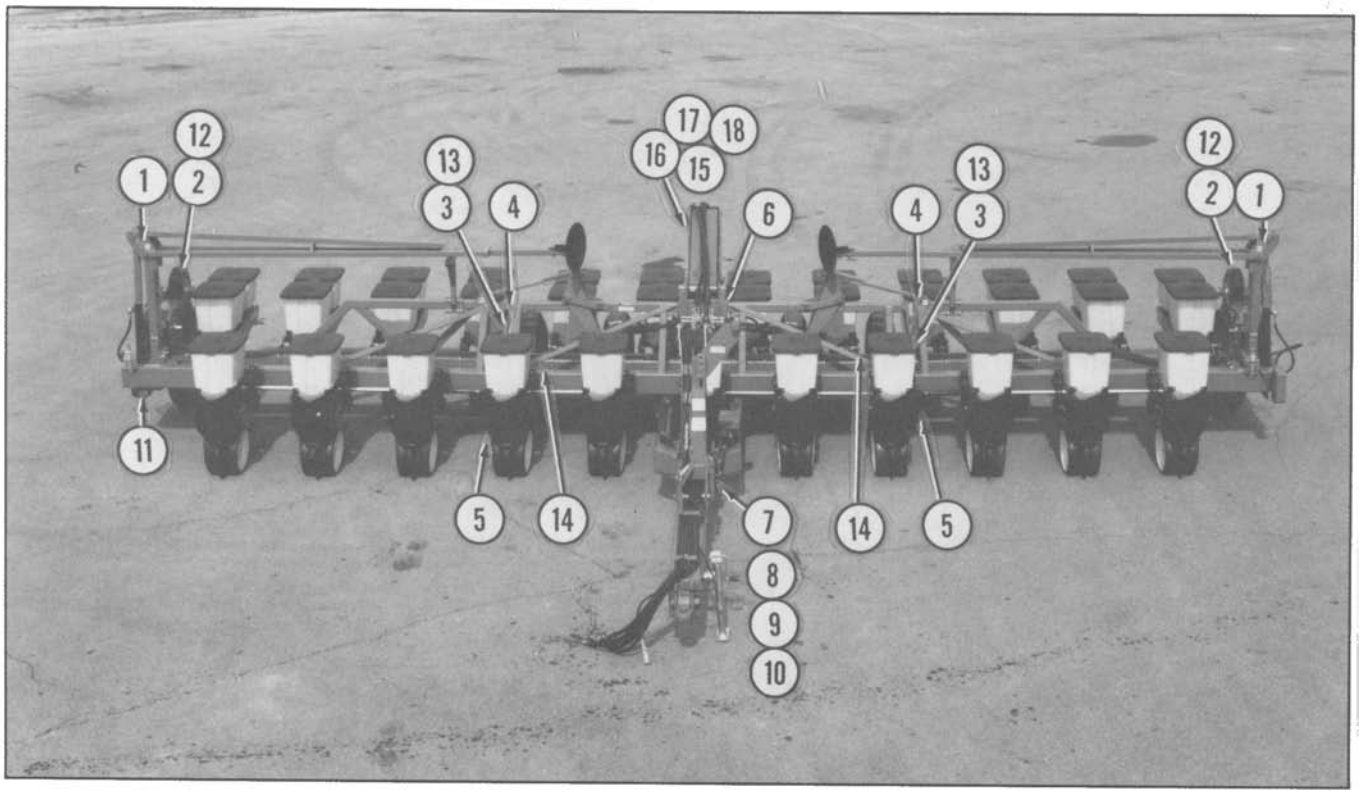
GREASE FITTINGS

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

48496-21

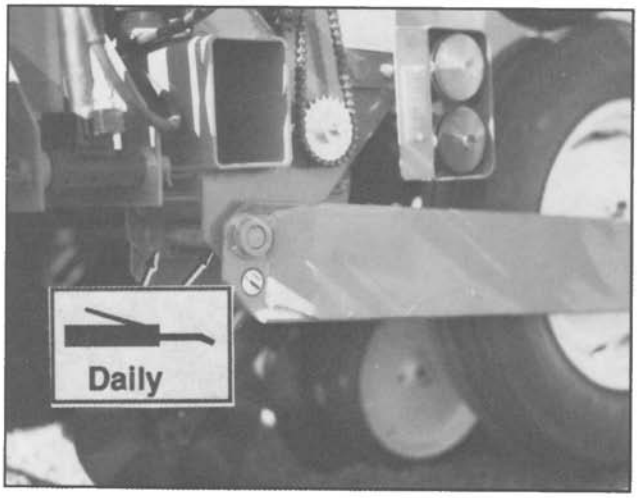


LUBRICATION

60355-14

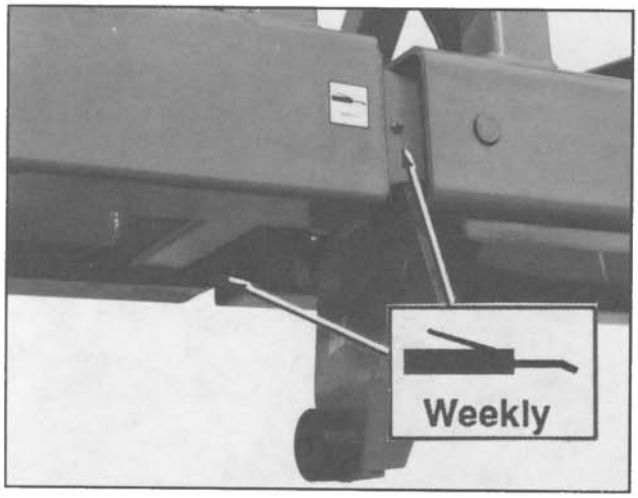
1. Marker Assemblies - 4 Zerks Per Assembly On 8 Row 30, 8 Row Wide & 12 Row 30. 2 Zerks Per Assembly On 12 Row Wide & 16 Row 30.

60356-2



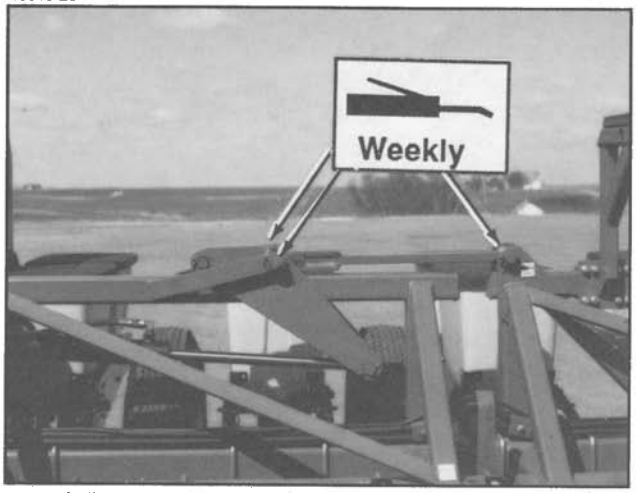
2. Driver Wheel Pivot - 2 Zerks Per Wheel Module

51502-8



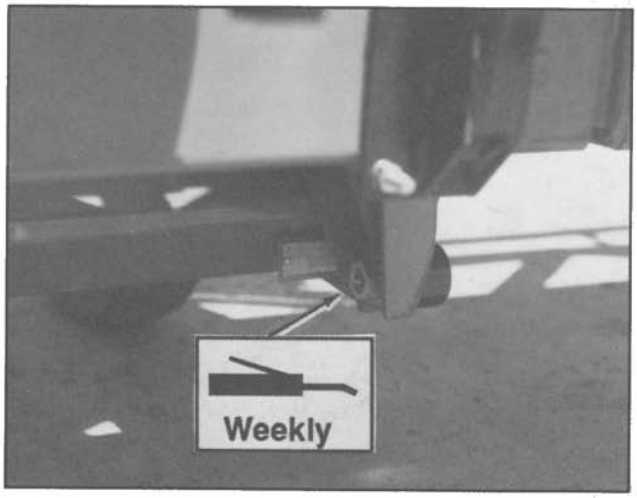
3. Wing Hinges - 2 Zerks Per Wing

48618-26



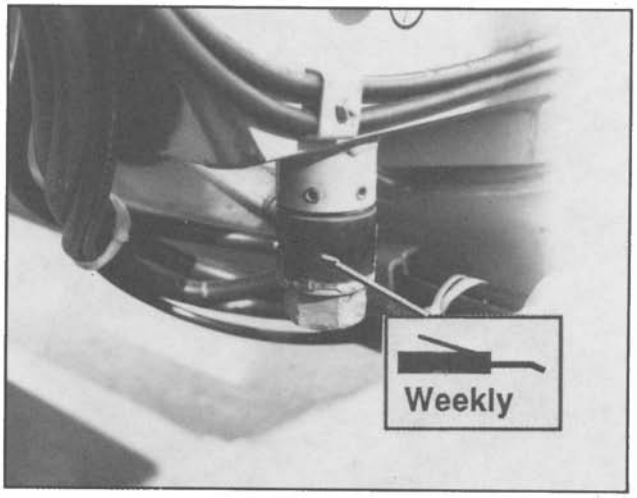
4. Wing Locks - 3 Zerks Per Wing

48837-12



5. Cam Follower - 1 Zerk Per Follower

51052-20

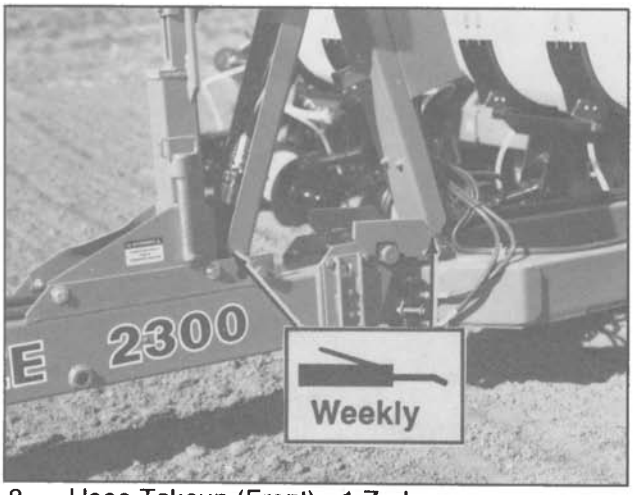


6. Rotation Cylinder - 1 Zerk

60355-24

7. Hitch Slide - 4 Zerks

60355-7

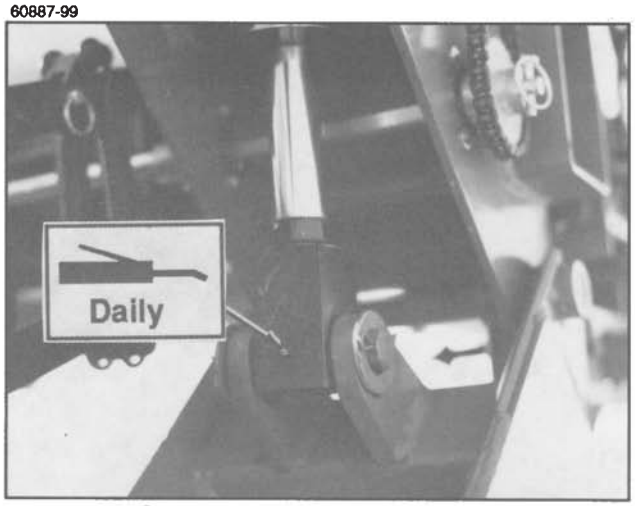


8. Hose Takeup (Front) - 1 Zerk
9. Hose Takeup (Rear) - 1 Zerk
10. Tongue Hook - 2 Zerks

51502-5

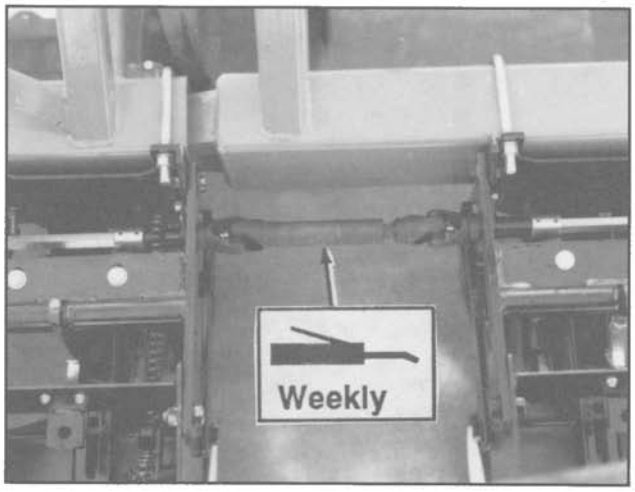
11. Transport Latch - 1 Zerk

60887-99



12. Slave Cylinders (On Wings) - 1 Zerk Per Cylinder

51293-20



13. U-Joints - 1 Zerk Per Hinge Area

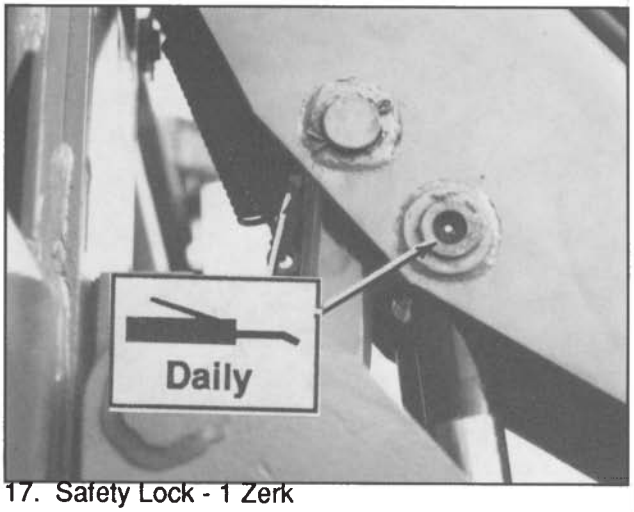
51502-7

14. Transport Wheel Bearings - 1 Zerk Per Hub

51502-7

15. Upper Lift Arm - 2 Zerks
16. Lower Lift Arm - 5 Zerks

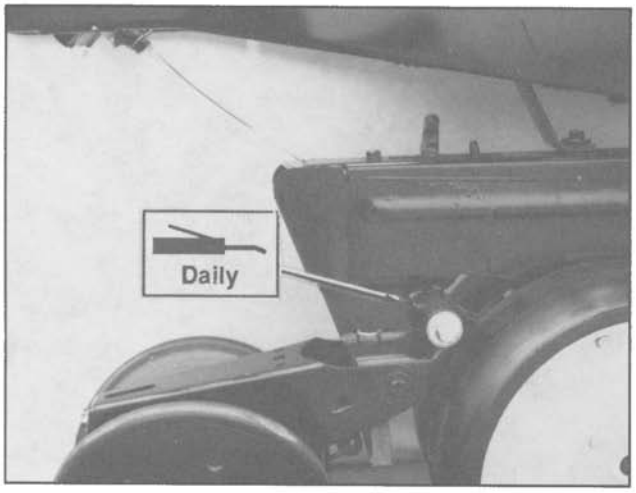
51502-3



17. Safety Lock - 1 Zerk
18. Pivot Pin - 2 Zerks

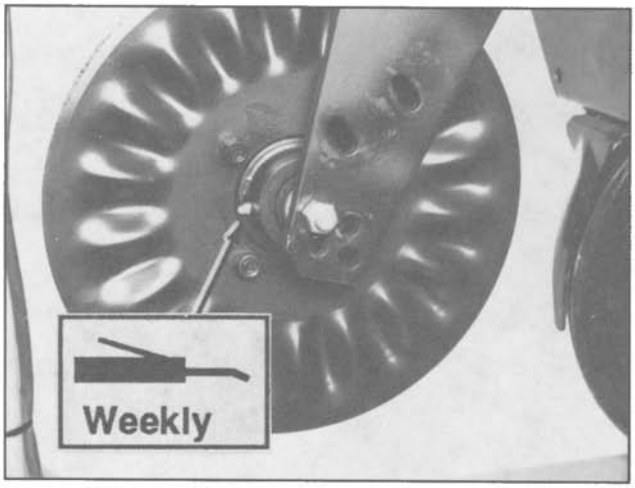
Row Unit

50677-13



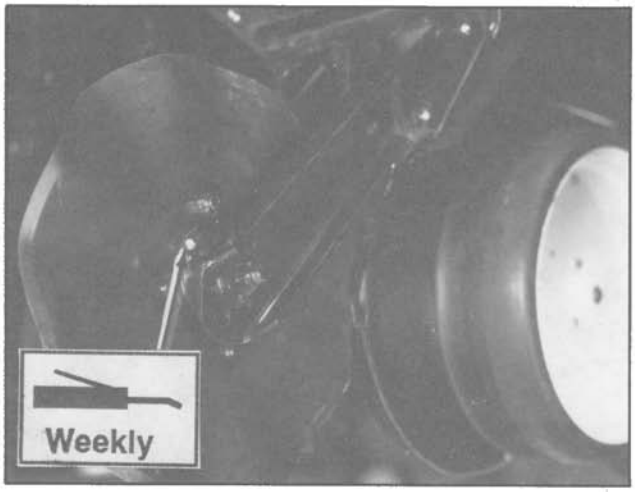
Gauge Wheel Arm - 1 Zerk Per Arm

56673-6



Frame Mounted Coulter Hub - 1 Zerk Per Hub

60569-42

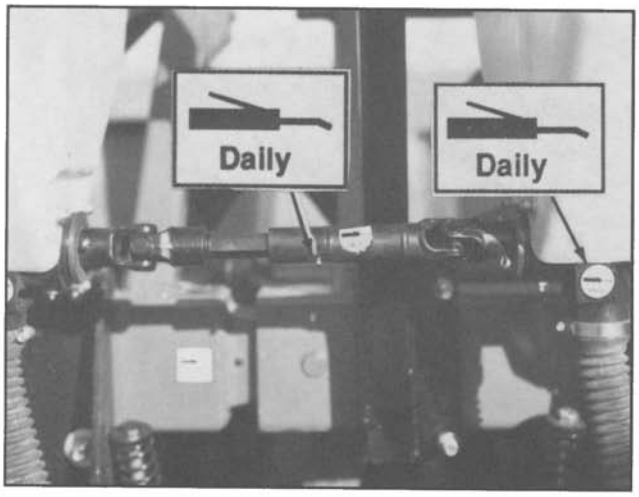


Row Unit Mounted No Till Coulter Hub - 1 Zerk Per Hub

LUBRICATION

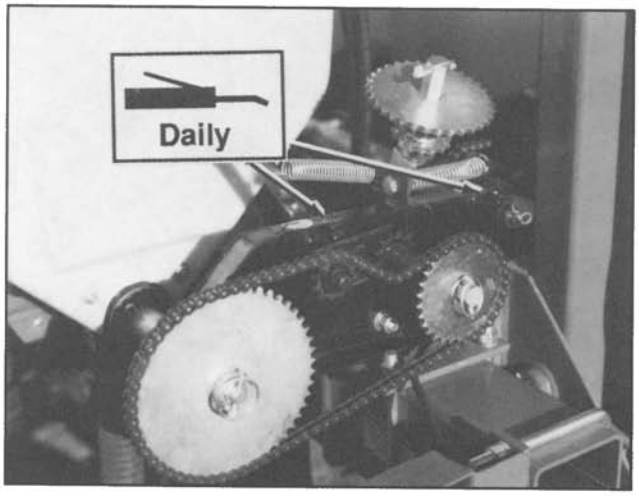
Dry Fertilizer Attachment

60389-15rev



Fertilizer Hopper - 2 Zerks Per Hopper
U-Joint - 1 Zerk Per Hinge Area

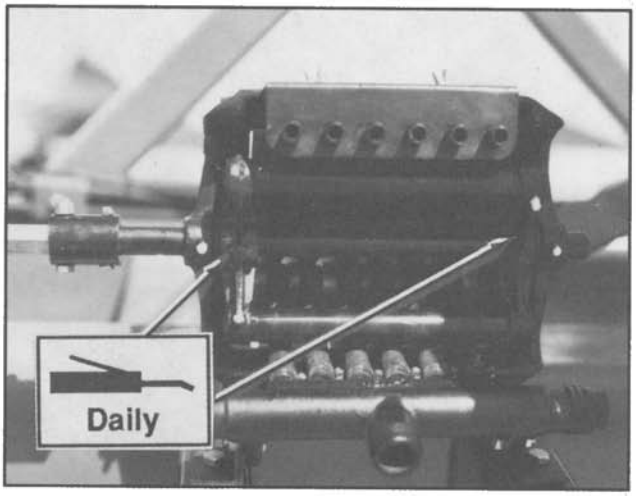
60389-6



Fertilizer Transmission - 2 Zerks Per Transmission

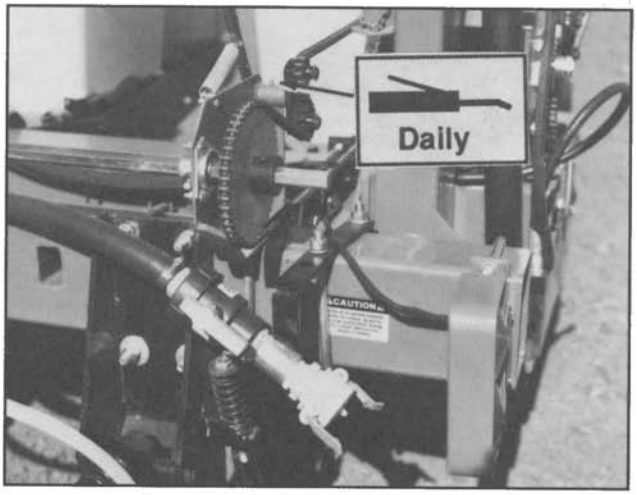
Liquid Fertilizer Attachment

48931-2



Squeeze Pump - 8 Zerks Per Pump

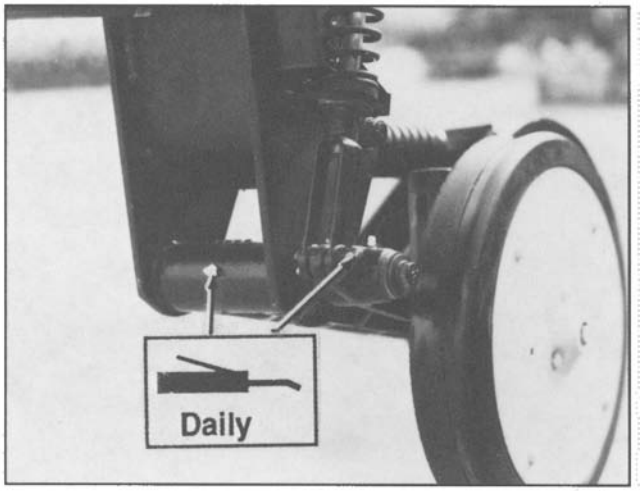
60356-10



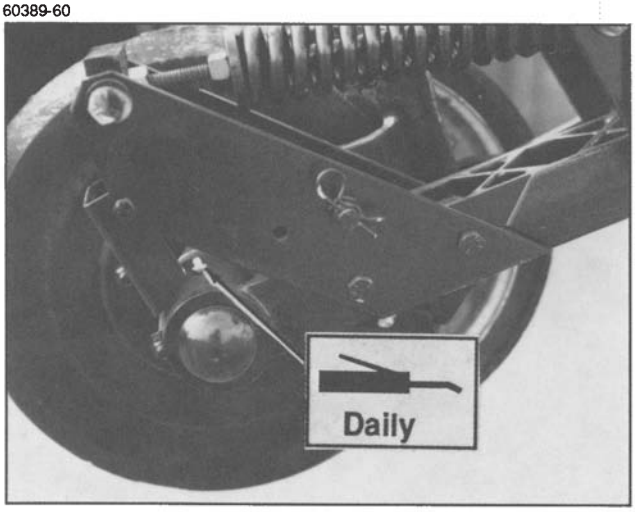
Drive Plate - 1 Zerk Per Plate

Single Disc Fertilizer Opener

60389-58



60389-60



3 Zerks Per Single Disc Fertilizer Opener

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.

Center Section Transport Tires Lug Nuts - 125 Ft. Lbs.
Wing Ground Drive Tires Lug Nuts - 90 Ft. Lbs.

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

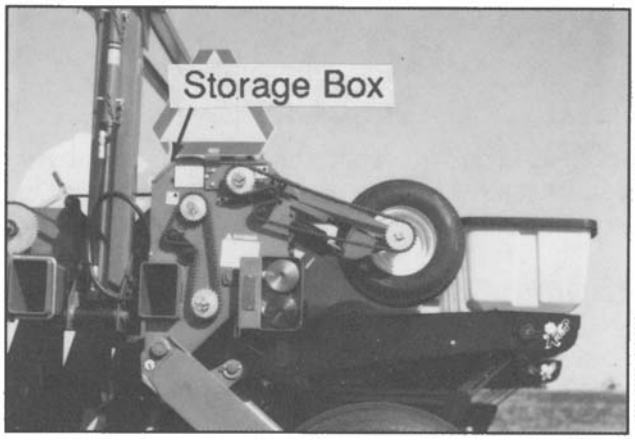
GRADE 8
6 Marks

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.

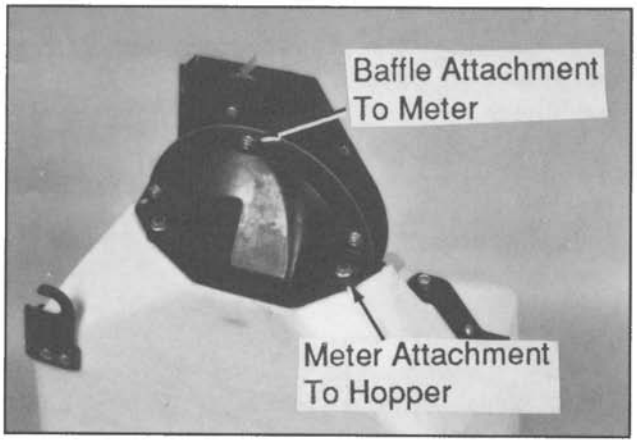
60355-15



FINGER PICKUP CORN METER INSPECTION/ADJUSTMENT

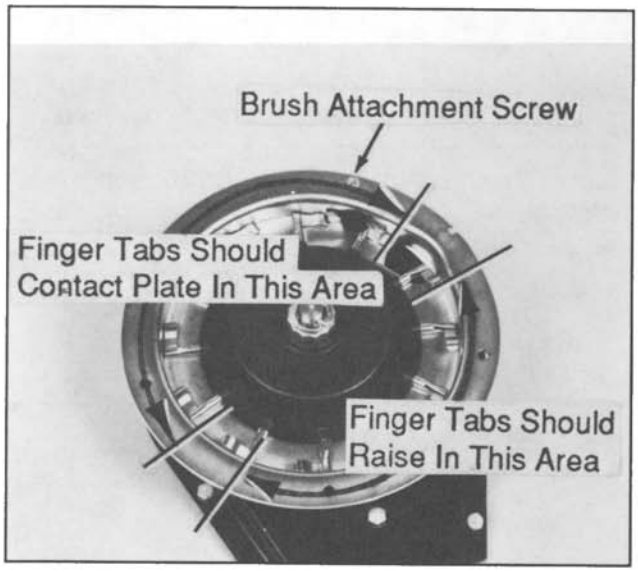
To inspect or service the finger pickup corn meter, remove the meter from the seed hopper by removing the two nuts which secure the mechanism to the hopper. Remove the baffle from the meter assembly by removing three cap screws. This will permit access to the finger pickup.

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

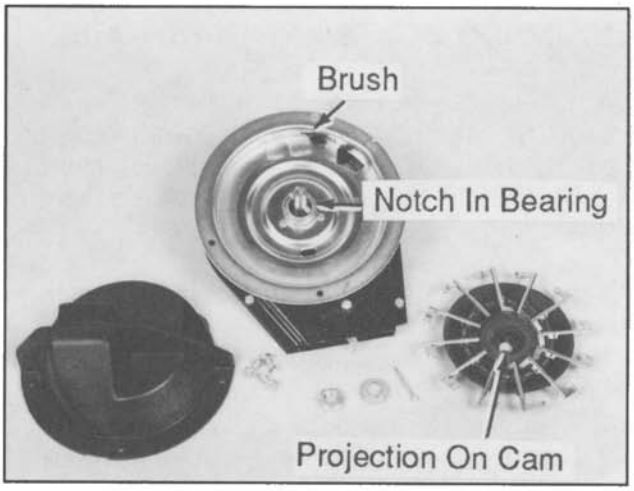


A build-up of debris or chaff may prevent proper finger operation and will require disassembly and cleaning of the corn meter as follows:

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.

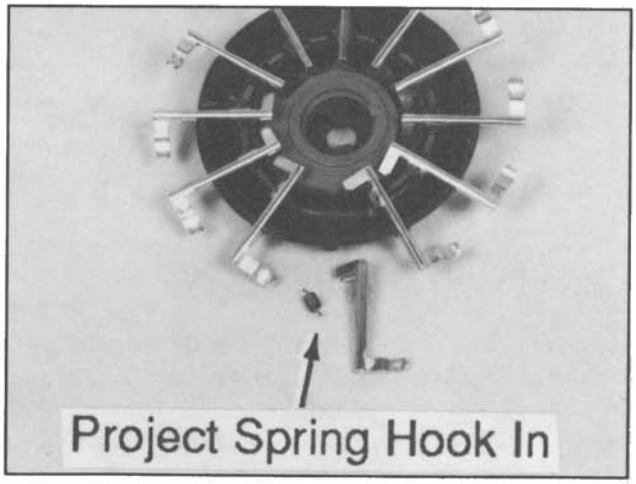
EXAMPLE: Approximately 600 acres of corn on a 6 row machine or 800 acres on an 8 row machine.

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

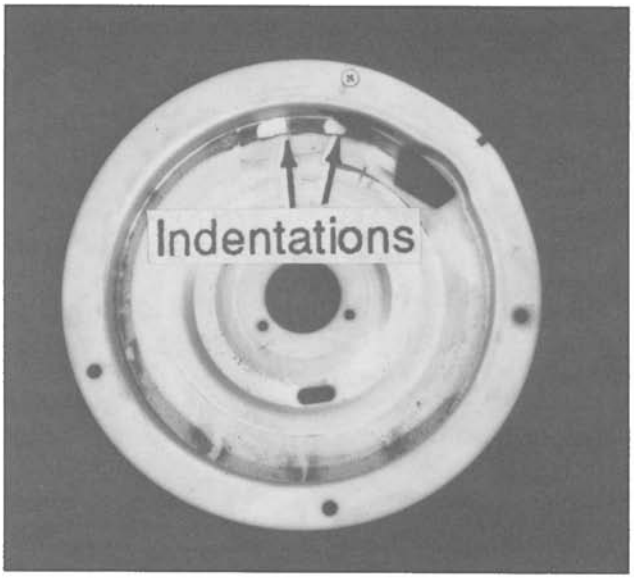


Photo shows worn plate

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.

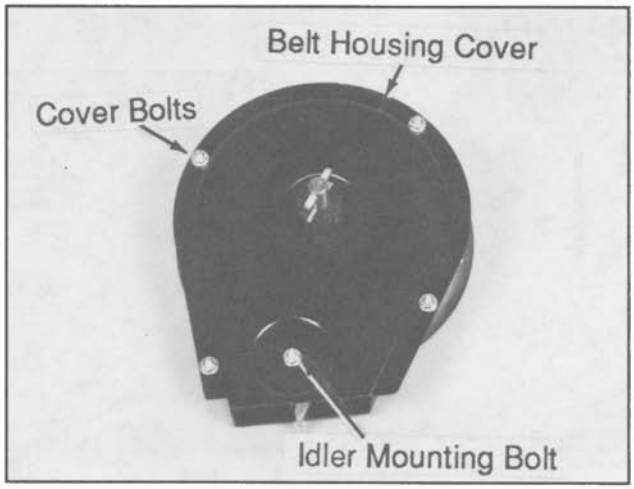
9. Turn finger holder by hand to make sure it is positioned firmly against the carrier, but is not over tightened and can be rotated with moderate force.

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

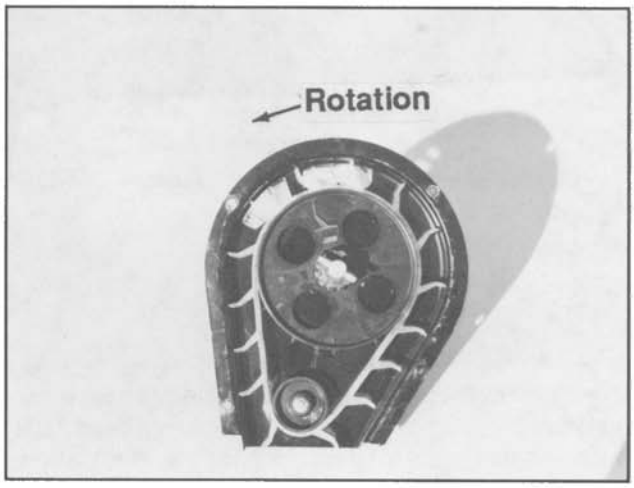
NOTE: Check tightness of adjusting nut on each unit after first day of use and periodically thereafter.

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.

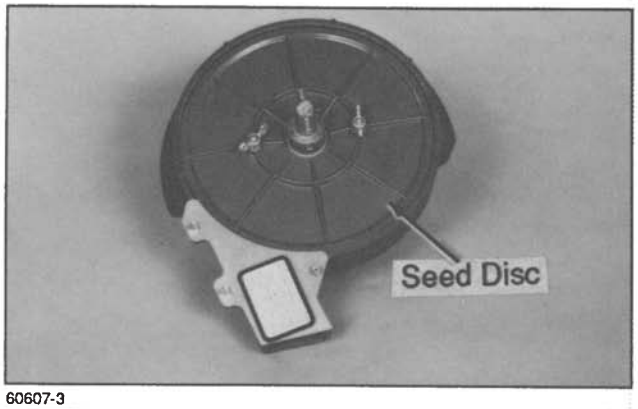
CAUTION: Do not over tighten hardware.

FINGER PICKUP CORN METER CLEANING

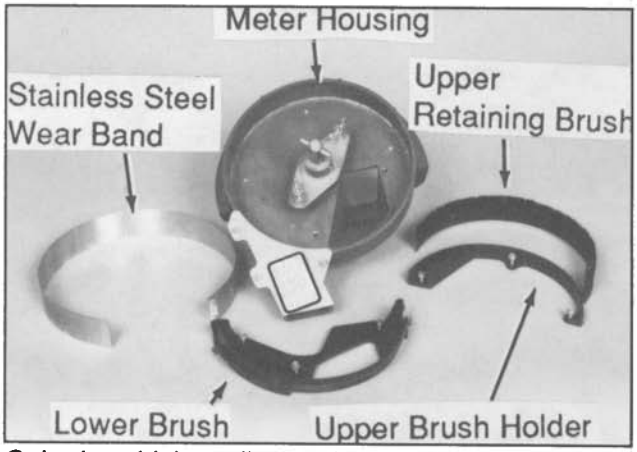
1. Disassemble meter.
2. Blow out any foreign material present in the meter mechanism.
3. Wash in mild soap and water. DO NOT USE GASOLINE, KEROSENE OR ANY OTHER PETROLEUM BASED PRODUCT.
4. Dry thoroughly.
5. Coat lightly with a rust inhibiter.
6. Store in a dry place.

BRUSH-TYPE SEED METER MAINTENANCE

60607-10

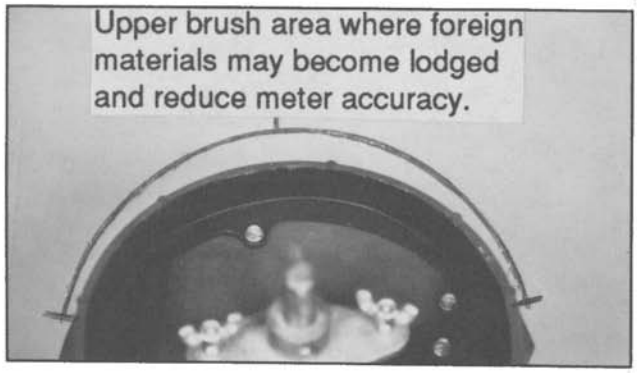


60607-3



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:

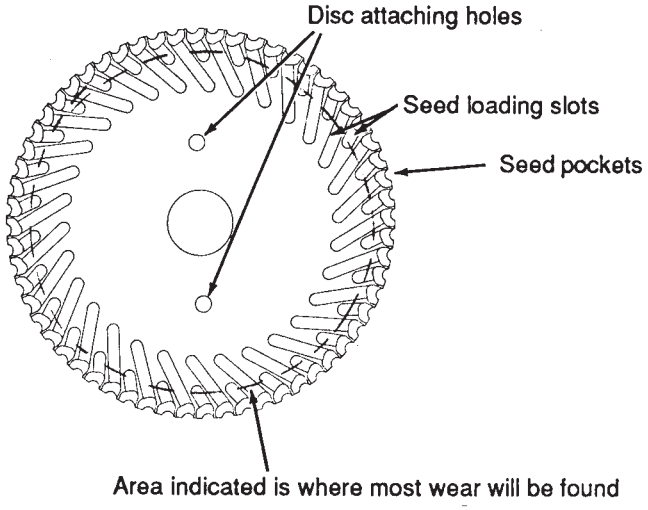
1. Remove meter from seed hopper by removing the two nuts which secure the meter to the hopper.
2. Remove seed disc and wash with soap and water and dry thoroughly.
3. Remove upper retaining brush by removing the three hex head screws from the brush holder and removing brush holder and retaining brush.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

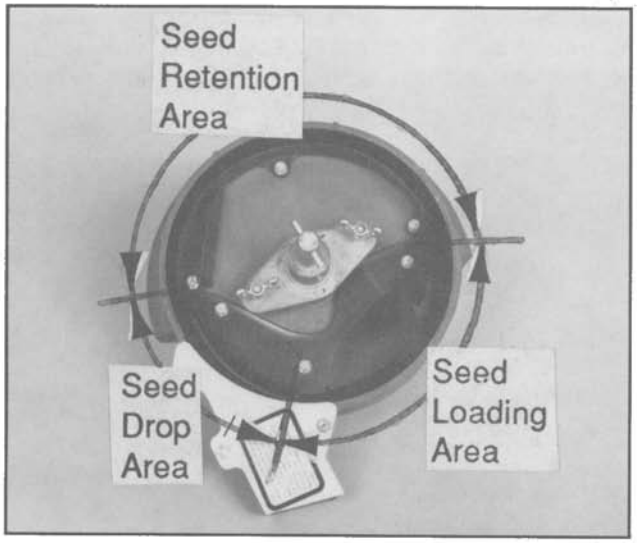
Stainless Steel Wear Band

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.

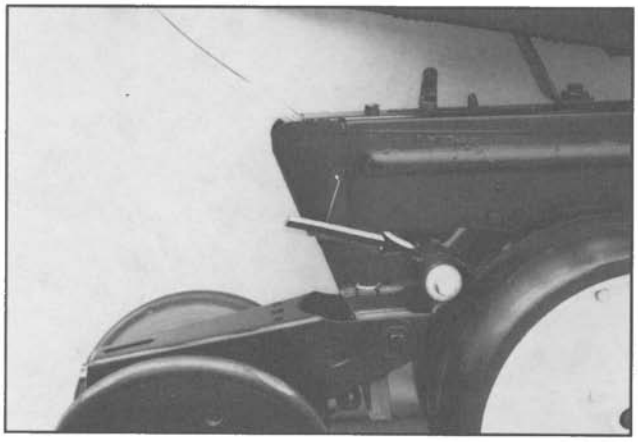
The retaining brush must apply enough pressure against the seed in the disc seed pocket as the disc rotates through the seed retention area to prevent the seed from dropping out of the disc pocket. A damaged spot, excessive wear on the brush or foreign material lodged in the brush may greatly reduce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

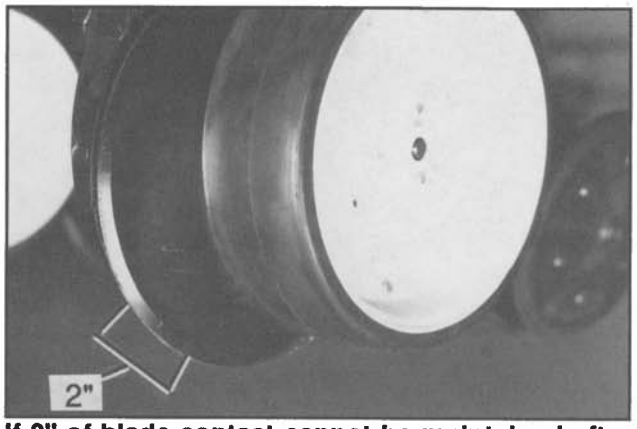


To adjust clearance between gauge wheels and opener blades, add or remove 1 1/64" spacer washers between the shank and gauge wheel arm. Store remaining spacer washers between gauge wheel arm and flat washer on outer side of gauge wheel arm.

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:

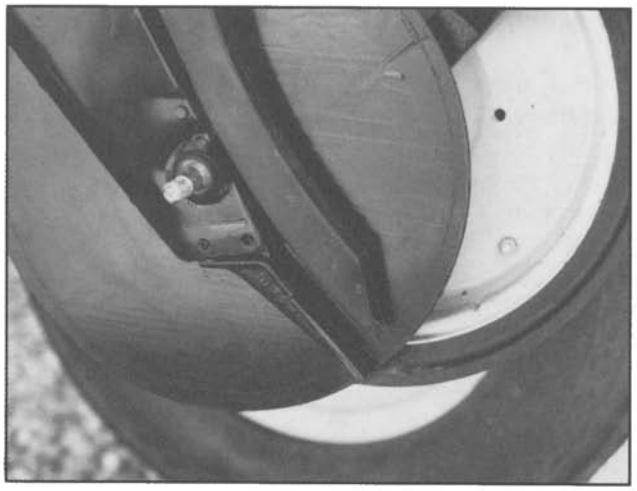
1. Remove gauge wheel, bearing cap, jam nut, washer and disc/bearing assembly.
2. Remove 1/4" rivets from bearing housing to expose bearing.
3. After installing new bearing, install three evenly spaced 1/4" bolts into three of the six holes in the bearing housing to hold the bearing and bearing housing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

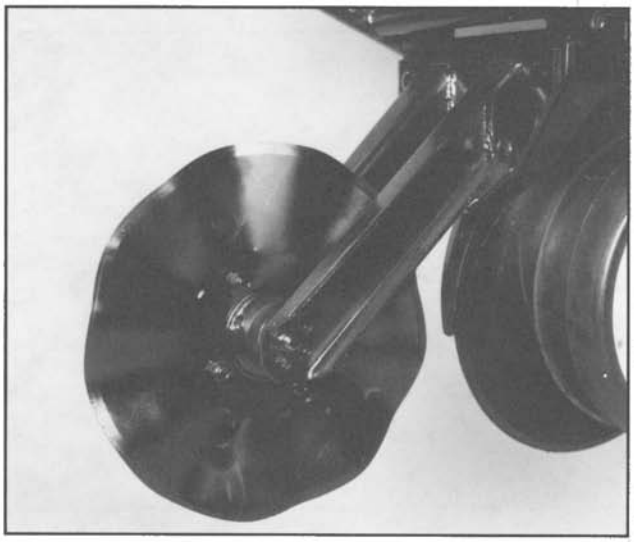


No till planting or planting in hard ground conditions will increase seed tube guard wear and necessitate more frequent inspection.

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.

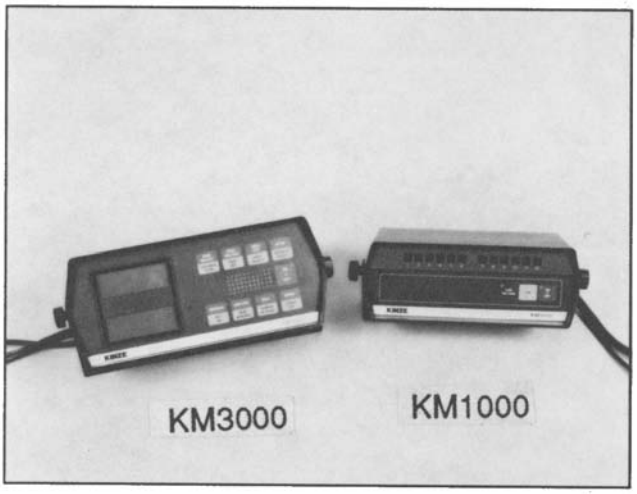
The coulter blade can be adjusted to one of four settings. Initially the blade is set in the highest position. As the blade wears it can be adjusted to one of the three lower settings. See "Row Unit Mounted No Till Coulter" in Operation Section of this manual.

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. System voltage insufficient. Battery connection corroded. Console defective.	Connect to 12 volt battery. Insure greater than 11.0 volts. Inspect battery connections. If console power cable terminals or battery terminals are dirty or corroded, clean terminals as required. 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. Defective 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. Plug suspect sensor cable into an adjacent row that is operating correctly. If sensor does not operate, sensor is defective. If you wish to continue planting and a replacement sensor is not available, disconnect the defective sensor cable from the planter harness, turn the monitor OFF and then back ON. The monitor will ignore the disconnected row sensor and you can continue to monitor all other rows.

KM1000 TROUBLESHOOTING CHART (Continued)

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

KM1000 TROUBLESHOOTING CHART (Continued)

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

KM3000 TROUBLESHOOTING CHART

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

KM3000 TROUBLESHOOTING CHART (Continued)

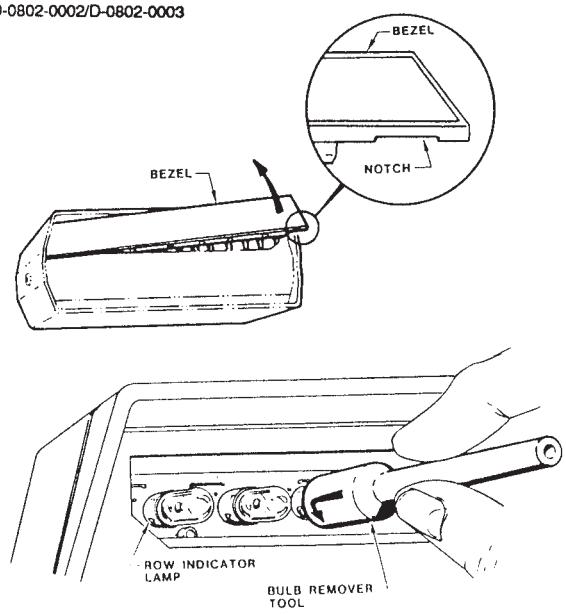
SYMPTOM	PROBABLE CAUSE	ACTION REQUIRED
3. Monitor completely "dead".	Blown console fuse.	Check fuse, located on rear panel of console. If fuse is blown, replace with a 5-amp, type AGC. If fuse blows again, check power connection to battery. If connections are reversed fuse will blow. If battery connections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

KM3000 TROUBLESHOOTING CHART (Continued)

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

SEED MONITOR ROW INDICATOR BULB REPLACEMENT (KM1000 Only)

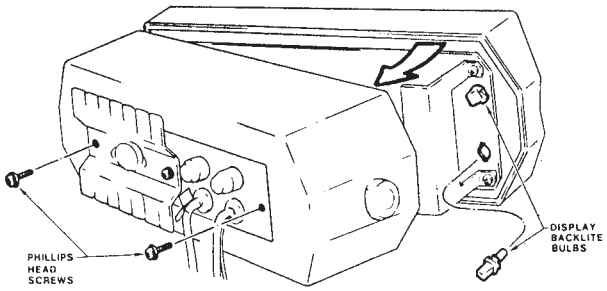
D-0802-0002/D-0802-0003



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

SEED MONITOR DISPLAY BACKLITE BULB REPLACEMENT (KM3000 Only)

D-0841-0006



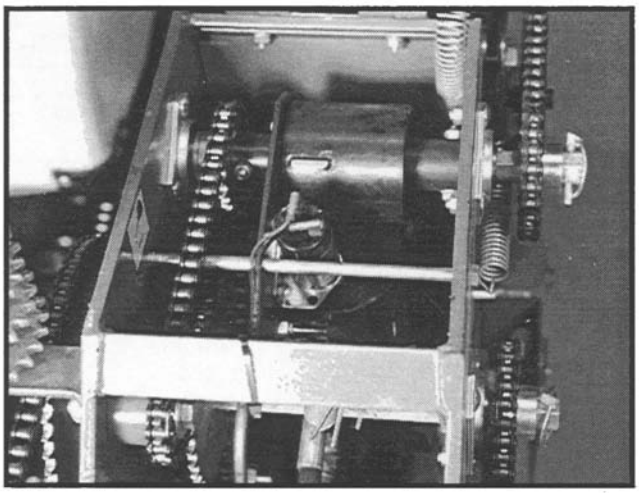
Remove the two outside Phillips head screws. NOTE: DO NOT REMOVE THE CENTER PHILLIPS HEAD SCREW. Carefully separate the console case from the front panel. Remove the defective bulb by turning the lamp assembly 1/4 turn counterclockwise and pulling straight out. Replace bulb with a GE #73 bulb (Part No.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

POINT ROW WRAP SPRING CLUTCH INSPECTION

Standard On 12 And 16 Row/Optional On 8 Row

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

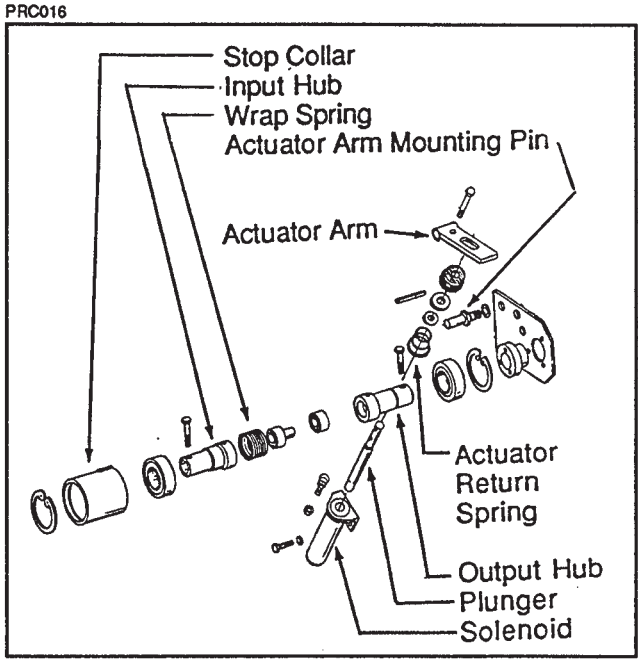
60569-50



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.

