TWIN-LINE II PLANTER

OPERATOR & PARTS MANUAL

M0137 **Reprint 7/98**

This manual is applicable to: Twin-Line II Planter
Model Number TL
Serial Number 31001 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 for oil leaks, proper hydraulic operation and proper chain alignment.

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

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

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

❑ Check to be sure SMV sign is in place.

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

❑ Paint all parts scratched in shipment.

❑ 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 _____

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 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.

This manual is applicable to: Twin-Line II Planter
Model Number TL
Serial Number 31001 and on

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

Model Number_____

Serial Number_____

Date Purchased_____

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.

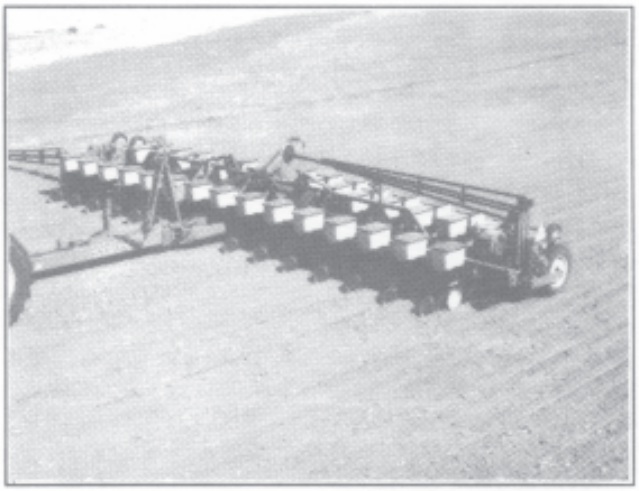
If service or replacement of failed parts which are covered by the Limited Warranty are required, it is the user's responsibility to deliver the machine along with the retail purchaser's copy of the Warranty And Delivery Report to the KINZE Dealer for service. Kinze warranty does not include cost of 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 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.

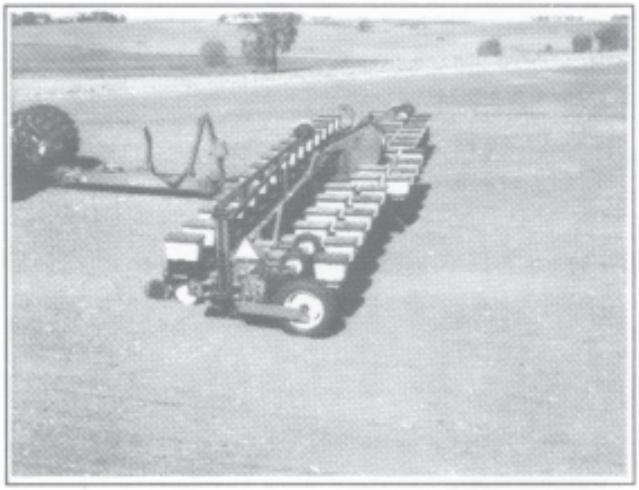
The Twin-Line planter permits installation of liquid or dry fertilizer application equipment and 1" no-till coulters.



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 reserves the right to change specifications or design without notice and without incurring obligation to install the same on machines previously manufactured.

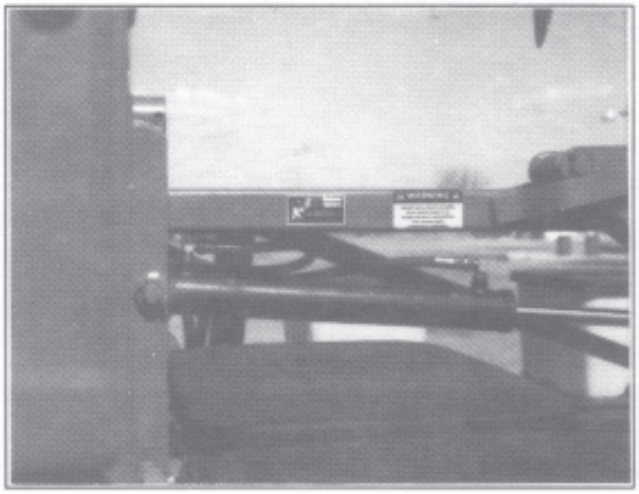
Right hand and left hand as used throughout this manual is determined by facing in the direction the machine will travel when in use unless otherwise stated.



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 in the space provided on page 1-1 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.



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" Rows	15 - 18" Rows
	8 Row Wide - 38" Rows	15 - 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 shaft and end mounted seed transmission.

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 - Two master per machine, one slave per wing wheel module (8 and 12 row/ one per wing, 16 row/two per wing).

MARKERS - Independently controlled

Dimensions/Operating

PLANTER SIZE	8 Row 30"	8 Row 36"	8 Row 38"	12 Row 30"	12 Row 36"	12 Row 38"	16 Row 30"
WIDTH	21' 2"	25' 2"	26' 6"	31' 2"	37' 2"	39' 2"	41' 2"
LENGTH* "Y" Hitch	18' 2"	19' 6"	19' 6"	21' 2"	25' 10"	25' 10"	26' 2"
LENGTH* Narrow "T" Hitch	16' 3"	17' 6"	17' 6"	19' 2"	23' 10"	23' 10"	NA

* With no-till coulters add 13 inches. Requires extension bracket for four center row units.

SPECIFICATIONS

Dimensions/Transport

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

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.

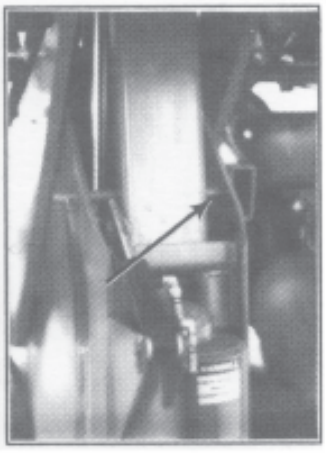
⚠ **Never allow the planter to be operated by anyone who is unfamiliar with the operation of all functions of the unit. All operators should read and thoroughly understand the instructions given in this manual prior to moving the unit.**

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

⚠ **Never ride on the planter frame 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.**

Tongue Safety Pin



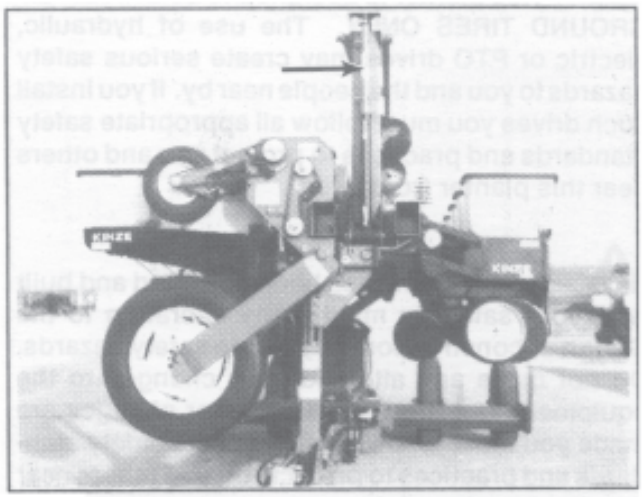
Manual Safety Lockup

⚠ **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 going to be transported for a long distance.**

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



⚠ **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.

SAFETY WARNING SIGNS ⚠

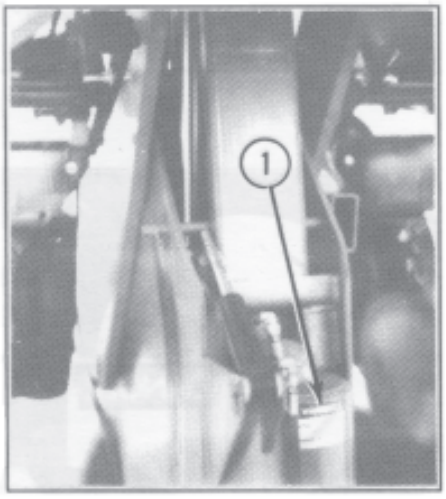
The "WARNING" signs illustrated on this page are placed on the machine to warn of hazards. The warnings found on these signs are for your personal safety and those around you. OBSERVE THESE WARNINGS!