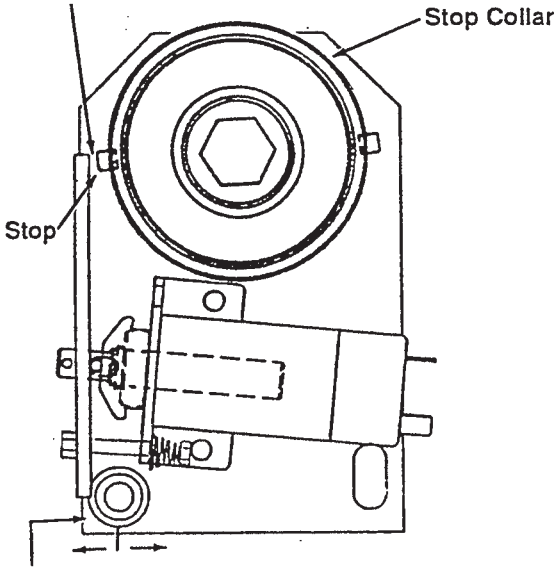
If the clutch or clutches fail to operate first determine if the problem is electrical or mechanical. Place the operational switch in the RIGHT or LEFT position. When the switch is in the RIGHT or LEFT position and the fuse on the rear of the control console is in working condition, the red indicator light on the control console should be lighted. If light does not come on, check the fuses on the front of the control console. See "Point Row Wrap Spring Clutch Troubleshooting" chart. If fuses are not blown, 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.

PRC016



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

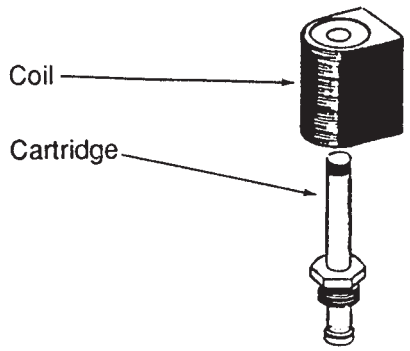
PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Neither clutch will disengage.	Main fuse blown in control box. Poor terminal connection in wiring harness. Wiring damage in wiring harness. Low voltage at coil. (12 volts required)	Replace fuse in rear of control box. Repair or replace. Repair or replace. Check 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.	Fuse blown. Actuator arm and plunger stuck in disengaged position. Actuator arm out of adjustment. Wrap spring broken or stretched. Foreign substance such as oil or grease on the input or output hubs. Something touching the stop collar. Clutch assembled incorrectly.	Replace fuse on front panel. Remove, free up and reinstall. Adjust actuator arm mounting pin in slot so that actuator arm clears stop on stop collar by approximately 1/16" when clutch is rotated. Disassemble clutch and replace spring. Disassemble clutch. Clean hubs and spring and reassemble. Check to ensure collar is free to turn with clutch. 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.	Fuses too large.	Replace fuses on front panel with 8 amp slow blow fuses.
Frequent fuse burnout.	Low voltage (12 volts required). Damage to wiring harness.	Check power source voltage for partically discharged battery, etc. Locate damage and repair or replace harnesss.

SOLENOID VALVE INSPECTION

The solenoid valve consists of a chambered body containing a cartridge valve which is activated by an electrical coil.

If the solenoid or solenoids fail to operate, first determine if the problem is electrical or hydraulic. If the valve is working properly, a click will be heard when the solenoid coil is energized. This will be the valve stem opening up. If no sound is heard, check the solenoid coil by touching the top of the coil housing with a metallic object such as a pliers or screwdriver. If the coil is working properly, the coil housing will be strongly magnetized when energized. If the voltage to the coil is low, the coil will be weakly magnetized when energized and no click will be heard.

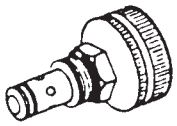
VVB019



SOLENOID VALVE TROUBLESHOOTING		
PROBLEM	**POSSIBLE CAUSE**	**POSSIBLE SOLUTION**
None of the solenoids will operate.	Low Voltage. Blown fuse. Battery connection. Wiring harness damaged.	Must be connected to 12 vol DC only. Negative ground. Replace fuse in back of control panel on tractor with 15 amp only. Clean and tighten. Repair or replace.
One solenoid valve will not operate.	Bad switch. Cut wire in harness. Bad coil. Poor connection at coil.	Replace on control panel. Locate and repair. Replace. Check.
Valve operating when not energized.	Valve stem stuck open. O-ring leaking. Foreign material under poppet.	Replace cartridge. Install new o-ring kit. Remove cartridge and clean.

FLOW CONTROL VALVE INSPECTION

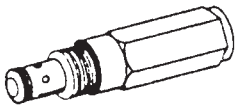
VVB020



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, it should be removed for inspection. Check for foreign material and contamination on both the valve and the seating area of the valve body. Replace any components found to be defective.

PRESSURE RELIEF VALVE INSPECTION

VVB020



If the pressure relief valve fails to release the tongue lock or function properly, remove the valve from the valve block and check for foreign material or check to see if the o-ring is leaking internally. Replace if found to be defective.

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.

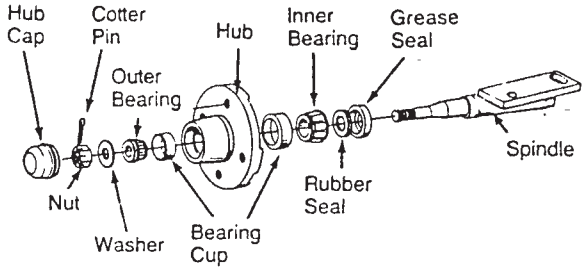
9. Clean spindle and install hub.

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.

MKR020



WHEEL BEARING LUBRICATION OR REPLACEMENT

NOTE: Each transport wheel hub is equipped with a grease fitting for lubrication. The below procedure is used only for bearing replacement.

1. Raise tire clear of ground and remove wheel.

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

3. Remove bearings, seals (Where Applicable) 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.

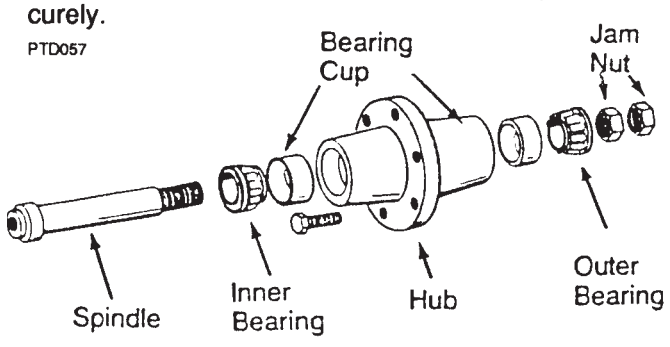
6. Place inner bearing and seal (Where Aplicable) in place.

7. Clean spindle and install hub.

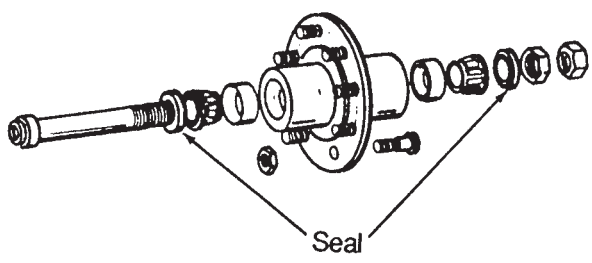
8. Install outer bearing, seal (Where Applicable) and stepped nut. Tighten jam nut while rotating hub until there is some drag. This assures that all bearing surfaces are in contact. Back off jam nut 1/4 turn or until there is only slight drag when rotating the hub. Install second jam nut to lock against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

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

PTD057



HTA029



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.

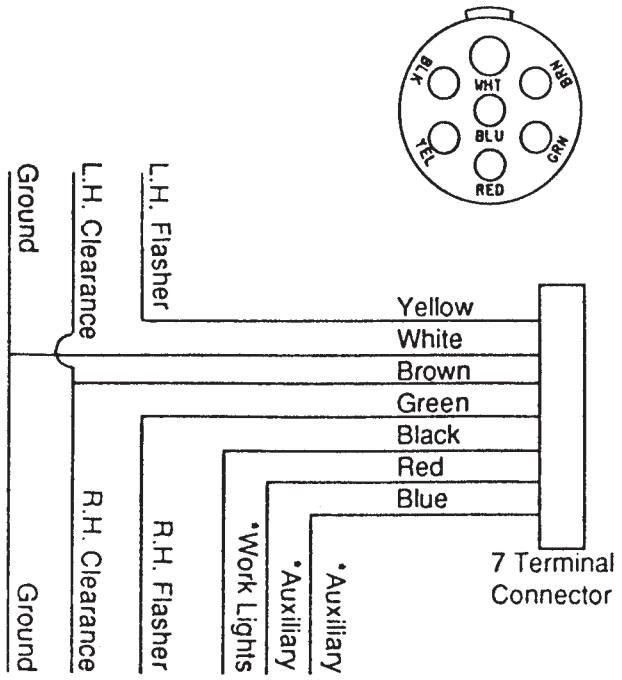
Grease or paint disc openers and marker blades to prevent rust.

If the planter is equipped with a liquid fertilizer attachment, open the shut off valve and flush water through the tanks, hoses and squeeze pumps.

If the planter is equipped with a dry fertilizer attachment, empty and clean hoppers, disassemble and clean metering augers and reassemble coating all metal parts with rust preventative.

If the planter is equipped with a dry fertilizer quick fill attachment, pull augers from tubes and thoroughly clean augers and tubes and treat with a rust preventative.

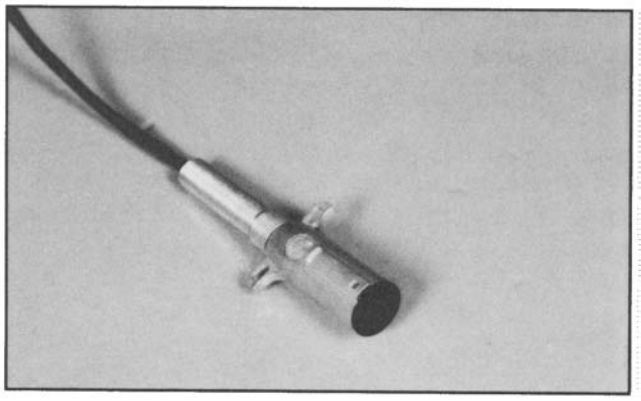
WIRING DIAGRAM



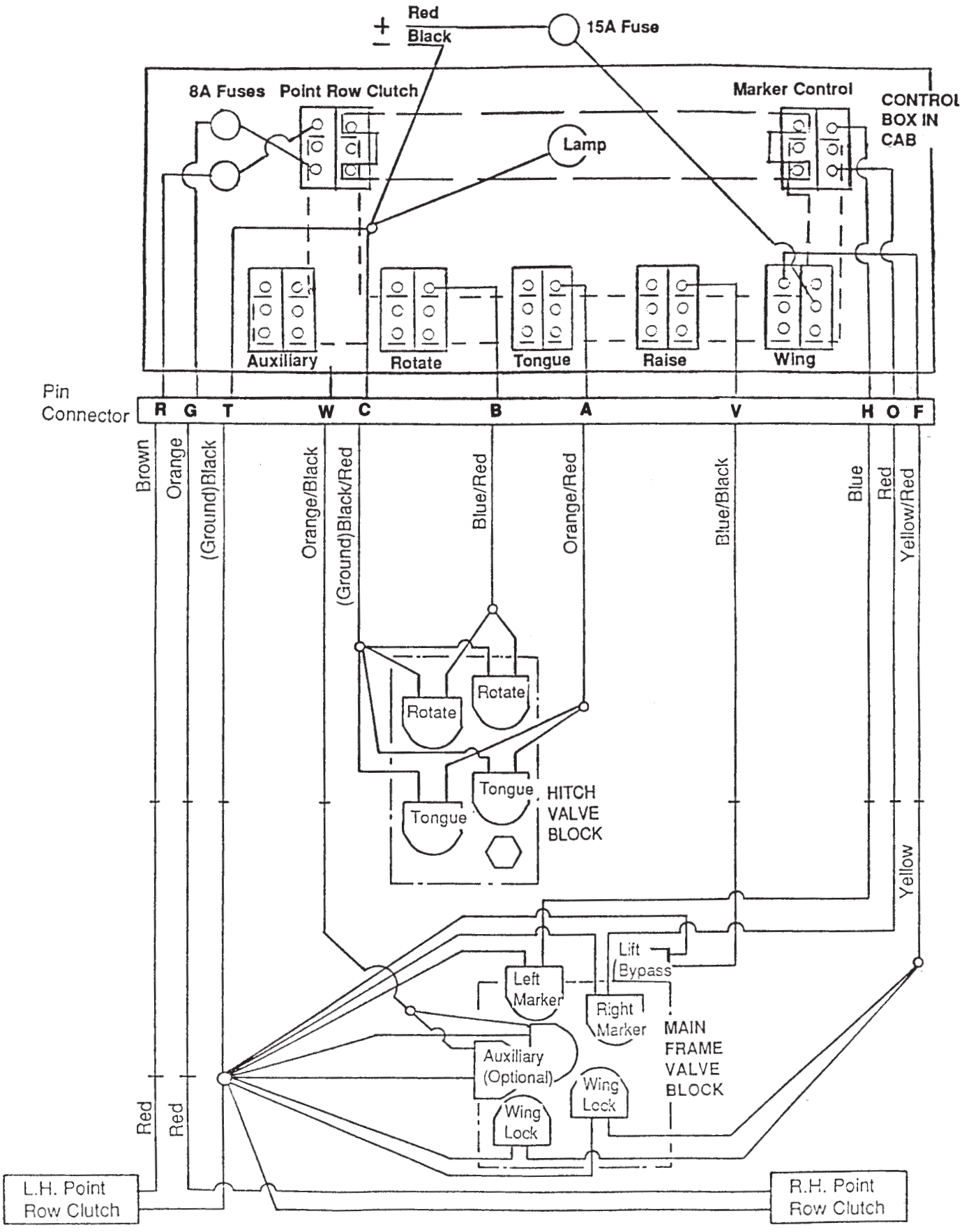
*Optional lights and wires (to be supplied by customer) may be wired into existing plug terminals.

Light package supplied on the Model 2300 Twin-Line® planter meets ASAE standards. For the correct wiring harness to be wired into the lights on your tractor, check with the tractor manufacturer.

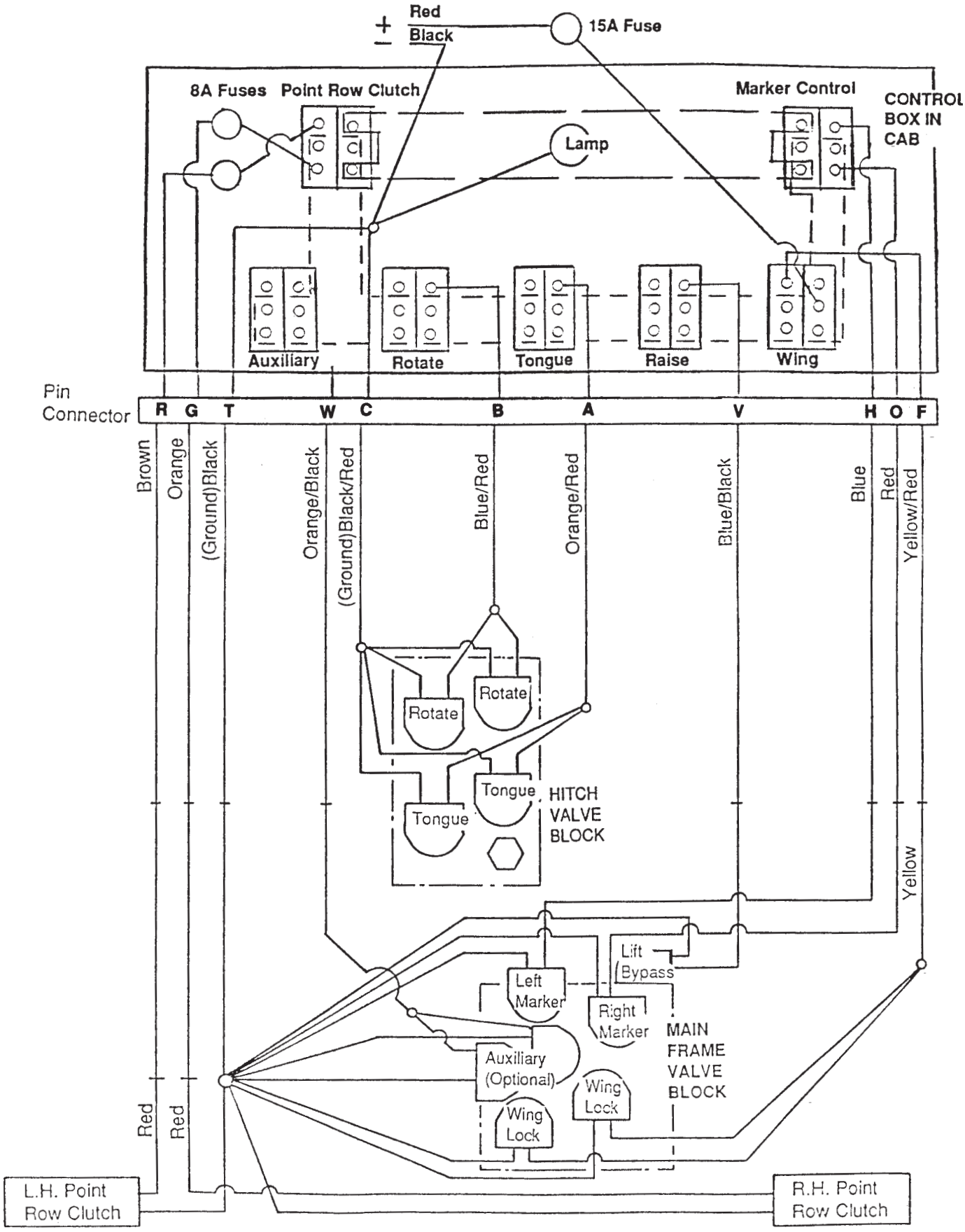
61111-36



WIRING DIAGRAM (23 Pin Connector)



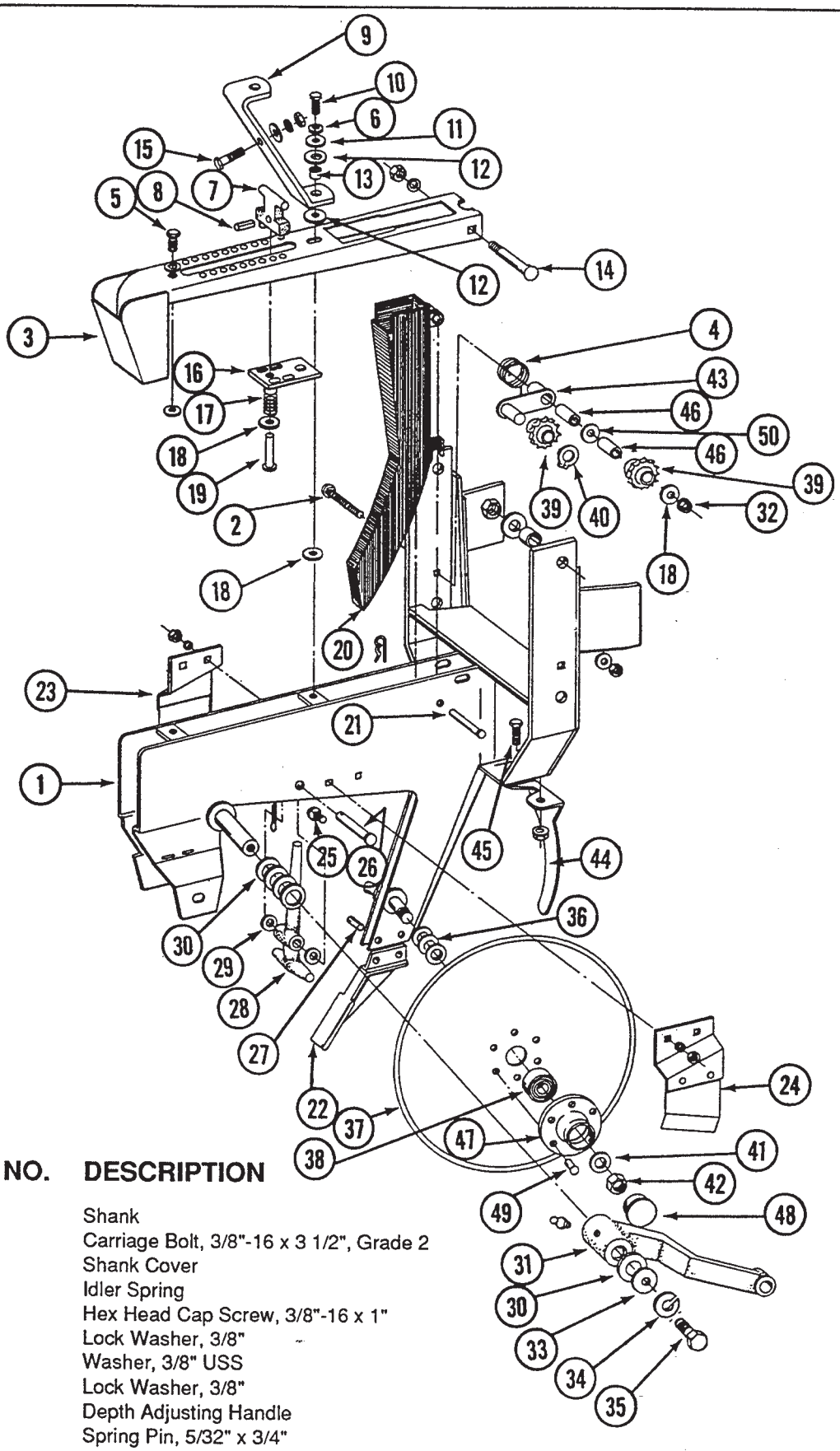
WIRING DIAGRAM (23 Pin Connector)



PARTS LIST INDEX

SHANK ASSEMBLY

RUB006/RUA004



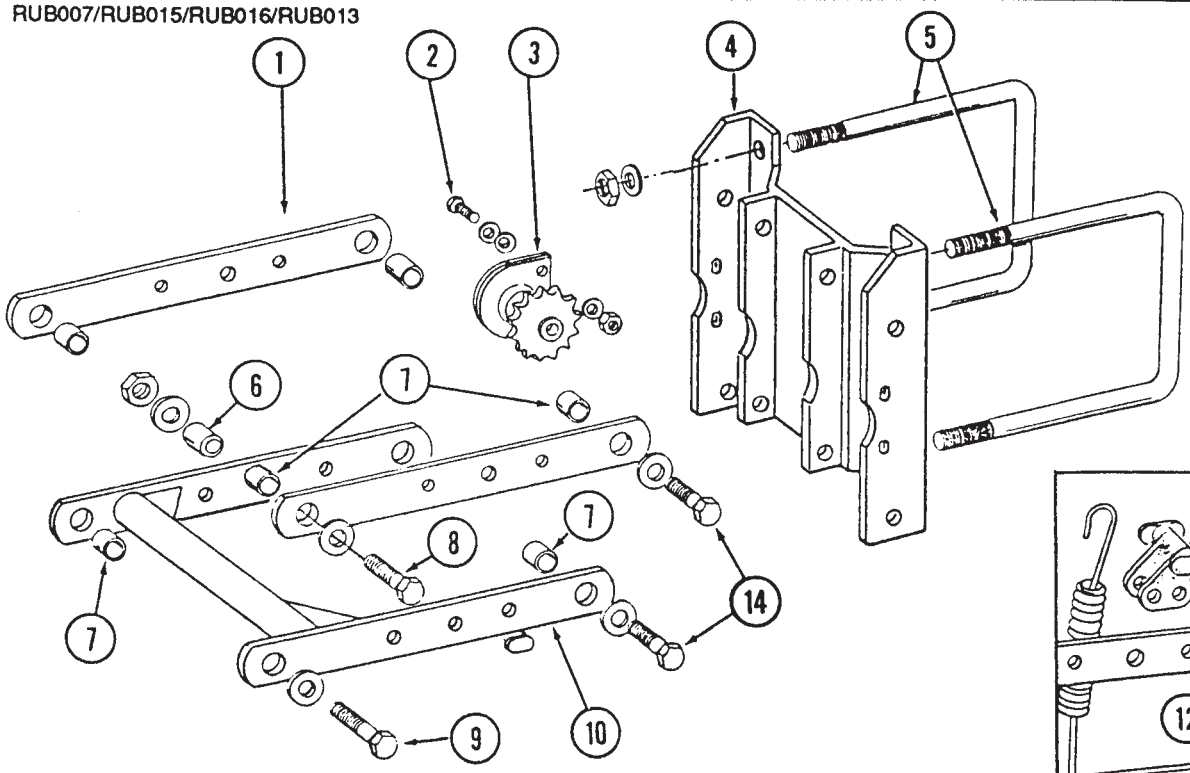
ITEM	PART NO.	DESCRIPTION
1.	A0860	Shank
2.	10307	Carriage Bolt, 3/8"-16 x 3 1/2", Grade 2
3.	A0811	Shank Cover
4.	D1065	Idler Spring
5.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
	10210	Washer, 3/8" USS
6.	10229	Lock Washer, 3/8"
7.	B0102	Depth Adjusting Handle
8.	10605	Spring Pin,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

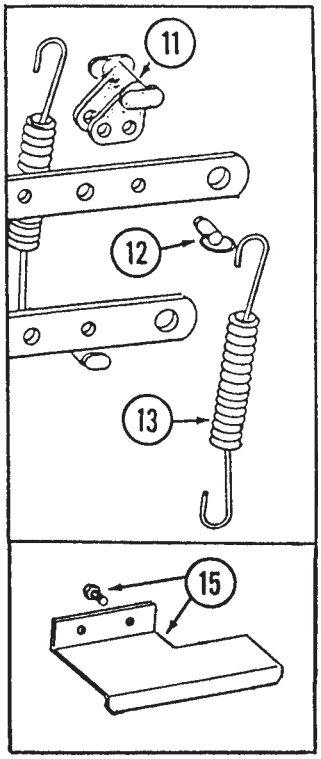
SHANK ASSEMBLY

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

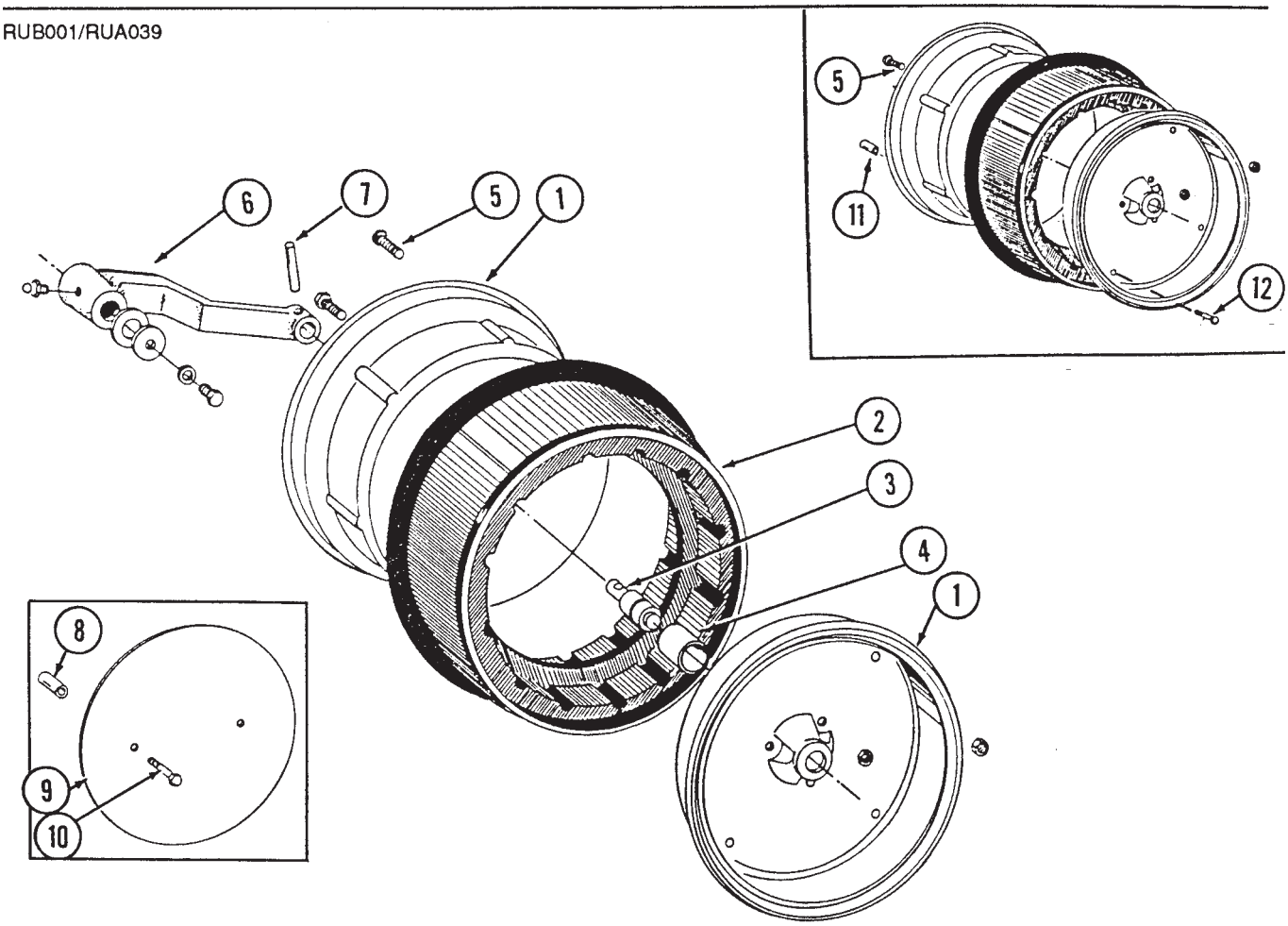




ITEM	PART NO.	DESCRIPTION
1.	D7619	Upper Arm
2.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10210	Washer, 3/8" USS (As Required)
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
3.	A1720	Bearing/Sprocket, 7/8" Bore
4.	A5798	Support Plate
5.	D1113	U-Bolt, 5" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	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

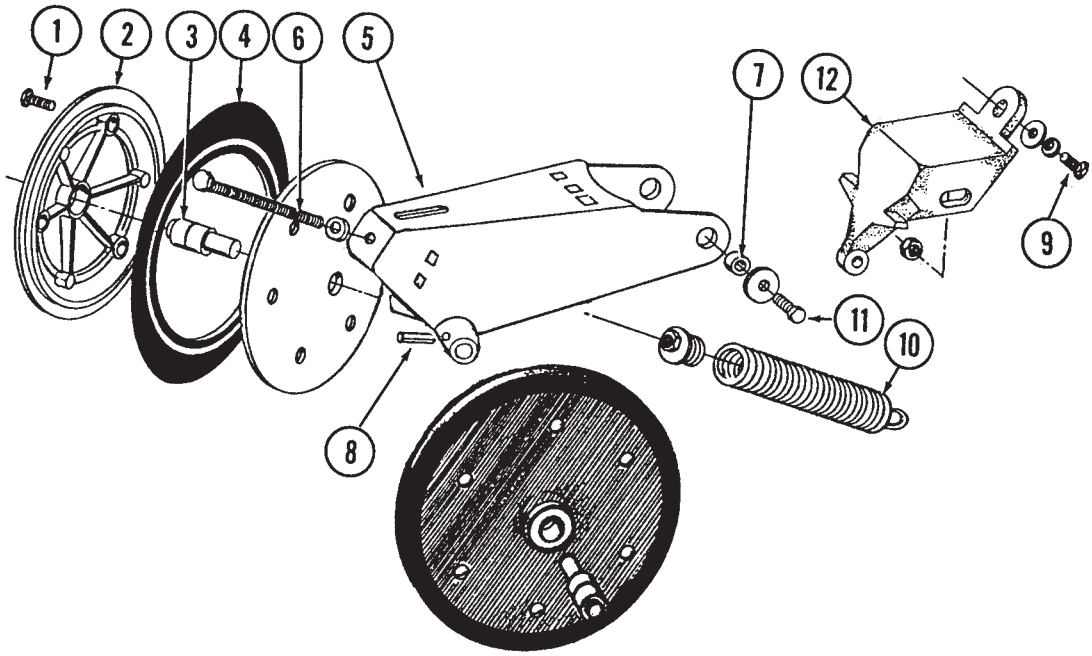
RUB001/RUA039



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

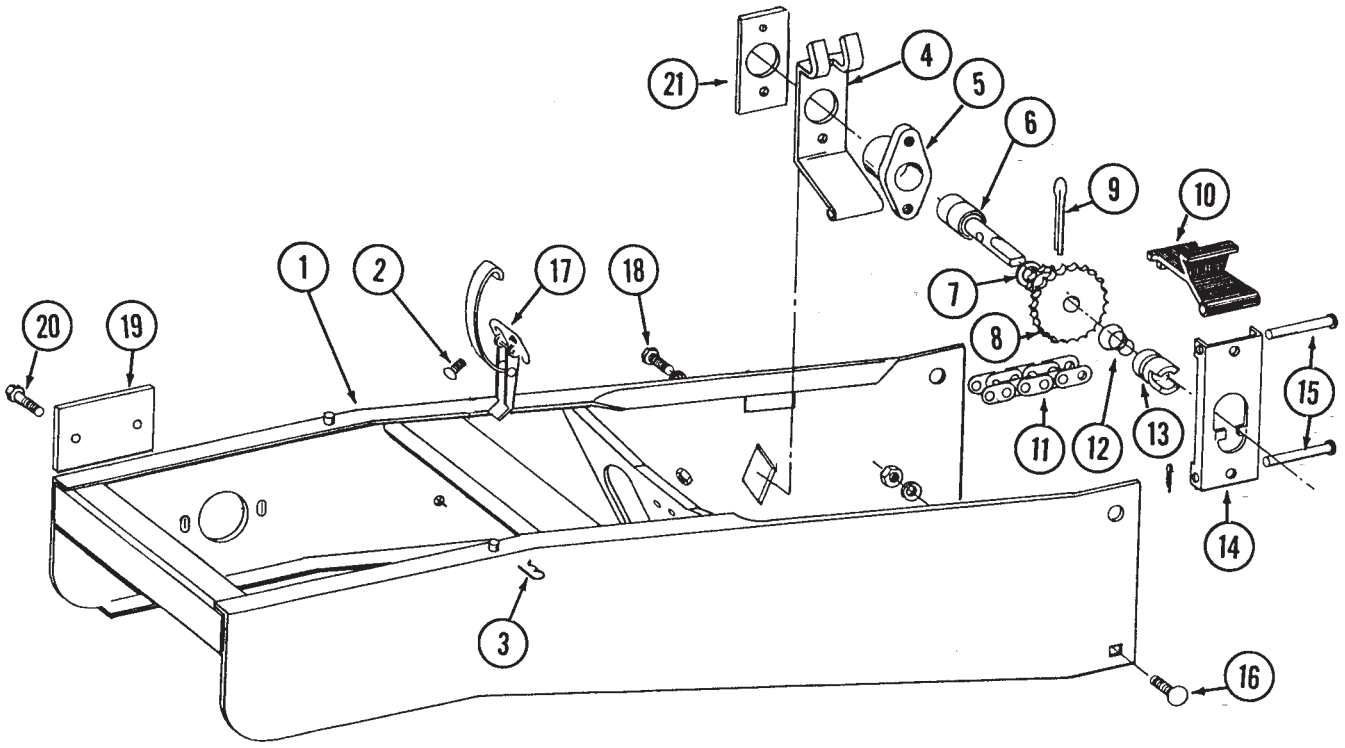
RUB004



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

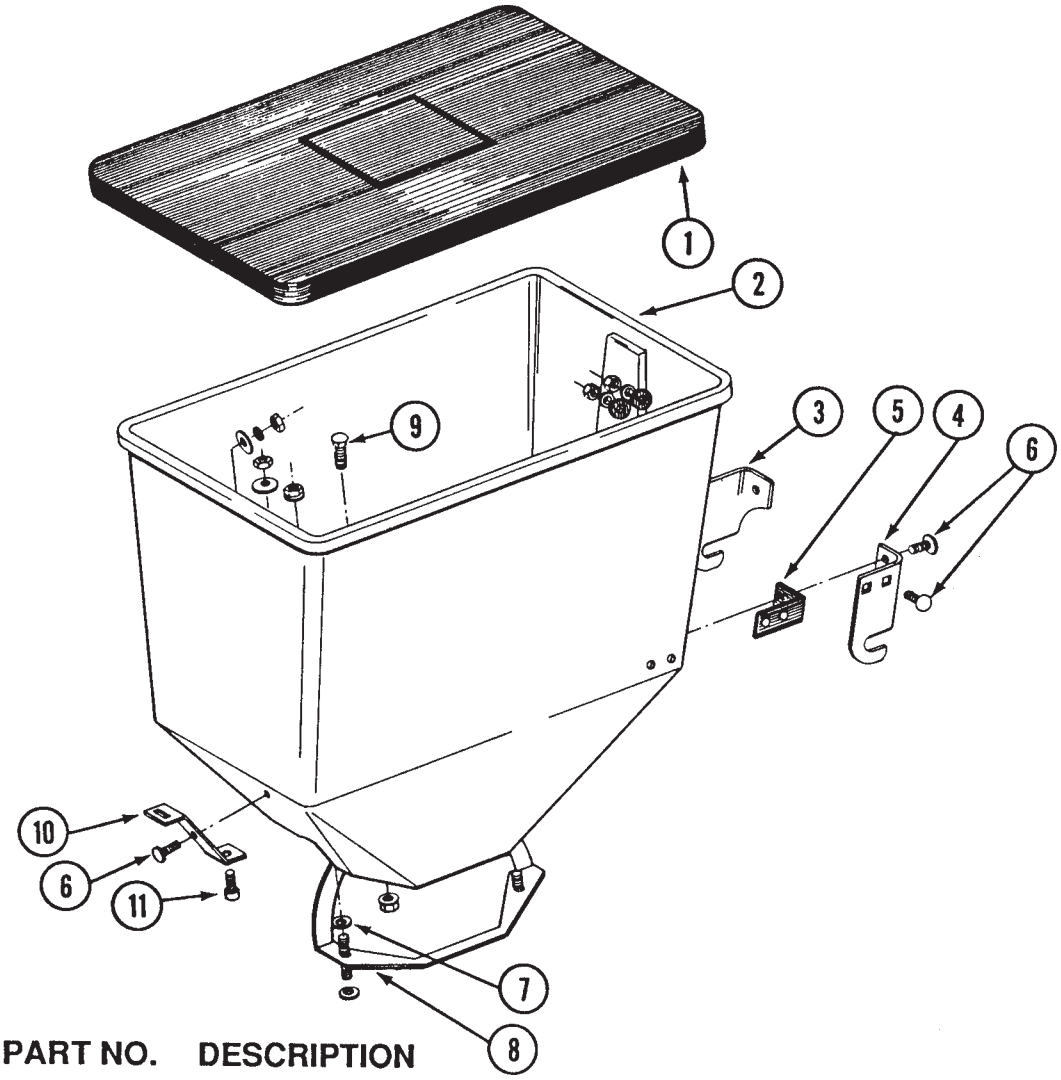
RUB005



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

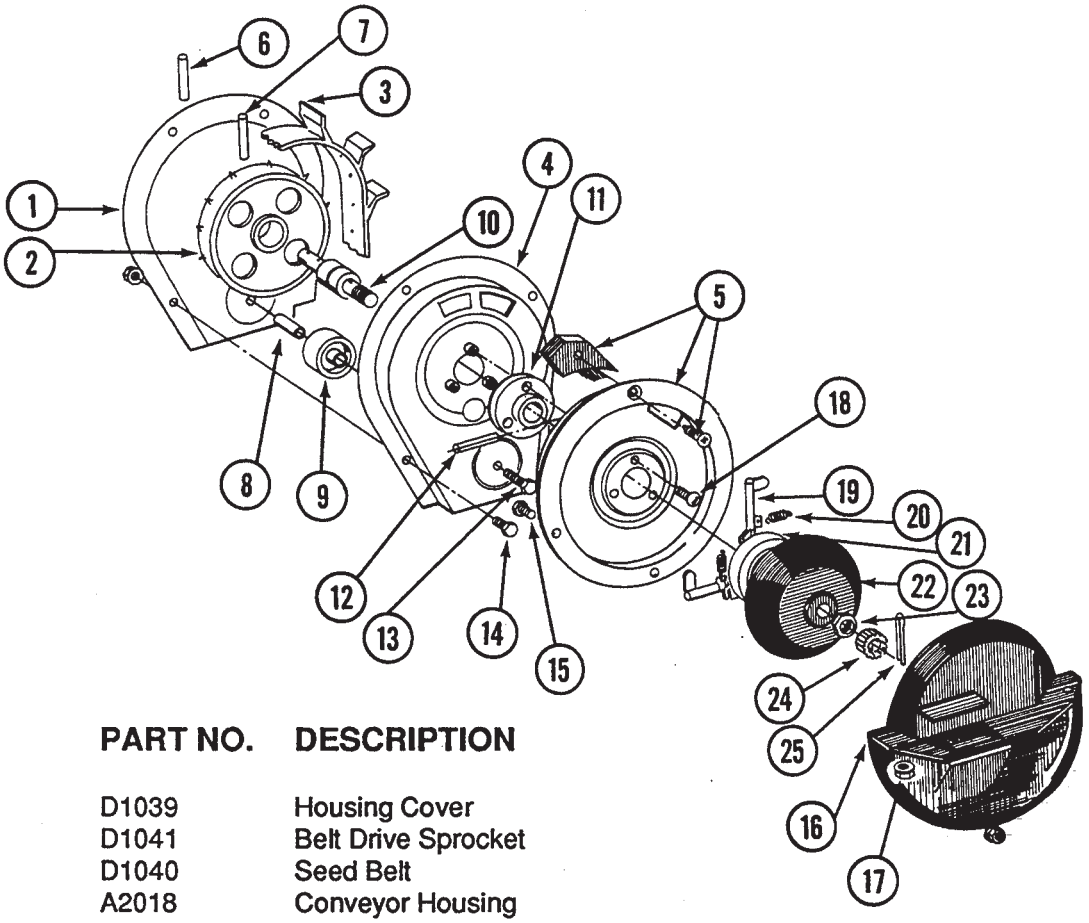
RUA015



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

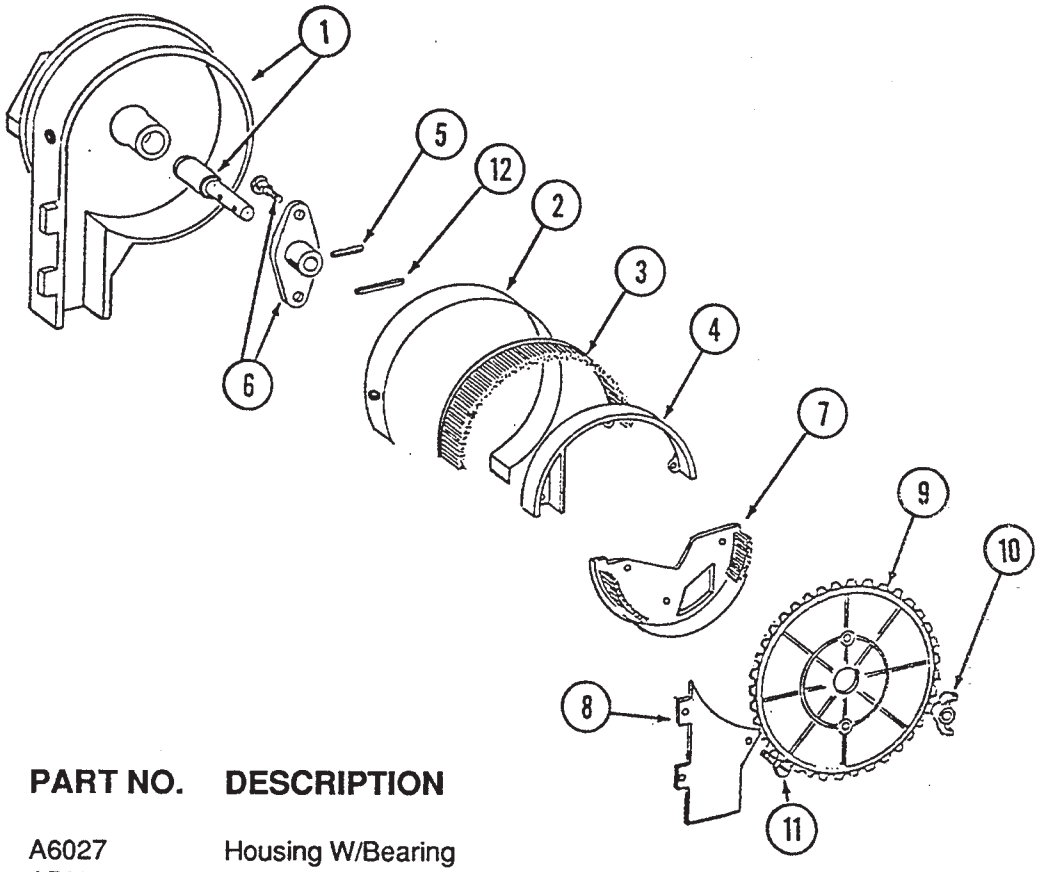
RUA015



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

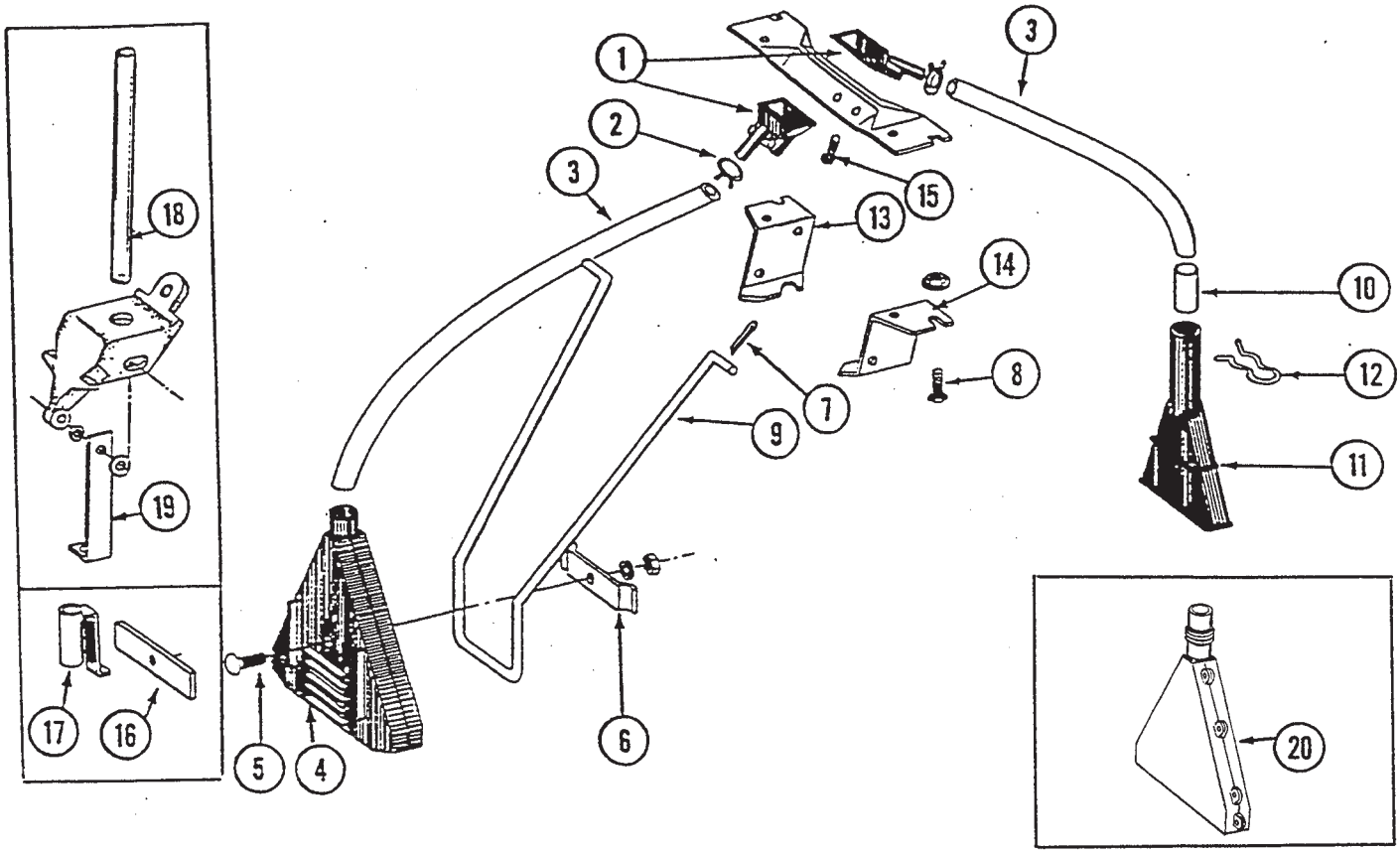
RUA037



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

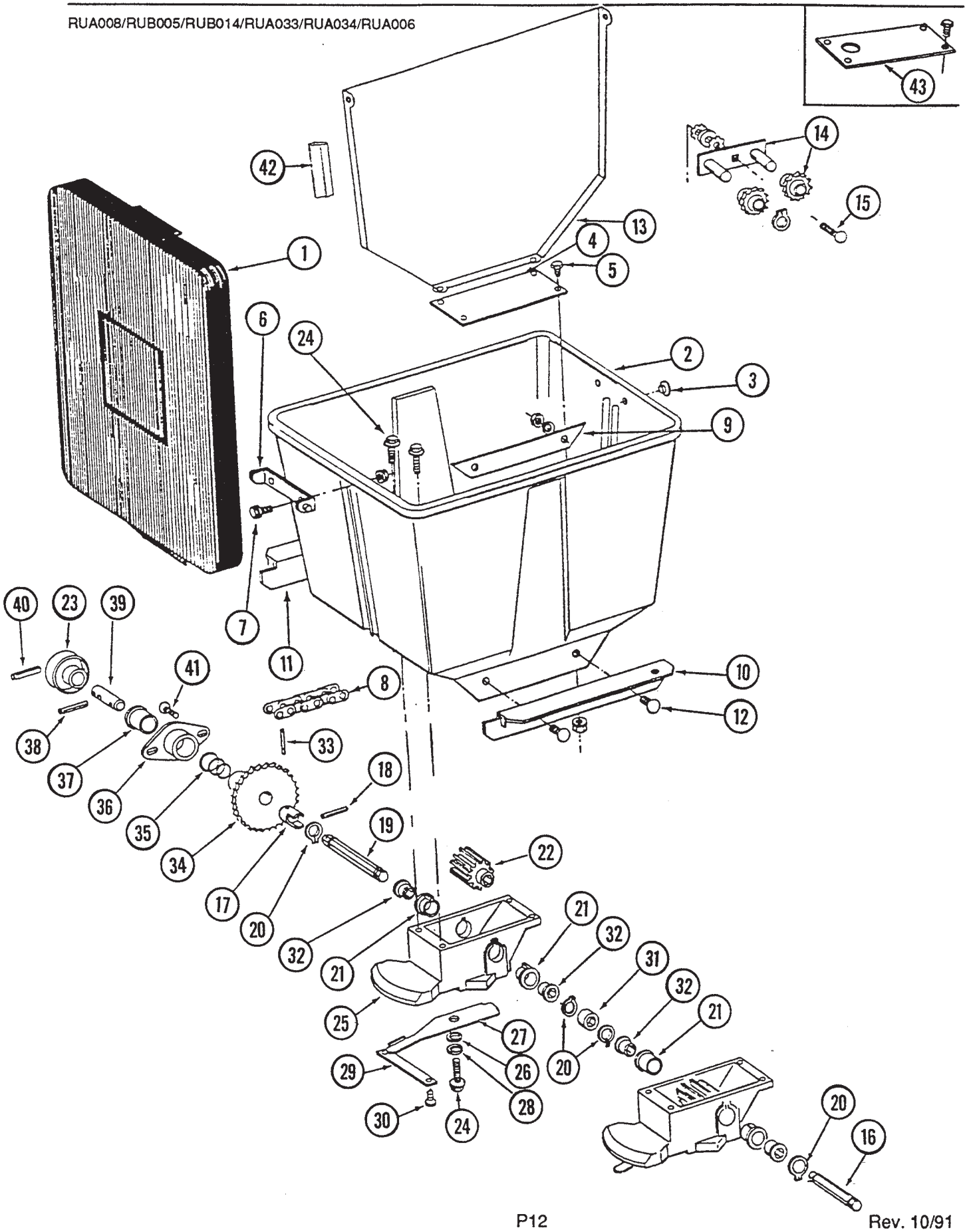
RUA013/RUA012/RUA016



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 Spreader (3" or 7" Band)