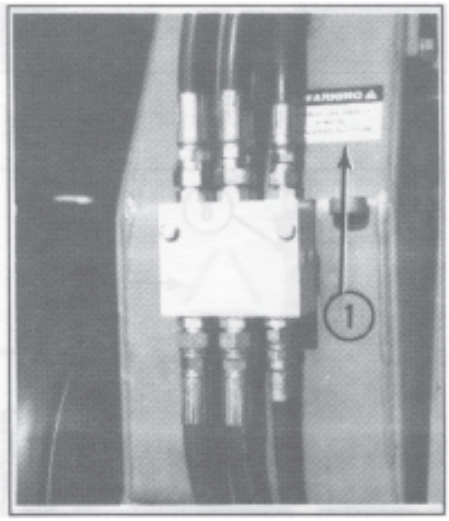
- **Keep these signs clean so they can be readily observed. Wash with soap and water or cleaning solution as required.**

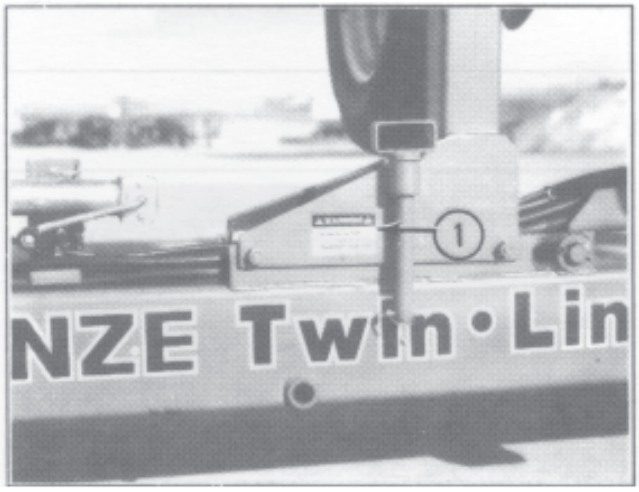
- **Replace "WARNING" signs should they become damaged, painted over or if they are missing.**

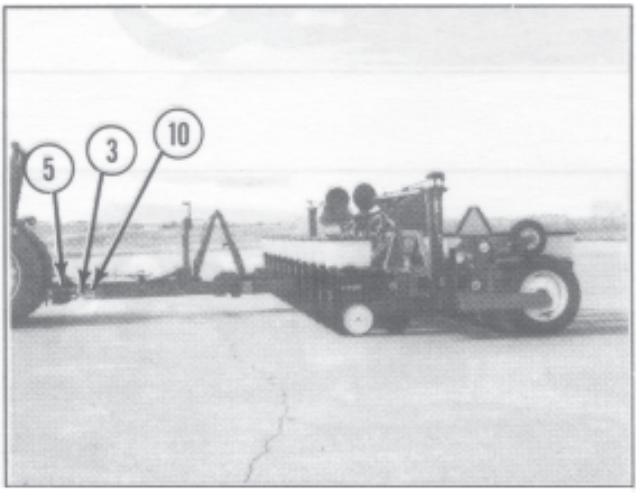
- **Check the SMV decal periodically. Replace if it shows loss of any of its reflective property.**