GRANULAR CHEMICAL HOPPER WITH METER(S) & THROWOUT

RUA008/RUB005/RUB014/RUA033/RUA034/RUA006



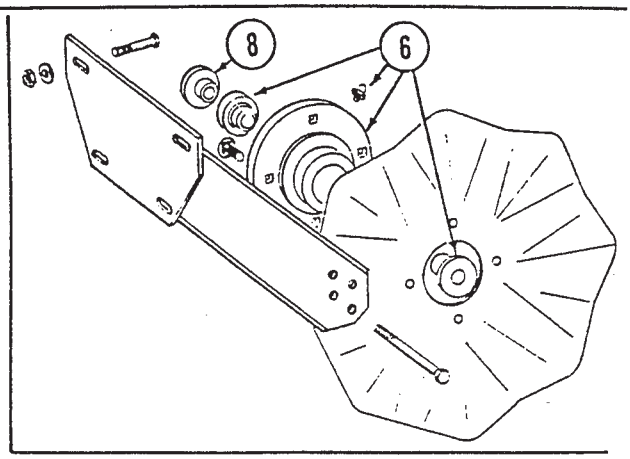
GRANULAR CHEMICAL HOPPER WITH METER(S) & THROWOUT

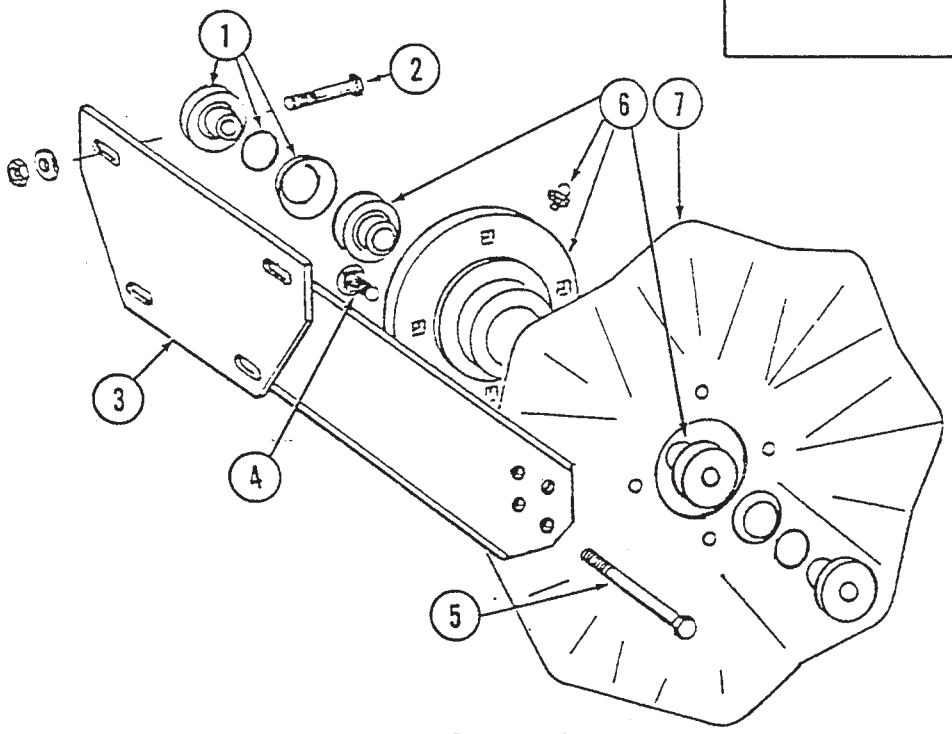
ITEM	PART NO.	DESCRIPTION
1.	A4444	Lid
2.	D1058	Hopper
3.	D1089	Plug
4.	D1056	Cover Plate
5.	10022	Hex Head Cap Screw, 1/4"-20 x 1/2"
	10621	Flange Nut, 1/4"-20
6.	D1060	Hinge
7.	10023	Hex Head Cap Screw, 1/4"-20 x 3/4"
	10621	Flange Nut, 1/4"-20
8.	3303-114	Roller Chain, No. 41, 114 Pitch Including 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

(Plateless Row Unit & Interplant Push Row Unit)

RUA036

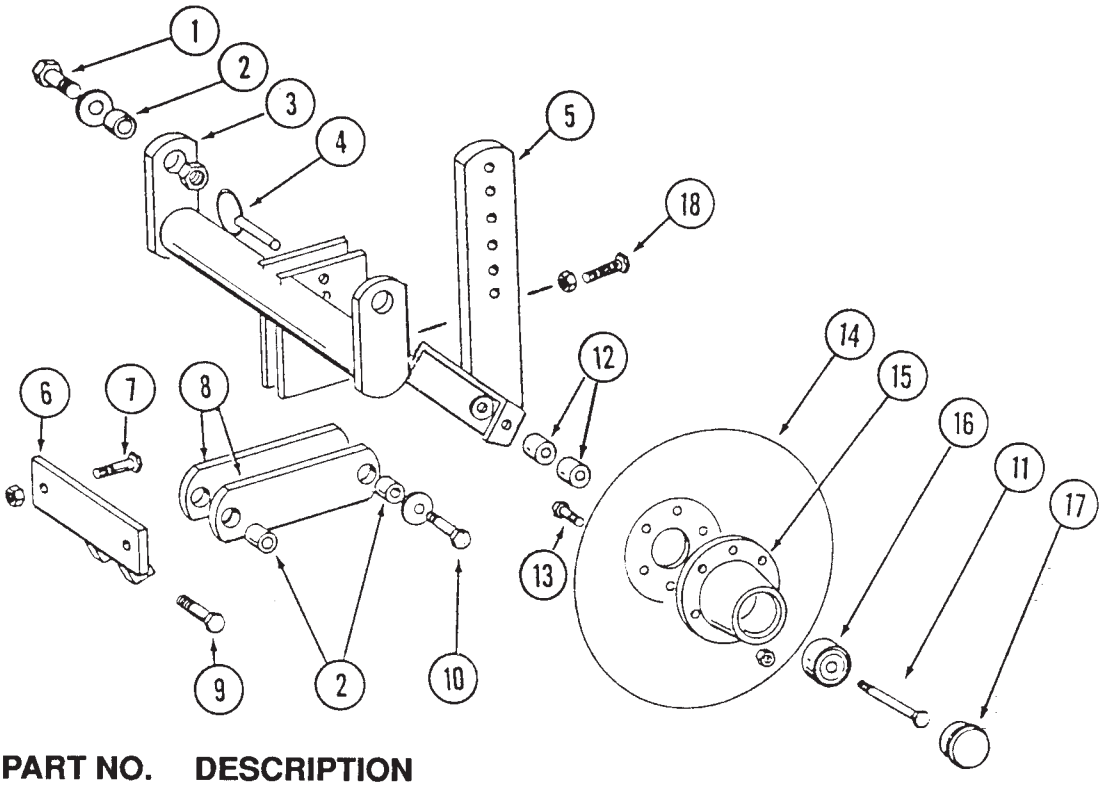




ITEM	PART NO.	DESCRIPTION
1.	GB0227	Adapter W/O-Ring And Spring Washer
	D8844	O-Ring
	D8843	Spring Washer
2.	10574	Carriage Bolt, 1/2"-13 x 1 1/4"
	10216	Washer, 1/2" USS
	10111	Lock Nut,1/2"-13
3.	A5625	Arm
4.	10574	Carriage Bolt, 1/2"-13 x 1 1/4"
	10111	Lock Nut, 1/2"-13
5.	10036	Hex Head Cap Screw,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

DISC FURROWER, ROW UNIT MOUNTED

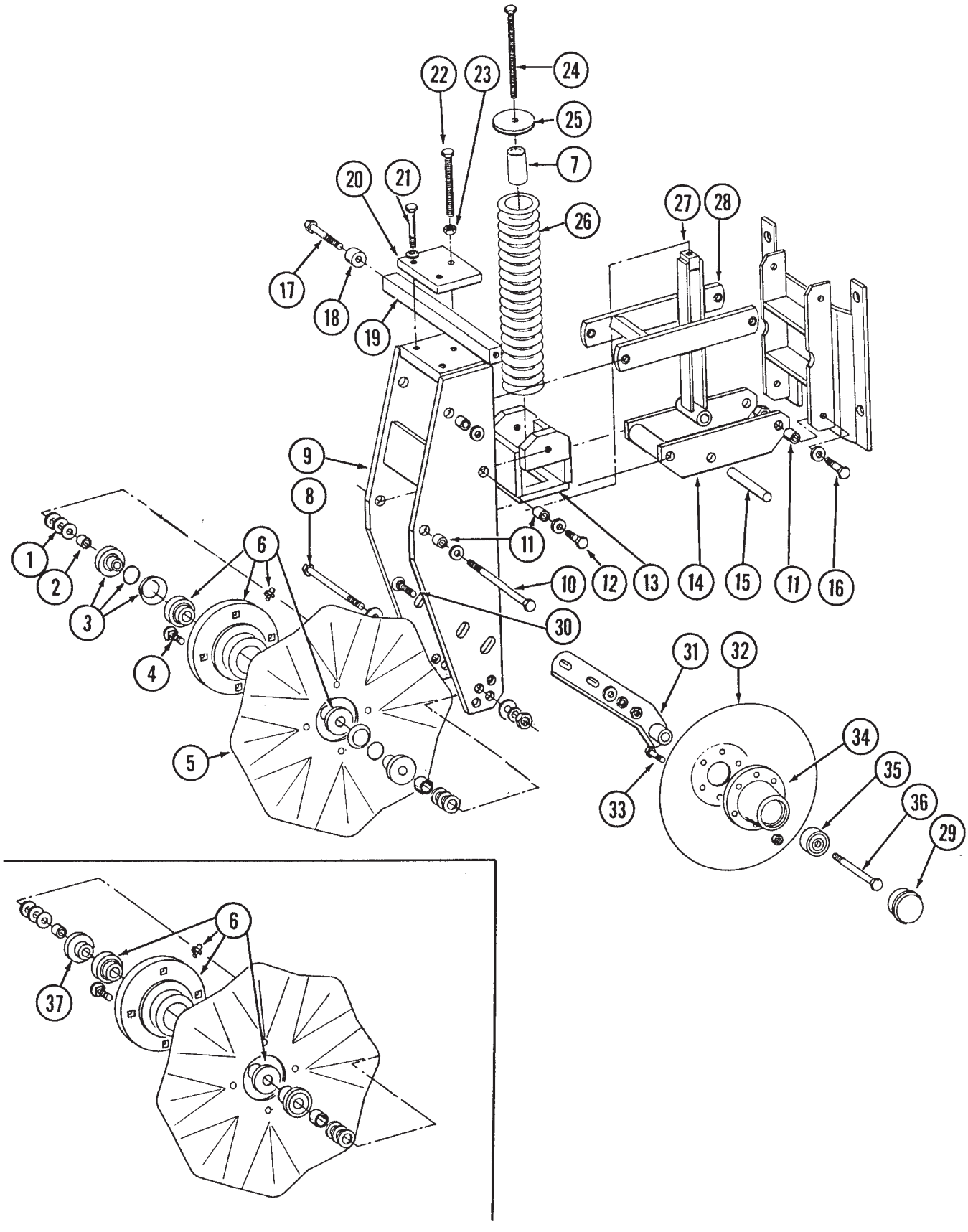
RUA038



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

FRAME MOUNTED COULTER W/DISC FURROWER

RUA035

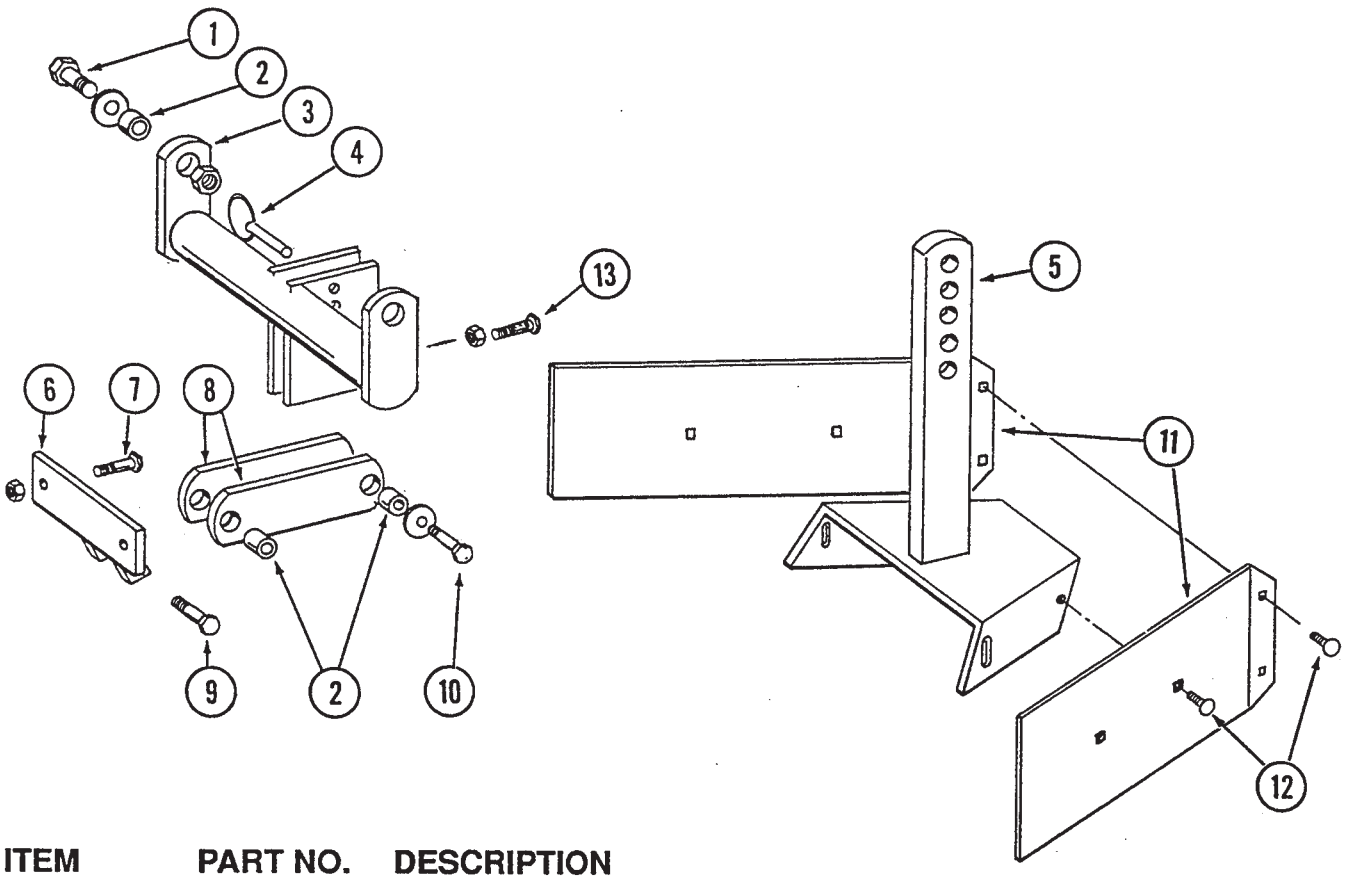


FRAME MOUNTED COULTER W/DISC FURROWER

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

BED LEVELER, ROW UNIT MOUNTED

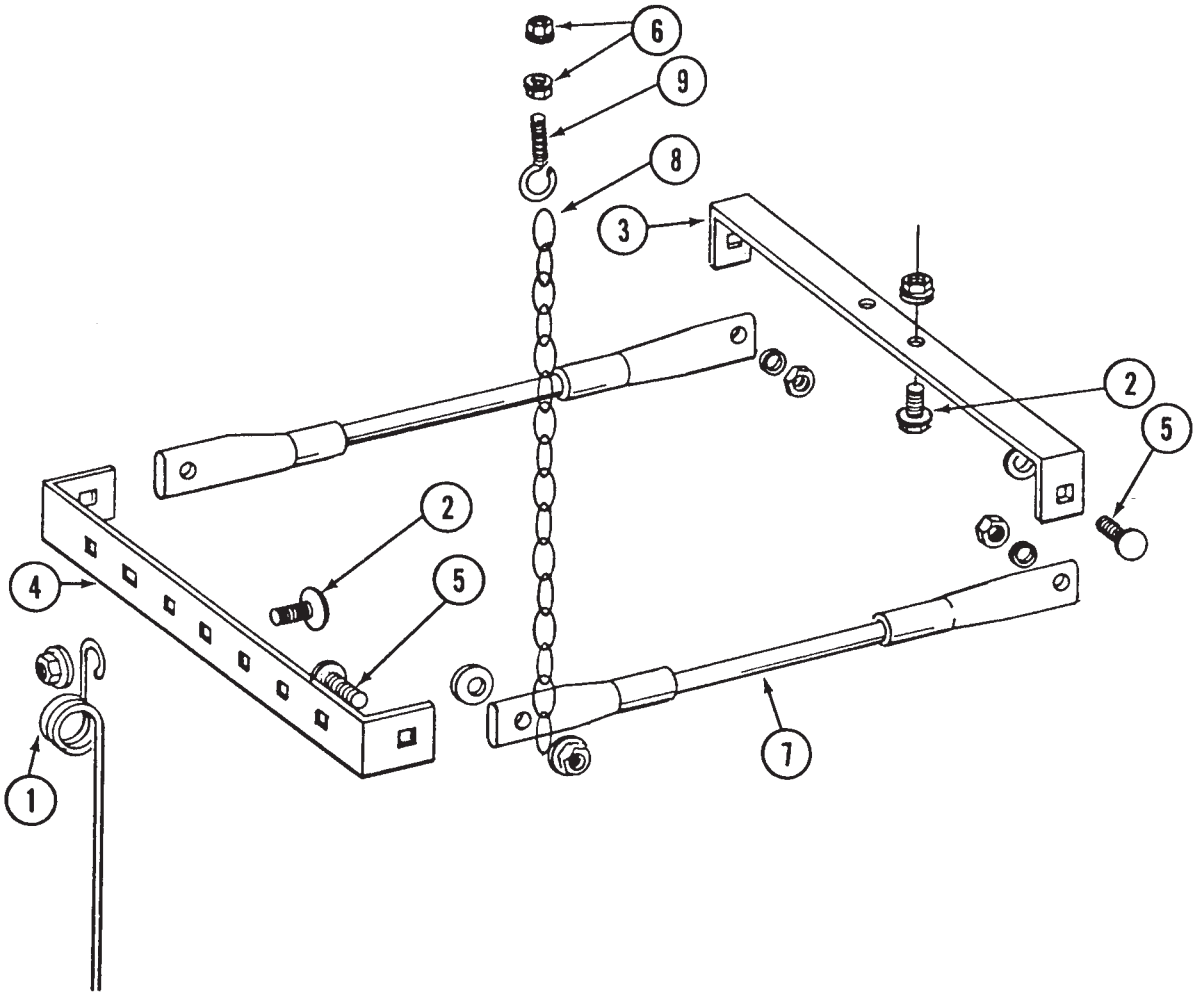
RUA038/RUA040



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

SPRING TOOTH INCORPORATOR

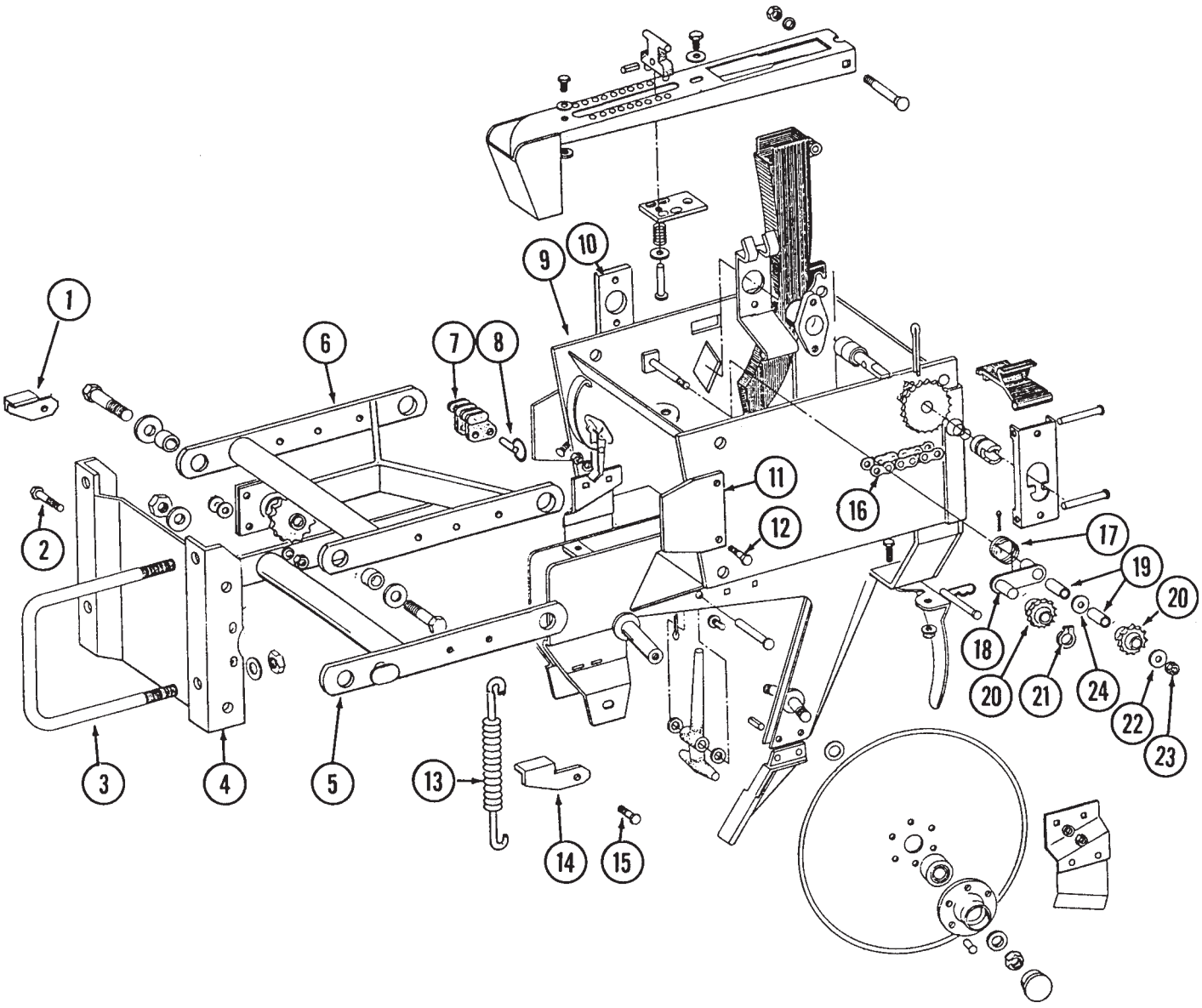
RUA011



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

INTERPLANT PUSH UNIT

RPU001/RPU009

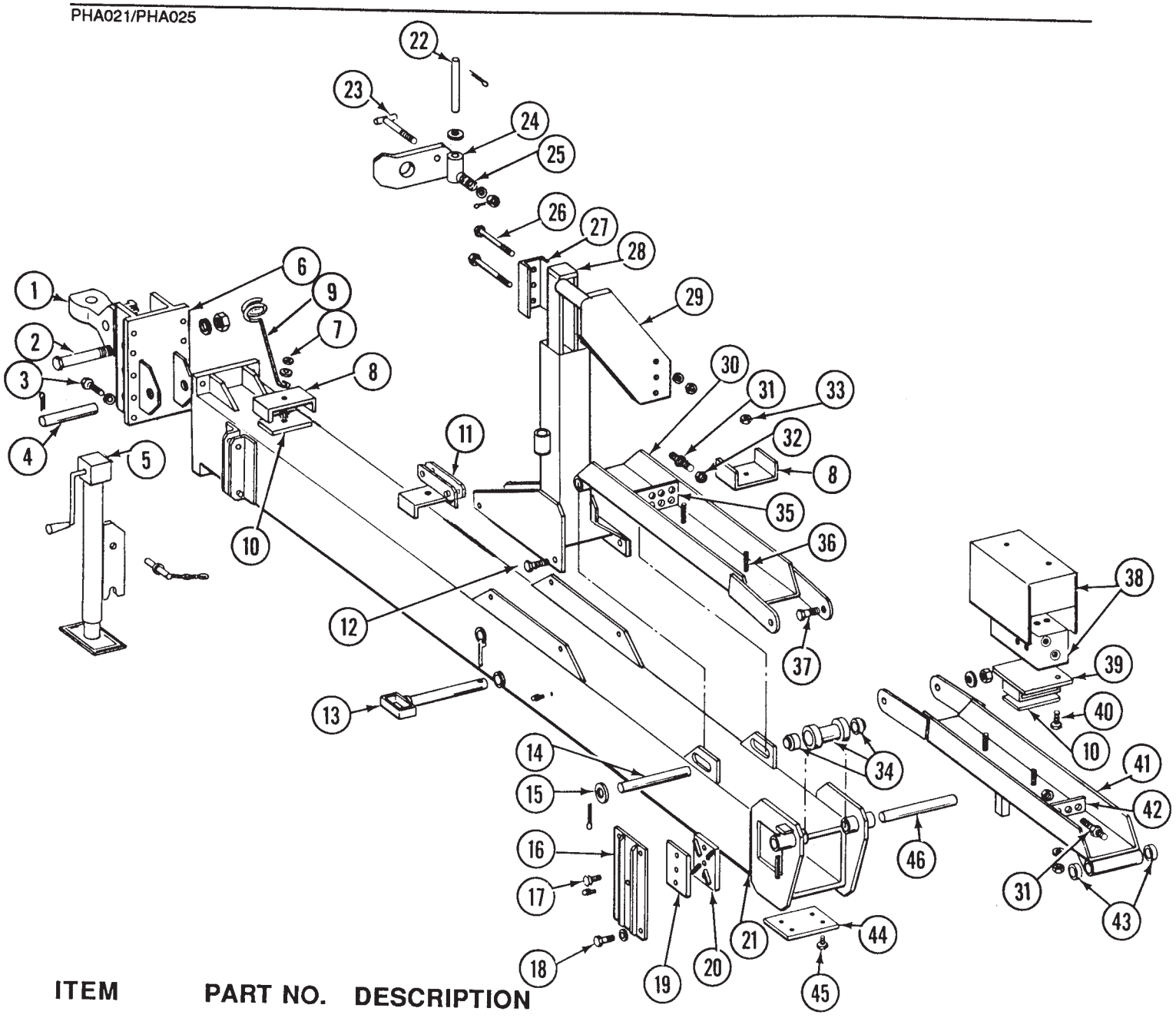


INTERPLANT PUSH UNIT

ITEM	PART NO.	DESCRIPTION
1.	D7627	Lockup, L.H.
2.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
3.	D1113	U-Bolt, 5" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
4.	A5786	Mounting Plate
5.	A5787	Lower Arm
6.	A5788	Upper Arm
7.	B0186	Spring Anchor
8.	10545	Detent Pin, 1" Grip
9.	A5846	Shank Assembly
10.	D2128	Plate
11.	D6161	Stop Bar
12.	10036	Hex Head Cap Screw, 1/2"-13 x 2"
	10216	Washer, 1/2" USS
	10102	Hex Nut, 1/2"-13
13.	D8249	Spring
14.	D7626	Lockup, R.H.
15.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10228	Lock Washer, 1/2"
	10111	Lock Nut, 1/2"-13
16.	3303-96	Roller Chain, No. 41, 96 Links Including Connector Link
	R0196	Connector Link, No. 41
17.	D2134	Idler Spring
18.	A2056	Idler Arm
19.	D1026	Spacer
20.	D7426	Sprocket
21.	10435	Retaining Ring
22.	10210	Washer, 3/8" USS
23.	10108	Lock Nut, 3/8"-16
24.	10384	Special Washer, 3/8"
A.	A5564	Lockup Package, Includes: (1) D7627, (1) D7626, (2) 10228, (2) 10017, (2) 10111

OUTER HITCH

PHA021/PHA025



ITEM	PART NO.	DESCRIPTION
1.	A4445	Clevis, Single, 12(Shown)/16 Row
	B0156	Clevis, Double, 8 Row
2.	10169	Hex Head Cap Screw, 1 1/4"-7 x 6"
	10157	Lock Nut, 1 1/4"-7
3.	10005	Hex Head Cap Screw, 5/8"-11 x 1 3/4"
	10009	Hex Head Cap Screw, 5/8"-11 x 2 1/2"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
4.	D5173	Pin, 1 1/4" x 5 1/8"
	10462	Cotter Pin, 3/16" x 2"
5.	A4994	Jack Assembly Complete
	A4995	Detent Pin Assembly
	R0517	Pin
	R0516	Crank Assembly
	R0515	Bevel Gears

OUTER HITCH

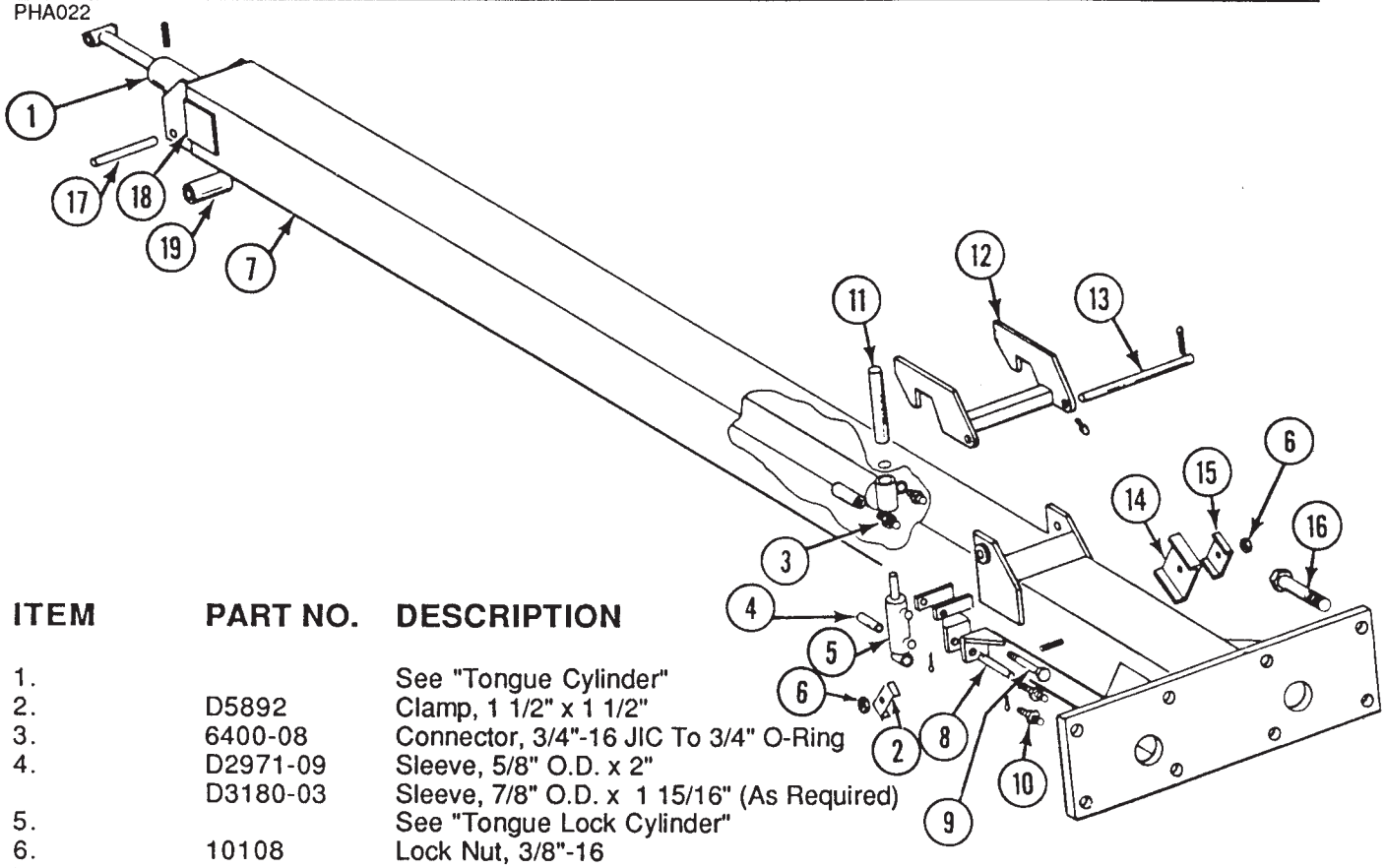
ITEM	PART NO.	DESCRIPTION
6.	A4420	Mount, All 8 Row 30/36/38 And 12 Row 30, 12 Row 36/38 With "Y" Hitch
	A4839	Mount, 12 Row 36/38 With "T" Hitch And All 16 Row
7.	10111	Lock Nut, 1/2"-12
8.	D8188	Clamp, 3" x 5 3/8"
9.	D8260	Hose Holder
10.	D8189	Rubber Strap
11.	A5842	Bracket, Jack Mount
12.	10009	Hex Head Cap Screw, 5/8"-11 x 2 1/2"
	10217	Washer, 5/8" USS
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
13.	A4402	Pin, 12 3/4", 8 Row 30/36/38 and12 Row 30
	A4845	Pin, 14 3/4", 12 Row 36/38 and16 Row 30
	D2558	Lynch Pin, 1/4"
	D2557	Lynch Pin, 7/16"
14.	D2168	Pin, 1 1/4" x 9 3/4"
	10460	Cotter Pin, 1/4" x 2"
15.	10139	Washer, 1 1/4" USS (Where Applicable)
	10226	Washer, 1 1/4" SAE (Where Applicable)
16.	A3858	Wear Mount W/Grease Fitting, All 8 Row 30/36/38 And 12 Row 30, 12 Row 36/38 With "Y" Hitch
	A2653	Wear Mount W/Grease Fitting, L.H., 12 Row 36/38 With "T" Hitch And All 16 Row
	A4882	Wear Mount W/Grease Fitting, R.H., 12 Row 36/38 With "T" Hitch And All 16 Row
	10641	Grease Fitting, 1/8" NPT
17.	10014	Hex Head Cap Screw, 1/2"-13 x 1"
	10228	Lock Washer, 1/2"
18.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2", 8/12 Row
	10016	Hex Head Cap Screw, 1/2"-13 x 2", 16 Row
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
19.	D5154	Shim (As Required), All 8 Row 30/36/38 And 12 Row 30, 12 Row 36/38 With "Y" Hitch
	D3501	Shim (As Required), 12 Row 36/38 With "T" Hitch And All 16 Row
20.	D5153	Wear Pad, Bronze, All 8 Row 30/36/38 And 12 Row 30, 12 Row 36/38 With "Y" Hitch
	D3478	Wear Pad, Bronze, 12 Row 36/38 With "T" Hitch And All 16 Row
21.		Outer Hitch, "Y", 61", 8 Row 30 (Non-stock Item)
		Outer Hitch, "T", 85", 8 Row 30 (Non-stock Item)
		Outer Hitch, "Y", 73", 8 Row 36/38 (Non-stock Item)
		Outer Hitch, "T", 97", 8 Row 36/38 (Non-stock Item)
		Outer Hitch, "Y", 97", 12 Row 30 (Non-stock Item)
		Outer Hitch, "T", 121", 12 Row 30(Shown) (Non-stock Item)
		Outer Hitch, "Y", 121", 12 Row 36/38 (Non-stock Item)
		Outer Hitch, "T", 151 1/2", 12 Row 36/38 (Non-stock Item)
		Outer Hitch, "Y", 127 1/2", 16 Row 30 (Non-stock Item)
		Outer Hitch, "T", 151 1/2", 16 Row 30 (Non-stock Item)
22.	D4732	Pin, 7/8" x 6 1/2"
	10463	Cotter Pin, 1/4" x 1 1/2"
23.	A3574	"T" Pin
	10216	Washer, 1/2" USS
	10335	Hex Jam Nut, 1/2"-13
	10470	Cotter Pin, 5/32" x 1"
24.	A4397	Lock Plate W/Grease Fitting
	10641	Grease Fitting, 1/8" NPT
25.	D4721	Spring
26.	10050	Hex Head Cap Screw, 3/4"-10 x 5"
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10

OUTER HITCH

ITEM	PART NO.	DESCRIPTION
27.	D6730	Bar
28.	A4401	Transport Post
29.	A4399	Latch Post
30.	A5469	Takeup, 15 1/2", 8 Row 30 With "Y" Hitch
	A4605	Takeup W/Grease Fitting, 35", 8 Row 30 With "T" Hitch
	A4598	Takeup W/Grease Fitting, 21 1/2", 8 Row 36/38 With "Y" Hitch
	A4412	Takeup W/Grease Fitting, 41", 8 Row 36/38 With "T" Hitch And 12 Row 30 (Shown) With "Y" Hitch
	A4415	Takeup W/Grease Fitting, 53", 12 Row 30 With "T" Hitch And 12 Row 36/38 And 16 Row 30 With "Y" Hitch
	A5587	Takeup W/Grease Fitting, 65", 12 Row 36/38 And 16 Row 30 With "T" Hitch
	10641	Grease Fitting, 1/8" NPT
31.	2700-10	Tube Union, 7/8"-14 JIC
	2403-10	Union, 7/8"-14 JIC
	2700-08	Bulkhead, 3/4"-16 JIC
32.	306-10	Lock Nut, 7/8"-14
	306-08	Lock Nut, 3/4"-16
33.	10108	Lock Nut, 3/8"-16
34.	A4418	Roller W/Bronze Bushings, 8/12 Row
	A4842	Roller W/Bronze Bushings, 16 Row
	D6556	Bronze Bushing
35.	A2627	Bulkhead
36.	10164	Hex Head Cap Screw, 3/8"-16 x 2 1/4"
	10210	Washer, 3/8"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
37.	D4695	Hex Head Cap Screw, Special
	10689	Carriage Bolt, 5/8"-11 x 2"
	B0123	Bushing
	10230	Lock Washer, 5/8"
	10217	Washer, 5/8" USS
	10104	Hex Nut, 5/8"-11
38.		See "Valve Block - Located On Hitch"
39.	A5841	Mount
40.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
41.	A5468	Takeup W/Grease Fitting, 15 1/2", 8 Row 30 With "Y" Hitch
	A4606	Takeup W/Grease Fitting, 35", 8 Row 30 With "T" Hitch
	A4599	Takeup W/Grease Fitting, 21 1/2", 8 Row 36/38 With "Y" Hitch
	A4414	Takeup W/Grease Fitting, 41", 8 Row 36/38 With "T" Hitch And 12 Row 30 With "Y" Hitch (Shown)
	A4417	Takeup W/Grease Fitting, 53", 12 Row 30 With "T" Hitch And 12 Row 36/38 With "Y" Hitch
	A5498	Takeup W/Grease Fitting, 53", 16 Row 30 With "Y" Hitch
	A5586	Takeup W/Grease Fitting, 65", 12 Row 36/38 And 16 Row 30 With "T" Hitch
	10641	Grease Fitting, 1/8" NPT
42.	A4607	Bulkhead
43.	D0752-15	Sleeve, 1", 12 Row 36/38 With "T" Hitch And All 16 Row
	10226	Washer, 1 1/4" SAE (8 And 12 Row As Required)
44.	D3488	Shim, 1/2" x 5" x 6 1/2", 16 Row Only
	D7518	Shim, 3/8" x 5" x 6 1/2", 12 Row 36/38 With "T" Hitch And All 16 Row
	D7519	Shim, 16 Ga. x 5" x 6 1/2", 12 Row 36/38 With "T" Hitch And All 16 Row
45.	10014	Hex Head Cap Screw, 1/2"-13 x 1"
	10228	Lock Washer, 1/2"
	10216	Washer, 1/2" USS
46.	D5804	Shaft, 1 1/4" x 12", 8/12 Row
	D7251	Shaft, 1 1/4" x 14", 16 Row
	10610	Spring Pin, 3/8" x 2"

INNER HITCH, "T"

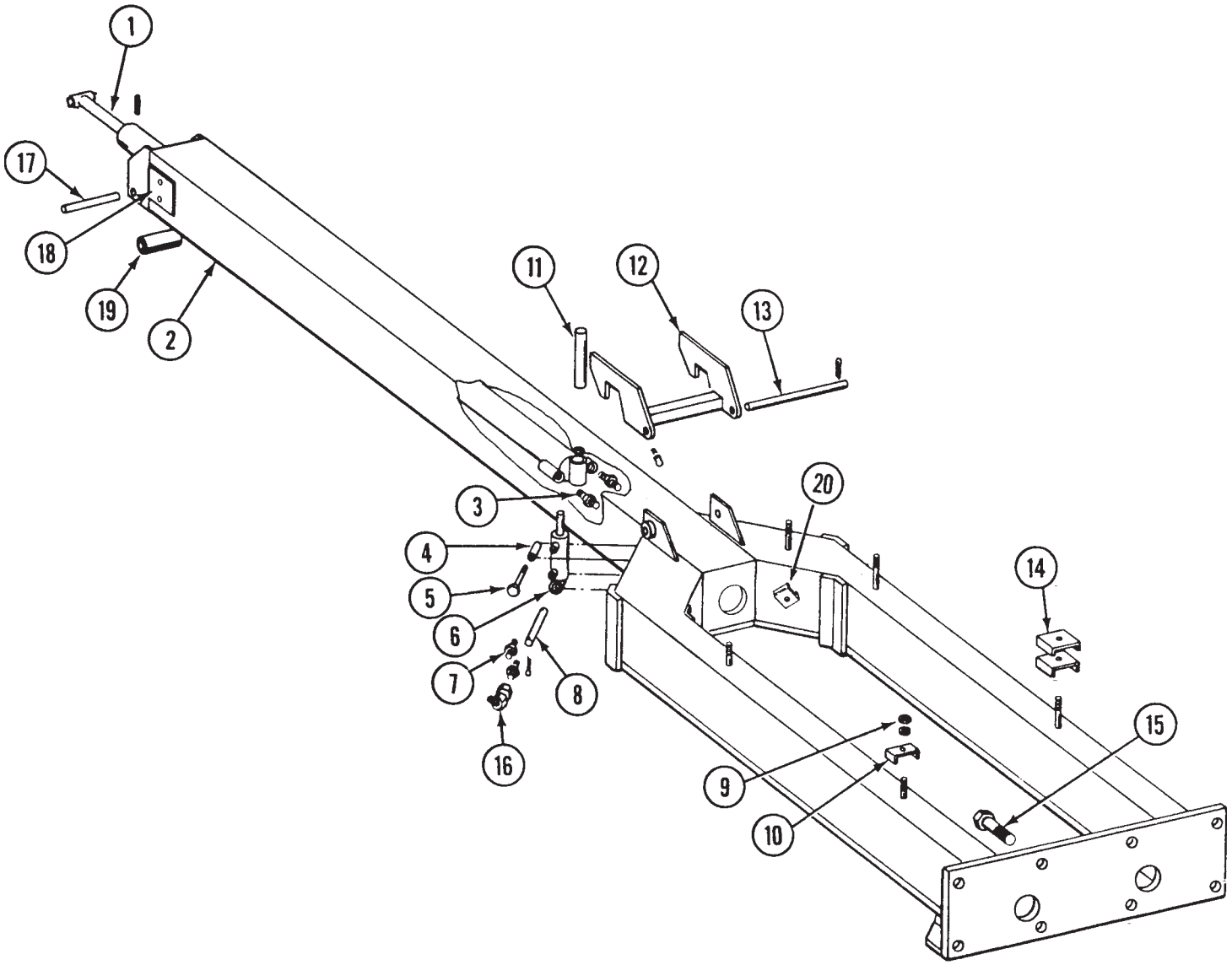
PHA022



ITEM	PART NO.	DESCRIPTION
1.		See "Tongue Cylinder"
2.	D5892	Clamp, 1 1/2" x 1 1/2"
3.	6400-08	Connector, 3/4"-16 JIC To 3/4" O-Ring
4.	D2971-09	Sleeve, 5/8" O.D. x 2"
	D3180-03	Sleeve, 7/8" O.D. x 1 15/16" (As Required)
5.		See "Tongue Lock Cylinder"
6.	10108	Lock Nut, 3/8"-16
7.		Inner Hitch, 117 1/2", 8 Row 30 (Non-stock Item)
		Inner Hitch, 129 1/2", 8 Row 36/38 (Non-stock Item)
		Inner Hitch, 153 1/2", 12 Row 30 (Non-stock Item)
		Inner Hitch, 188 1/4", 12 Row 36/38 (Non-stock Item)
		Inner Hitch, 188 1/4", 16 Row 30 (Non-stock Item)
8.	D7137	Pin, 3/4" x 3 1/4"
	10457	Cotter Pin, 5/32" x 1 1/2"
9.	10062	Hex Head Cap Screw, 3/8"-16 x 3"
	10101	Hex Nut, 3/8"-16
10.	6400-06-08	Connector, 3/4"-16 O-Ring To 9/16"-18 JIC
	6502-06	Swivel Elbow, 9/16"-18 JIC Male To Female, 45°
11.	D3537-07	Shaft, 1 1/4" x 6 5/8", 8 Row 30/36/38 And 12 Row 30
	D3537-08	Shaft, 1 1/4" x 7 5/8", 12 Row 36/38 And 16 Row 30
12.	A4407	Tongue Hook W/Grease Fittings, 8 Row 30/36/38 And 12 Row
	A4841	Tongue Hook W/Grease Fittings, 12 Row 36/38 And 16 Row 30
	10641	Grease Fitting, 1/8" NPT
13.	D5804	Shaft, 1 1/4" x 12", 8 Row 30/36/38 And 12 Row 30
	D7883	Shaft, 1 1/4" x 14 1/2",12 Row 36/38 And 16 Row 30
	10468	Cotter Pin, 3/8" x 2"
14.	D0740	Clamp, 4" x 3 1/2"
15.	D5875	Clamp, 2 1/2" x 2"
16.	10119	Hex Head Cap Screw, 1"-14 x 3", Grade 5
	10118	Lock Washer, 1"
	10117	Hex Nut, 1"-14, Grade 5
17.	D6807	Shaft, 1 1/4" x 7"
	10610	Spring Pin, 3/8" x 2"
18.	D5153	Bronze Wear Pad
	D5154	Shim
19.	A4411	Roller W/Bronze Bushings
	D6556	Bronze Bushing