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

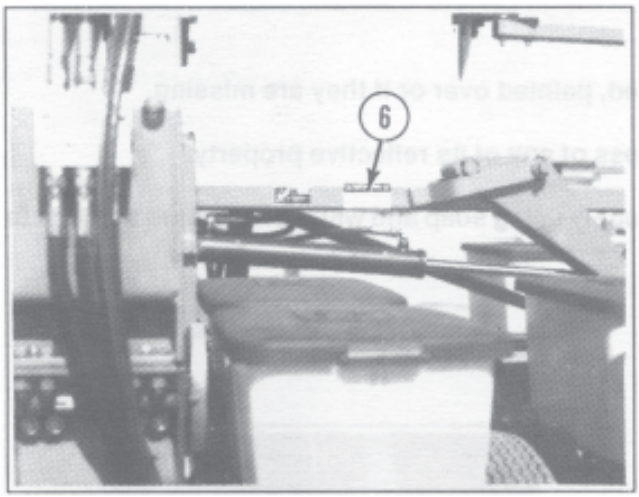


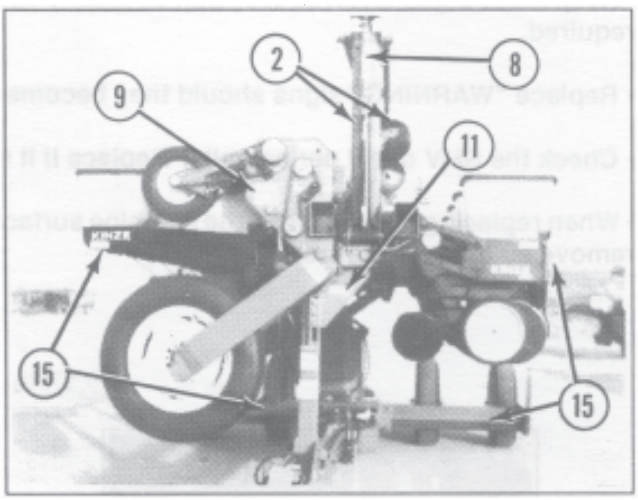


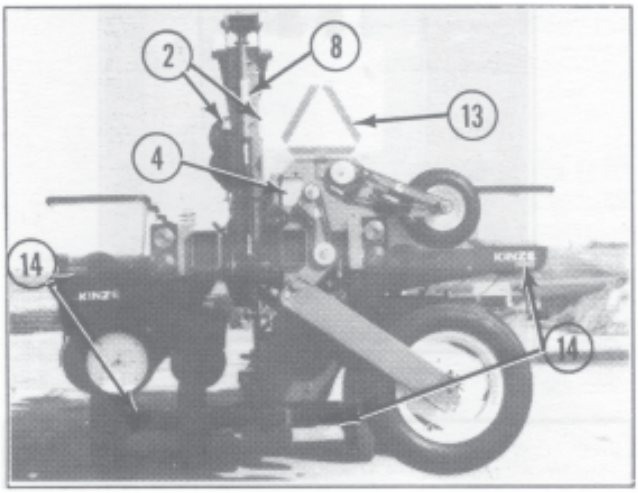


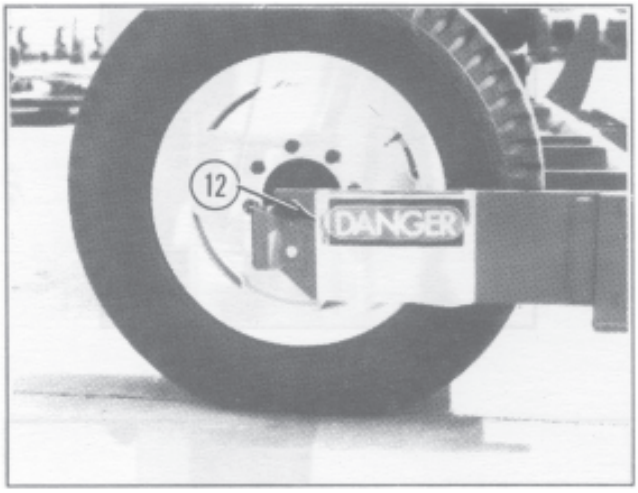


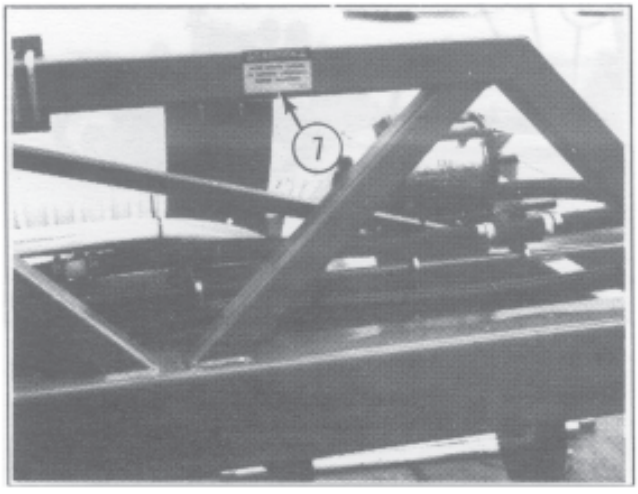
SAFETY WARNING SIGNS ⚠

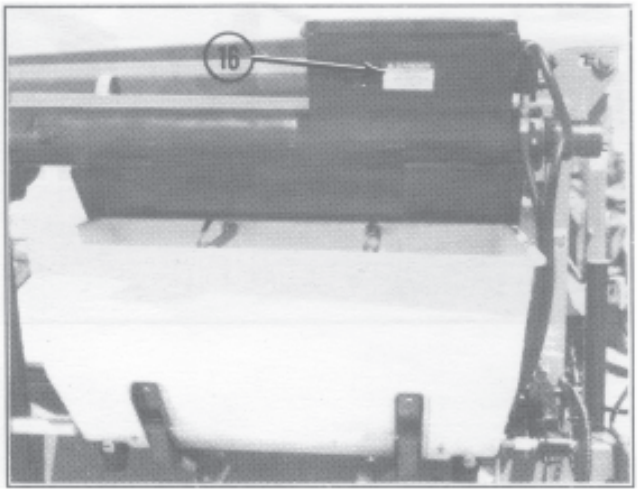










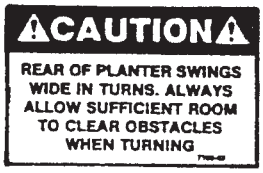


SAFETY WARNING SIGNS ⚠

1. Part No. 7100-02

2. Part No. 7100-42

3. Part No. 7100-56

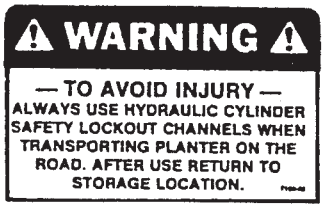


4. Part No. 7100-63

5. Part No. 7100-46

6. Part No. 7100-68

7. Part No. 7100-75

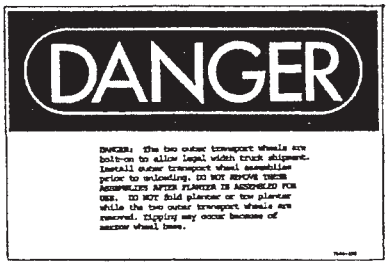


8. Part No. 7100-83

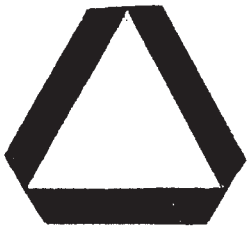
9. Part No. 7100-89

10. Part No. 7100-90

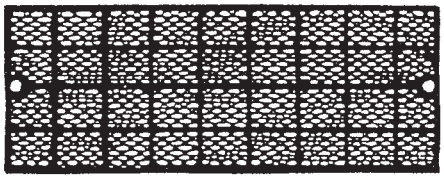
11. Part No. 7100-117



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

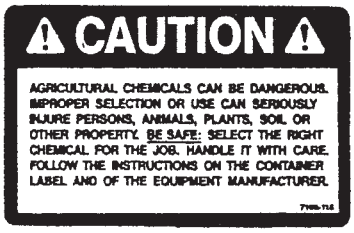


13. Part No. D2199
SMV Sign



14. Part No. 7200-03
Red Reflector (Qty. 4)
15. Part No. 7200-04
Amber Reflector (Qty. 2)

16. Part No. 7100-103



17. Part No. 7100-115
Located on under side of dry fertilizer quick fill hopper lid.

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

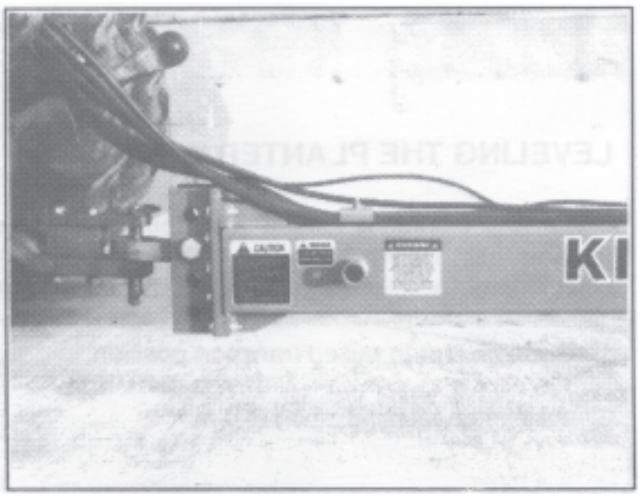
Lubricate the planter and row units per the lubrication information in this manual and the row unit operator's manual. Make sure all tires have been properly inflated. Check all drive chains for proper tension and lubrication.