INNER HITCH, "Y"

PHA023

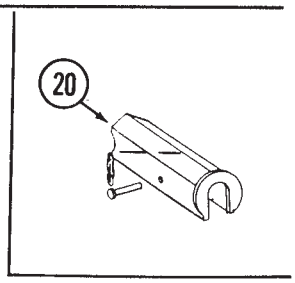


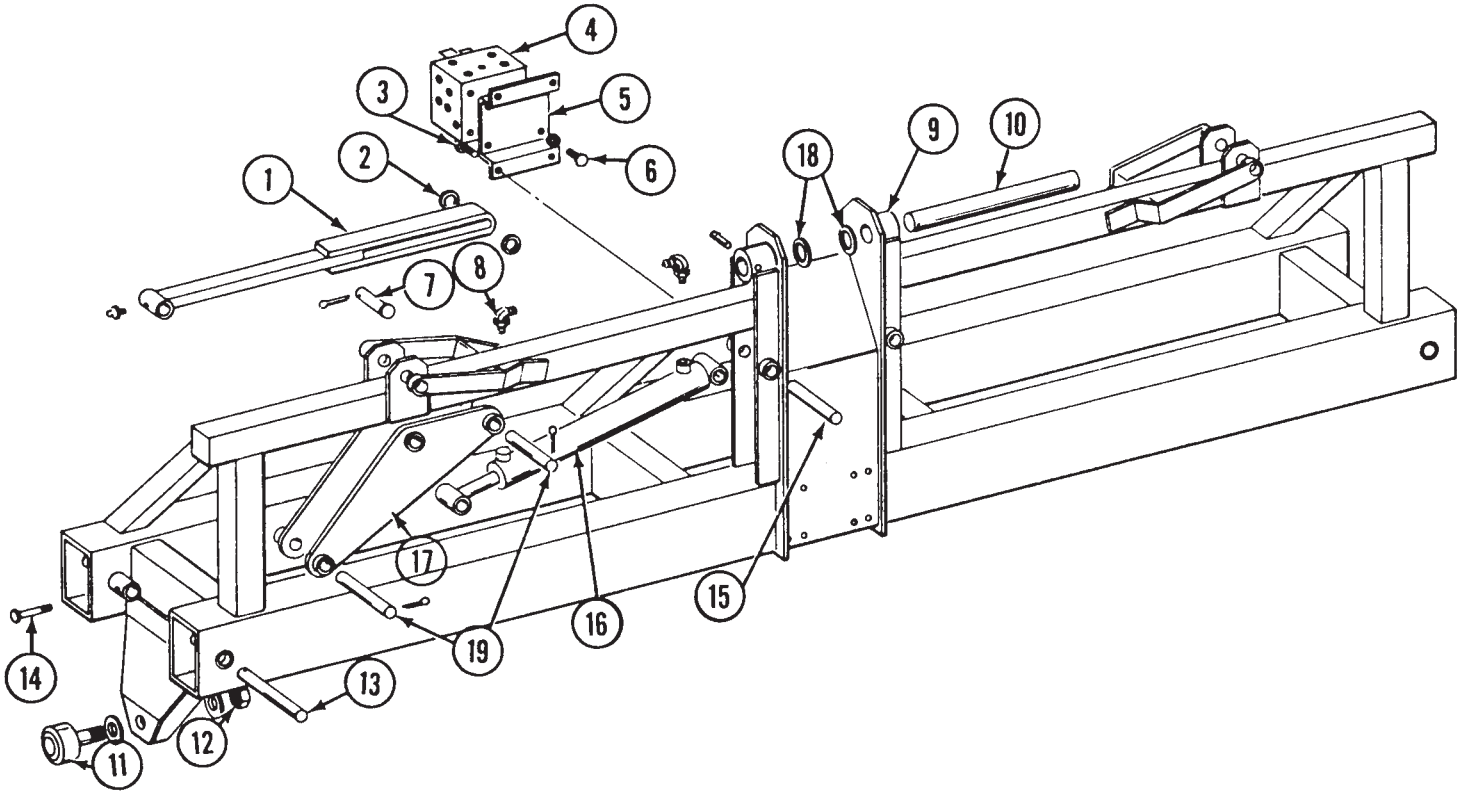
INNER HITCH, "Y"

ITEM	PART NO.	DESCRIPTION
1.		See "Tongue Cylinder"
2.		Inner Hitch, 140 1/4", 8 Row 30 (Non-stock Item)
		Inner Hitch, 152 1/4", 8 Row 36/38 (Non-stock Item)
		Inner Hitch, 176 1/2", 12 Row 30(Shown) (Non-stock Item)
		Inner Hitch, 198 1/2", 12 Row 36/38 (Non-stock Item)
		Inner Hitch, 212 1/4", 16 Row 30 (Non-stock Item)
3.	6400-08	Connector, 3/4"-16 JIC To 3/4" O-Ring
4.	D2971-09	Sleeve, 5/8" O.D. x 2"
	D3180-03	Sleeve, 7/8" O.D. x 15/16" (As Required)
5.	10062	Hex Head Cap Screw, 3/8"-16 x 3"
	10101	Hex Nut, 3/8"-16
6.		See "Tongue Lock Cylinder"
7.	6400-06-08	Connector, 3/4"-16 O-Ring To 9/16"-18 JIC
8.	D7137	Pin, 3/4" x 3 1/4"
	10457	Cotter Pin, 5/32" x 1 1/2"
9.	10108	Lock Nut, 3/8"-16
10.	D5892	Clamp, 1 1/2" x 1 1/2"
11.	D3537-07	Shaft, 1 1/4" x 6 5/8", 8/12 Row
	D3537-08	Shaft, 1 1/4" x 7 5/8", 16 Row
12.	A4407	Tongue Hook W/Grease Fittings, 8 Row 30/36/38 And 12 Row 30
	A4841	Tongue Hook W/Grease Fittings,12 Row 36/38 And 16 Row 30
	10641	Grease Fitting, 1/8" NPT
13.	D5804	Shaft, 1 1/4" x 12", 8 Row 30/36/38 And 12 Row 30
	D7883	Shaft, 1 1/4" x 14 1/2", 12 Row 36/38 And 16 Row 30
	10468	Cotter Pin, 3/8" x 2"
14.	D6027	Clamp, 2 1/2" x 2 1/2"
15.	10119	Hex Head Cap Screw, 1"-14 x 3", 8/12 Row
	10118	Lock Washer, 1"
	10017	Hex Nut, 1"-14. Grade 5
	10494	Hex Head Cap Screw, 1 1/4"-7 x 3 1/2", 16 Row
	10236	Lock Washer, 1 1/4"
	10239	Hex Nut, 1 1/4"-7
16.	6502-06	Swivel Elbow, 9/16"-18 JIC Male To Female, 45°
17.	D6807	Shaft, 1 1/4" x 7", 8/12 Row
	D7247	Shaft, 1 1/4" x 8", 16 Row
	10610	Spring Pin, 3/8" x 2"
18.	D5153	Bronze Wear Pad
	D5154	Shim
19.	A4411	Roller W/Bronze Bushings, 8/12 Row
	A4418	Roller W/Bronze Bushings, 16 Row
	D6556	Bronze Bushing
20.	D8188	Clamp, 3" x 5 3/8"

CENTER FRAME

PFA038/PLA014



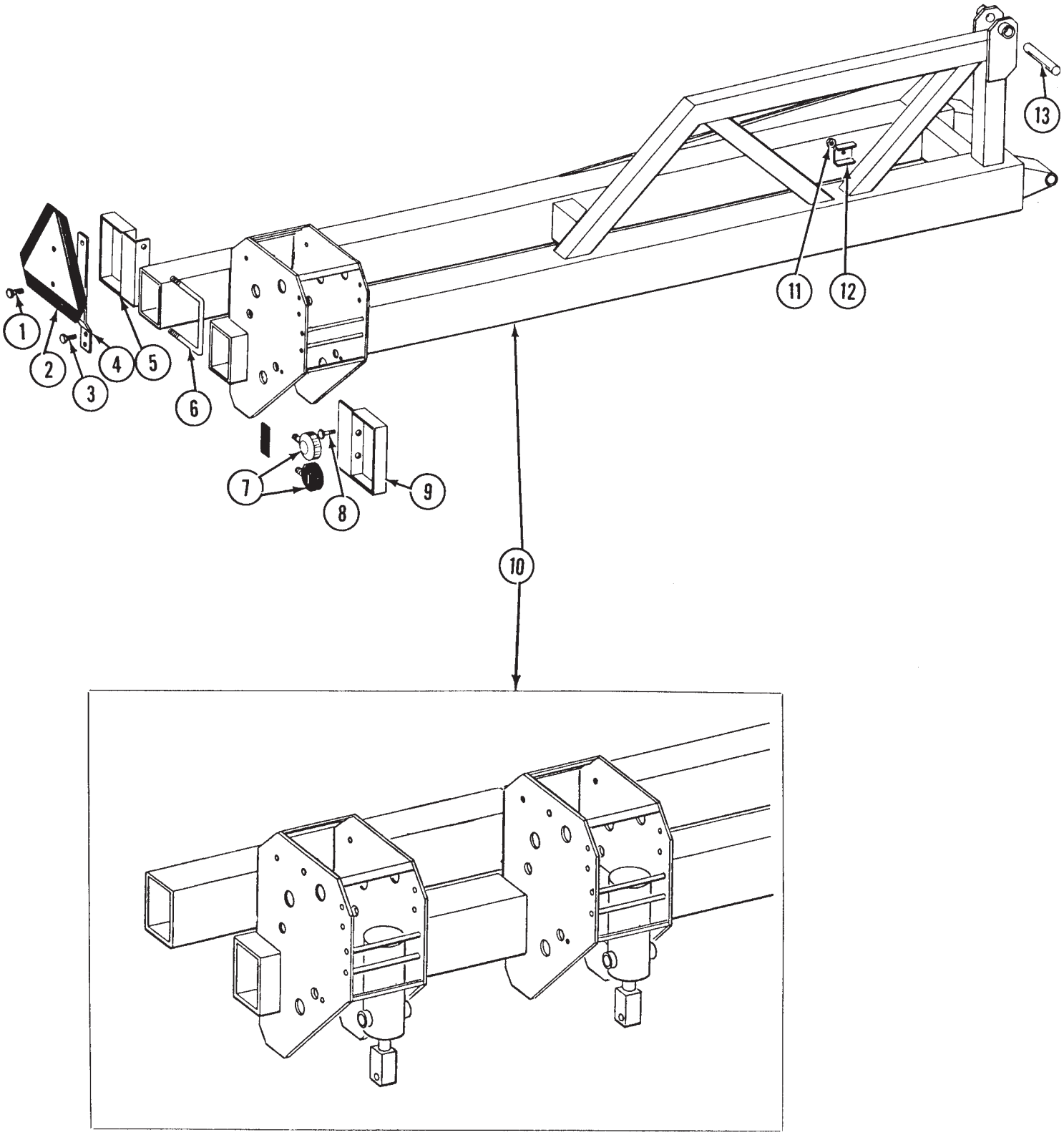


CENTER FRAME

ITEM	PART NO.	DESCRIPTION
1.	A3400	Link W/Grease Fitting, 8 Row 30, 12 Row 30 And 16 Row 30
	A2845	Link W/Grease Fitting, 8 Row 36/38 And 12 Row 36/38
	10641	Grease Fitting, 1/8" NPT
2.	D4171	Washer, 1 1/4", Hardened
3.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
4.		See "Junction Block - Located On Front Side Of Center Frame"
5.	D6731	Mounting Plate
6.	10019	Hex Head Cap Screw, 5/16"-18 x 1"
	10583	Hex Head Cap Screw, 5/16"-18 x 2 3/4"
	10232	Lock Washer, 5/16"
7.	A2621	Pin, 1 1/4" x 3 1/8"
	10460	Cotter Pin, 1/4" x 2"
8.	6801-08	Elbow, 3/4"-16 JIC To 3/4"-16 O-Ring
9.		Frame, 133", 8 Row 30 (Non-stock Item)
		Frame, 165", 8 Row 36/38 (Non-stock Item)
		Frame, 133", 12 Row 30 And 16 Row 30 (Non-stock Item)
		Frame, 165", 12 Row 36/38 (Non-stock Item)
10.	D6659	Pin, 2 1/8" x 16"
	10695	Spring Pin, 1/2" x 1 1/2"
11.	A2566	Cam Follower W/Grease Fitting
	10640	Grease Fitting, 1/4"-28
12.	10139	Washer, 1 1/4" USS
	10281	Hex Nut, 1 1/4"-12 NF
13.	D6683	Pin, 1 1/4" x 7 1/2"
14.	10486	Hex Head Cap Screw, 3/8"-16 x 2 3/4", Grade 8
	10108	Lock Nut, 3/8"-16
15.	D1701	Pin, 1 1/4" x 6 1/2"
	10460	Cotter Pin, 1/4" x 2"
16.		See "Wing Lock Cylinder"
17.	A3429	Toggle W/Grease Fittings
	10641	Grease Fitting, 1/8" NPT
	10640	Grease Fitting, 1/4"-28
18.	10234	Machine Bushing, 10 Gauge
19.	D4108	Pin, 1 1/4" x 7 1/2"
	10460	Cotter Pin, 1/4" x 2"
20.	A6049	Cylinder Stop (Where Applicable)

WING

PFA039/PFA046

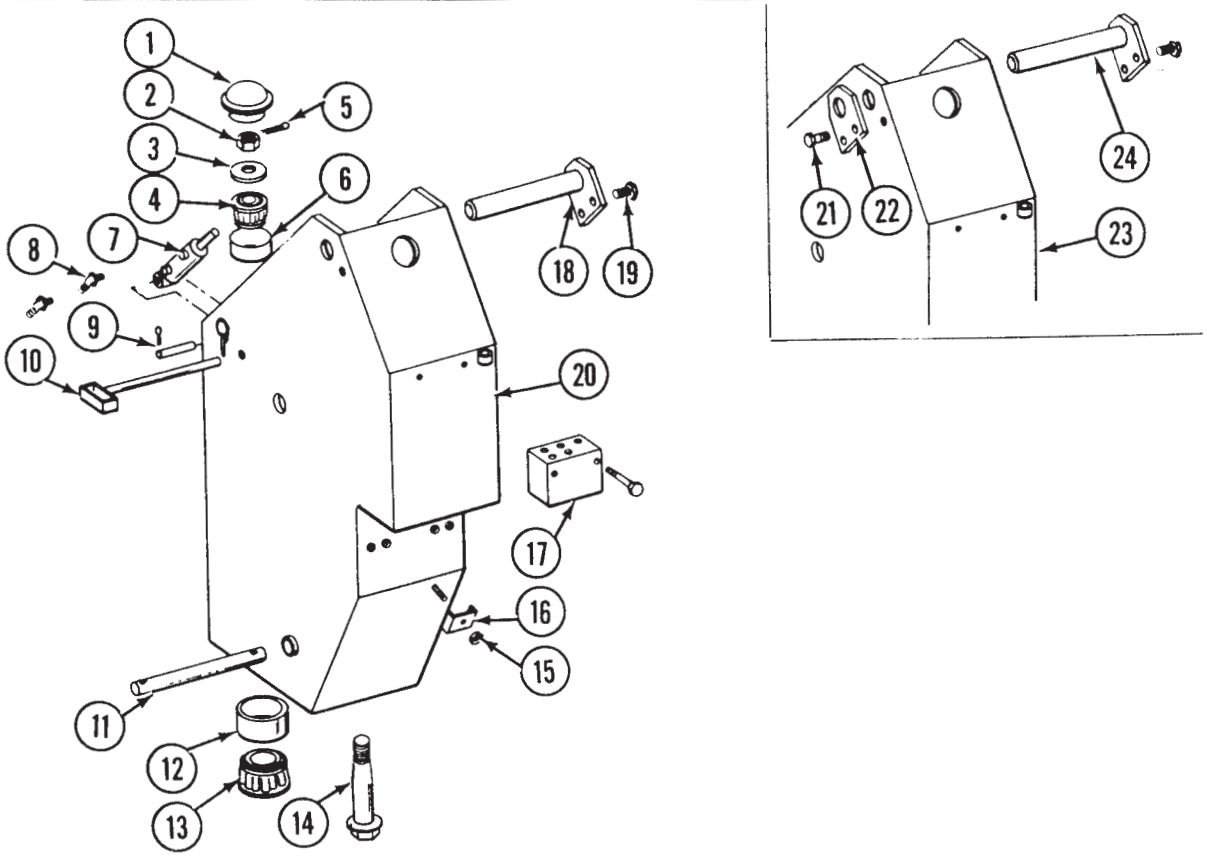


WING

ITEM	PART NO.	DESCRIPTION
1.	10022	Hex Head Cap Screw, 1/4"-20 x 1/2"
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20
2.		See "SMV, Decals, Reflectors And Tie Straps"
3.	10031	Hex Head Cap Screw, 5/16"-18 x 1 3/4"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
4.	D6783	Bracket
5.	A4431	Light Bracket
6.	D1113	U-Bolt, 5" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
7.	A4122	Single Red Light Assembly Complete W/Female Terminal
	A4123	Double Amber Light Assembly Complete W/Male Terminal
	R0968	Bulb, No. 1156
	R0970	Red Lens
	R0969	Amber Lens
	10289	Hex Nut, 1/2"-20
	10525	Star Washer, 1/2"
		Rubber Washer (Non-stock Item)
	R0971	O-Ring Gasket
	R0972	Pigtail
	10266	Female Terminal
	10269	Male Terminal
		NOTE: See "Electrical Components" for wiring harness.
8.	10019	Hex Head Cap Screw, 3/8"-18 x 1"
	10232	Lock Washer, 3/8"
	10106	Hex Nut, 3/8"-18
9.	A4604	Light Bracket
10.		Wing, L.H., 63 1/4", 8 Row 30 (Non-stock Item)
		Wing, R.H., 67 1/4", 8 Row 30 (Non-stock Item)
		Wing, L.H. And R.H., 71 1/4", 8 Row 36 (Non-stock Item)
		Wing, L.H. And R.H., 79 1/4", 8 Row 38 (Non-stock Item)
		Wing, L.H. And R.H., 123 1/4", 12 Row 30 (Non-stock Item)
		Wing, L.H. And R.H., 139 1/2", 12 Row 36 (Non-stock Item)
		Wing, L.H. And R.H., 150 1/2", 12 Row 38 (Non-stock Item)
		Wing, L.H. And R.H., 183 1/4", 16 Row 30 (Two Wheel Towers Per Wing) (Non-stock Item)
11.	10108	Lock Nut, 3/8"-16
12.	D5875	Clamp, 2 1/2" x 2"
13.	D1701	Pin, 1 1/4" x 6 1/2"
	10460	Cotter Pin, 1/4" x 2"

CENTER PIVOT

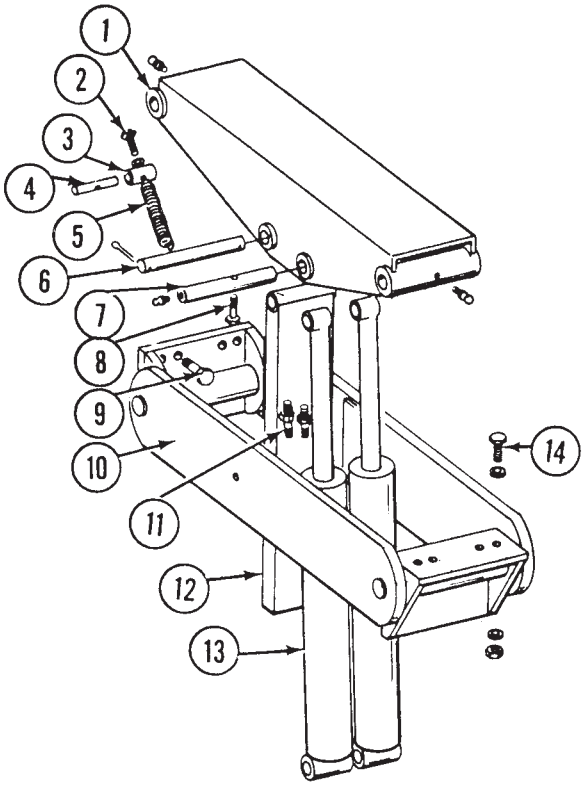
PFA040



ITEM	PART NO.	DESCRIPTION
1.	D4927	Cap
2.	10070	Hex Jam Nut, 1 1/4"-12, Grade 2
3.	D4171	Hardened Washer, 1 1/4"
4.	A0705	Cone
5.	10460	Cotter Pin, 1/4" x 2"
6.	R0322	Cup
7.		See "Lift Lock Cylinder"
8.	6801-06-08	Elbow, 3/4"-16 O-Ring To 9/16"-18 JIC
9.	D7137	Pin, 3/4" x 3 1/4"
	10457	Cotter Pin, 5/32" x 1 1/2"
10.	A4436	Pin
	D2558	Lynch Pin, 1/4"
11.	D6660	Pin, 1 1/2" x 13 5/8"
	10489	Spring Pin, 3/8" x 1 1/2"
12.	D6554	Cup
13.	A4288	Cone
14.	A4746	Pivot Bolt, Tapered
15.	10101	Hex Nut, 3/8"-16
16.	D5892	Clamp, 1 1/2" x 1 1/2"
17.		See "Junction Block - Located On Rear Side Of Center Frame"
18.	A4362	Pin, 11 1/4", 8/12 Row
19.	10005	Hex Head Cap Screw, 5/8"-11 x 1 3/4"
20.		Rotating Housing, 8/12 Row (Non-stock Item)
21.	10026	Hex Head Cap Screw, 3/4"-10 x 2", 16 Row
22.	D7210	Plate, 16 Row Only
23.		Rotating Housing, 16 Row (Non-stock Item)
24.	A4875	Pin, 12", 16 Row

CENTER LIFT ARMS

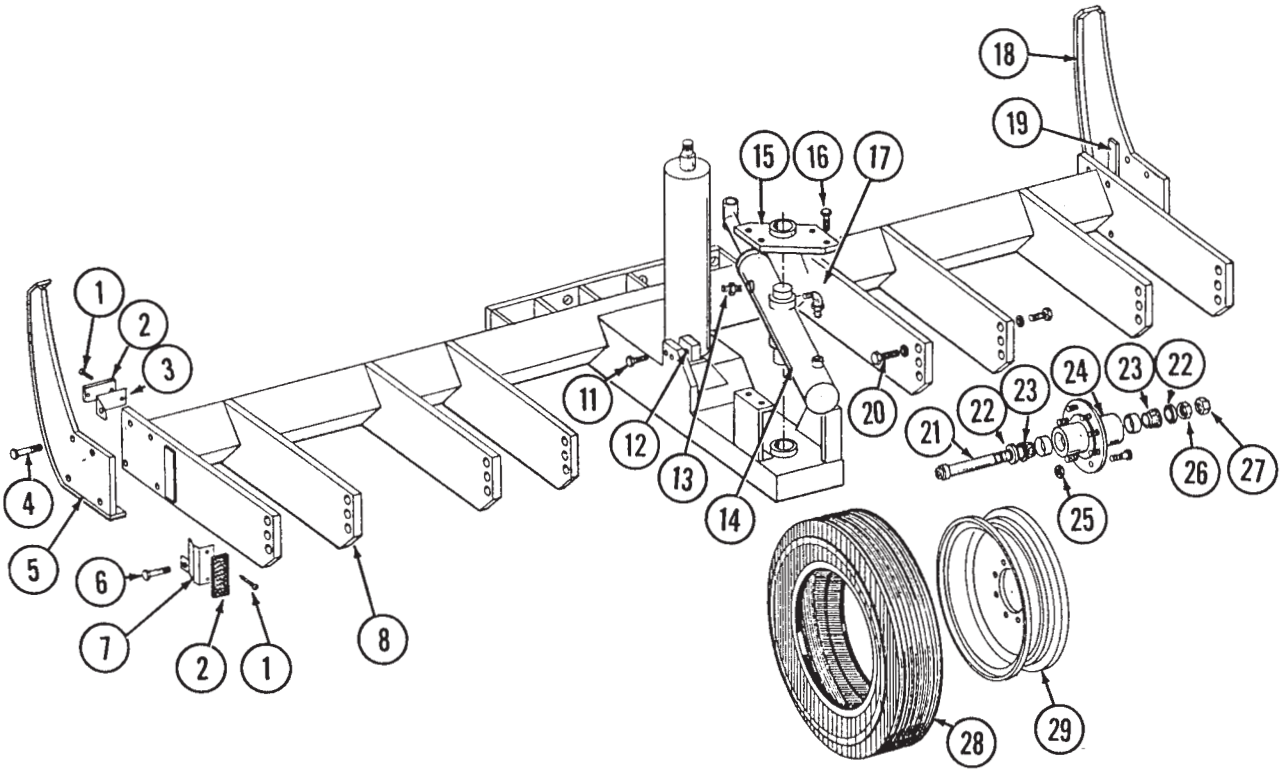
PFA041

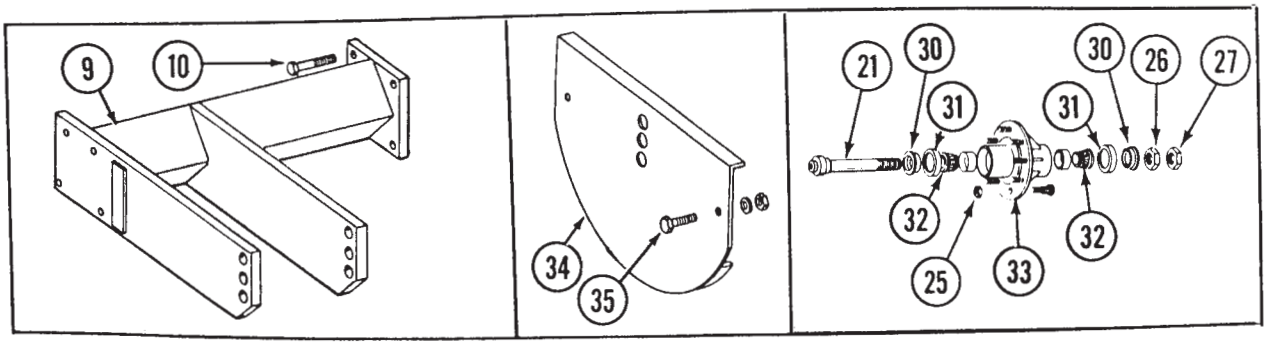


ITEM	PART NO.	DESCRIPTION
1.	A4360	Upper Lift Arm W/Grease Fittings
	10641	Grease Fitting, 1/8" NPT
2.	10077	Hex Head Cap Screw, 7/16"-14 x 4 1/2"
	10081	Washer, 7/16" USS
3.	D6701	Sleeve, 1 1/2"
4.	D6700	Pin, 3/4" x 2 1/2"
5.	A2052	Spring W/Plug
6.	D6657	Pin, 1 1/2" x 9 3/4"
	10462	Cotter Pin, 3/16" x 2"
7.	A4361	Pin W/Grease Fittings
	10641	Grease Fitting, 1/8" NPT
8.	10486	Hex Head Cap Screw, 3/8"-16 x 2 3/4", Grade 8
	10108	Lock Nut, 3/8"-16
9.	10097	Hex Head Cap Screw, 3/4"-16 x 2 1/2"
10.	A4356	Lower Lift Arm W/Grease Fittings
	10641	Grease Fitting, 1/8" NPT
11.	6400-10-08	Connector, 3/4"-16 O-Ring To 7/8"-14 JIC (Used With A4204 Cylinder)
	6400-L-10	Connector, 7/8"-14 O-Ring To 7/8"-14 JIC (Used With A5808 Cylinder)
12.	A4347	Safety Lock W/Grease Fitting
	10641	Grease Fitting, 1/8" NPT
13.		See "Master Lift Cylinder"
14.	10480	Hex Head Cap Screw, 3/4"-16 x 2"
	D2169	Special Washer
	10098	Hex Nut, 3/4"-16

AXLE AND TRANSPORT WHEELS

HTA029/HTA031/HTA032/PFA051





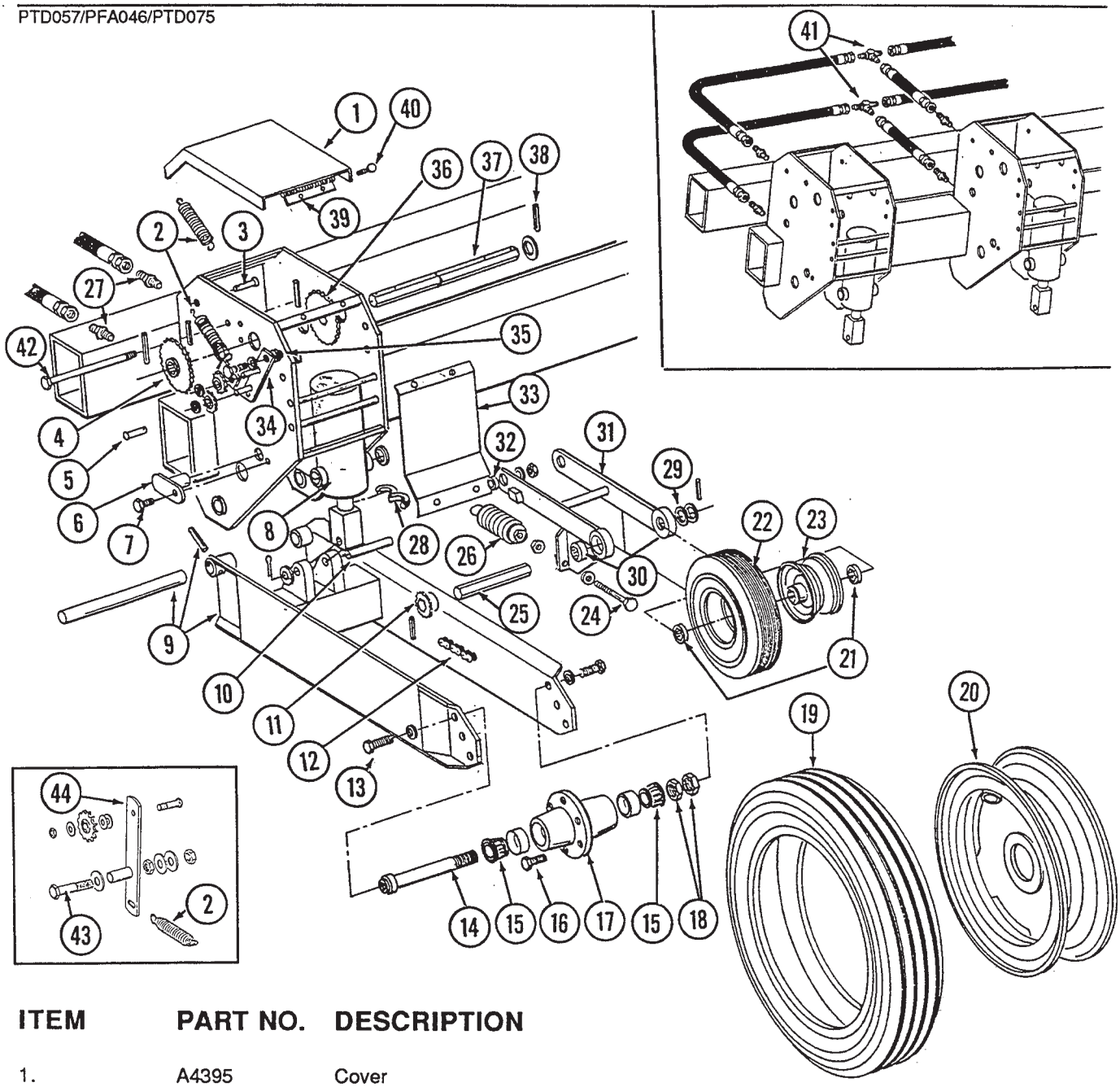
ITEM	PART NO.	DESCRIPTION
1.	10482	Slotted Screw, #8 x 3/4"
2.		See "SMV, Decals, Reflectors And Tie Straps"
3.	D6955	Mount, L.H. (Shown)
	D6956	Mount, R.H.
4.	10010	Hex Head Cap Screw, 5/8"-11 x 3"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
5.	A4367	Anti-Rotation Track, L.H.
6.	10039	Hex Head Cap Screw, 1/2"-13 x 1 3/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
7.	D6957	Mount, L.H. (Shown)
	D6958	Mount, R.H.
8.		Axle, 132", 8 Row 30 And 12 Row 30 (Shown) (Non-stock Item)
		Axle, 85", 8 Row 36/38 And 12 Row 36/38 (Non-stock Item)
		Axle, 132", 16 Row 30 (Non-stock Item)

AXLE AND TRANSPORT WHEELS

ITEM	PART NO.	DESCRIPTION
9.	A4627	Axle Stub, L.H., Wide Row Models Only (Shown)
	A4628	Axle Stub, R.H., Wide Row Models Only
10.	10479	Hex Head Cap Screw, 1"-14 x 3", Grade 8
	10118	Lock Washer, 1"
	10155	Hex Nut, 1"-14, Grade 8
11.	10016	Hex Head Cap Screw, 1/2"-13 x 2"
	10228	Lock Washer, 1/2"
12.	D3389	Tap Block
	D3398	Shim, 16 Gauge
	D7888	Shim, 22 Gauge
13.	6400-06-08	Connector, 3/4"-16 O-Ring To 9/16"-18 JIC
14.		See "Rotation Cylinder"
15.	A4366	Cap Plate
16.	10008	Hex Head Cap Screw, 5/8"-11 x 2"
	10005	Hex Head Cap Screw, 5/8"-11 x 1 3/4"
	D2169	Special Washer
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
17.	6801-06-08	Elbow, 3/4"-16 O-Ring To 9/16"-18 JIC
18.	A4368	Anti-Rotation Track, R.H.
19.	D3607-08	Bar
20.	10448	Hex Head Cap Screw, 7/8"-9 x 2 1/2", Grade 8
	10330	Lock Washer, 7/8"
21.	A4727	Spindle, 1 3/4"
22.	A4722	Seal
23.	A4723	Cone
24.	A4729	Hub W/Cups, Bolts And Grease Fitting, 8 Bolt, 1 3/4" Bore, 8/12 Row
	10641	Grease Fitting, 1/8" NPT
	D7079	Cup
	R0528	Bolt
25.	R0531	Nut, 5/8"-18 UNF
26.	D7089	Special Nut, 1 3/4"-12 UNF
27.	D7864	Special Hex Nut, 1 3/4"-12 UNF
28.	D7257	Tire, 7.50-20, Load Rated D, Bias Ply, 8/12 Row
	D7256	Tube, 8/12 Row
	D7262	Tire, 7.50-20, Load Rated E, Bias Ply, 16 Row
	D7256	Tube, 16 Row
	D7263	Flap, 16 Row
29.	A4291	Rim, W7B x 20H, 8/12 Row
	A4869	Rim , 16 Row
30.	D7163	Spacer
31.	A4799	Seal
32.	A4800	Cone
33.	A4801	Hub W/Cups, Bolts And Grease Fitting, 8 Bolt, 1 3/4" Bore, 16 Row
	D7167	Cup
	R0528	Bolt, Grade 5
	10641	Grease Fitting, 1/8" NPT
34.	A5716	Rock Guard (Optional)
35.	10037	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13

CONTACT DRIVE WHEEL

PTD057/PFA046/PTD075



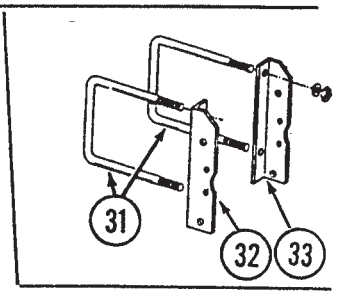
ITEM	PART NO.	DESCRIPTION
1.	A4395	Cover
2.	D5857	Spring
3.	10478	Clevis Pin, 5/16" x 1"
	10409	Ring
4.	A5109	Sprocket, 24 Tooth, 8/12 Row
	A5114	Sprocket, 30 Tooth-2 To 1 Reduction, 8/12 Row(Shown)
		See "Ratchet/Sprocket Assembly", 16 Row
5.	10408	Clevis Pin, 5/16" x 3/4"
	10409	Ring
6.	A5121	Pin
7.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
8.		See "Slave Lift Cylinder"
9.	A4389	Wheel Module W/Pin
	D6712	Pin, 1 1/4" x 12 1/2"
	10610	Roll Pin, 3/8" x 2"
10.	D5841	Pin, 1 1/4" x 5 5/8"
	10460	Cotter Pin, 1/4" x 2"

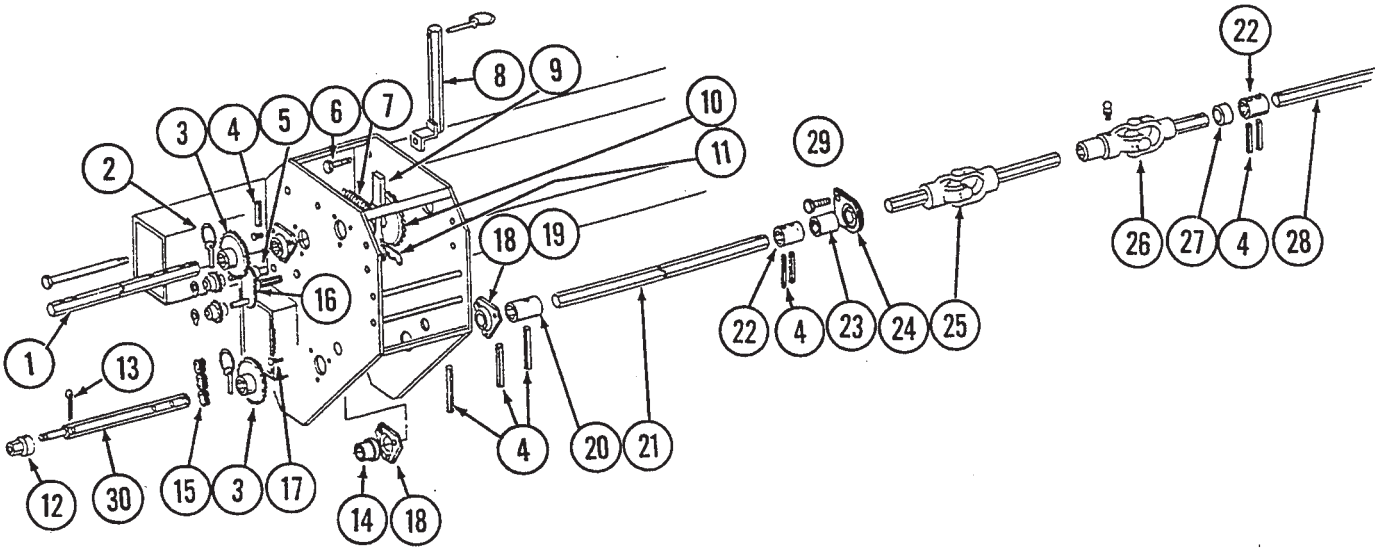
CONTACT DRIVE WHEEL

ITEM	PART NO.	DESCRIPTION
11.	A5109	Sprocket, 24 Tooth, 8/12 Row
	A5105	Sprocket, 15 Tooth-2 To 1 Reduction, 8/12/16 Row (Shown)
	A5114	Sprocket, 30 Tooth, 16 Row
12.	3310-126	Chain, No. 40, 126 Pitch Including Connector Link, 8/12 Row (SN 600000 To 600327)
	3310-132	Chain, No. 40, 132 Pitch Including Connector Link, 16 Row (SN 600000 To 600327)
	3310-112	Chain, No. 40, 112 Pitch Including Connector Link, 8/12 Row (SN 600328 And On)
	3310-118	Chain, No. 40, 118 Pitch Including Connector Link, 16 Row (SN 600328 And On)
	R0912	Connector Link, No. 40
13.	10026	Hex Head Cap Screw, 3/4"-10 x 2"
	10231	Lock Washer, 3/4"
14.	A4376	Spindle
15.	A0895	Cone
16.	R0270	Bolt, 9/16" x 1 1/8", Grade 5
17.	A2148	Hub W/Cups, 6 Bolt
	R0434	Cup
18.	10087	Hex Jam Nut, 1 1/2"-12
19.	D6177	Tire, 7.50 x 20, 6 Ply, Rib Implement
	D4167	Tube
20.	A2908	Rim, 5.5 x 20
21.	D1199-03	Spacer, 5/8" (As Required)
22.	D4700	Tire, 4.8 x 8, 6 Ply, Rib Implement
	D4701	Valve Stem
23.	A3553	Rim
24.	10038	Hex Head Cap Screw, 1/2"-13 x 3"
	10501	Hex Jam Nut, 1/2"-13
25.	D6775	Shaft, 7/8" x 12"
26.	A2068	Spring
27.	6400-08	Connector, 3/4"-16 JIC To O-Ring
28.	D6959	Split Washer, 1 1/2" (As Required), 8/12 Row
	D7171	Split Washer, 1 1/4" (As Required), 16 Row
29.	10233	Machine Bushing
30.	A5116	Bearing, 7/8" Hex Bore
31.	A4387	Wheel Arm
32.	B0218	Bushing
33.	D6895	Shield
34.	A4429	Idler W/Sprockets, Rings And Strap (SN 600000 To 600327)
	D7426	Sprocket
	10435	Ring
	D7641	Strap
35.	10009	Hex Head Cap Screw, 5/8"-11 x 2 1/2"
	10235	Machine Bushing
	10205	Washer, 5/8" SAE
	10107	Lock Nut, 5/8"-11
36.		See "Inner Module Drive"
37.	D7763	Shaft, 7/8" x 14", Used On 8 Row Models (See "Point Row Clutch For Models Equipped With Point Row Clutches.)
38.	10602	Spring Pin, 1/4" x 1 1/2"
39.	D5789	Hinge, Female
	D5790	Hinge, Male
40.	10064	Hex Head Cap Screw, 1/4"-20 x 1"
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20
41.	2603-08	Tee, 3/4"-16 JIC
42.	10595	Hex Head Cap Screw, 3/8"-16 x 10"
	10108	Lock Nut, 3/8"
43.	10743	Hex Head Cap Screw, 5/8"-11 x 3 3/4"
	10235	Machine Bushing
	10205	Washer, 5/8"-11 SAE
	10104	Hex Nut, 5/8"-11
	10107	Lock Nut, 5/8"-11
44.	A6534	Idler W/Sprocket And Hardware (SN 600328 And On)
	A5103	Sprocket
	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10206	Washer, 1/2" SAE
	10501	Lock Nut, 1/2"-13

TRANSMISSION AND ROW UNIT DRILL SHAFT

PTD056/PTD065/RUB007



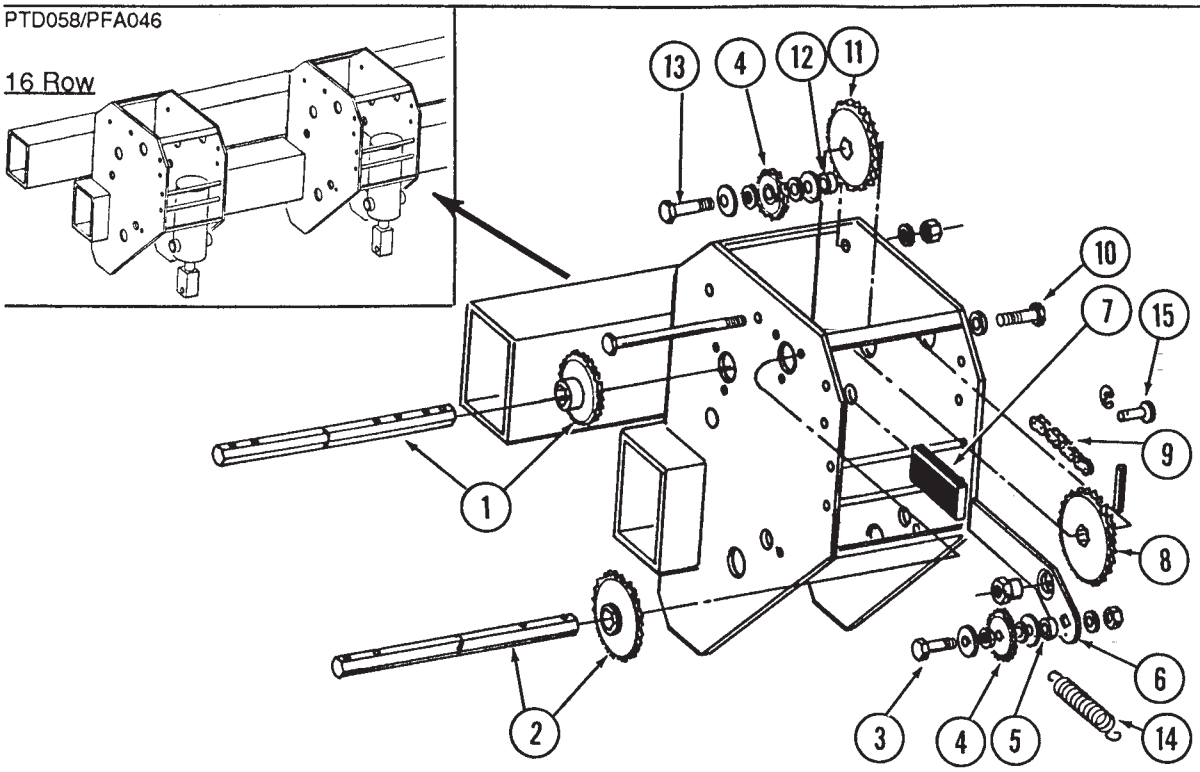


ITEM	PART NO.	DESCRIPTION
1.	D6780	Shaft, 7/8" x 15", 8/12 Row
	D8640	Shaft, 7/8" x 46 1/2", 16 Row
2.	D2558	Lynch Pin, 1/4"
3.	A5106	Sprocket, 17 Tooth
	A5107	Sprocket, 19 Tooth
	A5108	Sprocket, 23 Tooth (Qty. 2)
	A5109	Sprocket, 24 Tooth
	A5110	Sprocket, 25 Tooth
	A5111	Sprocket, 26 Tooth
	A5112	Sprocket, 27 Tooth
	A5113	Sprocket, 28 Tooth
4.	10602	Spring Pin, 1/4" x 1 1/2"
5.	10478	Clevis Pin, 5/16" x 1"
	10409	Ring
6.	10037	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
7.	D5857	Spring
8.	A4630	Sprocket Storage Rod
9.	A4235	Ratchet Wrench W/Protective Closure
	10445	Protective Closure, Red
10.		See "Inner Module Drive"
11.	10670	Hair Pin Clip, No. 3

TRANSMISSION AND ROW UNIT DRILL SHAFT

ITEM	PART NO.	DESCRIPTION
12.	D7127	Shear Coupler
13.	10462	Cotter Pin, 3/16" x 2"
14.	A5548	Special Bearing
15.	3310-80	Chain, No. 40, 80 Pitch Including Connector Link
	R0912	Connector Link, No. 40
16.	A4424	Idler W/Sprockets And Rings
	D7426	Sprocket
	10435	Ring
17.	10303	Carriage Bolt, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
18.	3400-01	Flangette
19.	2100-03	Bearing, 7/8" Hex
20.	D5212	Coupler
21.	D5887-41	Drill Shaft, Wing, 8 Row 30
	D5887-54.25	Drill Shaft, Wing, 8 Row 36/38
	D5887-101	Drill Shaft, Wing, 12 Row 30
	D5887-121.75	Drill Shaft, Wing, 12 Row 36
	D5887-128.75	Drill Shaft, Wing, 12 Row 38
	D5887-161	Drill Shaft, Wing, 16 Row 30
22.	D5886	Coupler
23.	D1199-04	Spacer, 2"
24.	A2180	Bearing Hanger, 7/8" Hex
25.	A4394	U-Joint, 14 3/4", 8 Row 30, 12 Row 30 And16 Row 30
	A5647	U-Joint, 19 3/4", 8 Row 36/38
	A4637	U-Joint, 21 3/4", 12 Row 36
	A4638	U-Joint, 23 3/4", 12 Row 38
26.	A4393	U-Joint W/Grease Fitting, 15"
	10640	Grease Fitting, 1/4"-28
27.	D1199-03	Spacer, 5/8"
28.	D5887-36	Drill Shaft, Main Frame, 8 Row 30, 12 Row 30 And 16 Row 30
	D5887-44	Drill Shaft, Main Frame, 8 Row 36/38 And 12 Row 36/38
29.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
30.	D7612	Shaft, 7/8" x 13 1/2"
31.	D1113	U-Bolt, 5" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
32.	D1022L	Support Angle (8 Row 38)
33.	D2298	Support Angle (8 Row 38)