DANGER: The outer transport wheels on wide row models are bolt-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 are required on all models. 12Vdc electrical system is required on all models.

TRACTOR PREPARATION AND HOOKUP



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 12Vdc 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.

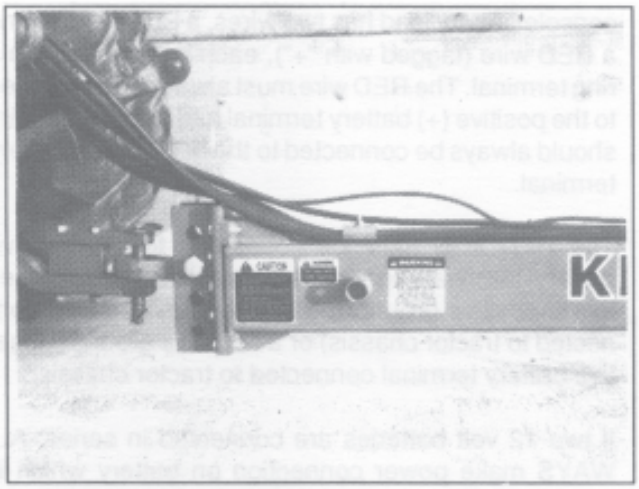
5. Ensure electrical control harness is securely connected.

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

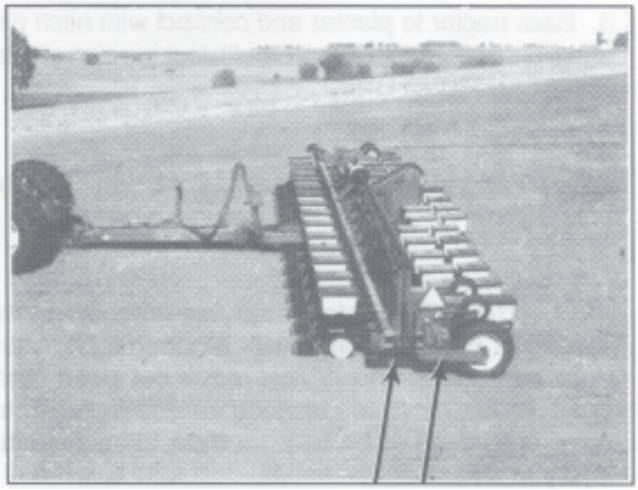
7. Lower planter to the planting position and check hitch for levelness. If hitch slopes up or down, disconnect planter and adjust hitch clevis up or down as necessary.

LEVELING THE PLANTER

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



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.

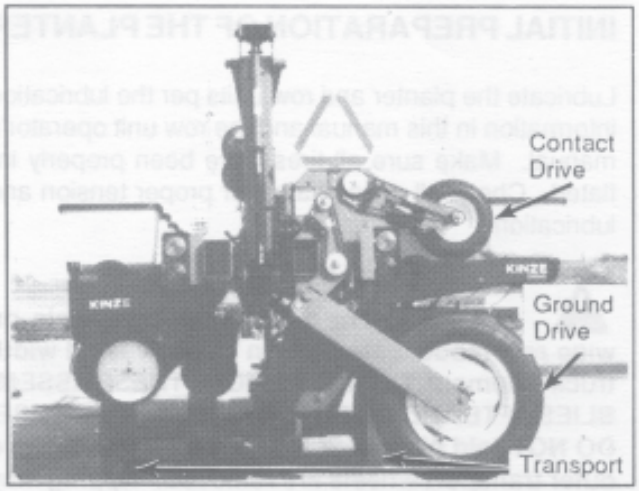


Always check fore and aft levelness with the planter lowered to proper operating depth. Recheck once planter is in the field.

In order to maintain lateral levelness, it is important that tire pressure 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



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

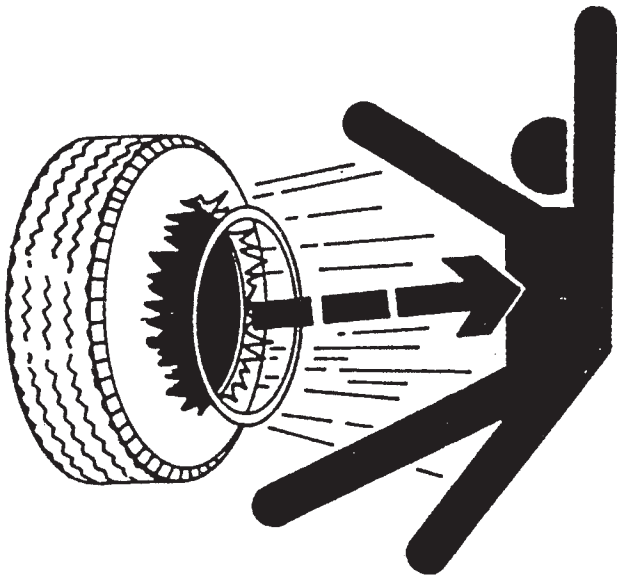
7.50 x 20, Transport (Center Section)	90 PSI
7.50 x 20, Ground Drive (Wings)	40 PSI
4.8 x 8, Contact Drive	50 PSI

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.



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

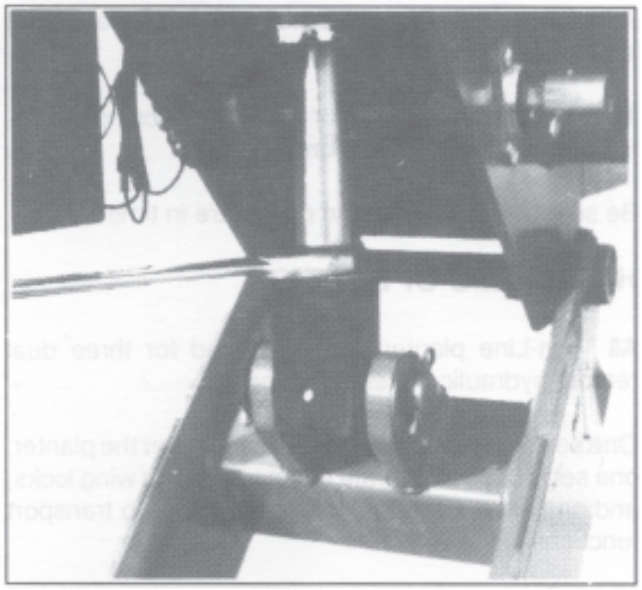
The multipiece rim used on the transport wheels on the 16 Row Twin-Line II Planter requires that specific procedures and safety instruction be followed in mounting and demounting of the tires.