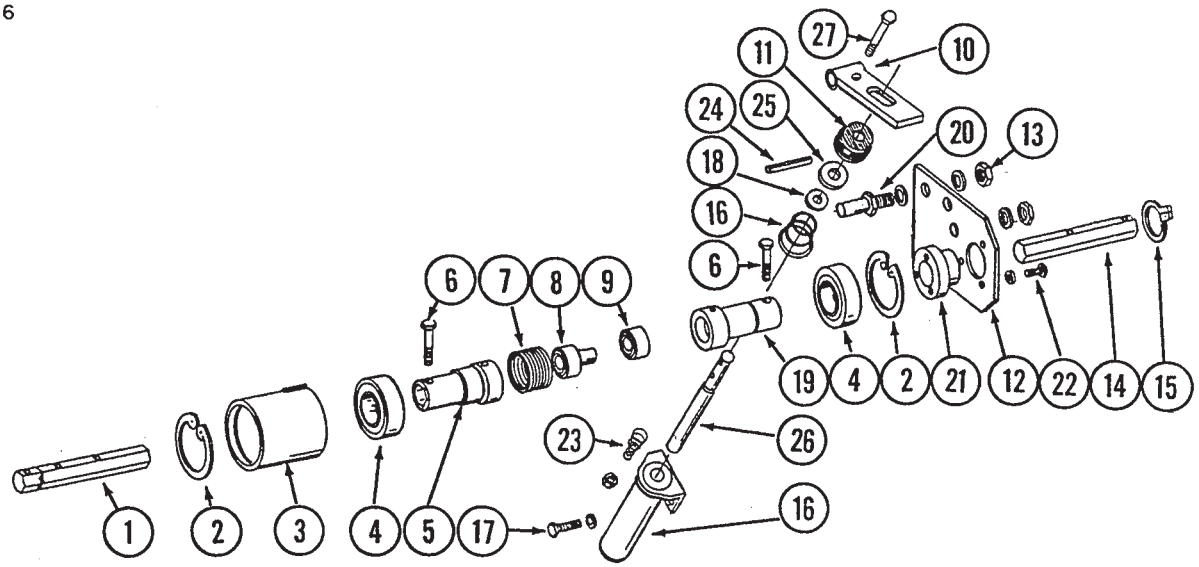
INNER MODULE DRIVE



ITEM	PART NO.	DESCRIPTION
1.		See "Transmission And Row Unit Drill Shaft"
2.		See "Contact Drive Wheel"
3.	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
4.	A5103	Idler Sprocket W/Bearing, 15 Tooth
5.	D4887-01	Sleeve, 5/8"
6.	A4425	Idler Arm, L.H. (Shown)
	A4426	Idler Arm, R.H.
7.	D5827	Cover
8.	A5107	Sprocket, 19 Tooth
9.	3310-85	Chain, No. 40, 85 Pitch Including Connector Link
	R0912	Connector Link, No. 40
	R0911	Offset Link, No. 40
10.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10229	Lock Washer, 3/8"
	D5756	Special Nut, 3/8"-16
11.	A5115	Sprocket, 33 Tooth
12.	D6897	Spacer
13.	10038	Hex Head Cap Screw, 1/2"-13 x 3"
	10216	Washer, 1/2" USS (Large)
	10128	Machine Bushing, 1/2" (Small)
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
14.	D5857	Spring
15.	10478	Clevis Pin, 5/16" x 1"
	10409	Ring

POINT ROW CLUTCH

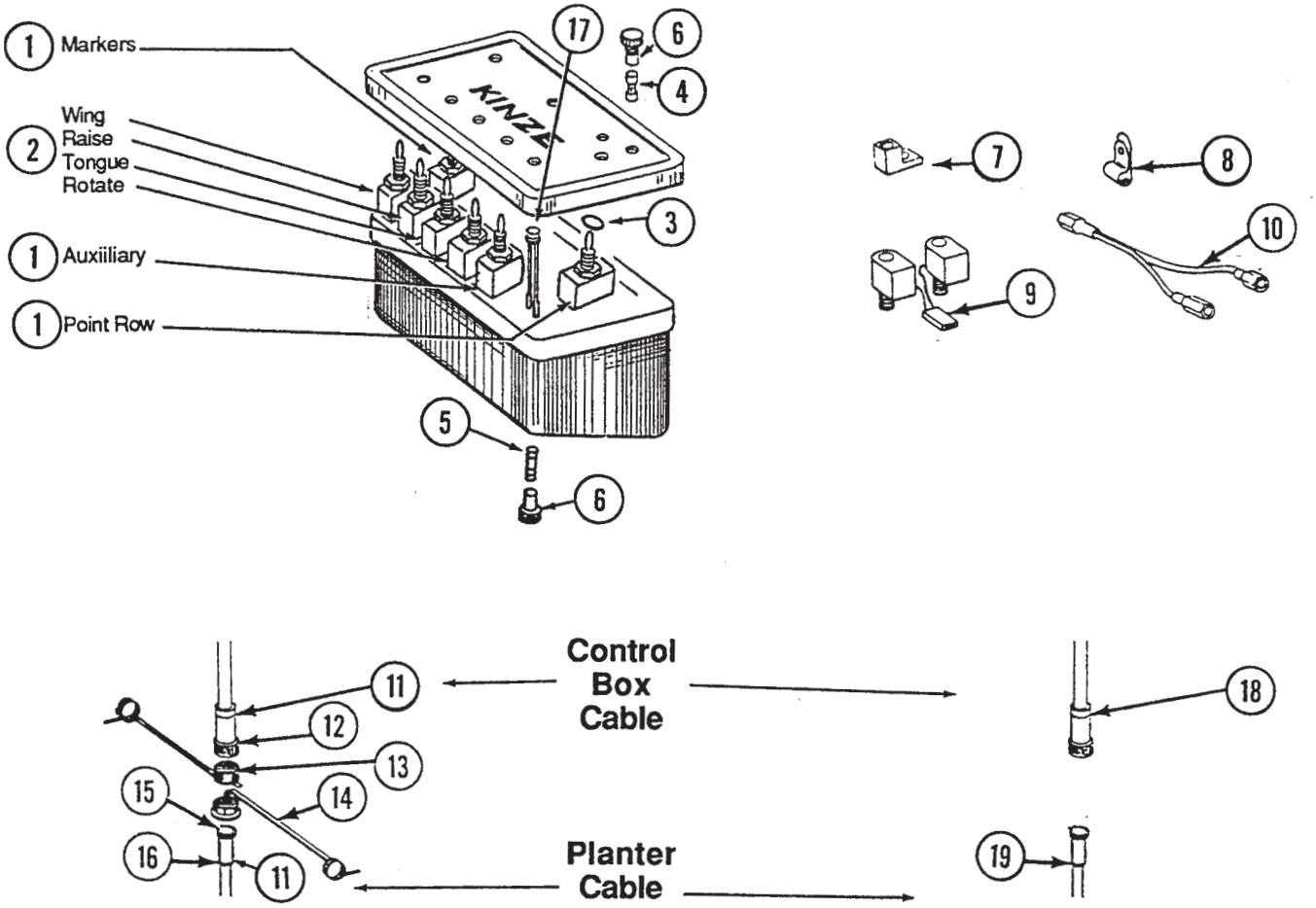
PRC016



ITEM	PART NO.	DESCRIPTION
1.	D7158	Input Shaft, 5 7/8", 8 And 12 Row
	D7199	Input Shaft, 36 7/8", 16 Row
2.	10136	Snap Ring, 3"
3.	A4924	Stop Collar, R.H.
	A4925	Stop Collar, L.H.
4.	A4921	Bearing
5.	D7872	Input Hub
6.	10041	Hex Head Cap Screw, 5/16"-18 x 2"
	10109	Lock Nut, 5/16"-18
7.	D7306	Wrap Spring, CW, 2"
	D7305	Wrap Spring, CCW, 2"
8.	D8056	Pilot Pin
9.	A4919	Bearing
10.	A5566	Actuator Arm
11.	R0646	Rubber Boot
12.	D7624	Plate
13.	10203	Washer, 3/8" SAE
	10229	Lock Washer, 3/8"
	10497	Hex Nut, 3/8"-16, Grade 2
14.	D7157	Shaft, 5 3/8", 12 And 16 Row
	D7762	Shaft, 6 3/8", 8 And 16 Row
15.	10496	Snap Ring, External Inverted
16.	A6086	Solenoid With Spring
	D8458	Spring
17.	10023	Hex Head Cap Screw, 1/4"-20 x 3/4"
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20
18.	D8922	Bushing, .625" O.D. (.047" Thick) (Where Applicable)
19.	D7873	Output Hub
20.	D7316	Mounting Pin
21.	D7314	Bushing
22.	10253	Hex Socket Head Screw, No. 10-32 x 1/2"
	10257	Lock Washer, No. 10
23.	D9216	Spring
24.	10187	Slotted Spring Pin, 5/32" x 2"
25.	10370	Machine Bushing, .812" O.D. (.031" Thick)
26.	D7623	Plunger
27.	10040	Hex Head Cap Screw, 1/4"-20 x 1 3/4"
	10110	Lock Nut, 1/4"-20
28.	A4855	Wiring Harness, 180", 8 Row Models, 2 Per Machine (3/16" Spades)
	A4854	Wiring Harness, 210", 12 Row30, 2 Per Machine (3/16" Spades)
	A4996	Wiring Harness, 264", 12 Row 36/38, 2 Per Machine (3/16" Spades)
	A4817	Wiring Harness, 240", 16 Row Model, 2 Per Machine, (3/16" Spades) (Not Shown)

ELECTRICAL COMPONENTS

ECP011/ECP018



24 PIN CONNECTOR
(Plastic Connector)

23 PIN CONNECTOR
(Metal Connector)

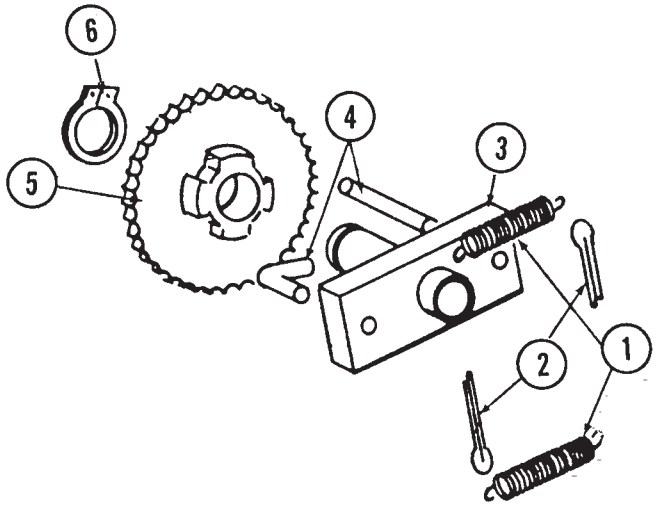
ITEM	PART NO.	DESCRIPTION
1.	A2528	Switch, 3 Position Toggle
2.	A2526	Switch, 2 Way Momentary Contact
3.	D3860	O-Ring
4.	D8253	Fuse, MDL-8
5.	D2829	Fuse, AGC-15
6.	A2612	Fuse Holder With Spade
7.	A3584	Ground Clamp
8.	D6291	Insulated Clamp
9.	10269	Male Tab Terminal
	10266	Female Terminal
10.	A3589	Harness, 2"
11.	A3492	Cable Clamp With Screws And Inserts
12.	A3491	Connector With Coupling Ring (24 Pin)
	R0807	Coupling Ring
	D3300	Socket Contact

ELECTRICAL COMPONENTS

ITEM	PART NO.	DESCRIPTION
13.	D4564	Dust Cover
14.	D4563	Dust Cap
15.	D4613	Peripheral Seal
16.	D4565	Connector (24 Pin)
	D3299	Pin Contact
17.	A5845	Indicator Light)
18.	A6108	Connector With Cable Clamp (23 Pin)
	D8740	Socket Contact (13 Used)
	D8739	Sealing Plug (10 Used)
19.	A6109	Connector With Cable Clamp (23 Pin)
	D8741	Pin Contact (13 Used)
	D8739	Sealing Pin (10 Used)
A.	A4866	Control Box Assembly With Short Harness (24 Pin)
	A6124	Control Box Assembly With Short Harness (23 Pin)
B.	A4487	Wiring Harness (24 Pin), 132", 8 Row 30 "Y" Hitch
	A4490	Wiring Harness (24 Pin), 164", 8 Row 30 "T" Hitch
	A4504	Wiring Harness (24 Pin), 150", 8 Row 36/38 "Y" Hitch
	A4516	Wiring Harness (24 Pin), 180", 8 Row 36/38 "T" Hitch
	A4438	Wiring Harness (24 Pin), 198", 12 Row 30 "Y" Hitch
	A4440	Wiring Harness (24 Pin), 252", 12 Row 30 "T" Hitch, 12 Row 36/38 And 16 Row 30 "Y" Hitch
	A5717	Wiring Harness (24 Pin), 300", 12 Row 36/38 And 16 Row 30 "T" Hitch
	A6318	Wiring Harness (23Pin), 132", 8 Row 30 "Y" Hitch
	A6317	Wiring Harness (23 Pin), 164", 8 Row 30 "T" Hitch
	A6319	Wiring Harness (23 Pin), 150", 8 Row 36/38 "Y" Hitch
	A6320	Wiring Harness (23 Pin), 180", 8 Row 36/38 "T" Hitch
	A6112	Wiring Harness (23 Pin), 198", 12 Row 30 "Y" Hitch
	A6111	Wiring Harness (23 Pin), 252", 12 Row 30 "T" Hitch, 12 Row 36/38 And 16 Row 30 "Y" Hitch
	A6113	Wiring Harness (23 Pin), 300", 12 Row 36/38 And 16 Row 30 "T" Hitch
		(Not Shown) TRACTOR TO VALVE BLOCK ON HITCH
C.	A4437	Wiring Harness, 277", 8 Row 30/36/38 And 12 Row 30 "Y" Hitch
	A4439	Wiring Harness, 216", 8 Row 30/36/38, 12 Row 30 And 16 Row 30 "T" Hitch
	A4813	Wiring Harness, 290", 12 Row 36/38 And 16 Row 30 "Y" Hitch
	A4051	Wiring Harness, 258", 12 Row 36/38 "T" Hitch
		(Not Shown) VALVE BLOCK ON HITCH TO VALVE BLOCK ON FRAME
D.	A4859	Wiring Harness, 552", All 8 Row 30
	A4858	Wiring Harness, 612", All 8 Row 36/38
	A4857	Wiring Harness, 684", All12 Row 30
	A4997	Wiring Harness, 768", 12 Row 36/38 "Y" Hitch
	A4815	Wiring Harness, 780", 12 Row 36/38 "T" Hitch And All 16 Row 30
		(Not Shown) WARNING LIGHTS
E.	A3933	Harness Extension, 15', (24 Pin) (Not Shown)
	A6348	Harness Extension, 15', (23 Pin) (Not Shown)

RATCHET/SPROCKET ASSEMBLY 16 ROW 30

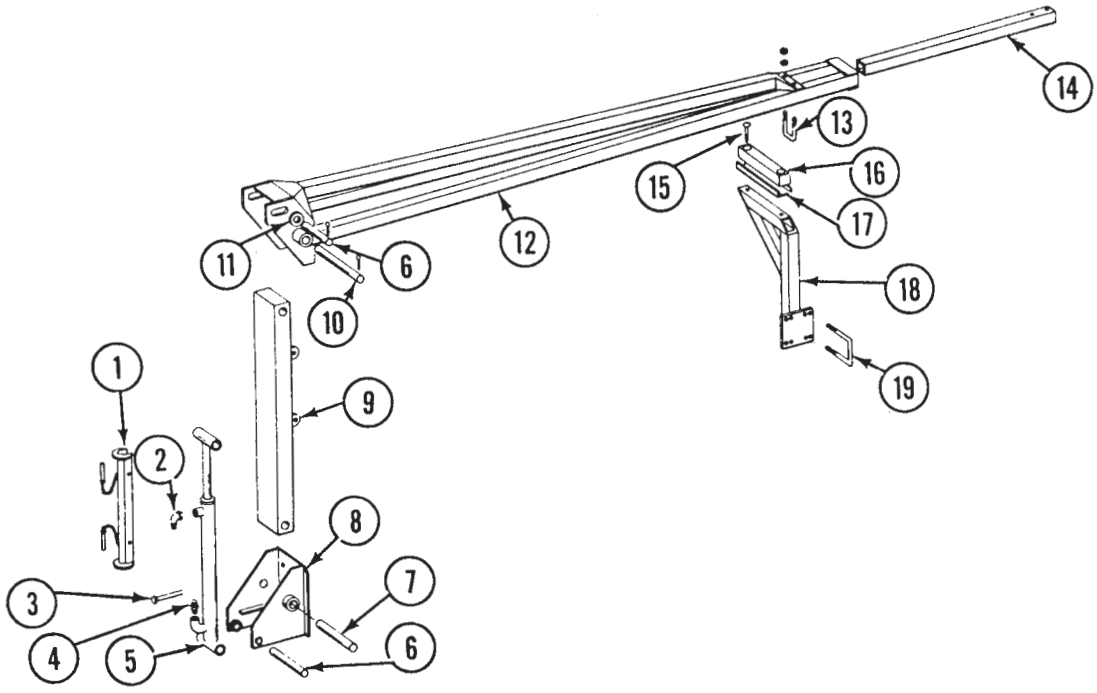
PTD032



ITEM	PART NO.	DESCRIPTION
1.	D1256	Spring
2.	10464	Cotter Pin, 3/16" x 1"
3.	A0378	Block
4.	D1255	"L" Pin
5.	A5165	Sprocket, 30 Tooth
6.	10430	Ring
A.	A5164	Ratchet/Sprocket Assembly Complete

MARKER ASSEMBLY 8 ROW 30/36/38 & 12 ROW 30

MKR019/MKR022

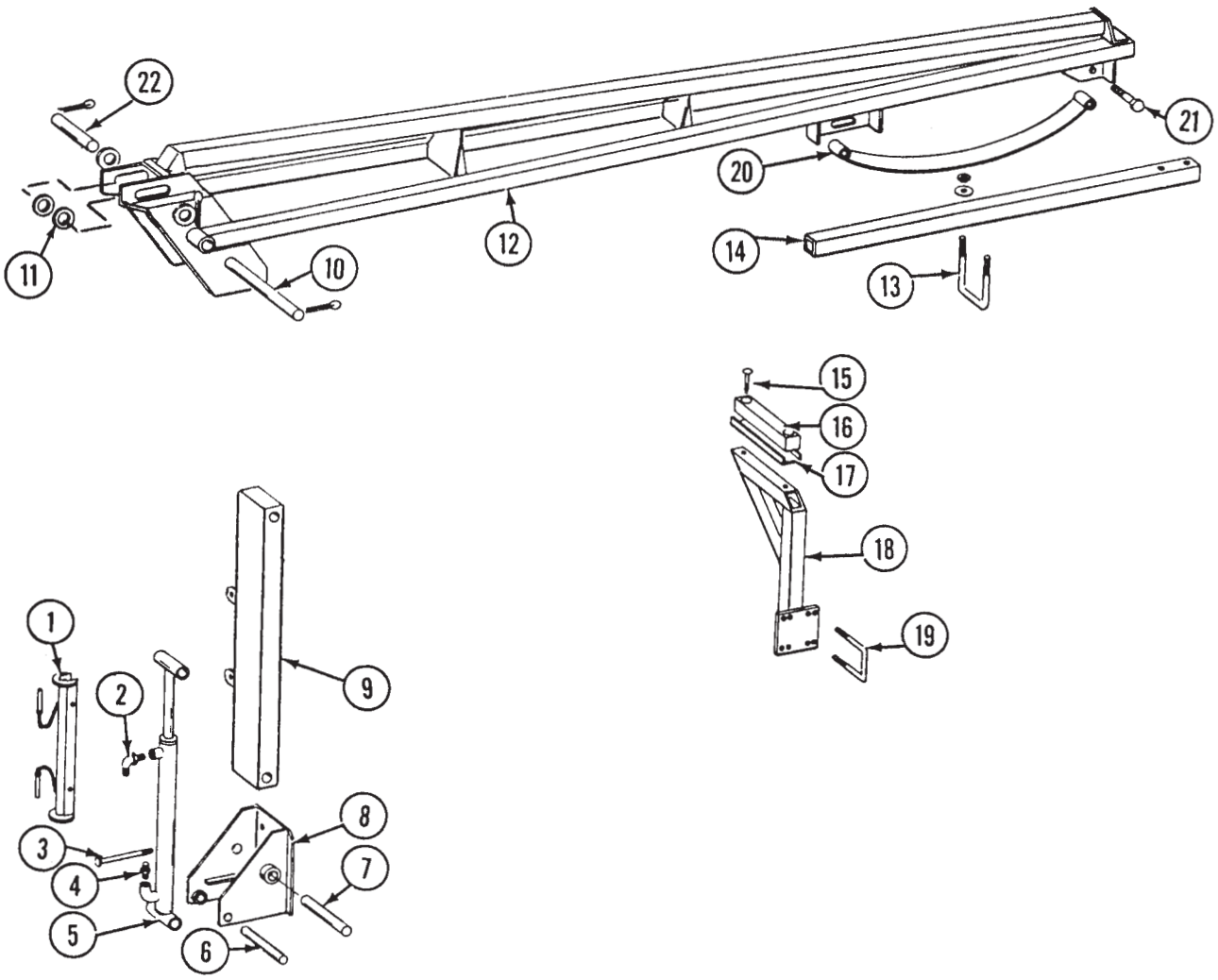


MARKER ASSEMBLY 8 ROW 30/36/38 & 12 ROW 30

ITEM	PART NO.	DESCRIPTION
1.	A5526	Lockup
2.	6801-08	Elbow, 3/4"-16 JIC To 3/4"-16 O-Ring
3.	10318	Hex Head Cap Screw, 5/8"-11 x 4 1/2"
	10205	Washer, 5/8" SAE
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
4.	6400-08	Connector, 3/4"-16 JIC To 3/4"-16 O-Ring
5.		See "Marker Cylinder"
6.	D2161	Pin, 1 1/4" x 8 1/2"
	10460	Cotter Pin, 1/4" x 2"
7.	D0652	Pin, 1 1/4" x 9 1/2"
	10460	Cotter Pin, 1/4" x 2"
8.	A5130	Mount
9.	A4611	First Stage W/Grease Fittings
	10641	Grease Fitting, 1/8" NPT
10.	D3214	Pin, 1 1/4" x 12 1/4"
	10460	Cotter Pin, 1/4" x 2"
11.	10226	Washer, 1 1/4" SAE
12.	A4353	Arm W/Grease Fittings, 12 Row 30
	10641	Grease Fitting, 1/8" NPT
	A5188	Arm, 8 Row 30
	A5192	Arm, 8 Row 36/38
13.	D2721	U-Bolt, 2" x 2" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
14.	D0453-07	Extension Tube, 45", 12 Row 30
	D0453-03	Extension Tube, 50", 8 Row 30
	D0453-08	Extension Tube, 65", 8 Row 36/38
15.	10039	Hex Head Cap Screw, 1/2"-13 x 1 3/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
16.	D4512	Rubber Stop
17.	D6772	Retainer
18.	A4421	Stand, 12 Row 30 Only
19.	D4743	U-Bolt, 3" x 3" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13

MARKER ASSEMBLY 12 ROW 36/38 And 16 ROW 30

MKR019/MKR022/MKR023



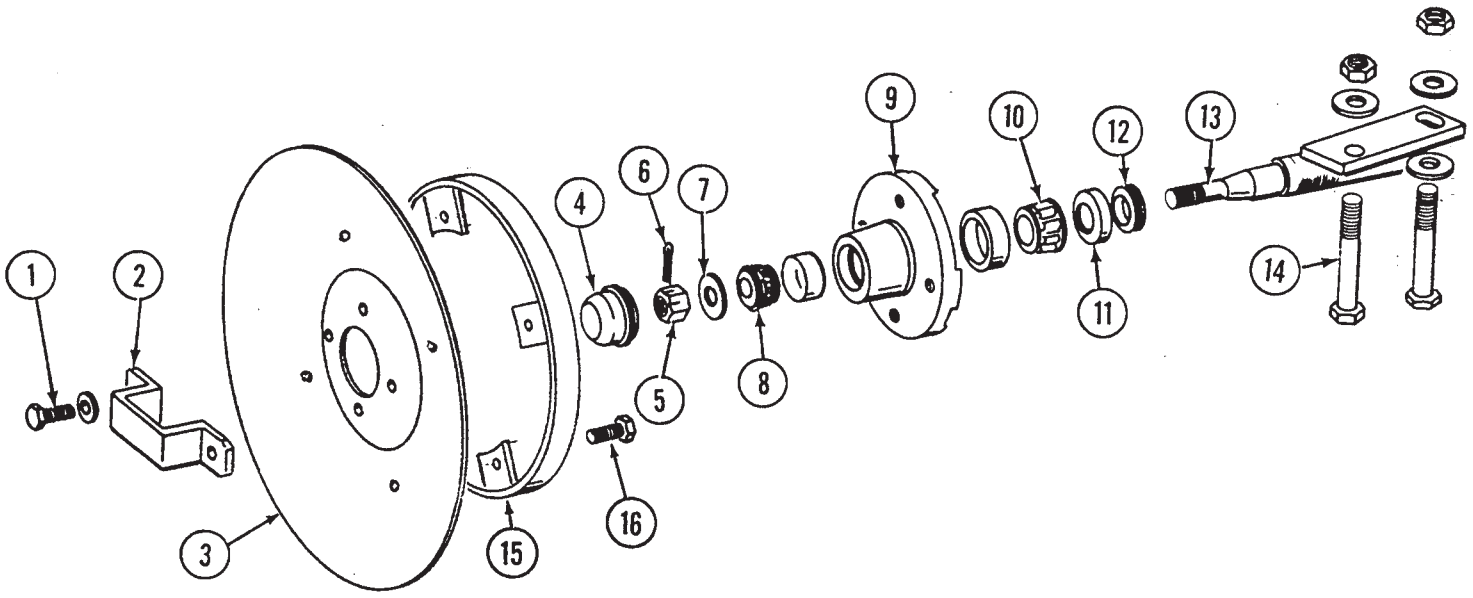
12 Row Shown

MARKER ASSEMBLY 12 ROW 36/38 AND 16 ROW 30

ITEM	PART NO.	DESCRIPTION
1.	A5527	Lockup
2.	6801-08	Elbow, 3/4"-16 JIC To 3/4"-16 O-Ring
3.	10068	Hex Head Cap Screw, 5/8"-11 x 6"
	10008	Hex Head Cap Screw, 5/8"-11 x 2"
	10205	Washer, 5/8" SAE
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
4.	6400-08	Connector, 3/4"-16 JIC To 3/4"-16 O-Ring
	6801-08	Elbow, 3/4"-16 JIC To 3/4"-16 O-Ring
5.		See "Marker Cylinder"
6.	D0652	Pin, 1 1/4" x 9 1/2"
	10460	Cotter Pin, 1/4" x 2"
7.	D7209	Pin, 1 1/4" x 11 1/2"
	10049	Hex Head Cap Screw, 3/8"-16 x 2 1/2"
	10108	Lock Nut, 3/8"-16
8.	A4877	Mount
9.	A4878	First Stage W/Grease Fittings, R.H.
	A4983	First Stage W/Grease Fittings, L.H.
	10641	Grease Fitting, 1/8" NPT
10.	D0737	Pin, 1 1/4" x 13 1/4"
	10460	Cotter Pin, 1/4" x 2"
11.	10226	Washer, 1 1/4" SAE
	10159	Machine Bushing, 10 Gauge
	10322	Machine Bushing, 18 Gauge
12.	A4978	Arm, 138 1/4", 12 Row 36
	A4979	Arm, 150 1/4", 12 Row 38
	A4853	Arm, 172 1/4", 16 Row 30
13.	D2721	U-Bolt, 2" x 2" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
14.	D0453-04	Extension Tube, 60", 12 Row 36/38
	D0453-03	Extension Tube, 50", 16 Row 30
15.	10039	Hex Head Cap Screw, 1/2"-13 x 1 3/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
16.	D4512	Rubber Stop
17.	D6772	Retainer
18.	A4421	Stand
19.	D4743	U-Bolt, 3" x 3" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
20.	A4991	Leaf Spring
21.	10515	Hex Head Cap Screw, 9/16"-12 x 3 1/2"
	10517	Washer, 9/16" USS
	10516	Lock Nut, 9/16"-12
22.	D1701	Pin, 1 1/4" x 6 1/2"
	10460	Cotter Pin, 1/4" x 2"

MARKER SPINDLE/HUB/BLADE

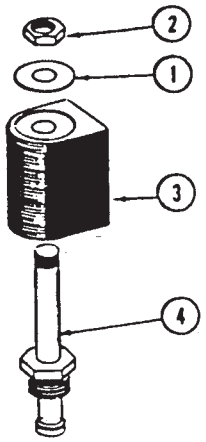
MKR020



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)

SOLENOID VALVE

VVB019



ITEM	PART NO.	DESCRIPTION
1.	R0760	Plate
2.	R0761	Hex Nut
3.	R0762	Coil
4.	R0763	Cartridge
A.	A2484	Solenoid Valve Complete
B.	R0764	Seal Kit, Includes: (2)O-Rings, (1)BU Ring

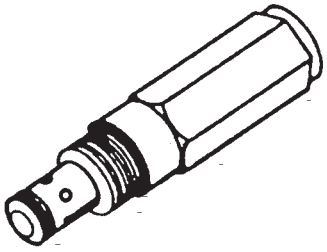
FLOW CONTROL VALVE

VVB020

ITEM	PART NO.	DESCRIPTION
A.	A3413	Flow Control Valve
B.	R0764	Seal Kit, Includes: (2)O-Rings, (1)BU Ring

PRESSURE RELIEF VALVE

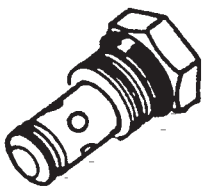
VVB020



ITEM	PART NO.	DESCRIPTION
A.	A3407	Pressure Relief Valve, 1000 PSI
B.	R0764	Seal Kit, Includes: (2)O-Rings, (1)BU Ring

CHECK VALVE

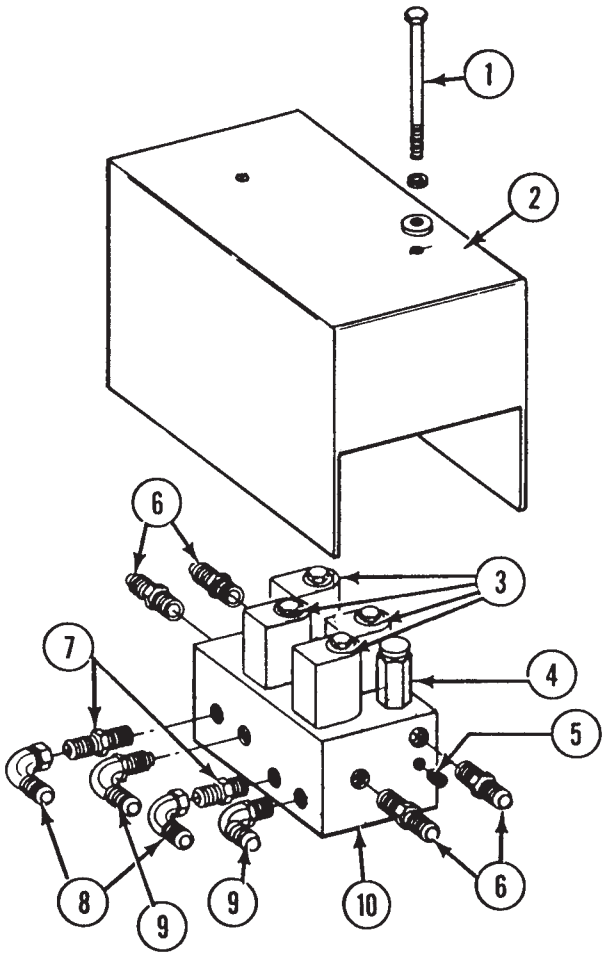
VVB020



ITEM	PART NO.	DESCRIPTION
A.	A4293	Check Valve
B.	R0764	Seal Kit, Includes: (2)O-Rings, (1)BU Ring

VALVE BLOCK - LOCATED ON HITCH

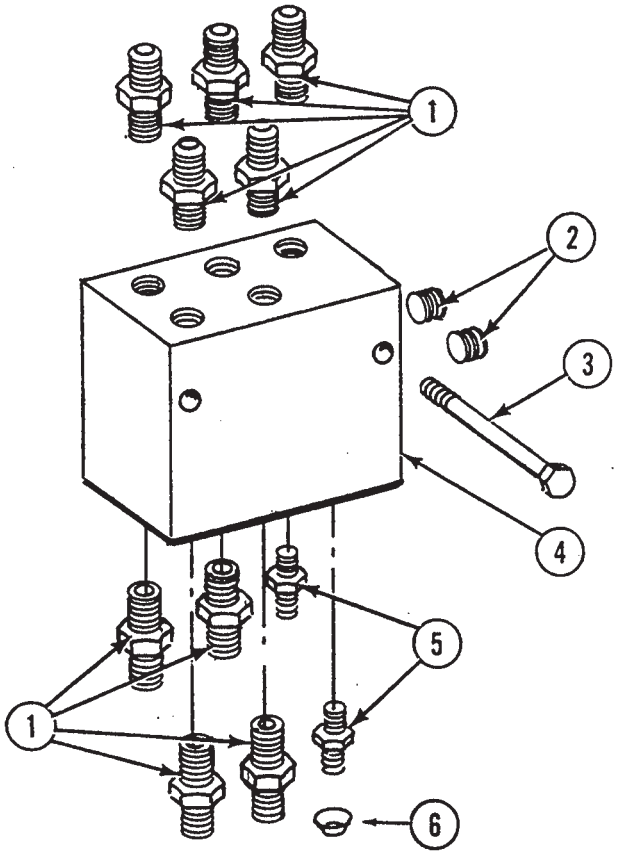
VVB021



ITEM	PART NO.	DESCRIPTION
1.	10172	Hex Head Cap Screw, 3/8"-16 x 5"
	10061	Hex Head Cap Screw, 3/8"-16 x 3 1/2"
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
2.	A4392	Cover, 12 3/16" x 7 1/2", 8 Row 30/36/38 "T" Hitch And All 12 And 16 Row Models
	A4663	Cover, 10 1/8" x 5 1/4", 8 Row 30/36/38 "Y" Hitch
3.		See "Solenoid Valve"
4.		See "Pressure Relief Valve"
5.	10350	Hex Socket Head Plug, 1/4" NPT
	6408-H06-O	Hex Socket Head Plug, 9/16"-18 O-Ring
6.	6400-08	Connector, 3/4"-16 JIC To 3/4"-16 O-Ring
7.	6400-06-08	Connector, 9/16"-18 JIC To 3/4"-16 O-Ring
8.	6500-06	Elbow, 9/16"-18 JIC Male To Female
9.	6801-06-08	Elbow, 9/16"-18 JIC To 3/4"-16 O-Ring
10.	D5039	Block

JUNCTION BLOCK - LOCATED ON REAR SIDE OF CENTER FRAME

VVB024

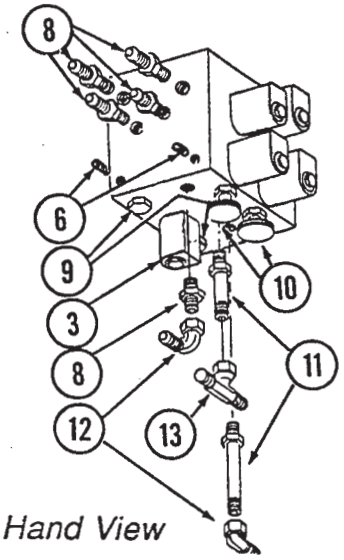


ITEM	PART NO.	DESCRIPTION
1.	6400-10	Connector, 7/8"-14 JIC To O-Ring
2.	10350	Hex Socket Head Plug, 1/4" NPT
	6408-H06-O	Hex Socket Head Plug, 9/16"-18 O-Ring
3.	10172	Hex Head Cap Screw, 3/8"-16 x 5"
4.	D6713	Block
5.	6400-06-08	Connector, 9/16"-18 JIC To 3/4"-16 O-Ring
6.	A6621	Restrictor W/Pin, 16 Row Only
	10744	Pin, 1/32" x 1/2"

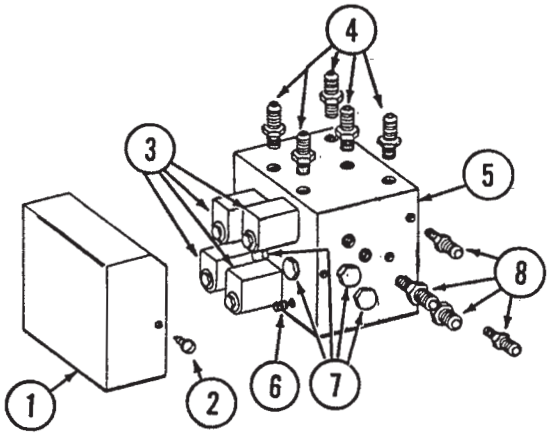
VALVE BLOCK - LOCATED ON FRONT SIDE OF CENTER FRAME

VVB022/VVB023

8 And 12 Row (SN 600000 To 600088)

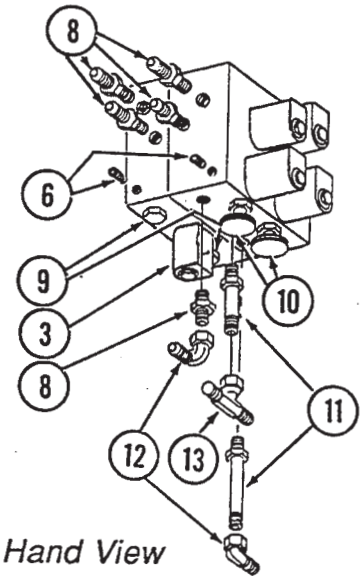


Right Hand View

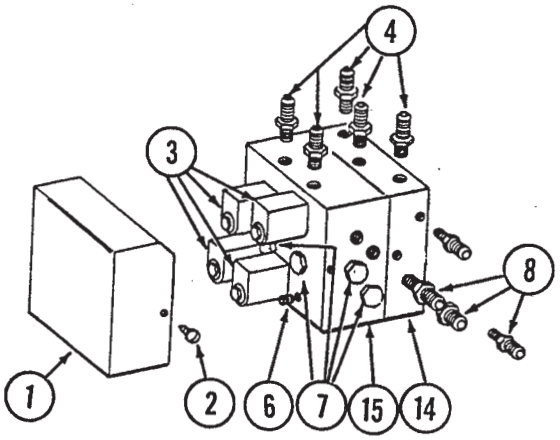


Left Hand View

8 And 12 Row (SN 600089 And On)



Right Hand View



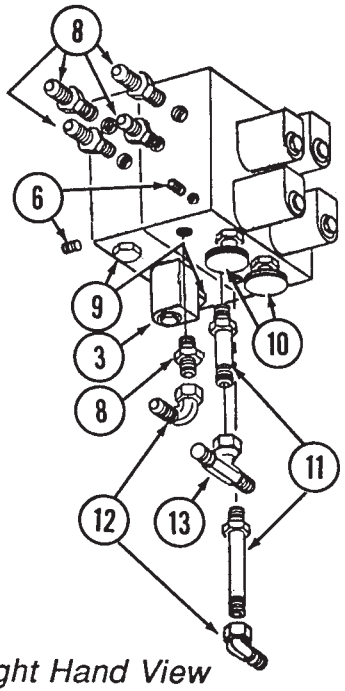
Left Hand View

ITEM	PART NO.	DESCRIPTION
1.	A4639	Cover
2.	10518	Screw, No. 12 x 3/8"
3.		See "Solenoid Valve"
4.	6400-10	Connector, 7/8"-14 JIC To O-Ring
5.	D6708	Block
6.	10350	Hex Socket Head Plug, 1/4" NPT
	6408-H06-O	Hex Socket Head Plug, 9/16"-18 O-Ring
7.	6408-10	Plug, 7/8"-14 O-Ring
8.	6400-08	Connector, 3/4"-16 JIC To O-Ring
9.		See "Check Valve"
10.		See "Flow Control Valve"
11.	6400-L-08	Long Connector, 3/4"-16 JIC To O-Ring
12.	6500-08	Elbow, 3/4"-16 JIC Male To Female
13.	6600-08	Tee, 3/4"-16 JIC
14.	D7906	Block
15.	D7654	Block

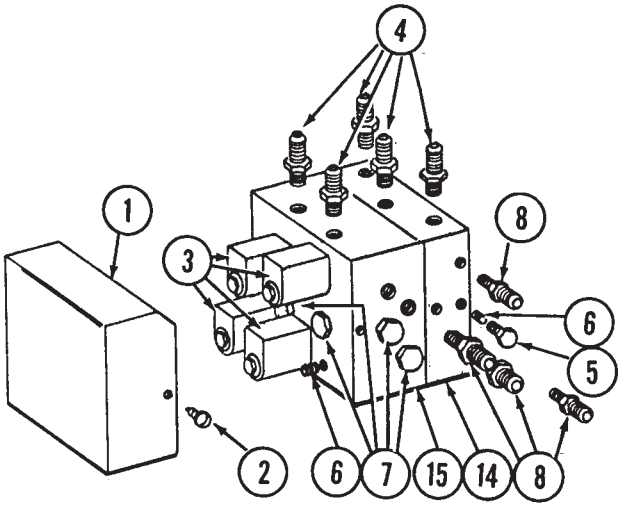
VALVE BLOCK - LOCATED ON FRONT SIDE OF CENTER FRAME

VVB022/VVB023

16 Row



Right Hand View

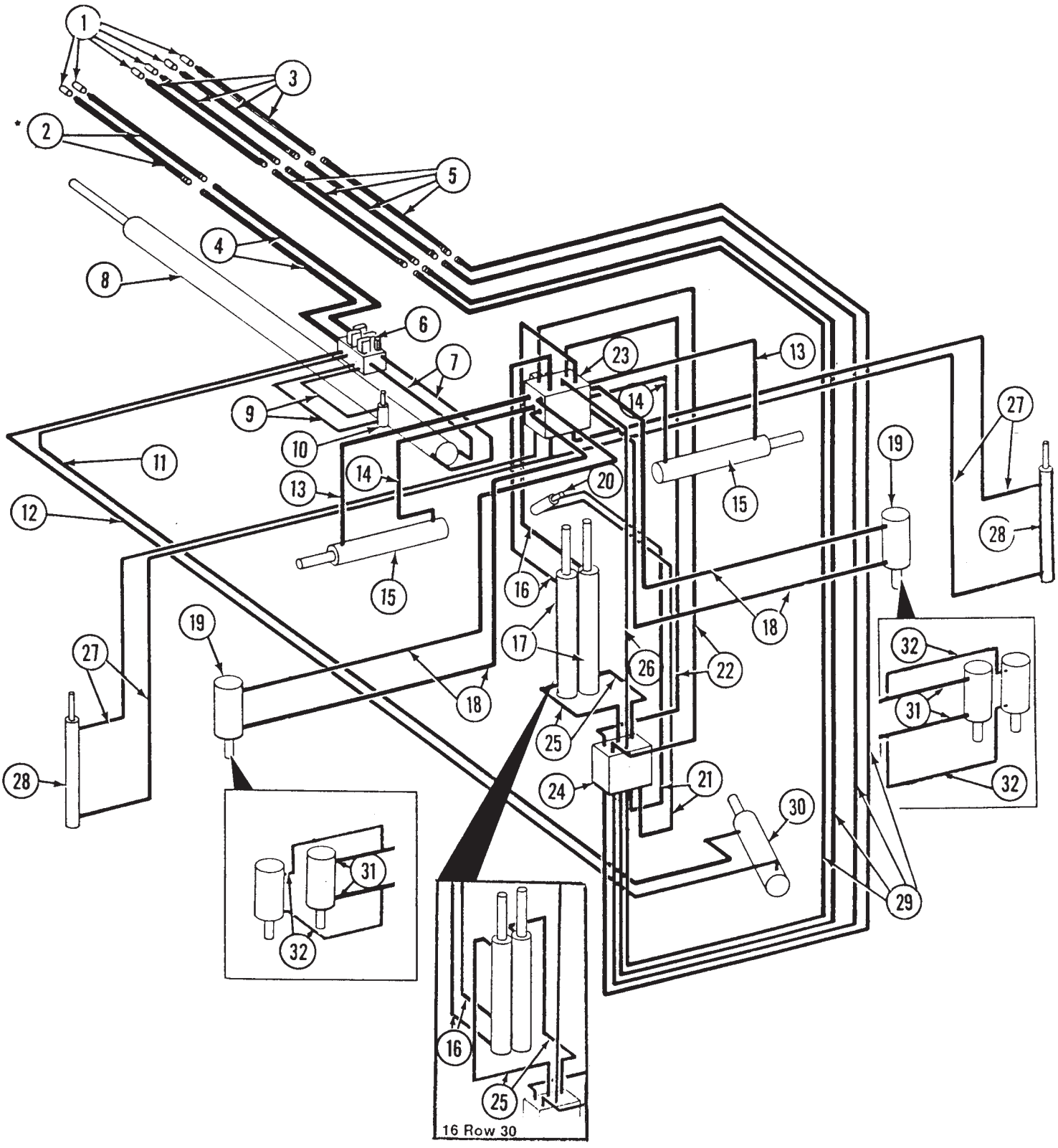


Left Hand View

ITEM	PART NO.	DESCRIPTION
1.	A4639	Cover
2.	10518	Screw, No. 12 x 3/8"
3.		See "Solenoid Valve"
4.	6400-10	Connector, 7/8"-14 JIC To O-Ring
5.	6408-08	Plug, 3/4"-16 O-Ring
6.	10350	Hex Socket Head Plug, 1/4" NPT
	6408-H06-O	Hex Socket Head Plug, 9/16"-18 O-Ring
7.	6408-10	Plug, 7/8"-14 O-Ring
8.	6400-08	Connector, 3/4"-16 JIC To O-Ring
9.		See "Check Valve"
10.		See "Flow Control Valve"
11.	6400-L-08	Long Connector, 3/4"-16 JIC To O-Ring
12.	6500-08	Elbow, 3/4"-16 JIC Male To Female
13.	6600-08	Tee, 3/4"-16 JIC
14.	D7655	Block
15.	D7654	Block

HYDRAULIC SYSTEM

PHS032



* Not used on 8 Row 30/36/38 with "Y" hitch.

HYDRAULIC SYSTEM

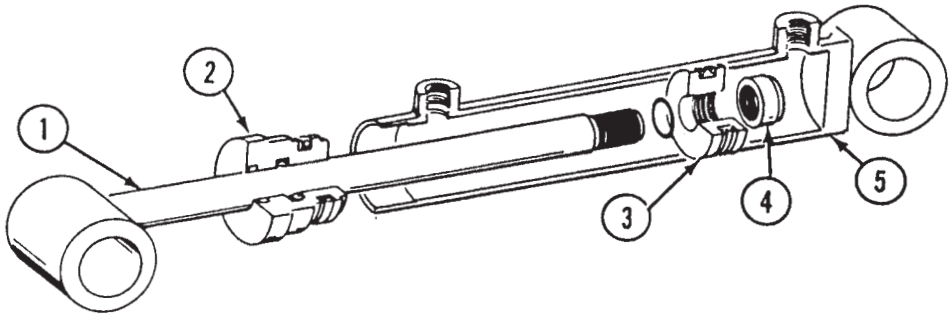
ITEM	PART NO.	DESCRIPTION
1.	D4086	Tip, Pioneer
2.	A1015	Hose Assembly, 3/8" x 138", *8 Row 30 "T" Hitch
	A1012	Hose Assembly, 3/8" x 140", *8 Row 36/38 "T" Hitch
	A1081	Hose Assembly, 3/8" x 168", 12 Row 30/36/38 "Y" Hitch And 12 Row 30 "T" Hitch
	A3130	Hose Assembly, 3/8" x 173", 16 Row 30 "Y" Hitch
	A3134	Hose Assembly, 3/8" x 198", 12 Row 36/38, 16 Row 30 "T" Hitch
3.	A1417	Hose Assembly, 1/2" x 138", *8 Row 30 "T" Hitch
	A1423	Hose Assembly, 1/2" x 140", *8 Row 36/38 "T" Hitch
	A1470	Hose Assembly, 1/2" x 168", 12 Row 30/36/38 "Y" Hitch And 12 Row 30 "T" Hitch
	A1476	Hose Assembly, 1/2" x 173", 16 Row 30 "Y" Hitch
	A1477	Hose Assembly, 1/2" x 198", 12 Row 36/38,16 Row 30 "T" Hitch
4.	A1001	Hose Assembly, 3/8" x 135", 8 Row 30 "Y" Hitch
	A3119	Hose Assembly, 3/8" x 36", 8 Row 30 "T" Hitch
	A3162	Hose Assembly, 3/8" x 162", 8 Row 36/38 "Y" Hitch
	A3158	Hose Assembly, 3/8" x 46", 8 Row 36/38 "T" Hitch And 12 Row 30 "Y" Hitch
	A3157	Hose Assembly, 3/8" x 70", 12 Row 30 "T" Hitch And 12 Row 36/38, 16 Row 30 "T"/"Y" Hitch
5.	A1423	Hose Assembly, 1/2" x 140", 8 Row 30 "Y" Hitch
	A1420	Hose Assembly, 1/2" x 48", 8 Row 30 "T" Hitch
	A1470	Hose Assembly, 1/2" x 168", 8 Row 36/38 "Y" Hitch
	A1425	Hose Assembly, 1/2" x 60", 8 Row 36/38 "T" Hitch And 12 Row 30 "Y" Hitch
	A1465	Hose Assembly, 1/2" x 84", 12 Row 30 "T" Hitch And 12 Row 36/38,16 Row 30 "T"/"Y" Hitch
6.		See "Valve Block - Located On Hitch"
7.	A3159	Hose Assembly, 3/8" x 97", 8 Row 30/36/38, 12 Row 30 "T" Hitch
	A3128	Hose Assembly, 3/8" x 52", 8 Row 30/36/38 "Y" Hitch
	A3156	Hose Assembly, 3/8" x 68", 12 Row 30/36/38 "Y" Hitch
	A3140	Hose Assembly, 3/8" x 94", 12 Row 36/38 "T" Hitch And16 Row 30 "T"/"Y" Hitch
8.		See "Tongue Cylinders"
9.	A1139	Hose Assembly, 1/4" x 40", 8 Row 30/36/38, 12 Row 30 "T" Hitch And 12 Row 30/36/38 "Y" Hitch
	A1181	Hose Assembly, 1/4" x 32", 8 Row 30/36/38 "Y" Hitch
	A1132	Hose Assembly, 1/4" x 44", 12 Row 36/38 "T" Hitch And16 Row 30 "T"/"Y" Hitch
10.		See "Tongue Lock Cylinder"
11.	A1102	Hose Assembly, 1/4" x 95", 8 Row 30/36/38, 12 Row 30 "T" Hitch
	A1116	Hose Assembly, 1/4" x 136", 8 Row 30/36/38 "Y" Hitch
	A1109	Hose Assembly, 1/4" x 145", 12 Row 30/36/38 "Y" Hitch
	A1183	Hose Assembly, 1/4" x 157", 16 Row 30 "Y" Hitch
	A1150	Hose Assembly, 1/4" x 103", 12 Row 36/38,16 Row 30 "T" Hitch
12.	A1134	Hose Assembly, 1/4" x 116", 8 Row 30/36/38, 12 Row 30 "T" Hitch
	A1110	Hose Assembly, 1/4" x 150", 8 Row 30/36/38 "Y" Hitch
	A1129	Hose Assembly, 1/4" x 168", 12 Row 30/36/38 "Y" Hitch
	A1105	Hose Assembly, 1/4" x 125", 12 Row 36/38 "T" Hitch
	A1121	Hose Assembly, 1/4" x 180", 16 Row 30 "Y" Hitch
	A1168	Hose Assembly, 1/4" x 120", 16 Row 30 "T" Hitch
13.	A3155	Hose Assembly, 3/8" x 28 1/2"
14.	A1003	Hose Assembly, 3/8" x 27"
15.		See "Wing Lock Cylinder"
16.	A1465	Hose Assembly, 1/2" x 84"
17.		See "Center Lift Cylinder"

HYDRAULIC SYSTEM

ITEM	PART NO.	DESCRIPTION
18.	A3137	Hose Assembly, 3/8" x 140", 8 Row 30
	A3101	Hose Assembly, 3/8" x 168", 8 Row 36/38
	A3154	Hose Assembly, 3/8" x 196", 12 Row 30
	A1093	Hose Assembly, 3/8" x 230", 12 Row 36
	A1033	Hose Assembly, 3/8" x 250", 12 Row 38
	A1057	Hose Assembly, 3/8" x 216", 16 Row 30
19.		See "Wing Lift Cylinders"
20.		See "Lift Lock Cylinder"
21.	A1170	Hose Assembly, 1/4" x 90"
22.	A1464	Hose Assembly, 1/2" x 72"
23.		See "Valve Block(s) - Located On Front Side Of Center Frame"
24.		See "Junction Block - Located On Rear Side Of Center Frame"
25.	A1458	Hose Assembly, 1/2" x 34"
26.	A1463	Hose Assembly, 1/2" x 68"
27.	A3114	Hose Assembly, 3/8" x 156", 8 Row 30
	A1029	Hose Assembly, 3/8" x 190", 8 Row 36/38
	A1057	Hose Assembly, 3/8" x 216", 12 Row 30
	A3141	Hose Assembly, 3/8" x 260", 12 Row 36
	A1034	Hose Assembly, 3/8" x 272", 12 Row 38
	A1036	Hose Assembly, 3/8" x 280", 16 Row 30
28.		See "Marker Cylinders"
29.	A1467	Hose Assembly, 1/2" x 120", 8 Row 30/36/38, 12 Row 30 "T" Hitch
	A1461	Hose Assembly, 1/2" x 169", 8 Row 30/36/38, 12 Row 30/36/38 "Y" Hitch
	A1469	Hose Assembly, 1/2" x 185", 16 Row 30 "Y" Hitch
	A1478	Hose Assembly, 1/2" x 128", 12 Row 36/38, 16 Row 30 "T" Hitch
30.		See "Rotation Cylinder"
31.	A3122	Hose Assembly, 3/8" x 10 1/2", 16 Row 30 Only
32.	A1018	Hose Assembly, 3/8" x 40", 16 Row 30 Only

WING LOCK CYLINDER, ALL MODELS
MARKER CYLINDER, 12 ROW WIDE AND 16 ROW 30

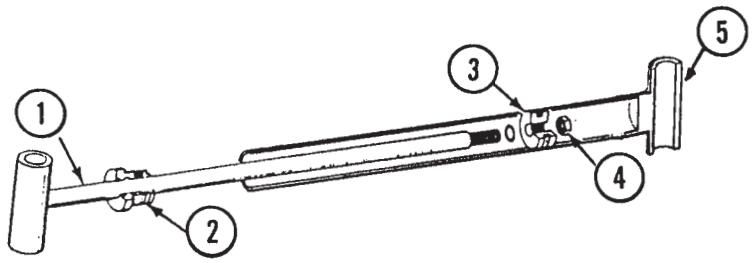
CYL032



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

MARKER CYLINDER, 8 ROW 30/WIDE AND 12 ROW 30

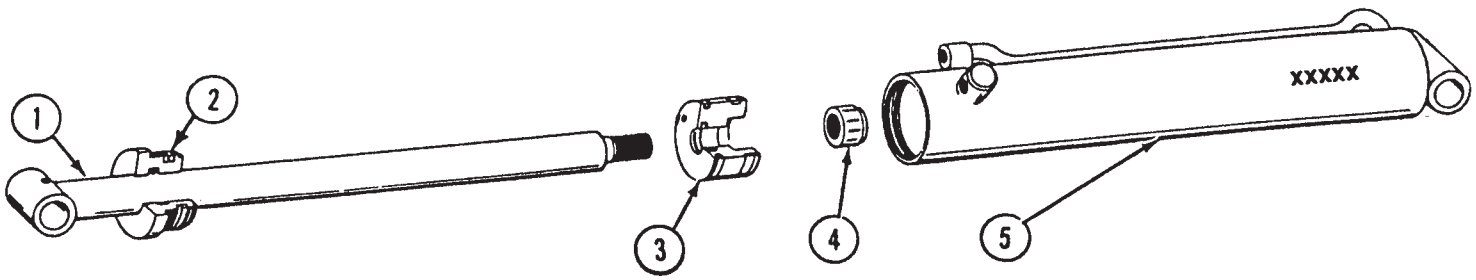
CYL039



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

CENTER LIFT CYLINDER, ALL MODELS

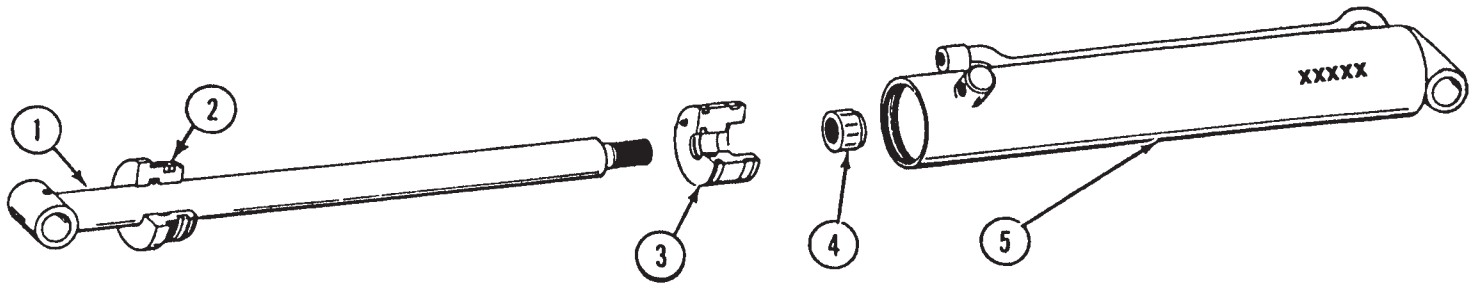
CYL033



ITEM	PART NO.	DESCRIPTION
1.	A4908	Rod Assembly
2.	D7132	Gland
3.	A4327	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacement Kit (Set Screw, Guide, Spring And Ball)
4.	R0993	Lock Nut, 1 1/8"-12
5.	A4761	Barrel
A.	A4204	Cylinder Complete, 4" x 20" (3/4" Ports)(Part No. Stamped On Barrel)
B.	R0992	Seal Kit, Includes: (1)Wear Ring, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper, (1) Uniring

CENTER LIFT CYLINDER, ALL MODELS

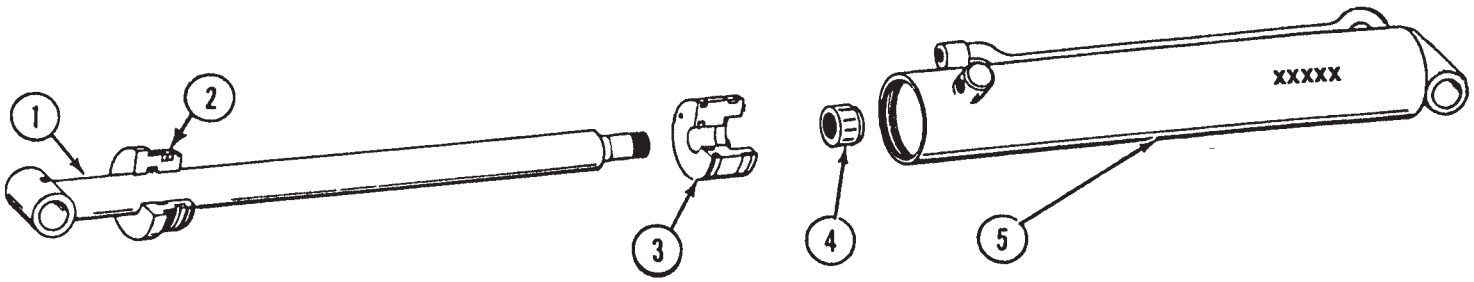
CYL033



ITEM	PART NO.	DESCRIPTION
1.	A4908	Rod Assembly
2.	D7132	Gland
3.	A4327	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacement Kit (Set Screw, Guide, Spring And Ball)
4.	R0993	Lock Nut, 1 1/8"-12
5.	A5809	Barrel
A.	A5808	Cylinder Complete, 4" x 20" (7/8" Ports)(Part No. Stamped On Barrel)
B.	R0992	Seal Kit, Includes: (1)Wear Ring, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper, (1) Uniring

CENTER LIFT CYLINDER, ALL MODELS

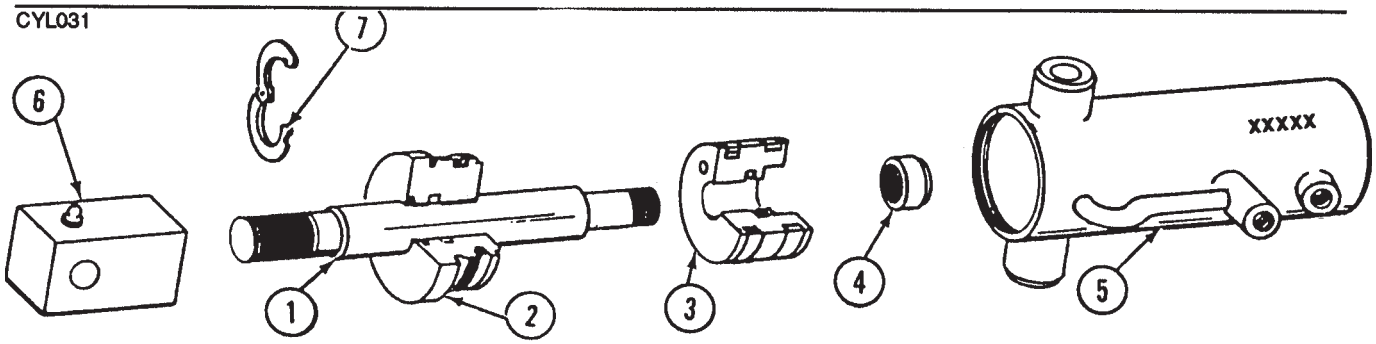
CYL033



ITEM	PART NO.	DESCRIPTION
1.	A6139	Rod Assembly
2.	D7132	Gland
3.	A6133	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacement Kit (Set Screw, Guide, Spring And Ball)
4.	R0993	Lock Nut, 1 1/8"-12
5.	A5809	Barrel
A.	A6123	Cylinder Complete, 4" x 20" (Part No. Stamped On Barrel)
B.	R0992	Seal Kit, Includes: (1)Wear Ring, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper, (1) Uniring

WING LIFT CYLINDER, 8 AND 12 ROW

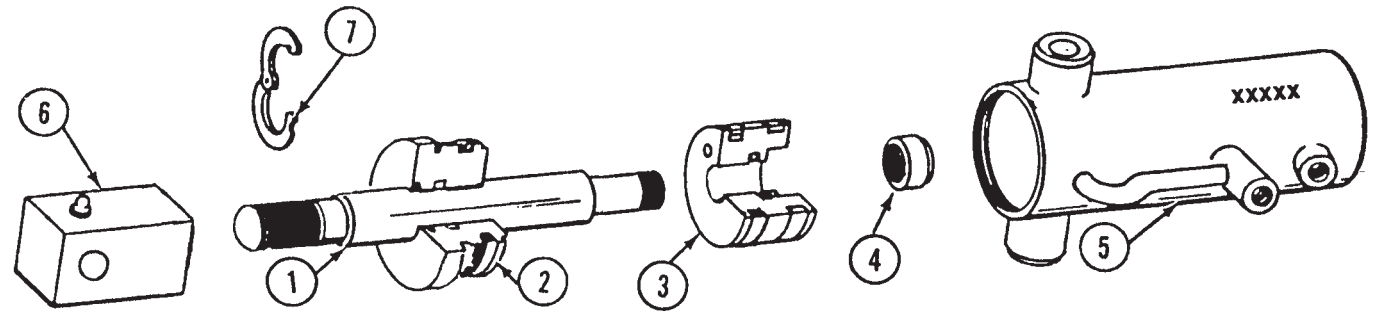
CYL031



ITEM	PART NO.	DESCRIPTION
1.	D8757	Rod
2.	D7164	Gland
3.	A6133	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacement Kit (Set Screw, Guide, Spring And Ball)
4.	R0993	Lock Nut, 1 1/8"-12
5.	A4802	Barrel
6.	A4797	Clevis
7.	D6959	Split Washer
A.	A6118	Cylinder Complete With Split Washer, 4" x 5 1/2" (Part No. Stamped On Barrel)
B.	R1007	Seal Kit, Includes: (2)O-Rings, (1)BU Ring, (1)Wear Ring, (1)Rod Wiper, (1)U-Cup, (1)Uniring

WING LIFT CYLINDER, 16 ROW

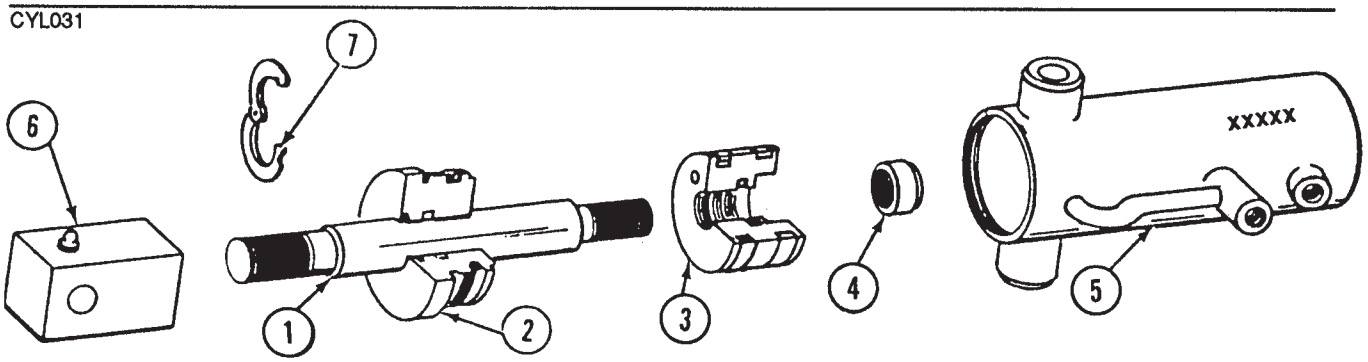
CYL031



ITEM	PART NO.	DESCRIPTION
1.	D8758	Rod
2.	D7800	Gland
3.	A6136	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacement Kit (Set Screw, Guide, Spring And Ball)
4.	R1049	Lock Nut, 7/8"-14
5.	A5617	Barrel
6.	A4797	Clevis
7.	D6959	Split Washer
A.	A6122	Cylinder Complete With Split Washer, 3 3/4" x 5 1/2" (Part No. Stamped On Barrel)
B.	R1050	Seal Kit, Includes: (2)O-Rings, (1)BU Ring, (1)Wear Ring, (1)Rod Wiper, (1)U-Cup, (1)Uniring

WING LIFT CYLINDER, 8 AND 12 ROW

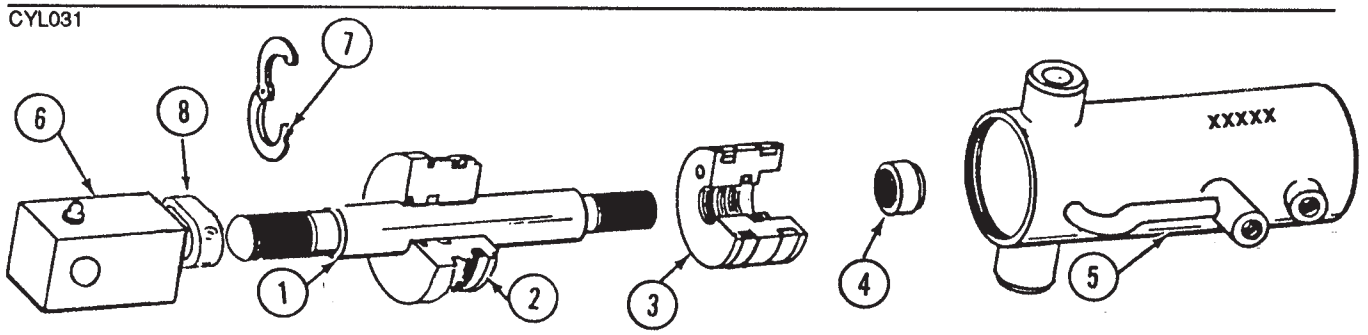
CYL031



ITEM	PART NO.	DESCRIPTION
1.	D7166	Rod
2.	D7164	Gland
3.	A4327	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacement Kit (Set Screw, Guide, Spring And Ball)
4.	R0993	Lock Nut, 1 1/8"-12
5.	A4802	Barrel
6.	A4797	Clevis
7.	D6959	Split Washer
A.	A4205	Cylinder Complete With Split Washer, 4" x 5 1/2" (Part No. Stamped On Barrel)
B.	R1007	Seal Kit, Includes: (2)O-Rings, (1)BU Ring, (1)Wear Ring, (1)Rod Wiper, (1)U-Cup, (1)Uniring

WING LIFT CYLINDER, 16 ROW

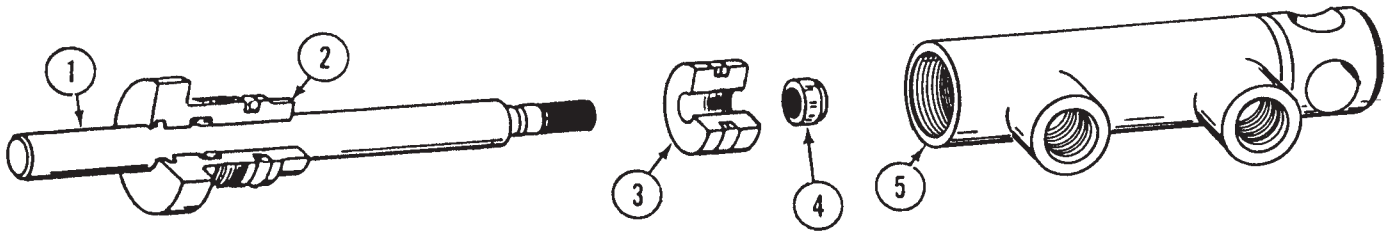
CYL031



ITEM	PART NO.	DESCRIPTION
1.	D7801	Rod
2.	D7800	Gland
3.	A5618	Piston W/Rephasing Valve
	R1169	Rephasing Valve Replacement Kit (Set Screw, Guide, Spring And Ball)
4.	R1049	Lock Nut, 7/8"-14
5.	A5617	Barrel
6.	A4797	Clevis
7.	D6959	Split Washer
8.	R1058	Wrench Flat (Where Applicable)
A.	A5573	Cylinder Complete With Split Washer, 3 3/4" x 5 1/2" (Part No. Stamped On Barrel)
B.	R1050	Seal Kit, Includes: (2)O-Rings, (1)BU Ring, (1)Wear Ring, (1)Rod Wiper, (1)U-Cup, (1)Uniring

LIFT LOCK CYLINDER, ALL MODELS

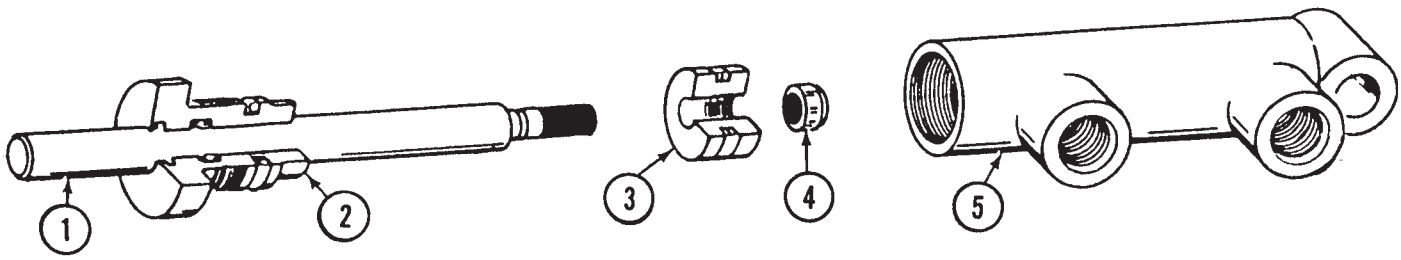
CYL035/CYL050



ITEM	PART NO.	DESCRIPTION
1.	D7124	Rod
2.	D7122	Gland
3.	D7120	Piston
4.	R0999	Lock Nut, 1/2"-20
5.	A6020	Barrel
A.	A4309	Cylinder Complete, 1 1/2" x 2 1/2"
B.	R1001	Seal Kit, Includes: (2)O-Rings, (1)U-Cup, (1)Rod Wiper, (1)Seal

TONGUE LOCK CYLINDER, ALL MODELS

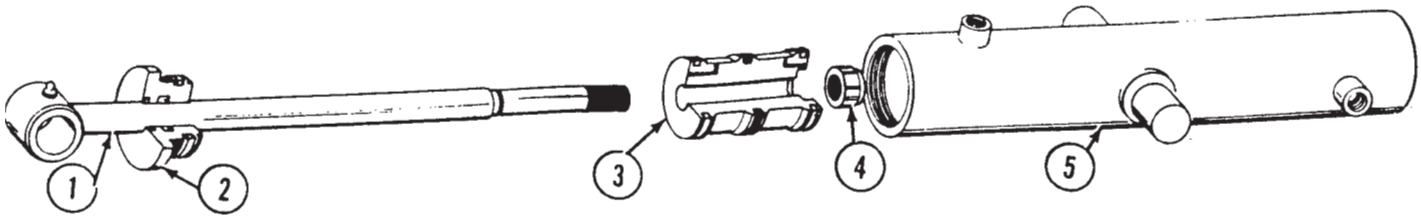
CYL035



ITEM	PART NO.	DESCRIPTION
1.	D7123	Rod
2.	D7122	Gland
3.	D7120	Piston
4.	R0999	Lock Nut, 1/2"-20
5.	A4754	Barrel
A.	A4310	Cylinder Complete, 1 1/2" x 2 1/2"
B.	R1001	Seal Kit, Includes: (2)O-Rings, (1)U-Cup, (1)Rod Wiper, (1)Seal

ROTATION CYLINDER, ALL MODELS

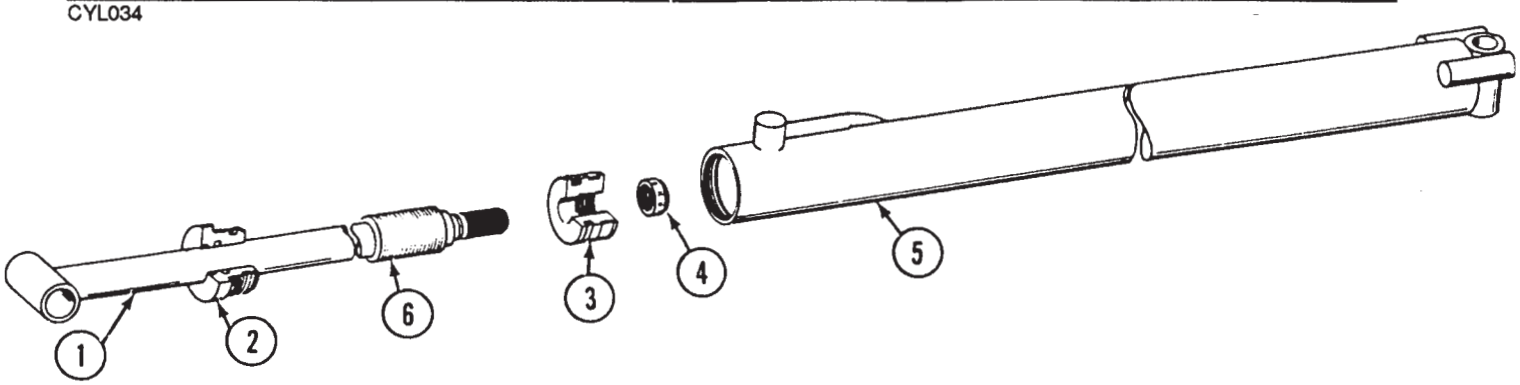
CYL034



ITEM	PART NO.	DESCRIPTION
1.	A4768	Rod Assembly
2.	D6571	Gland
3.	D7136	Piston
4.	R0987	Lock Nut, 1 1/4" Thin
5.	A4769	Barrel
A.	A4284	Cylinder Complete, 4" x 16"
B.	R1003	Seal Kit, Includes: (1)Uniring, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper, (1)Cast Iron Ring

TONGUE CYLINDER
8 ROW 30 WITH "Y" HITCH

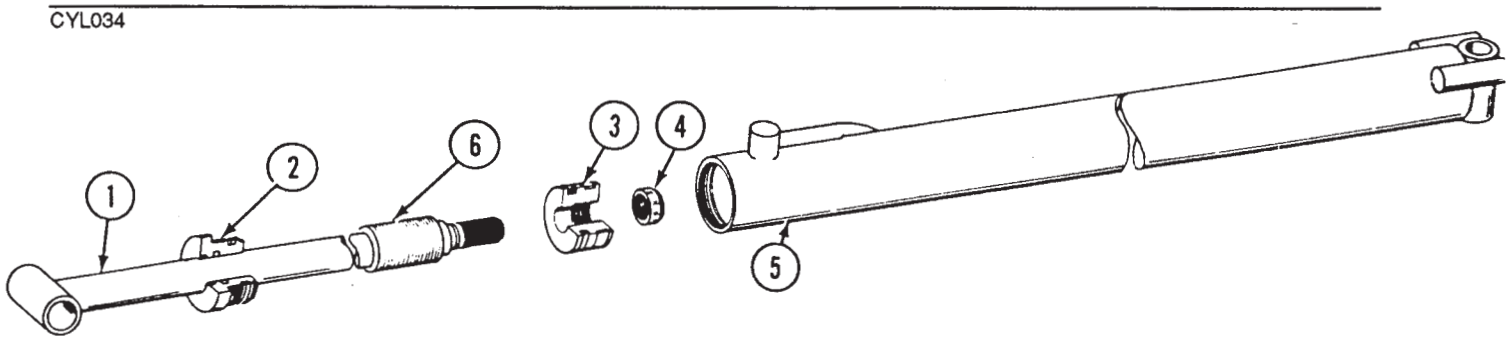
CYL034



ITEM	PART NO.	DESCRIPTION
1.	A4785	Rod Assembly
2.	D7146	Gland
3.	D4527	Piston
4.	R0987	Lock Nut, 1 1/4"-12 Thin
5.	A4786	Barrel
6.	D7147	Spacer
A.	A4483	Cylinder Complete, 3" x 24"
B.	R1004	Seal Kit, Includes: (2)O-Rings, (1)BU Ring, (1)Wear Ring, (1)Wiper, (1)U-Cup, (1)T Seal W/BU Rings

TONGUE CYLINDER
8 ROW 30 WITH "T" HITCH

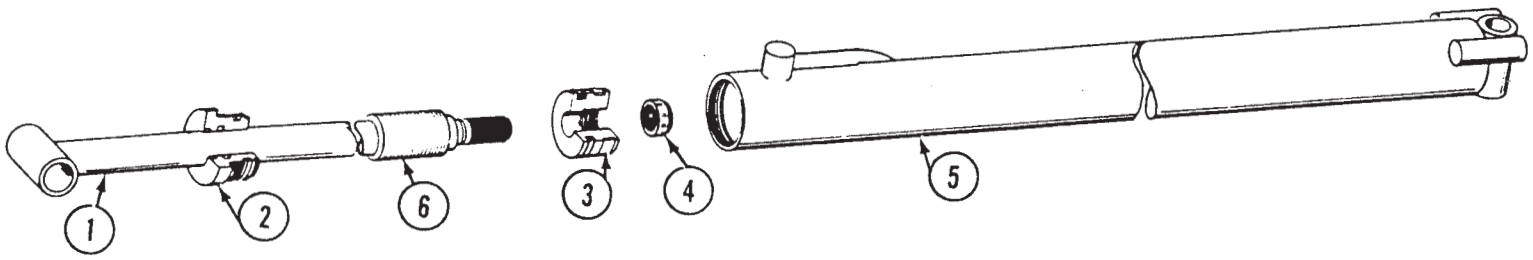
CYL034



ITEM	PART NO.	DESCRIPTION
1.	A4789	Rod Assembly
2.	D7146	Gland
3.	D4527	Piston
4.	R0987	Lock Nut, 1 1/4"-12 Thin
5.	A4790	Barrel
6.	D7147	Spacer
A.	A4485	Cylinder Complete, 3" x 48"
B.	R1004	Seal Kit, Includes: (2)O-Rings, (1)BU Ring, (1)Wear Ring, (1)Wiper, (1)U-Cup, (1)T Seal W/BU Ring

TONGUE CYLINDER
8 ROW 36/38 WITH "Y" HITCH

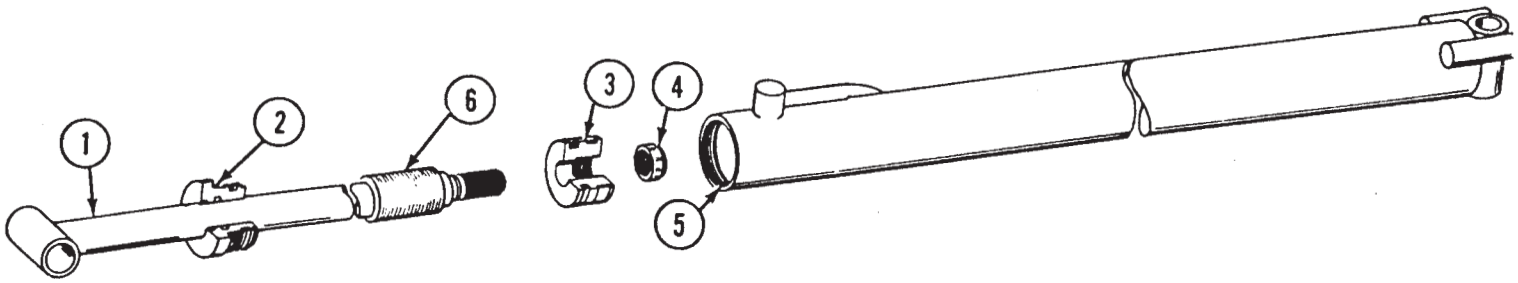
CYL034



ITEM	PART NO.	DESCRIPTION
1.	A4791	Rod Assembly
2.	D7146	Gland
3.	D4527	Piston
4.	R0987	Lock Nut, 1 1/4"-12 Thin
5.	A4792	Barrel
6.	D7147	Spacer
A.	A4484	Cylinder Complete, 3" x 36"
B.	R1004	Seal Kit, Includes: (2)O-Rings, (1)BU Ring, (1)Wear Ring, (1)Wiper, (1)U-Cup, (1)T Seal W/BU Rings

TONGUE CYLINDER
8 ROW 36/38 WITH "T" HITCH
12 ROW 30 WITH "Y" HITCH

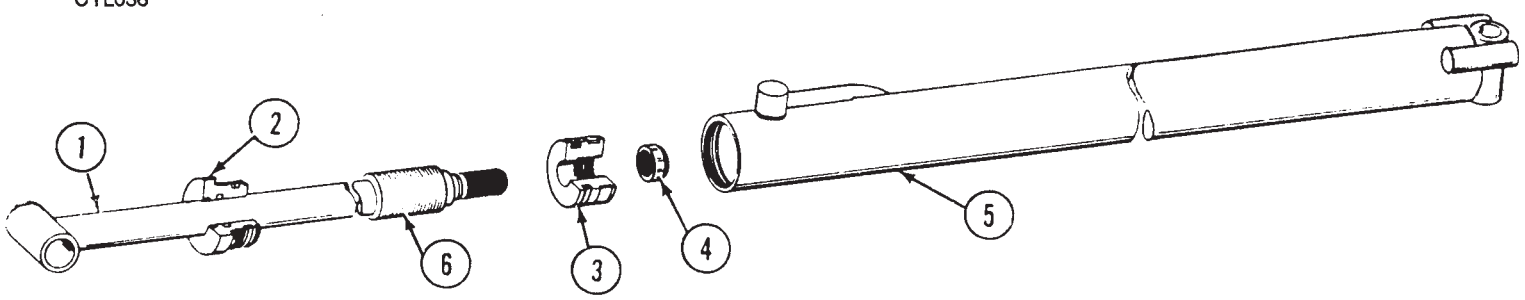
CYL034



ITEM	PART NO.	DESCRIPTION
1.	A4780	Rod Assembly
2.	D7146	Gland
3.	D4527	Piston
4.	R0987	Lock Nut, 1 1/4"-12 Thin
5.	A4779	Barrel
6.	D7147	Spacer
A.	A4285	Cylinder Complete, 3" x 60"
B.	R1004	Seal Kit, Includes: (2)O-Rings, (1)BU Ring, (1)Wear Ring, (1)Wiper, (1)U-Cup, (1)T Seal W/BU Ring

TONGUE CYLINDER
12 ROW 30 WITH "T" HITCH
12 ROW 36/38, 16 ROW 30 WITH "Y" HITCH

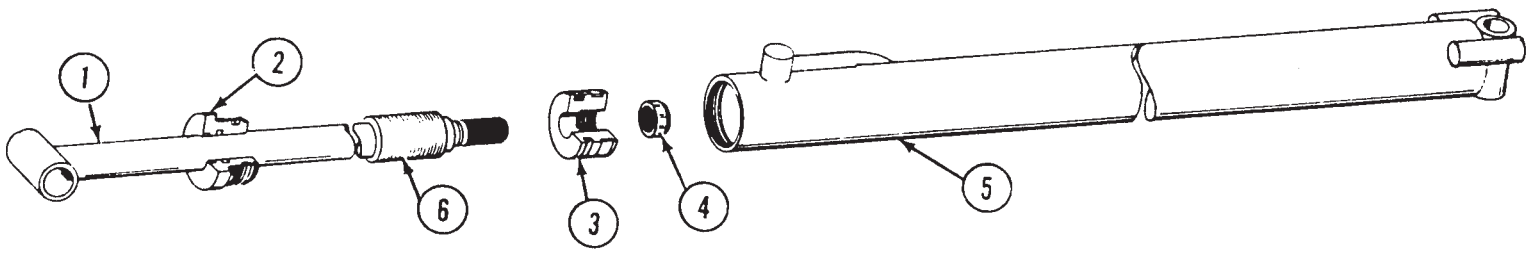
CYL036



ITEM	PART NO.	DESCRIPTION
1.	A4782	Rod Assembly
2.	D7146	Gland
3.	D4527	Piston
4.	R0987	Lock Nut, 1 1/4"-12 Thin
5.	A4781	Barrel
6.	D7147	Spacer
A.	A4332	Cylinder Complete, 3" x 84"
B.	R1004	Seal Kit, Includes: (1)Wear Ring, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper, (1)T Seal W/BU Rings

TONGUE CYLINDER
12 ROW 36/38, 16 ROW 30 WITH "T" HITCH

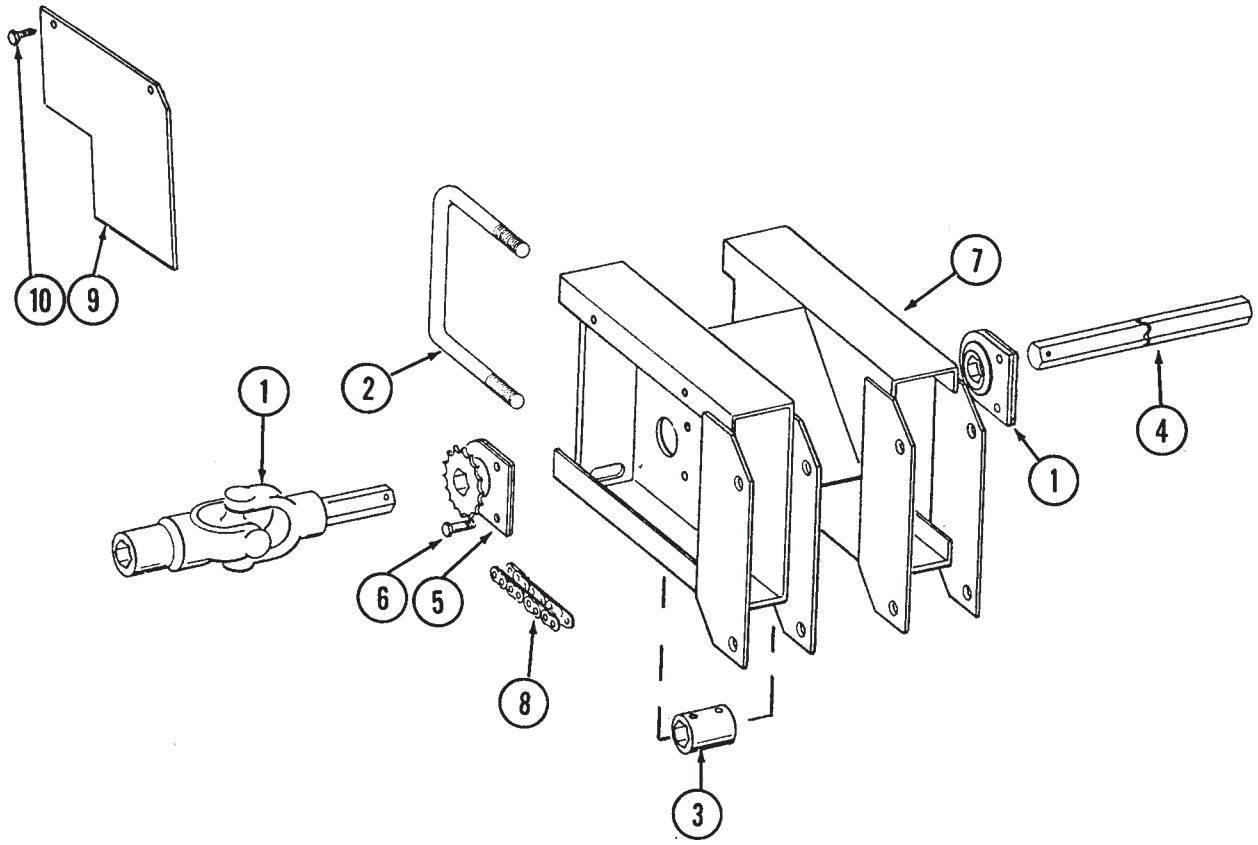
CYL036



ITEM	PART NO.	DESCRIPTION
1.	A5620	Rod Assembly
2.	D7146	Gland
3.	D4527	Piston
4.	R0987	Lock Nut, 1 1/4"-12 Thin
5.	A5619	Barrel
6.	D7147	Spacer
A.	A5584	Cylinder Complete, 3" x 108"
B.	R1004	Seal Kit, Includes: (1)Wear Ring, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper, (1)T Seal W/BU Rings

ROW UNIT EXTENSIONS

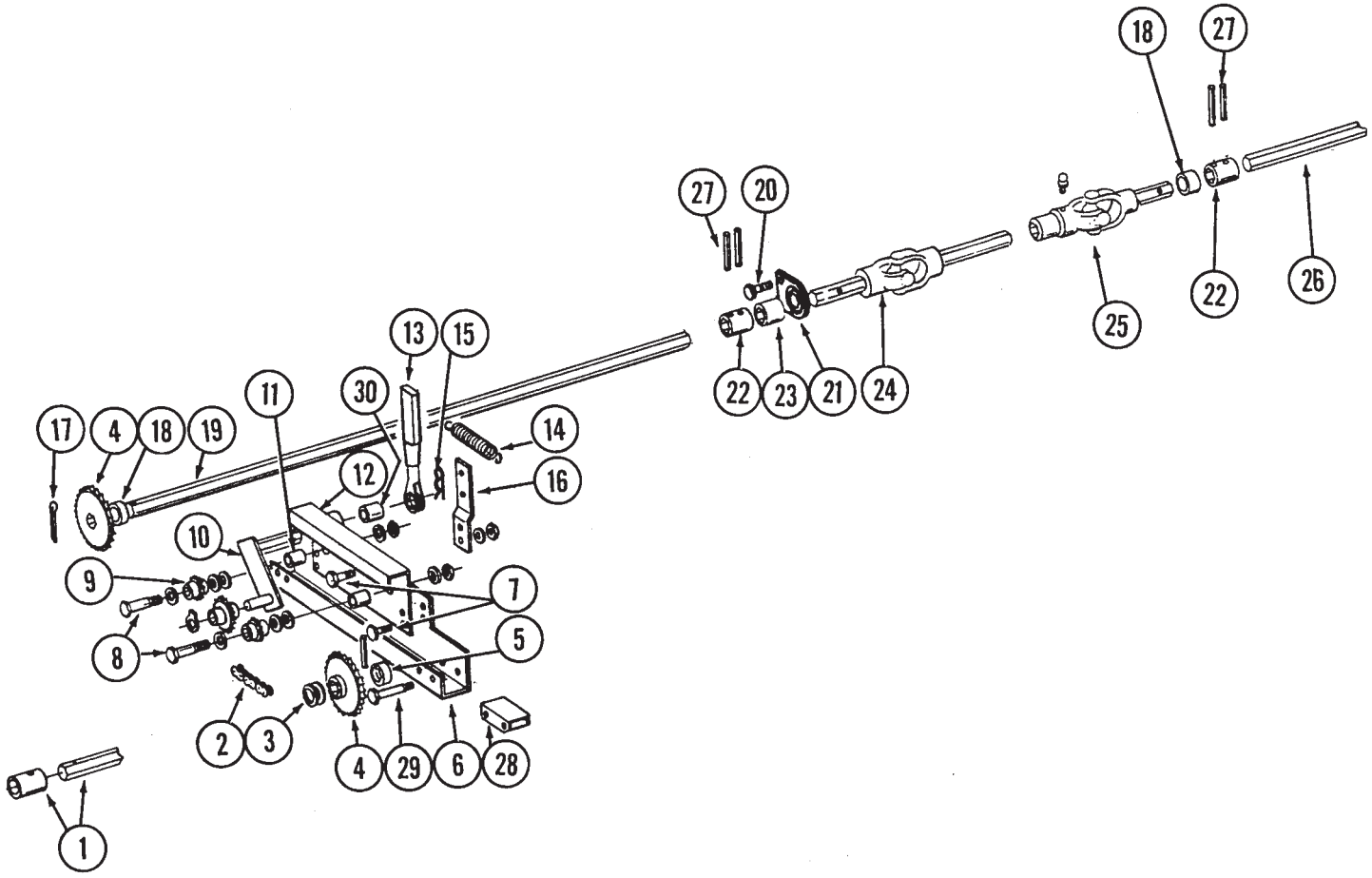
PTD067



ITEM	PART NO.	DESCRIPTION
1.		See "Transmission And Row Unit Drill Shaft"
2.		See "Parallel Arms, Mounting Bracket And Quick Adjustable Down Force Springs"
3.		See "Transmission And Row Unit Drill Shaft"
4.		Main Frame Drill Shaft - See "Transmission And Row Unit Drill Shaft"
5.		See "Parallel Arms, Mounting Bracket And Quick Adjustable Down Force Springs"
6.		See "Parallel Arms, Mounting Bracket And Quick Adjustable Down Force Springs"
7.	A5639	Extension Bracket, 15"
8.	3303-53	Chain, No. 41, 53 Pitch Including Connector And Offset Link (Add to row unit drive chain)
	R0196	Connector Link, No. 41
	R0201	Offset Link, No. 41
9.	D8733	Mud Guard
10.	10570	Self Tapping Screw, 1/4" x 3/4"

PUSH UNIT DRIVE

PTD059



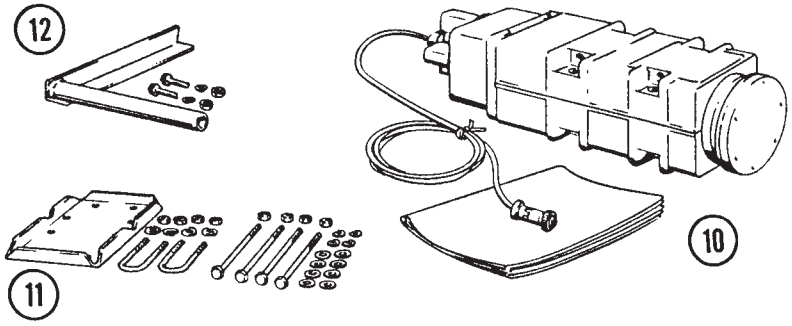
ITEM	PART NO.	DESCRIPTION
1.		See "Transmission And Row Unit Drill Shaft"
2.	3310-138	Chain, No. 40, 138 Pitch Including Connector Link
	R0912	Connector Link, No. 40
3.	10233	Machine Bushing (As Required)
4.	A5107	Sprocket, 19 Tooth

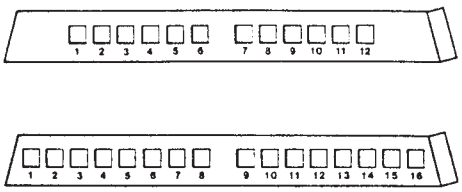
PUSH UNIT DRIVE

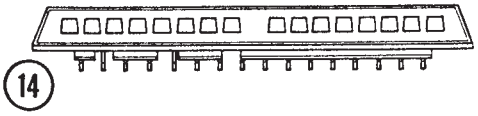
ITEM	PART NO.	DESCRIPTION
5.	D0917	Lock Collar, Less Set Screws
	10145	Set Screw, 5/16"-18 x 1/2"
6.	D6828	Chain Cover
7.	10064	Hex Head Cap Screw, 1/4"-20 x 1"
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20
8.	10049	Hex Head Cap Screw, 3/8"-16 x 2 1/2"
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
9.	D7426	Idler Sprocket
10.	A4523	Idler With Sprocket And Ring
	D7426	Sprocket
	10435	Ring
11.	D1026	Sleeve
12.	A4525	Cover, L.H. (Shown)
	A4524	Cover, R.H.
13.	A4235	Ratchet Wrench Kit With Protective Cover
	10445	Protective Cover
14.	D5857	Spring
15.	10670	Hair Pin Clip, No. 3
16.	D5860	Bar
17.	10460	Cotter Pin, 1/4" x 2"
18.	D1199-03	Spacer, 5/8"
19.	D6825-11.25	Drill Shaft, Wing, 8 Row 30/36/38
	D6825-71.25	Drill Shaft, Wing, 12 Row 30
	D6825-83.25	Drill Shaft, Wing, 12 Row 36
	D6825-87.25	Drill Shaft, Wing, 12 Row 38
	D6825-131.25	Drill Shaft, Wing, 16 Row 30
20.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
21.	A2180	Bearing Hanger, 7/8" Hex Bore
22.	D5886	Coupler
23.	D1199-04	Spacer, 2"
24.	A4638	U-Joint, 23 3/4", 8 Row 38 And 12 Row 36/38
	A4637	U-Joint, 21 3/4", 8 Row 36
	A4394	U-Joint, 14 3/4", 8 Row 30, 12 Row 30 And 16 Row 30
25.	A4393	U-Joint With Grease Fitting, 15"
	10640	Grease Fitting, 1/4"-28
26.	D5887-58.5	Drill Shaft, Main Frame, L.H., 8 Row 30, 12 Row 30 And 16 Row 30
	D5887-39	Drill Shaft, Main Frame, R.H., 8 Row 30, 12 Row 30 And 16 Row 30
	D5887-74	Drill Shaft, Main Frame, L.H., 8 Row 36/38 And 12 Row 36/38
	D5887-48	Drill Shaft, Main Frame, R.H., 8 Row 36/38 And 12 Row 36/38
27.	10602	Spring Pin, 1/4" x 1 1/2"
28.	D7905	Wear Block
29.	10403	Hex Head Cap Screw, 1/4"-20 x 2 1/2"
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20
30.	D6819	Sleeve

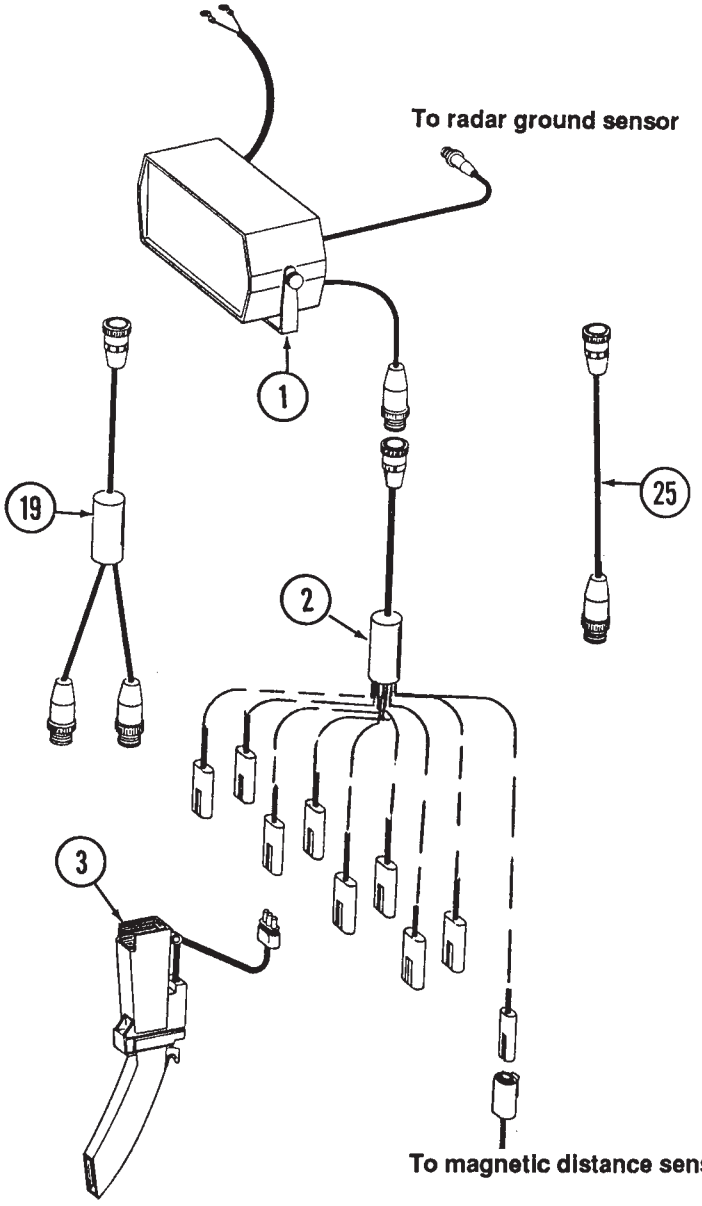
ELECTRONIC SEED MONITOR

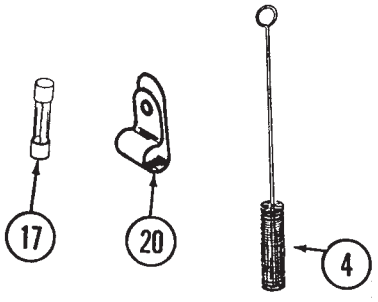
ECP017/D-0640-0001/D-0640-0003/D-0640-0004/D-1172-0001/D-1172-0002/ECP019/ECP020/ECP021/ECP022

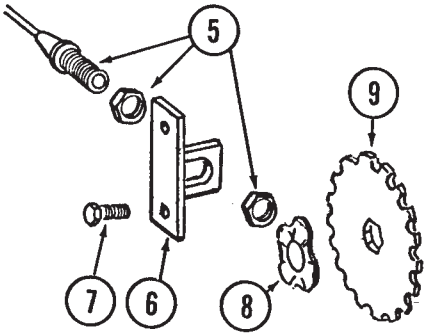


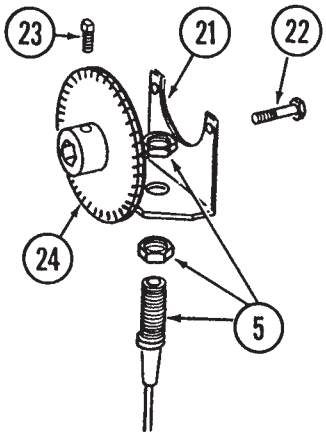










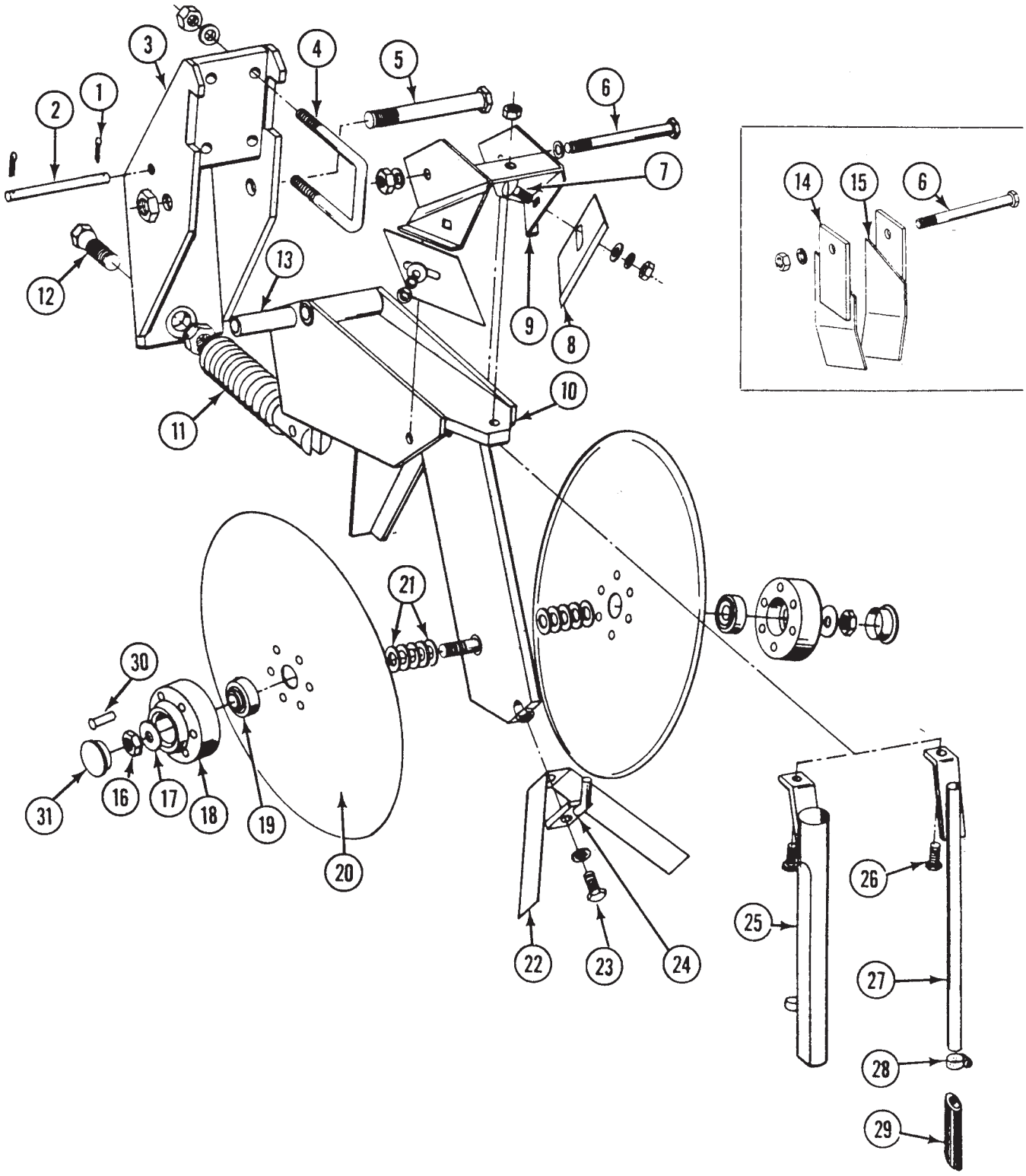


ELECTRONIC SEED MONITOR

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.	A5877	Planter Harness, 8 Row
	A5878	Planter Harness, 12 Row
	A5879	Planter Harness, 16 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 (Used on 12 Row)
	R1083	KM1000 Bezel Decal, 16 Row (Used on 8 and 16 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.	A5884	Y-Connector, 16 Row
	A5885	Y-Connector, 24 Row
	A5886	Y-Connector, 32 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
	A5882	Extension Cable, 30', 1-32 Rows

DOUBLE DISC FERTILIZER OPENER

FOC007/FOC010

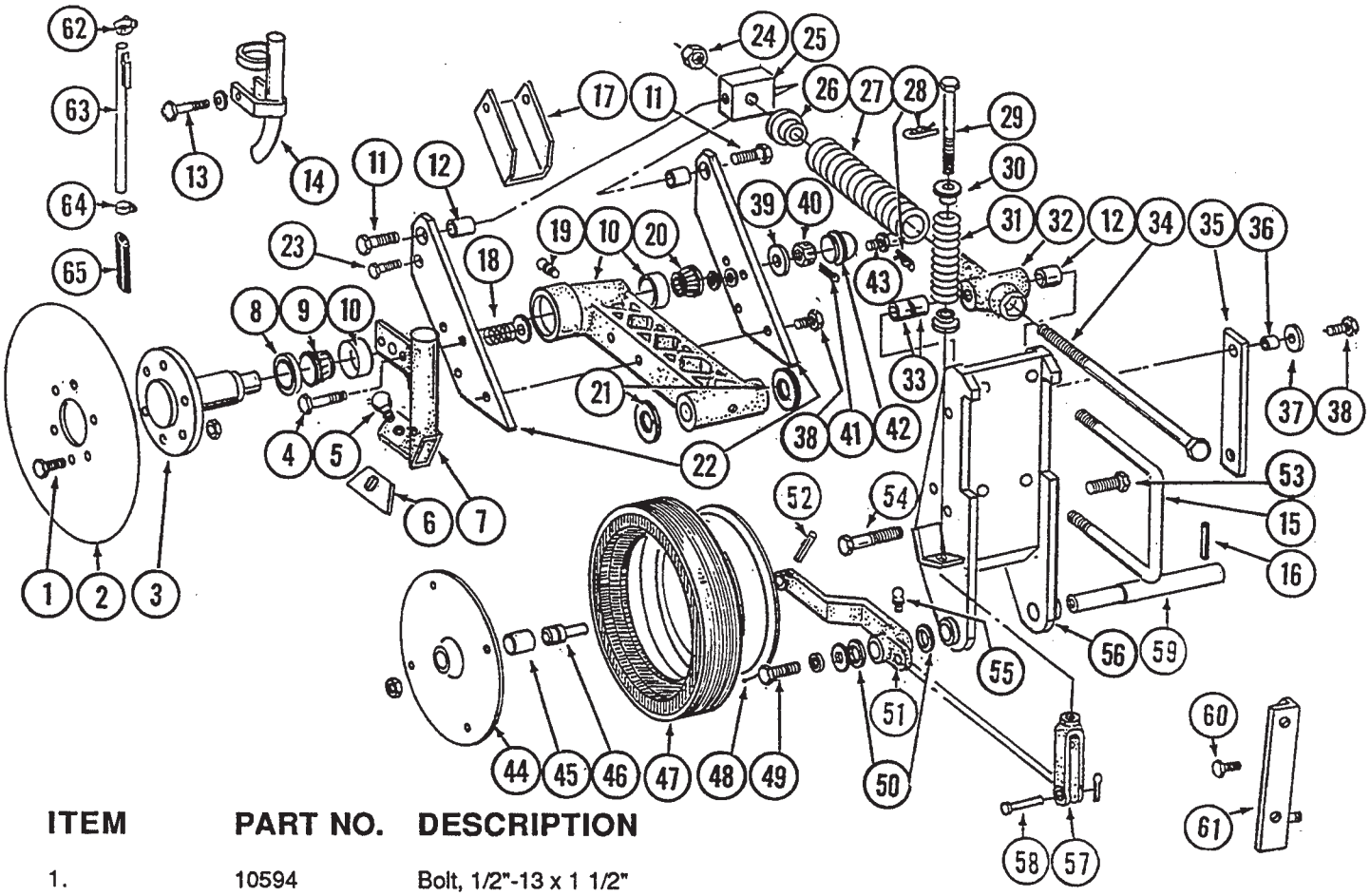


DOUBLE DISC FERTILIZER OPENER

ITEM	PART NO.	DESCRIPTION
1.	10451	Cotter Pin, 1/8" x 1"
2.	D1657	Lockup Pin
3.	A0785	Bracket
4.	D1339	U-Bolt, 2 1/2" x 2 1/2" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
5.	10046	Hex Head Cap Screw, 5/8"-11 x 5"
	10107	Lock Nut, 5/8"-11
6.	10045	Hex Head Cap Screw, 1/2"-13 x 4 1/2"
	10111	Lock Nut, 1/2"-13
7.	10305	Carriage Bolt, 3/8"-16 x 1"
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
8.	D1673	Scraper
9.	A0810	Scraper Mount
10.	A0308	Shank
11.	A0328	Spring
12.	D0962	Hex Head Adjusting Bolt, 5/8"-18
	10499	Jam Nut, 5/8"-18
13.	D0487	Bushing
14.	A3665	Scraper, L.H., Special
15.	A3666	Scraper, R.H., Special
16.	10503	Jam Nut, R.H., 5/8"-11
	10504	Jam Nut, L.H., 5/8"-11
17.	10204	Machine Bushing, 21/32"
18.	B0134	Hub
19.	A2014	Bearing
20.	D1030	Blade
21.	10213	Machine Bushing, 11/16"
22.	D2589	Inner Scraper
23.	10019	Hex Head Cap Screw, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
24.	A0312	Mount
25.	A1369	Drop Tube, Dry Fertilizer
26.	10133	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	10109	Lock Nut, 5/16"-18
27.	A0318	Drop Tube, Liquid Fertilizer
28.	10681	Clamp, No. 6
29.	D1797	Extension
30.	10542	Rivet, 1/4" x 1 5/16"
31.	D1132	Cap
A.	A0320	Disc And Bearing Assembly (Items 18-20)

SINGLE DISC FERTILIZER OPENER

FOC016/FOC007



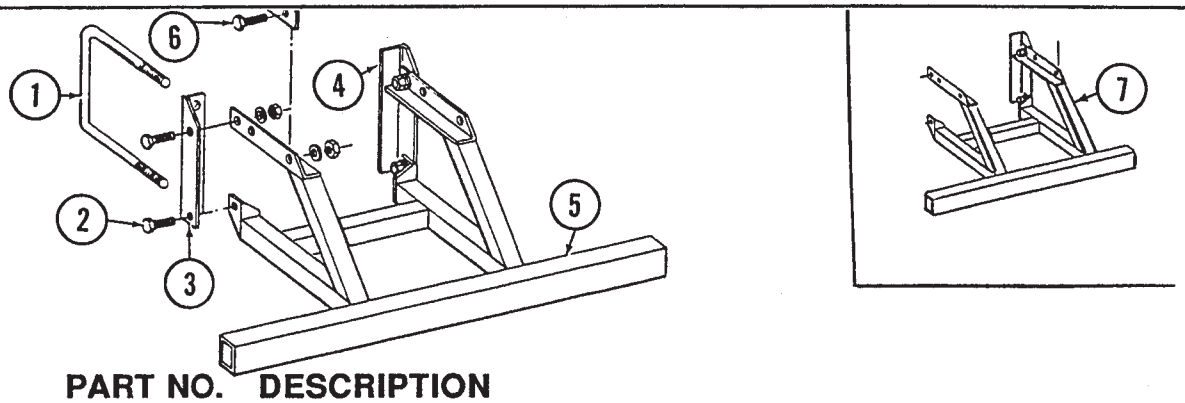
ITEM	PART NO.	DESCRIPTION
1.	10594	Bolt, 1/2"-13 x 1 1/2"
	10111	Lock Nut, 1/2"-13
2.	D7900	Blade, 18"
3.	B0205	Spindle
4.	10049	Hex Head Cap Screw, 3/8"-16 x 2 1/2"
	10210	Lock Washer, 3/8"
	10108	Lock Nut, 3/8"-16
5.	10599	Carriage Bolt, 3/8"-16 x 1 1/4"
	10210	Washer, 3/8"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
6.	D7912	Scraper
7.	B0210	DropTube, R.H.
	B0209	Drop Tube, L.H. (Shown)
8.	A4286	Seal
9.	A4287	Outer Bearing
10.	A5887	Arm W/Cups
	D6553	Outer Cup
	R0188	Inner Cup
11.	10055	Hex Head Cap Screw, 5/8"-11 x 1 1/4"
	10230	Lock Washer, 5/8"
	10205	Washer, 5/8" SAE
12.	B0218	Bushing
13.	10403	Hex Head Cap Screw, 1/4"-20 x 2 1/2"
	10209	Washer, 1/4" USS
	10110	Lock Nut, 1/4"-20
14.	A6408	Liquid Drop Tube
15.	D1113	U-Bolt, 5" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
16.	10610	Spring Pin, 3/8" x 2"

SINGLE DISC FERTILIZER OPENER

ITEM	PART NO.	DESCRIPTION
17.	D8238	Channel
18.	D7962	Spring
19.	10641	Grease Fitting, 1/8" NPT
20.	A0237	Inner Bearing
21.	10322	Bushing (As Required)
22.	D8224	Bar
23.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10108	Lock Nut, 3/8"-16
24.	10105	Hex Nut, 3/4"-10
25.	D7908	Tap Block
26.	B0213	Spring Guide
27.	D2115	Compression Spring
28.	10592	Hair Pin Clip, No. 11
29.	D8214	Special Bolt
30.	B0212	Washer
31.	D8308	Spring
32.	B0206	Guide Rod
33.	D8815	Bushing, 1 1/8"
34.	D7907	Special Bolt
35.	D8239	Bar Hook
36.	D7904-02	Tube
37.	10206	Washer, 1/2" SAE
38.	10039	Hex Head Cap Screw, 1/2"-13 x 1 3/4"
	10111	Lock Nut, 1/2"-13
39.	10220	Machine Bushing
40.	10507	Slotted Nut, 1"-14
41.	10459	Cotter Pin, 3/16" x 1 1/2"
42.	D1104	Cap
43.	D8276	Pin
	10237	Lock Washer, 7/16"
	10100	Hex Nut, 7/16"-14
44.	D4888	Half Wheel
45.	B0118	Sleeve
46.	A2022	Bearing
47.	D4850	Offset Tire
48.	D1048	Half Wheel
49.	10438	Hex Head Cap Screw, 1/2"-13 x 3/4"
	10228	Lock Washer, 1/2"
	10216	Washer, 1/2" USS
50.	10526	Bushing
51.	D8030	Wheel Arm, R.H.
	D8031	Wheel Arm, L.H. (Shown)
52.	10603	Spring Pin, 1/4" x 1 1/4"
53.	10007	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	10230	Lock Washer, 5/8"
54.	10010	Hex Head Cap Screw, 5/8"-11 x 3"
	10205	Washer, 5/8" SAE
	10230	Lock Washer, 5/8"
55.	10640	Grease Fitting, 1/4"-28
56.	A5728	Opener Mount, R.H.
	A5727	Opener Mount, L.H. (Shown)
57.	D8218	Yoke
58.	10560	Clevis Pin, 1/2" x 1 3/4"
	10456	Cotter Pin, 1/8" x 3/4"
59.	D7911	Pivot Pin
60.	10005	Hex Head Cap Screw, 5/8"-11 x 1 3/4"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
61.	A6345	Mounting Angle, L.H. (As Required) (Shown)
	A6344	Mounting Angle, R.H. (As Required)
62.	10672	Clamp, No. 28
63.	A5791	Liquid Drop Tube
64.	10673	Clamp, No. 8
65.	D1797	Extension

DRY/LIQUID FERTILIZER MOUNTS (DOUBLE DISC OPENERS)

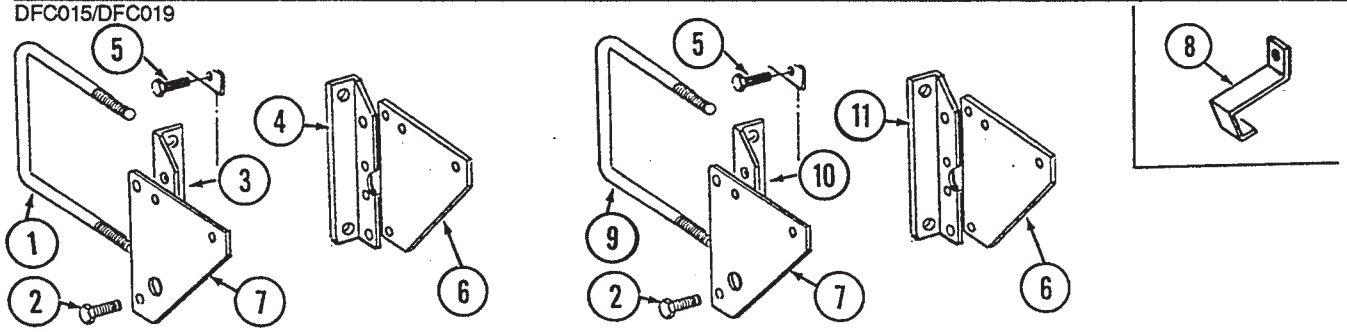
DFC015



ITEM	PART NO.	DESCRIPTION
1.	D1747	U-Bolt, 5" x 7" x 3/4"-10
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10
2.	10007	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
3.	D4782	Angle, R.H.
4.	D4781	Angle, L.H.
5.	A3624	Opener Mount
6.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
7.	A4827	Opener Mount, Special, L.H.
	A4828	Opener Mount, Special, R.H. (Shown)

DRY/LIQUID FERTILIZER MOUNTS (SINGLE DISC OPENERS)

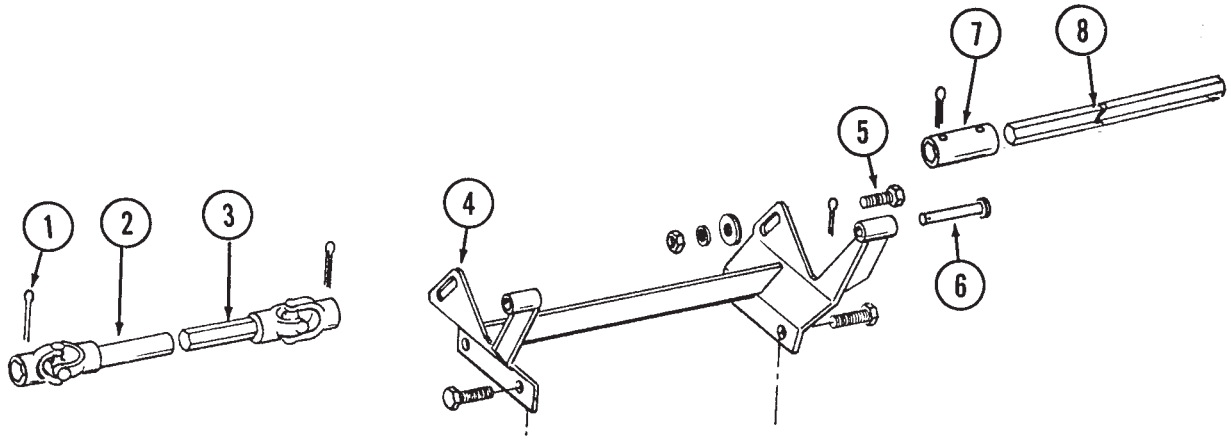
DFC015/DFC019



ITEM	PART NO.	DESCRIPTION
1.	D1113	U-Bolt, 5" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
2.	10007	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
3.	D2298	Angle, R.H.
4.	D1022L	Angle, L.H.
5.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
6.	D8023	Plate, Liquid Fertilizer
7.	D8314	Plate, Dry Fertilizer
8.	D8722	Holder (As Required)
9.	D1747	U-Bolt, 5" x 7" x 3/4"-10
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10
10.	D4782	Angle, R.H.
11.	D4781	Angle, L.H.

DRY FERTILIZER HOPPER MOUNT AND COUPLERS

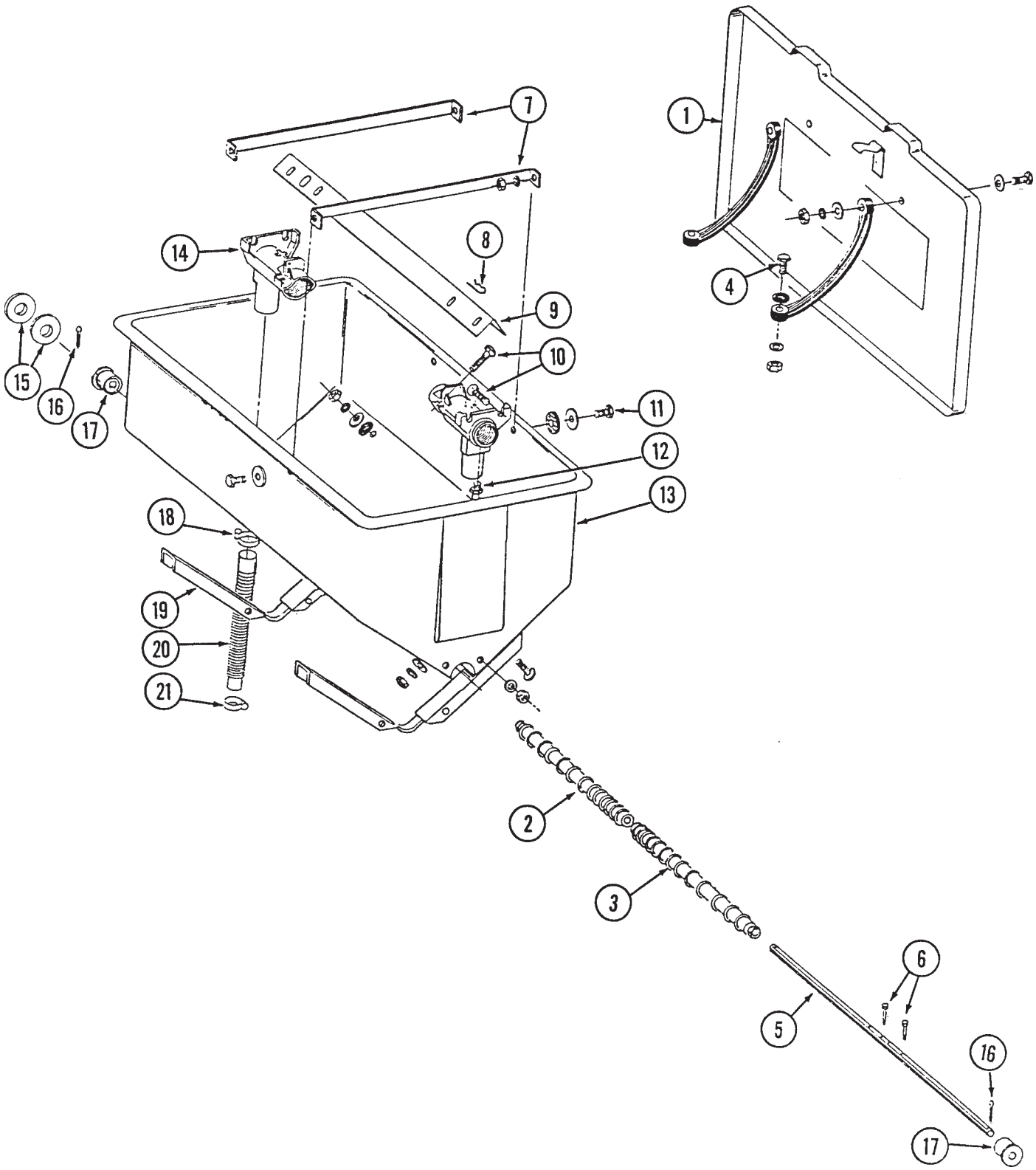
DFC015



ITEM	PART NO.	DESCRIPTION
1.	10460	Cotter Pin, 1/4" x 2"
2.	A5674	U-Joint, 10"
	10640	Grease Fitting, 1/4"-28
3.	A5673	U-Joint, 11", 8 Row 30, 12 Row 30 And 16 Row 30
	A5675	U-Joint, 26", 8 Row 36/38 And 12 Row 36/38
4.	A3627	Hopper Mount
5.	10037	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	10206	Washer, 1/2" SAE
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
6.	10561	Clevis Pin, 1/2" x 3"
	10451	Cotter Pin, 1/8" x 1"
7.	D7867	Coupler, 3",12 Row 30 And 16 Row 30 (1 hole)
	D7868	Coupler, 7", 8 Row 36/38 And12 Row 36/38 (1 hole)
	D5886	Coupler, 1 3/4", 8 Row 30/36/38, 12 Row 30/36/38 And 16 Row 30 (2 holes) (Shown)
8.	D6825-06	Shaft, 6", 8 Row 36 (2 holes)
	D2548-15.5	Shaft, 15 1/2", 12 Row 30 And 16 Row 30 (1 hole)
	D2548-27.5	Shaft, 27 1/2", 12 Row 36/38 (1 hole)
	D7869	Shaft, 3 1/4", 12 Row 36/38 (3 holes)

DRY FERTILIZER HOPPER AND MOUNTS

DFC009/DFC018

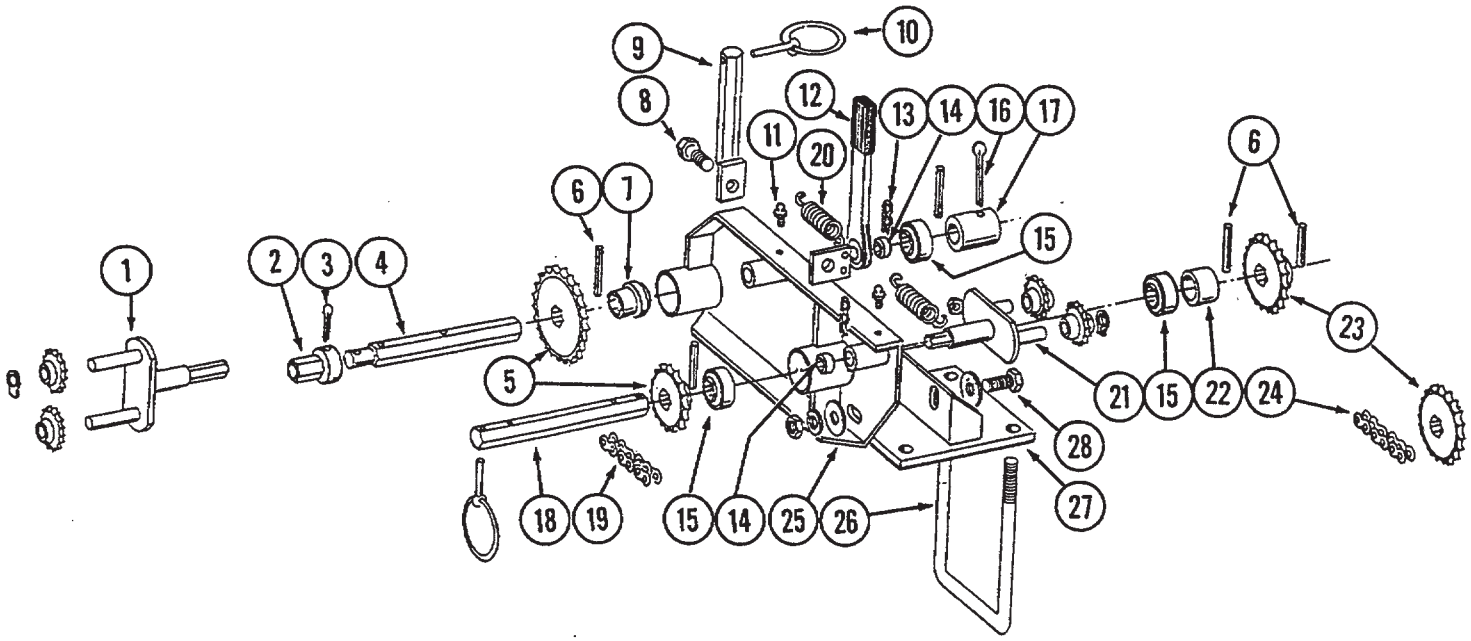


DRY FERTILIZER HOPPER AND MOUNTS

ITEM	PART NO.	DESCRIPTION
1.	A2101	Lid With Retainers, Clips, Rivets, Rubber Straps And Hardware
	D1380	Front Clip
	D2412	Rear Retainer
	10655	Rivet, 3/16" x 13/32"
	D1210	Rubber Strap
	10171	Hex Head Cap Screw, 5/16"-18 x 1 1/4"
	10219	Washer, 5/16" USS
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
2.	B0198	Auger, R.H.
3.	B0199	Auger, L.H.
4.	10133	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	10219	Washer, 5/16" USS
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
5.	D7848	Shaft
6.	10587	Hex Head Cap Screw, 1/4"-20 x 2", Stainless Steel
	10588	Hex Nut, 1/4"-20, Stainless Steel
7.	D1209	Strap
8.	10670	Hair Pin Clip, No. 3
9.	D1207	Baffle
10.	10303	Carriage Bolt, 5/16"-18 x 1", Grade 2
	10219	Washer, 5/16" USS
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
11.	10171	Hex Head Cap Screw, 5/16"-18 x 1 1/4"
	10201	Special Washer
	D1213	Rubber Washer
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
12.	10641	Grease Fitting, 1/8" NPT
13.	D1379	Hopper
14.	D1200	Outlet Housing
15.	10233	Machine Bushing (Use on inner side of two middle hoppers only)
16.	10460	Cotter Pin, 1/4" x 2"
17.	B0200	Bearing
18.	10676	Clamp, No. 36
19.	A5652	Saddle
20.	D3790	Rubber Tube
21.	10672	Clamp, No. 28

DRY FERTILIZER DRIVE

DFC016

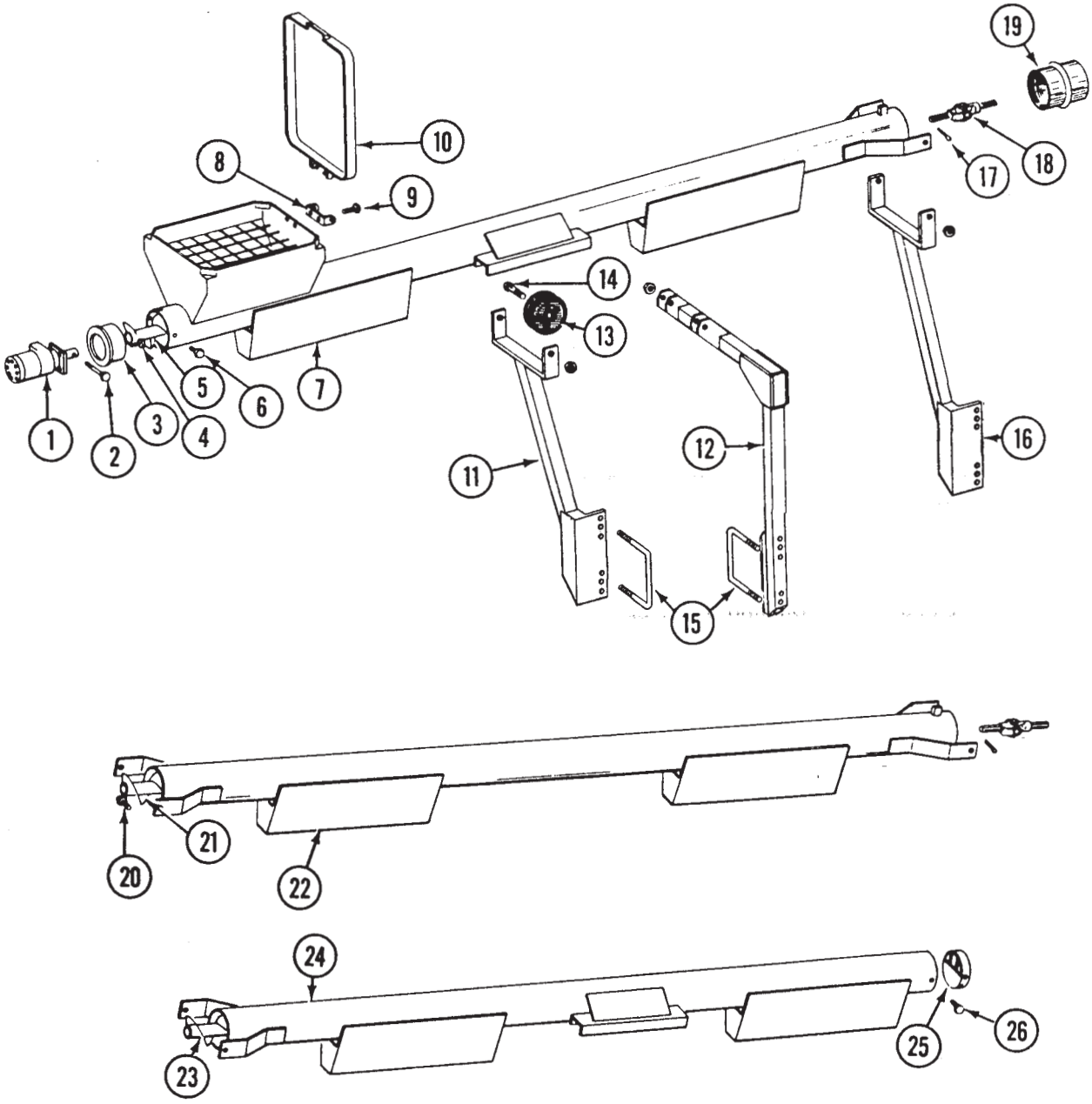


DRY FERTILIZER DRIVE

ITEM	PART NO.	DESCRIPTION
1.	A5136	Idler With Sprockets And Rings
	D7426	Sprocket
	10435	Ring
2.	D7127	Shear Coupler
3.	10462	Cotter Pin, 3/16" x 2"
4.	D7866	Shaft, 7/8" x 7 1/2"
5.	A5105	Sprocket, 15 Tooth
	A5107	Sprocket, 19 Tooth
	A5114	Sprocket, 30 Tooth
	A5115	Sprocket, 33 Tooth
	A6337	Sprocket, 35 Tooth
6.	10602	Spring Pin, 1/4" x 1 1/2"
7.	A5624	Extended Bearing
8.	10037	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	10111	Lock Nut, 1/2"-13
9.	A5229	Rod
10.	D2558	Lynch Pin, 1/4"
11	10640	Grease Fitting, 1/4"-28
12.	A4235	Ratchet Wrench Kit With Protective Closure
	10445	Protective Closure
13.	10670	Hair Pin Clip, No. 3
14.	D6819	Sleeve
15.	A5116	Bearing, 7/8" Hex
16.	10460	Cotter Pin, 1/4" x 2"
17.	D7867	Coupler, 3", 8 Row 30, 12 Row 30 And 16 Row 30
	D7868	Coupler, 7", 8 Row 36/38 And 12 Row 36/38
18.	D6902	Shaft, 7/8" x 7 3/4"
19.	3310-88	Chain, No. 40, 88 Pitch Including Connector Link
	R0912	Connector Link, No. 40
20.	D5857	Spring
21.	A4626	Idler With Sprockets And Rings
	D7426	Sprocket
	10435	Ring
22.	D1199-03	Spacer, 5/8"
23.	A5109	Sprocket, 24 Tooth
24.	3310-118	Chain, No. 40, 118 Pitch Including Connector Link
	R0912	Connector Link, No. 40
25.	A5671	Transmission Plate, L.H.
	A5672	Transmission Plate, R.H.
26.	D1134	U-Bolt, 7" x 5" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
27.	A4624	Mount
28.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10206	Washer, 1/2" SAE
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13

DRY FERTILIZER QUICK FILL

DFQ002/DFQ003/DFQ004/DFQ005



ITEM	PART NO.	DESCRIPTION
1.		See "Dry Fertilizer Quick Fill Hydraulic System"
2.	10041	Hex Head Cap Screw, 5/16"-18 x 2"
	10109	Lock Nut, 5/16"-18
3.	B0174	Motor Mount
4.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10229	Lock Washer, 3/8"
5.	A4649	Auger, L.H. Side, 57 1/2", 8 Row 30
	A4659	Auger, L.H. Side, 69 1/2", 8 Row 36/38
	A5420	Auger, L.H. Side, 110 3/4", 12 Row 30
	A5421	Auger, L.H. Side, 121 1/2", 12 Row 36
	A5422	Auger, L.H. Side, 131 1/2", 12 Row 38
	A5423	Auger, L.H. Side, 170 3/4", 16 Row 30

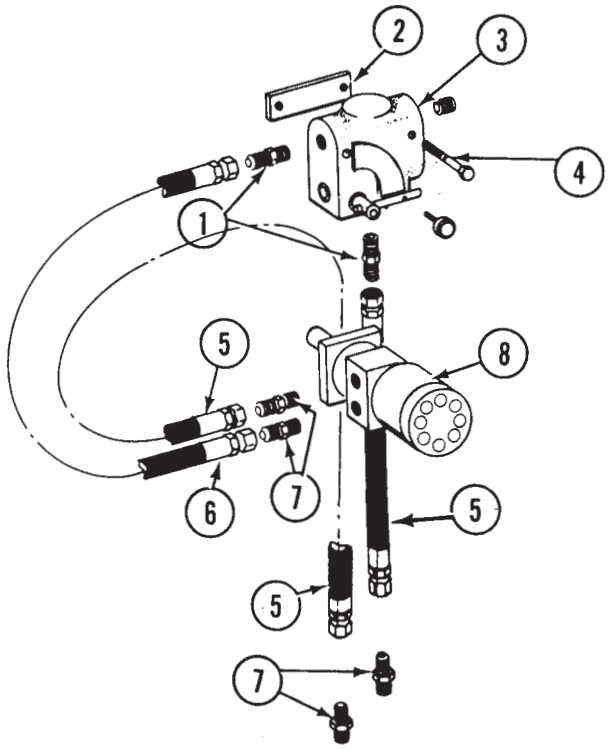
DRY FERTILIZER QUICK FILL

ITEM	PART NO.	DESCRIPTION
6.	10023	Hex Head Cap Screw, 1/4"-20 x 3/4"
	10227	Lock Washer, 1/4"
7.	A4647	Auger Tube, L.H. Side, 60", 8 Row 30
	A4655	Auger Tube, L.H. Side, 72", 8 Row 36/38
	A5409	Auger Tube, L.H. Side, 113 1/4", 12 Row 30
	A5413	Auger Tube, L.H. Side, 124", 12 Row 36
	A5415	Auger Tube, L.H. Side, 134", 12 Row 38
	A5411	Auger Tube, L.H. Side, 173 1/4", 16 Row 30
8.	D1060	Hinge
9.	10064	Hex Head Cap Screw, 1/4"-20 x 1"
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20
10.	A4444	Lid
11.	A4640	Wheel Mount, R.H., 12 Row 30/36/38 And 16 Row 30
	A4641	Wheel Mount, L.H., 12 Row 30/36/38 (Shown) And 16 Row 30
12.	A4652	Wheel Mount, R.H., 8 Row 30/36/38
	A4651	Wheel Mount, L.H., 8 Row 30/36/38 (Shown)
13.	A4005	Wheel With Bearing
14.	10033	Hex Head Cap Screw, 1/2"-13 x 3 1/2"
	10216	Washer, 1/2" USS
	10111	Lock Nut, 1/2"-13
15.	D1113	U-Bolt, 5" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
16.	A4644	Hinge Mount, R.H.
	A4645	Hinge Mount, L.H. (Shown)
17.	10460	Cotter Pin, 1/4" x 2"
18.	A5442	U-Joint
19.	D6115	Boot
20.	10009	Hex Head Cap Screw, 5/8"-11 x 2 1/2"
	10217	Washer, 5/8" USS
	10107	Lock Nut, 5/8"-11
21.	A5424	Auger, Center, 115 3/4", 8 Row 30, 12 Row 30 And 16 Row 30
	A4658	Auger, Center, 139 3/4", 8 Row 36/38
	A5425	Auger, Center, 154 1/4", 12 Row 36/38
22.	A5412	Auger Tube, Center, 118 1/2", 8 Row 30, 12 Row 30 And 16 Row 30
	A4656	Auger Tube, Center, 142 1/2", 8 Row 36/38
	A5417	Auger Tube, Center, 157", 12 Row 36/38
23.	A4648	Auger, R.H. Side, 36 1/4", 8 Row 30
	A4657	Auger, R.H. Side, 45 1/4", 8 Row 36/38
	A5426	Auger, R.H. Side, 96 1/4", 12 Row 30
	A5427	Auger, R.H. Side, 106 3/4", 12 Row 36
	A5440	Auger, R.H. Side, 115 1/4", 12 Row 38
	A5441	Auger, R.H. Side, 156 1/4", 16 Row 30
24.	A4646	Auger Tube, R.H. Side, 60", 8 Row 30
	A4654	Auger Tube, R.H. Side, 72", 8 Row 36/38
	A5408	Auger Tube, R.H. Side, 104 1/4", 12 Row 30
	A5414	Auger Tube, R.H. Side, 115", 12 Row 36
	A5416	Auger Tube, R.H. Side, 125", 12 Row 38
	A5410	Auger Tube, R.H. Side, 164 1/4", 16 Row 30
25.	A5373	End Shield
26.	10023	Hex Head Cap Screw, 1/4"-20 x 3/4"
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20

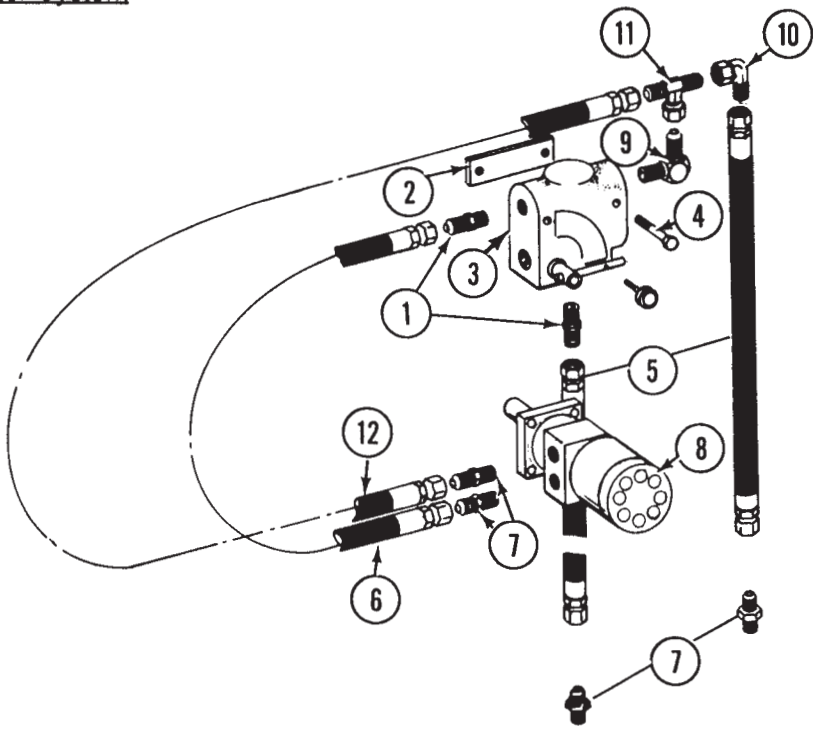
DRY FERTILIZER QUICK FILL HYDRAULIC SYSTEM

PHS030/PHS031

Closed Center System



Open Center System

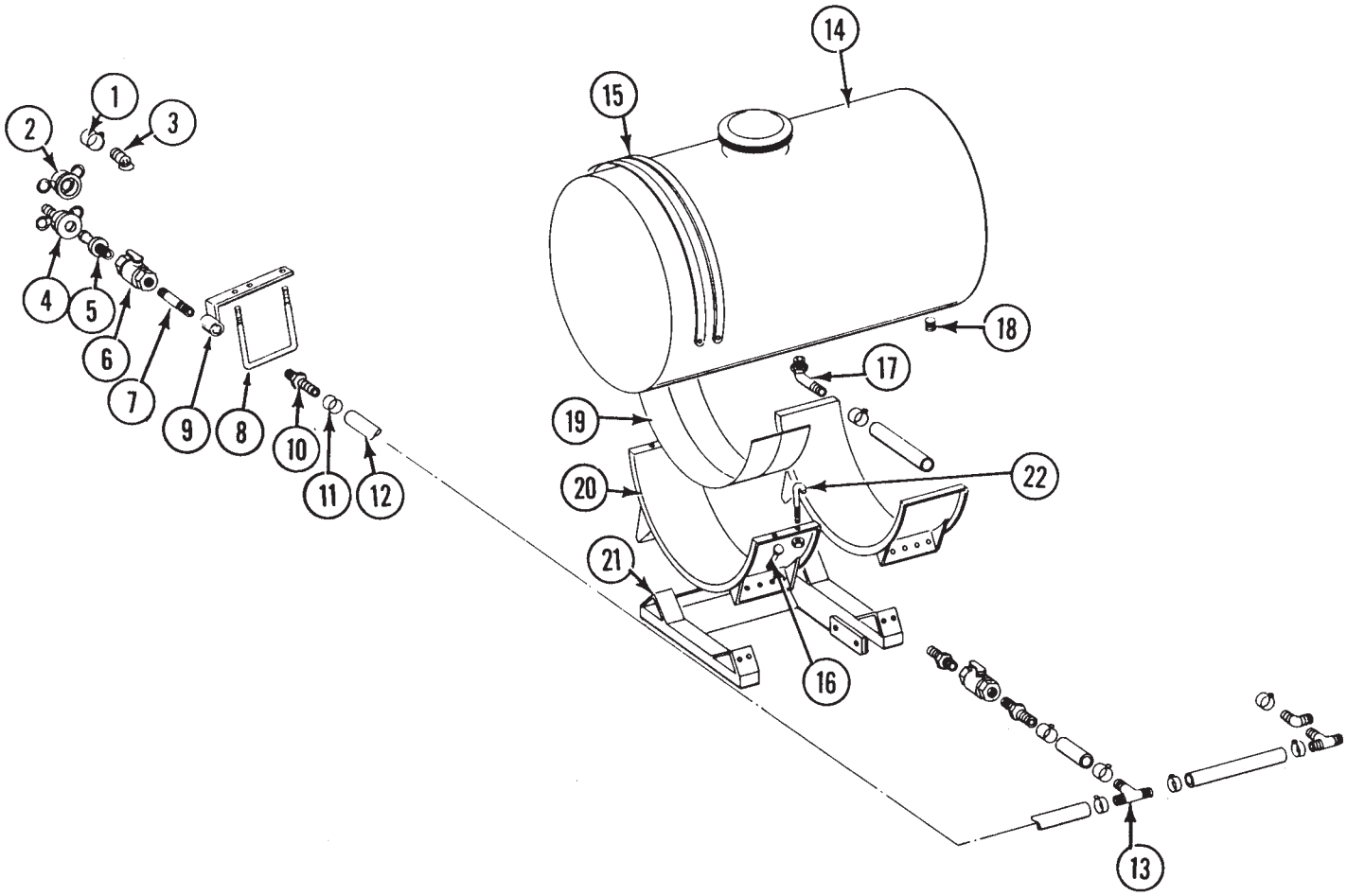


DRY FERTILIZER QUICK FILL HYDRAULIC SYSTEM

ITEM	PART NO.	DESCRIPTION
1.	2404-10-08	Adapter, 7/8"-14 JIC To 1/2" NPT
2.	D6244	Spacer
3.	A5374	Flow Control Valve
	R0979	O-Ring
	R0980	Handle
	R0981	Side Lever Spool
4.	10403	Hex Head Cap Screw, 1/4"-20 x 2 1/2"
	10110	Lock Nut, 1/4"-20
5.	A1402	Hose Assembly, 1/2" x 162", 8 Row 30
	A1469	Hose Assembly, 1/2" x 185", 8 Row 36/38
	A1468	Hose Assembly, 1/2" x 220", 12 Row 30
	A1471	Hose Assembly, 1/2" x 264", 12 Row 36/38
	A1426	Hose Assembly, 1/2" x 278", 16 Row 30
6.	A1450	Hose Assembly, 1/2" x 22"
7.	6400-10	Connector, 7/8"-14 JIC To 7/8"-14 O-Ring
8.	A5163	Motor
9.	2501-10-08	Elbow, 7/8"-14 JIC To 1/2" NPT
10.	6501-10	Swivel Elbow, 7/8"-14 JIC
11.	6600-10	Swivel Outlet Tee, 7/8"-14 JIC
12.	A1424	Hose Assembly, 1/2" x 30"

LIQUID FERTILIZER TANKS, SADDLES, SADDLE MOUNTS AND HOSES

LFC021/LFC023

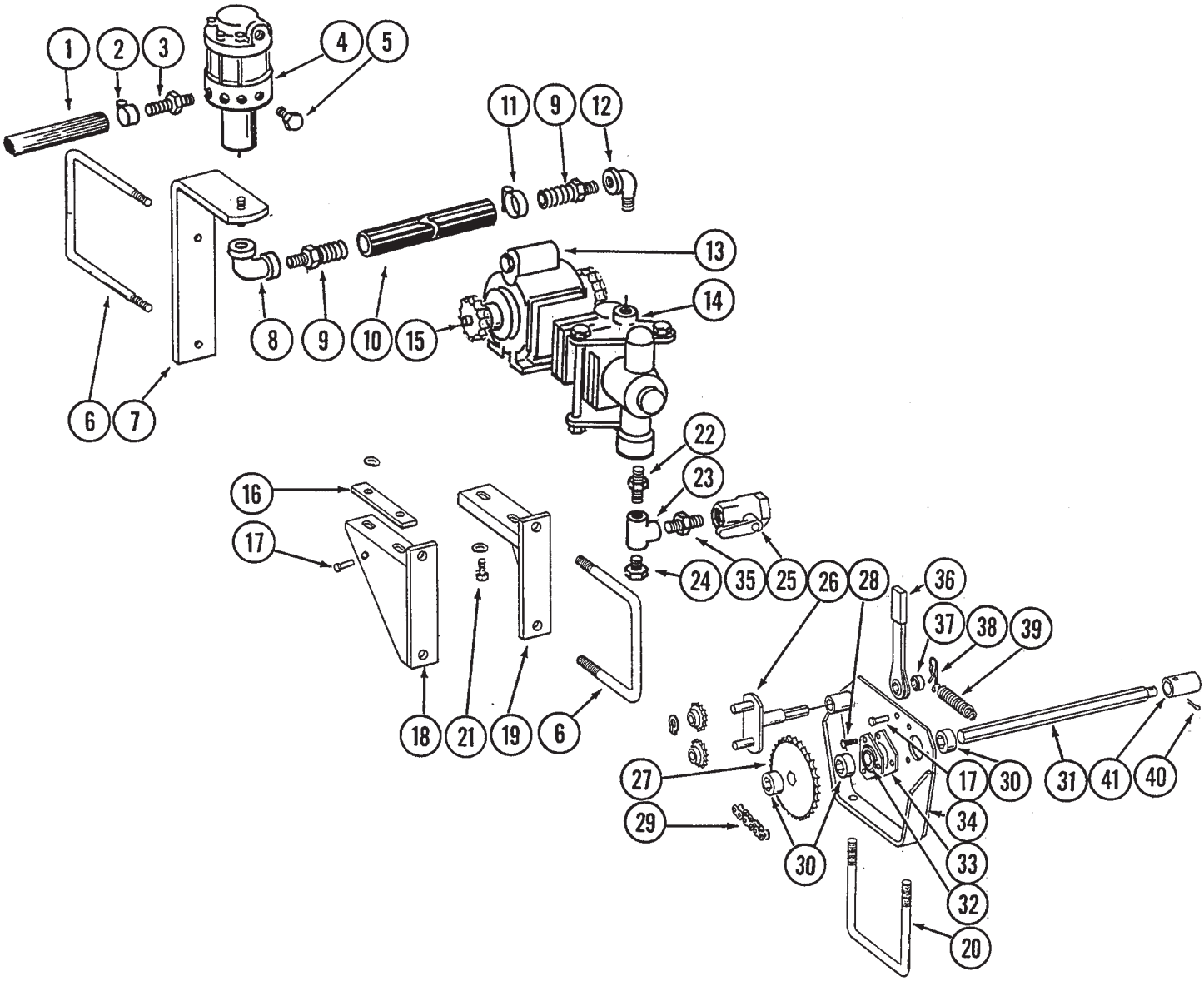


LIQUID FERTILIZER TANKS, SADDLES, SADDLE MOUNTS AND HOSES

ITEM	PART NO.	DESCRIPTION
1.	10672	Clamp, No. 28
2.	D1515	Dust Cap, 1 1/4"
3.	D1517	Dust Plug
4.	D1516	Adapter
5.	D1514	Adapter
6.	A4976	Ball Valve, Full Port
	R1015	Body O-Ring
	R1016	Stem O-Ring
	R1017	Teflon Seat
	R1018	Ball
	R1019	Handle
7.	10619	Pipe Nipple, 1 1/4" x 3"
8.	D8306	U-Bolt, 7" x 5" x 1/2"-13
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
9.	A5917	Quick Fill Mount
10.	10626	Adapter, 1 1/4" NPT To 1 1/4" Barb
11.	10674	Clamp, No. 24
12.	4200-01	Hose, 1 1/4" x 22', 8 Row 30/36/38
	4200-06	Hose, 1 1/4" x 40', 12 Row 30
	4200-05	Hose, 1 1/4" x 50', 12 Row 36/38 And 16 Row 30
13.	10633	Tee, 1 1/4"
14.	D1812	Tank With Lid And Fittings, 30" x 150 Gallon, 8 Row Models (Qty. 2)
	A5258	Tank With Lid And Fittings, 30" x 110 Gallon, 12/16 Row Models (Qty. 4)
	R0508	Nylon Fitting, 1 1/4"
	R0509	Fill Well (Use With R0510)
	R1005	Fill Well, Threaded (Use With R1006)
	R0510	Lid, 10" (Use With R0509)
	R1006	Lid, 10", Threaded (Use With R1005)
	R0513	Nylon Fitting, 3/8"
15.	D1520	Band, 30"
16.	10003	Hex Head Cap Screw, 3/8"-16 x 1 1/2"
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
17.	10629	Elbow
18.	10096	Nylon Plug, 3/4"
19.	D1862	Pad, 8" x 14'
20.	A5264	Saddle
21.	A4621	Tank Mount
22.	D1337	J-Bolt, 5/16"
	10109	Lock Nut, 5/16"-18

LIQUID FERTILIZER PISTON PUMP DRIVE

LFC022/LFC024/LFC026/CCU007



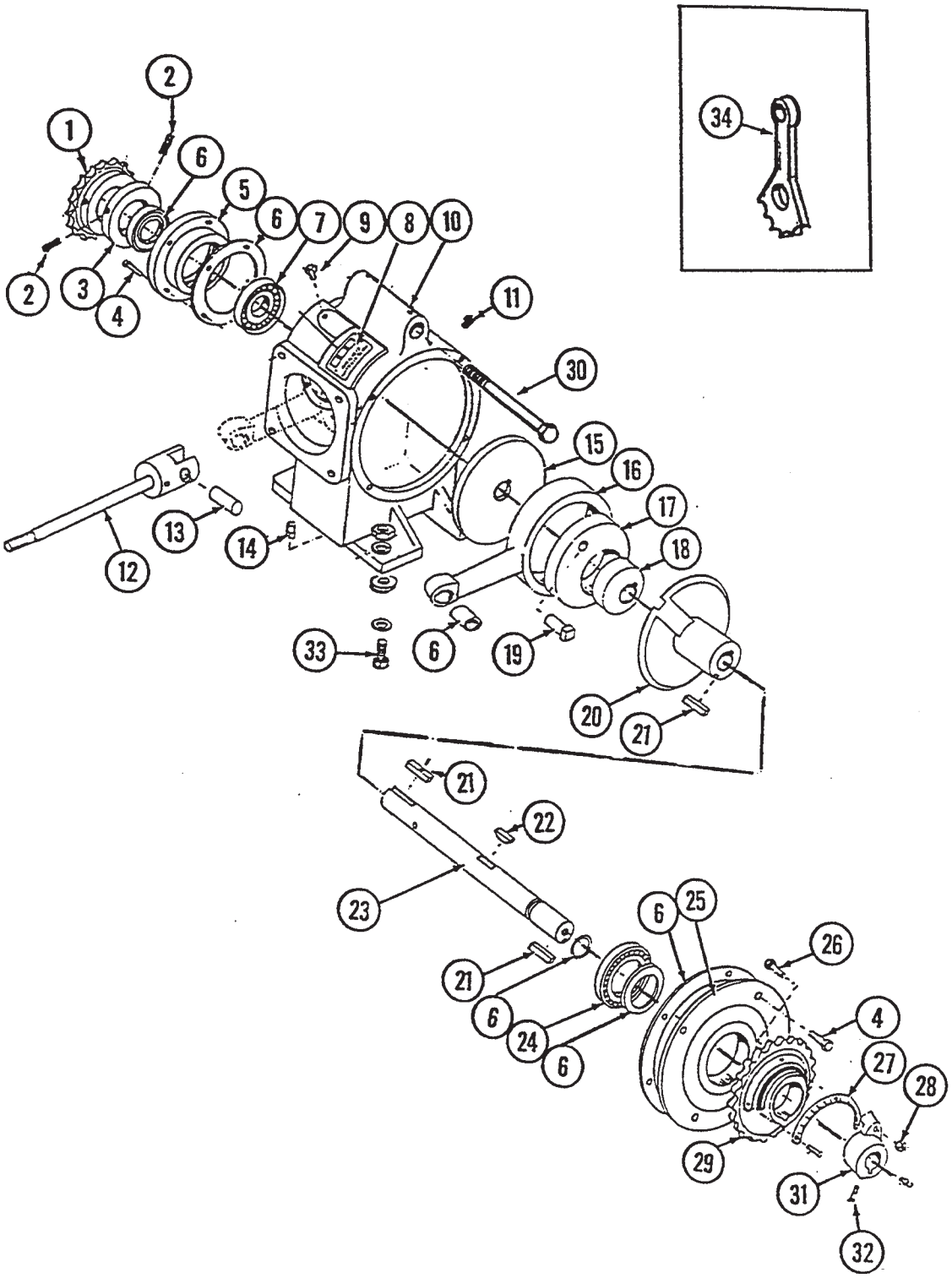
ITEM	PART NO.	DESCRIPTION
1.	4300-10	Hose, 1/2" x 60', 8 Row Models
	4300-12	Hose, 1/2" x 90', 12 Row 30
	4300-05	Hose, 1/2" x 100', 12 Row 36/38 And 16 Row
2.	10673	Clamp, No. 8
3.	D8816	Hose Barb
4.		See "Liquid Fertilizer Flow Divider"
5.	10292	Plug, 1/4" NPT

LIQUID FERTILIZER PISTON PUMP DRIVE

ITEM	PART NO.	DESCRIPTION
6.	D1113	U-Bolt, 5" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
7.	A6527	Support
8.	10733	Elbow, 3/4"
9.	10734	Hose Barb, 3/4"
10.	4205-06	Hose, 3/4" x 110"
11.	10675	Clamp, No. 20
12.	10735	Elbow, 90°, 3/4"
13.		See "Liquid Fertilizer Piston Pump (Crankcase Assembly)"
14.		See "Liquid Fertilizer Piston Pump (Cylinder Assembly)"
15.	A6509	Sprocket W/Set Screw, 23 Tooth
16.	D9242	Spacer
17.	10478	Clevis Pin, 5/16" x 1"
	10409	Retaining Ring
	10669	Hair Pin Clip, No. 22
18.	A4619	Pump Mount, L.H.
19.	A4620	Pump Mount, R.H.
20.	D1134	U-Bolt, 7" x 5" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
21.	10047	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
	10210	Washer, 3/8" USS
	R1122	Mounting Pad
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
22.	10728	Reducing Nipple, 1 1/2" To 1 1/4"
23.	10719	Tee, 1 1/4"
24.	10739	Pipe Plug, 1 1/4"
25.		See "Liquid Fertilizer Tanks, Saddles, Mounts And Hoses"
26.	A5136	Idler W/Sprockets And Rings
	D7426	Sprocket
	10435	Ring
27.	A5194	Sprocket, 50 Tooth
28.	10303	Carriage Bolt, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
29.	3310-152	Chain, No. 40, 152 Pitch Including Connector
	R0912	Connector Link, No. 40
30.	D0917	Lock Collar, 7/8" Hex, Less Set Screws
	10145	Set Screw, 5/16"-18 x 1/2"
31.	D9277	Shaft, 25"
32.	2100-03	Bearing, 7/8" Hex Bore, Spherical
33.	3400-01	Flangette
34.	A6530	Drive Plate W/Grease Fitting, R.H. (Shown)
	A6531	Drive Plate W/Grease Fitting, L.H.
	10640	Grease Fitting, 1/4"-28
35.	10619	Close Nipple, 1 1/4"
36.	A4235	Ratchet Arm W/Protective Closure
	10445	Protective Closure
37.	D6819	Sleeve
38.	10670	Hair Pin Clip, No. 3
39.	D5857	Spring
40.	10460	Cotter Pin, 1/4" x 2"
41.	D9048	Coupler, 2 1/2"

LIQUID FERTILIZER PISTON PUMP (Crankcase Assembly)

JB-L4400-991/CCU007

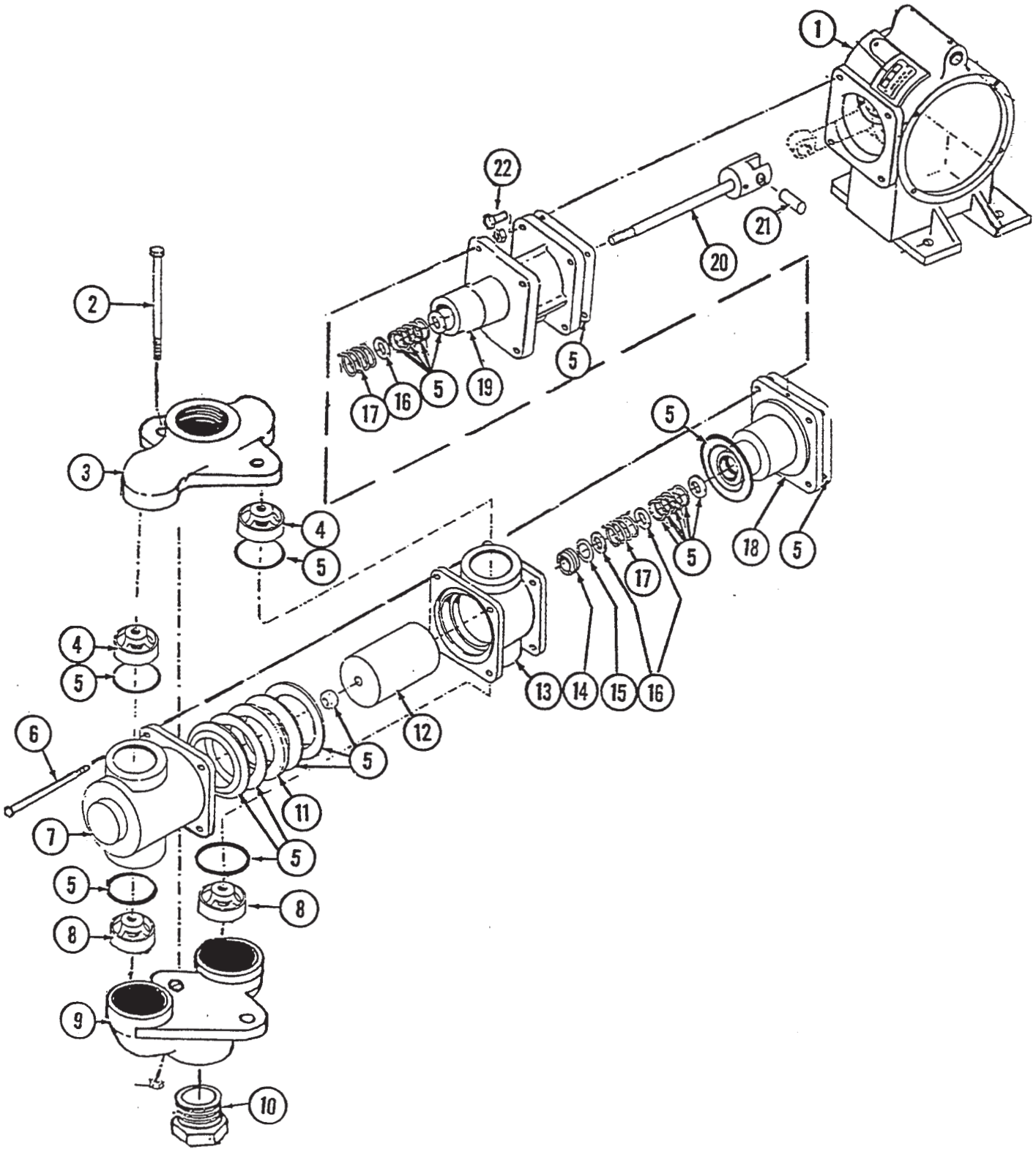


LIQUID FERTILIZER PISTON PUMP (Crankcase Assembly)

ITEM	PART NO.	DESCRIPTION
1.		See "Liquid Fertilizer Piston Pump Drive"
2.	10688	Hex Socket Head Set Screw, 3/8"-16 x 5/8"
3.	R1147	Spacer
4.	10019	Hex Bolt, 5/16"-18 x 1"
5.	R1102	Housing
6.	R1173	Repair Kit, Also Includes Items 5 On "Liquid Fertilizer Piston Pump (Cylinder Assembly)" Pages
7.	R1104	Bearing
8.	R1105	Name Plate
9.	10054	Hex Bolt, 5/16"-18 x 1/2"
10.	R1106	Crankcase
11.	R1107	Vent Plug
12.		See "Liquid Fertilizer Piston Pump (Cylinder Assembly)"
13.		See "Liquid Fertilizer Piston Pump (Cylinder Assembly)"
14.	R1123	Plug
15.	R1108	Disc
16.	R1109	Connecting Rod
17.	R1110	Large Eccentric
18.	R1111	Small Eccentric
19.	R1120	Eccentric Pin
20.	R1119	Sleeve
21.	R1118	Setting Arm Key
22.	R1112	Woodruff Key
23.	R1148	Crankshaft
24.	R1116	Bearing
25.	R1166	Cover Plate
26.	R1167	Square Head Bolt, 3/8"-16 x 1 3/4"
27.	R1168	Scale
28.	10108	Lock Nut, 3/8"-16
29.	R1114	Flange
30.	10318	Hex Head Cap Screw, 5/8"-11 x 4 1/2"
	10104	Hex Nut, 5/8"-11
31.	R1165	Arm
32.	10693	Hex Socket Head Set Screw, 5/16"-18 x 3/8"
33.		See "Liquid Fertilizer Piston Pump Drive"
34.	R1100	Adjustment Wrench
A.	A6154	Piston Pump Complete, Includes Crankcase (Items 2-34) and Cylinder (Items 1-22) Assemblies

LIQUID FERTILIZER PISTON PUMP (Cylinder Assembly)

JB-L4400-991/SKH007

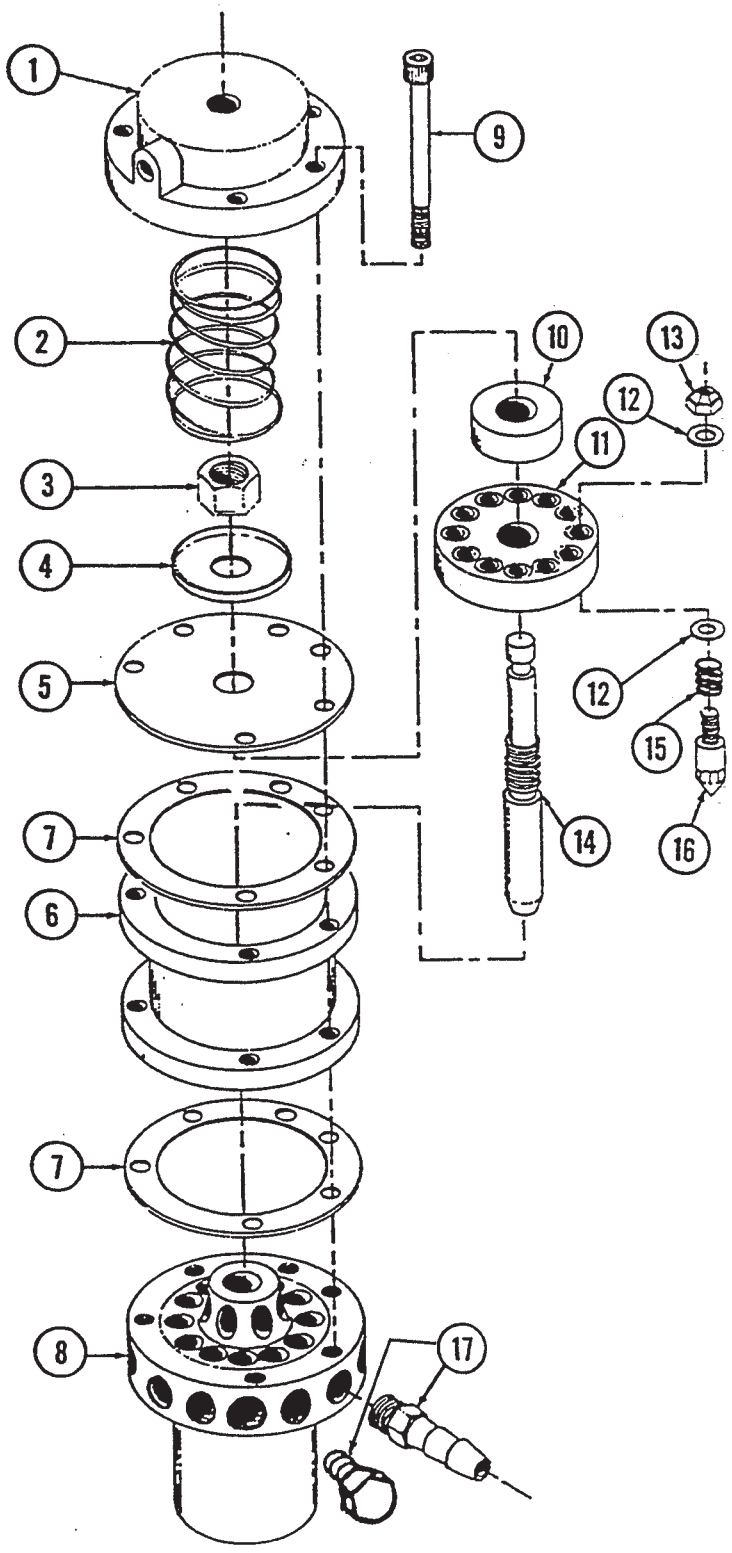


LIQUID FERTILIZER PISTON PUMP (Cylinder Assembly)

ITEM	PART NO.	DESCRIPTION
1.		See "Liquid Fertilizer Piston Pump (Crankcase Assembly)"
2.	10686	Hex Head Cap Screw, 3/8"-16 x 8"
	10101	Hex Nut, 3/8"-16
3.	R1145	Discharge Manifold
4.	R1144	Discharge Valve
5.	R1173	Repair Kit, Also Includes Items 6 On "Liquid Fertilizer Piston Pump (Crankcase Assembly)" Pages
6.	10687	Hex Head Cap Screw, 3/8"-16 x 5 1/2"
	10101	Hex Nut, 3/8"-16
7.	R1143	Outboard Cylinder
8.	R1142	Suction Valve
9.	R1140	Suction Manifold
10.		See "Liquid Fertilizer Piston Pump Drive"
11.	R1137	Flange Packing Washer
12.	R1136	Plunger
13.	R1135	Inboard Cylinder
14.	R1134	Stuffing Box Insert
15.	R1133	Retaining Ring
16.	R1129	Washer
17.	R1130	Packing Spring
18.	R1132	Outboard Stuffing Box
19.	R1127	Crosshead Guide
20.	R1125	Piston Rod
21.	R1124	Pin
22.	10019	Hex Head Cap Screw, 5/16"-18 x 1"

LIQUID FERTILIZER PISTON PUMP FLOW DIVIDER

JB-L2190-991



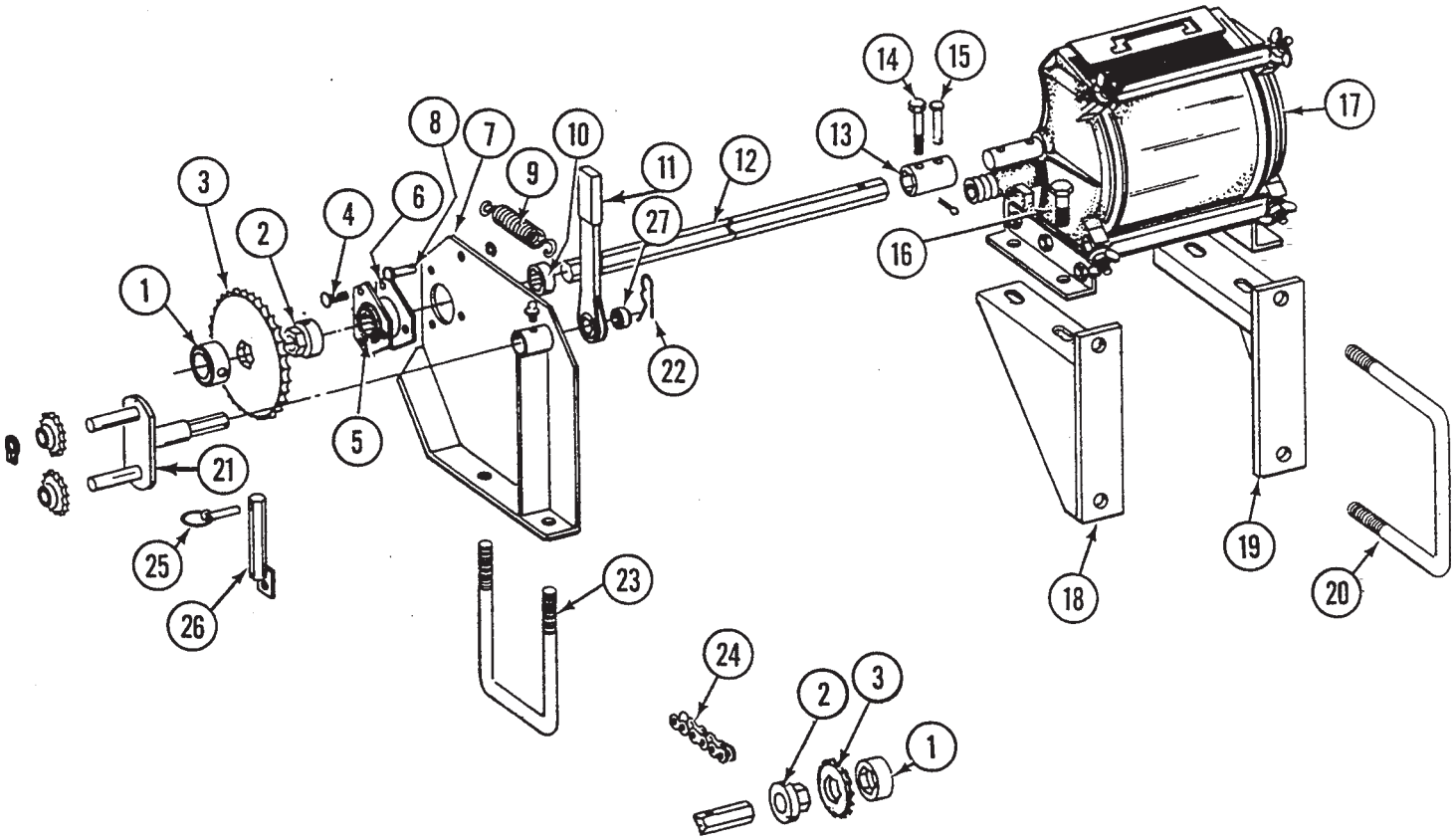
LIQUID FERTILIZER PISTON PUMP FLOW DIVIDER

ITEM	PART NO.	DESCRIPTION
1.	R1150	Cap
2.	R1151	Spring
3.	10358	Hex Nut, 9/16"-18
4.	R1152	Plate
5.	R1153	Diaphram
6.	R1154	Housing
7.	R1155	Gasket
8.	*	Manifold
9.	R1157	Socket Screw, 1/4"
10.	R1158	Lock
11.	*	Disk
12.	*	Stainless Steel Washer
13.	*	Valve Nut
14.	R1162	Plunger
15.	*	Spring
16.	*	Valve
17.		See "Liquid Fertilizer Piston Pump Drive"
A.	A6158	Liquid Fertilizer Piston Pump Flow Divider Complete

* **Factory calibration required. Replacement not recommended. Always be sure timing marks on disk and manifold line up.**

LIQUID FERTILIZER SQUEEZE PUMP DRIVE

LFC022



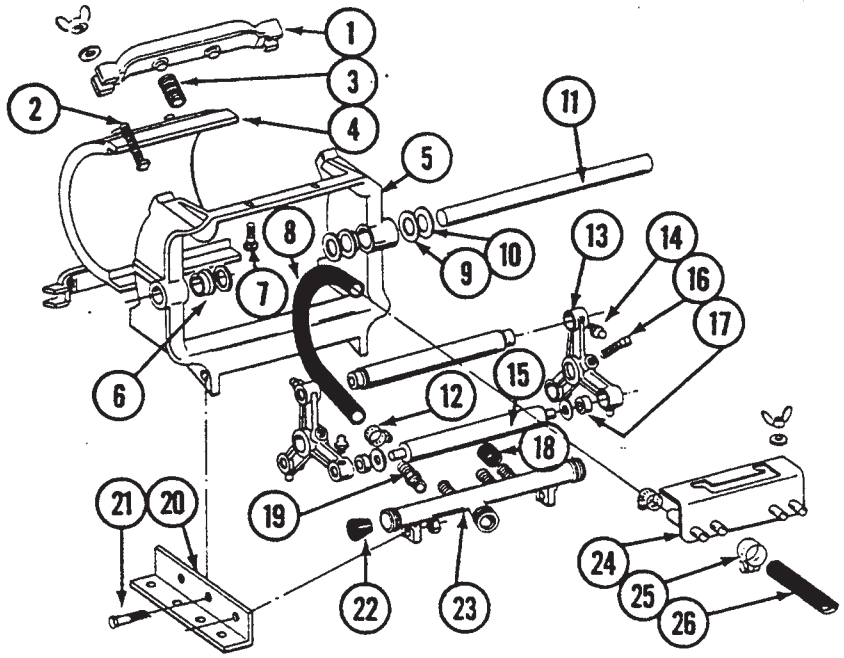
ITEM	PART NO.	DESCRIPTION
1.	A2355	Lock Collar With Set Screws
	10120	Set Screw, 3/8"-16 x 1/2"
2.	A2354	Adapter With Set Screws
	10120	Set Screw, 3/8"-16 x 1/2"
3.	2500-70	Sprocket, 16 Tooth
	2500-71	Sprocket, 18 Tooth
	2500-72	Sprocket, 20 Tooth
	2500-73	Sprocket, 30 Tooth
	2500-74	Sprocket, 44 Tooth
	2500-75	Sprocket, 46 Tooth
	2500-76	Sprocket, 52 Tooth
	2500-78	Sprocket, 62 Tooth
	2500-77	Sprocket, 60 Tooth (Optional)

LIQUID FERTILIZER SQUEEZE PUMP DRIVE

ITEM	PART NO.	DESCRIPTION
4.	10303	Carriage Bolt, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
5.	2100-03	Bearing, 7/8" Hex
6.	3400-01	Flangette
7.	A4617	Drive Plate With Grease Fitting, L.H.
	A4618	Drive Plate With Grease Fitting, R.H.
	10641	Grease Fitting, 1/8" NPT
8.	10478	Clevis Pin, 5/16" x 1"
	10409	Retaining Ring, 5/16"
9.	D5857	Spring
10.	D0917	Lock Collar, Less Set Screws
	10145	Set Screw, 5/16"-18 x 1/2"
11.	A4235	Ratchet Wrench With Protective Closure
	10445	Protective Closure
12.	D2548-48	Shaft, 7/8" x 48", 8 Row 30/36/38 (Trim Excess) And 12 Row 30
	D2548-72	Shaft, 7/8" x 72", 12 Row 36/38
	D2548-70	Shaft, 7/8" x 70", 16 Row 30
13.	D6924	Coupler
14.	10339	Hex Head Cap Screw, 5/16"-18 x 2"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
15.	10558	Clevis Pin, 5/16" x 1 3/4"
	10467	Cotter Pin, 5/32" x 3/4"
16.	10004	Hex Head Cap Screw, 3/8"-14 x 1 1/4"
	10210	Washer, 3/8" USS
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/4"-14
17.		See "Liquid Fertilizer Squeeze Pump"
18.	A4619	Pump Mount, L.H.
19.	A4620	Pump Mount, R.H.
20.	D1113	U-Bolt, 5" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
21.	A5136	Idler With Sprockets And Rings
	D7426	Sprocket
	10435	Ring
22.	10670	Hair Pin Clip, No. 3
23.	D1134	U-Bolt, 7" x 5" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
24.	3310-176	Chain, No. 40, 176 Pitch Including Connector Link
	R0912	Connector Link, No. 40
25.	D2558	Lynch Pin, 1/4"
26.	A5251	Storage Rod
27.	D6819	Sleeve
A.	6999X	Sprocket And Adapter Package, Includes: (4)10145, (2)2500-70, (2)2500-71, (2)2500-72, (2)2500-73, (2)2500-74, (2)2500-75, (2)2500-76, (2)2500-78, (4)A2354, (4)A2355, (2)D0917

LIQUID FERTILIZER SQUEEZE PUMP 8 ROW MODELS

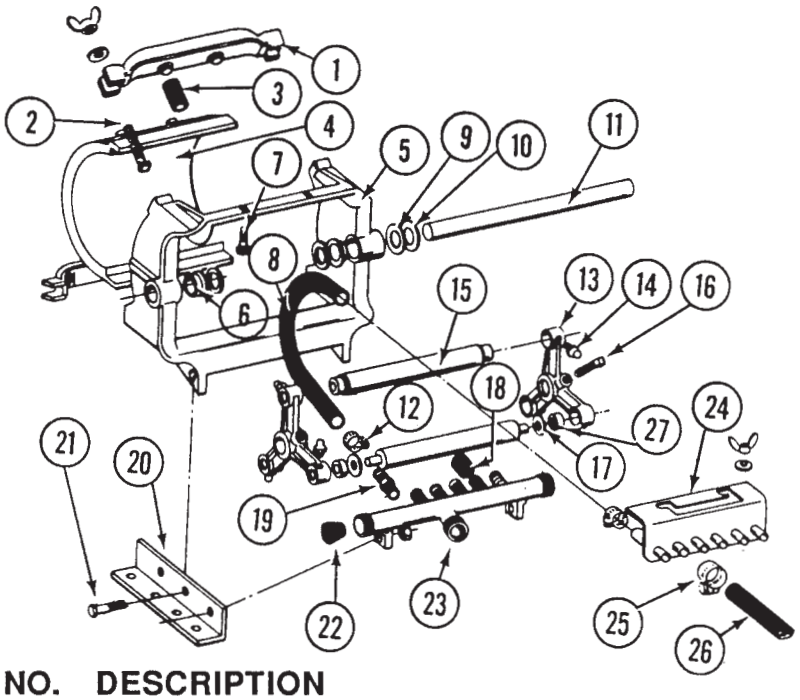
LFC011



ITEM	PART NO.	DESCRIPTION
1.	R0216	Spring Anchor Bar
2.	10130	Square Head Machine Bolt, 5/16"-18 x 1 3/4"
	10219	Washer, 5/16" USS
	10144	Wing Nut, 5/16"-18
3.	R0214	Spring
4.	R0212	Plate
5.	R0208	Frame
6.	R0207	Nylon Bushing
7.	10303	Carriage Bolt, 5/16"-18 x 1"
	10219	Washer, 5/16" USS
	10144	Wing Nut, 5/16"-18
8.	R0215	Metering Hose, 1/2" x 13"
9.	R0225	Shim, 1/32"
10.	R0226	Shim, 3/64"
11.	R0210	Shaft
12.	10681	Clamp, No. 6
13.	R0223	Roller Arm
14.	10640	Grease Fitting, 1/4"-28
15.	R0209	Roller
16.	10131	Set Screw, 5/16"-18 x 3/4"
17.	R0227	Nylon Bushing
18.	R0211	Rubber Cap
19.	R0232	Adapter
20.	R0213	Angle
21.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10101	Hex Nut, 3/8"-16
22.	R0217	Manifold Plug
23.	R0228	Intake Manifold
24.	R0224	Discharge Manifold
25.	10673	Clamp, No. 8
26.	4300-10	Hose, 1/2" x 60'
A.	A0321	Squeeze Pump Complete, 4 Rows (Items 1-24)

LIQUID FERTILIZER SQUEEZE PUMP 12 ROW MODELS

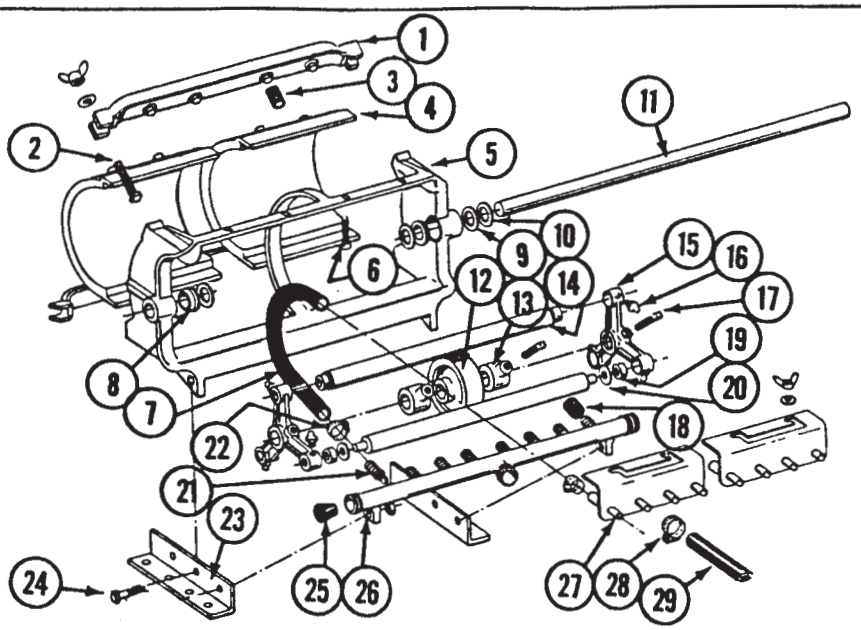
LFC011



ITEM	PART NO.	DESCRIPTION
1.	R0216	Spring Anchor Bar
2.	10130	Square Head Machine Bolt, 5/16"-18 x 1 3/4"
	10219	Washer, 5/16" USS
	10144	Wing Nut, 5/16"-18
3.	R0214	Spring
4.	R0212	Plate
5.	R0208	Frame
6.	R0207	Nylon Bushing
7.	10303	Carriage Bolt, 5/16"-18 x 1"
	10219	Washer, 5/16" USS
	10144	Wing Nut, 5/16"-18
8.	R0215	Metering Hose, 1/2" x 13"
9.	R0225	Shim, 1/32"
10.	R0226	Shim, 3/64"
11.	R0210	Shaft
12.	10681	Clamp, No. 6
13.	R0231	Roller Arm
14.	10640	Grease Fitting, 1/4"-28
15.	R0233	Roller
16.	10131	Set Screw, 5/16"-18 x 3/4"
17.	R0229	Nylon Bushing
18.	R0211	Rubber Cap
19.	R0232	Adapter
20.	R0213	Angle
21.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10101	Hex Nut, 3/8"-16
22.	R0217	Manifold Plug
23.	R0228	Intake Manifold
24.	R0224	Discharge Manifold
25.	10673	Clamp, No. 8
26.	4300-12	Hose, 1/2" x 90', 12 Row 30
	4300-05	Hose, 1/2" x 100', 12 Row 36/38
27.	R0230	Roller Bearing
A.	A0322	Squeeze Pump Complete, 6 Rows (Items 1-24 And 27)

LIQUID FERTILIZER SQUEEZE PUMP 16 ROW MODEL

LFC010



ITEM	PART NO.	DESCRIPTION
1.	R0221	Spring Anchor Bar
2.	10130	Square Head Machine Bolt, 5/16"-18 x 1 3/4"
	10219	Washer, 5/16" USS
	10144	Wing Nut, 5/16"-18
3.	R0214	Spring
4.	R0212	Plate
5.	R0222	Frame
6.	10303	Round Head Machine Bolt, 5/16"-18 x 1"
	10219	Washer, 5/16" USS
	10144	Wing Nut, 5/16"-18
7.	R0215	Metering Hose, 1/2" x 13"
8.	R0207	Nylon Bushing
9.	R0225	Shim, 1/32"
10.	R0226	Shim, 3/64"
11.	R0220	Shaft
12.	R0281	Back Up Roller
13.	R0282	Set Collar
14.	R0283	Roller
15.	R0231	Roller Arm
16.	10640	Grease Fitting, 1/4"-28
17.	10131	Set Screw, 5/16"-18 x 3/4"
18.	R0211	Rubber Cap
19.	R0230	Bearing
20.	R0229	Nylon Washer
21.	R0232	Adapter
22.	10681	Clamp, No. 6
23.	R0279	Angle, Left.
	R0280	Angle, Right
24.	10004	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	10101	Hex Nut, 3/8"-16
25.	R0217	Manifold Plug
26.	R0284	Intake Manifold
27	R0236	Discharge Manifold
28.	10673	Clamp, No. 8
29.	4300-05	Hose, 1/2" x 100'
A.	A0323	Squeeze Pump Complete, 8 Rows (Items 1 - 27)

SMV, DECALS, REFLECTORS AND TIE STRAPS

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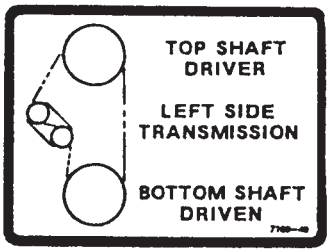

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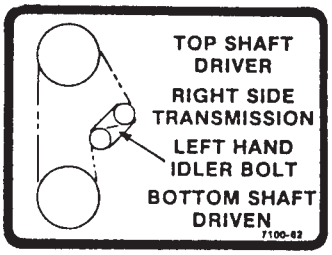

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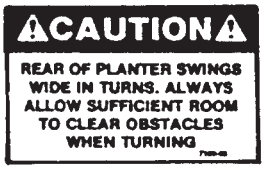

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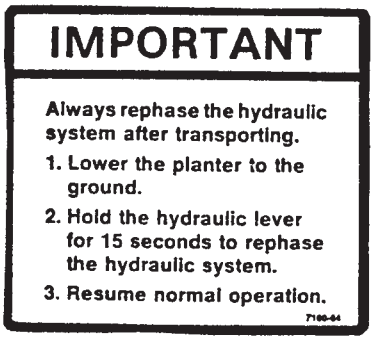

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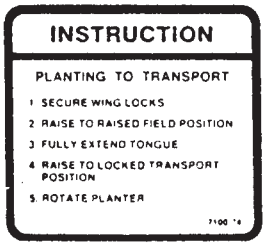

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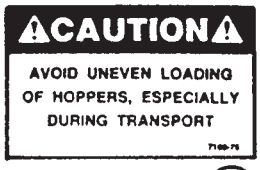

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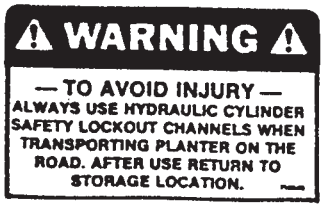

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SMV, DECALS, REFLECTORS AND TIE STRAPS

⚠ 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

16

⚠ DANGER

- ROTATING AUGER -
KEEP CLOTHING, YOURSELF AND OTHERS WELL CLEAR WHEN OPERATING

7100-183

17

Weekly

18

Weekly

19

⚠ CAUTION ⚠

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

7100-116

20

DAILY

21

⚠ DANGER

SERIOUS INJURY OR DEATH CAN RESULT FROM CONTACT WITH ELECTRIC LINES. USE CARE TO AVOID CONTACT WITH ELECTRIC LINES WHEN MOVING OR OPERATING THIS MACHINE.

7100-127

22

ATTENTION

Connect directly to
BATTERY
wherever possible

Connect black lead to negative terminal

Connect to 12 Volts Only

7100-128

23

DANGER

DANGER: The two outer transport wheels are bolt-on to allow legal width truck shipment. Install outer transport wheel assemblies prior to unloading. DO NOT REMOVE THESE ASSEMBLIES AFTER PLANTER IS ASSEMBLED FOR USE. DO NOT field planter or tow planter while the two outer transport wheels are removed. Tipping may occur because of narrow wheel base.

7100-129

24

25

USE 1 TABLESPOON POWDERED GRAPHITE WITH EACH HOPPER FILL OF SEED. SEED TREATMENT, FOREIGN MATERIAL, DIRT, OR SEED CHAFF MAY CAUSE GRADUAL REDUCTION OF SEED POPULATION. REFER TO MANUAL FOR MAINTENANCE AND CARE. 7100-153

26

USE 8 AMP TIME DELAY FUSE ONLY
7100-155

27

2300

28

MARKER SPEED CONTROL

RAISE — SEE MANUAL FOR PROPER ADJUSTMENT — LOWER

7100-166

29

⚠ WARNING ⚠

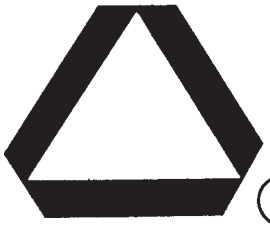
ALWAYS INSTALL HYDRAULIC CYLINDER LOCKOUT CHANNELS ON MARKER CYLINDERS BEFORE OPERATING THIS CROSS-FILL AUGER

7100-163

30

31

SMV, DECALS, REFLECTORS AND TIE STRAPS



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ITEM	PART NO.	DESCRIPTION
1.	7100-02	Decal, Warning
2.	7100-42	Decal, Warning
3.	7100-46	Decal, Caution
4.	7100-49	Decal, Left Side Transmission
5.	7100-54	Decal, KINZE, 4 3/16" x 17 3/16"
	7100-104	Decal, KINZE, 3" x 12"
6.	7100-56	Decal, Caution
7.	7100-62	Decal, Right Side Transmission
8.	7100-63	Decal, Caution
9.	7100-64	Decal, Important
10.	7100-68	Decal, Warning
11.	7100-73	Decal, Transport To Planting
12.	7100-74	Decal, Planting To Transport
13.	7100-75	Decal, Caution
14.	7100-83	Decal, Warning
15.	7100-89	Decal, Danger
16.	7100-90	Decal, Warning
17.	7100-103	Decal, Danger
18.	7100-110	Decal, Grease Weekly
19.	7100-111	Decal, Oil Daily
20.	7100-115	Decal, Caution
21.	7100-116	Decal, Grease Daily
22.	7100-117	Decal, Danger
23.	7100-123	Decal, Attention
24.	7100-129	Decal, Danger
25.	7100-144	Decal, Logo
26.	7100-153	Decal, Information
27.	7100-155	Decal, Instruction
28.	7100-159	Decal, 2300
29.	7100-160	Decal, Information
30.	7100-163	Decal, Warning
31.	7200-03	Reflector, Red
	7200-04	Reflector, Amber
32.	D2199	SMV Sign
33.	D1512	Tie Strap, 7"
	D2117	Tie Strap, 14 1/2"
	D1162	Tie Strap, 28"
	D2984	Tie Strap, 33"
34.	D7638-01	LineLoc, Red
	D7638-02	LineLoc, Blue
	D7638-03	LineLoc, Green
35.	7100-177	Decal, Twin-Line®, 3/4" x 3"
36.	7100-182	Decal, Meter Alignment
37.	R0146	Seed Flow Lube, 1 Pound Can (Not Shown)
38.	R0155	Blue Paint, Aerosol (Not Shown)
	R0439	Blue Paint, Quart
	R0440	Blue Paint, Gallon

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