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.



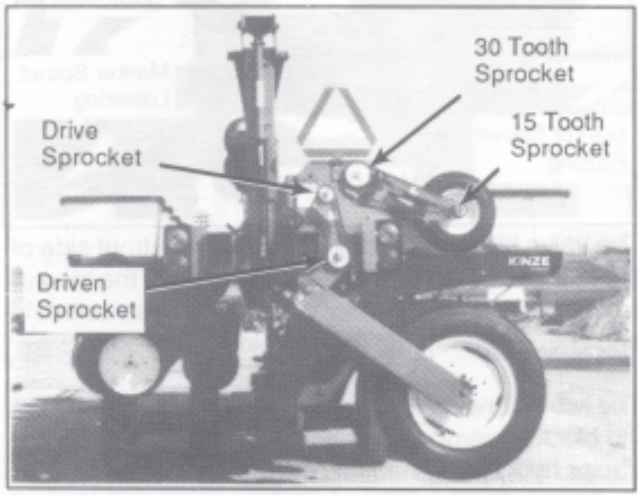
3. Using a 1 1/2" wrench on the cylinder rod, turn the rod to loosen the clevis enough to install the desired number of split washers. A supply of split washers can be found in the storage area on the wheel module.

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



The above photo shows the 2 to 1 drive reduction package installed.

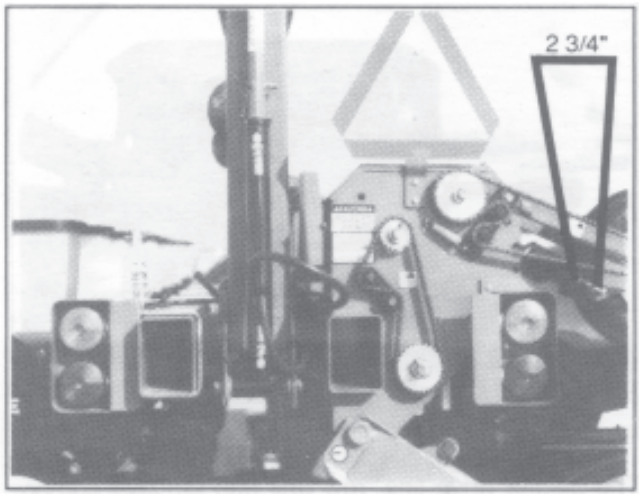
Planting population rate changes are made at each end of the planter. The planter is designed to allow simple, rapid changes in sprockets to obtain the desired planting population. By removing the lynch pins on the hexagon shafts, sprockets can be interchanged with those from the sprocket storage rod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

NOTE: The 2 to 1 drive reduction package 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.

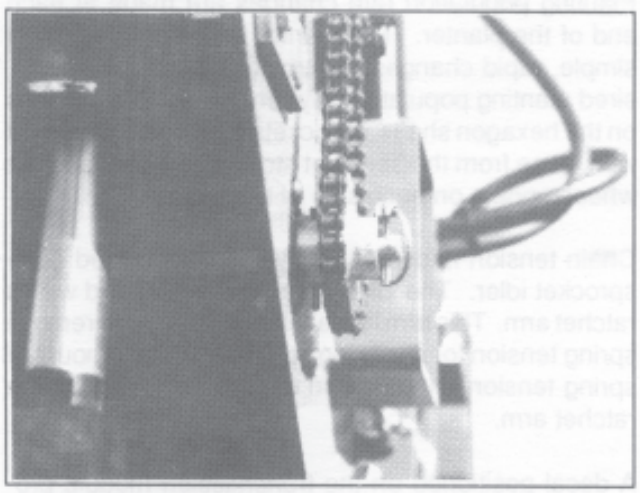
CONTACT DRIVE WHEEL SPRING ADJUSTMENT

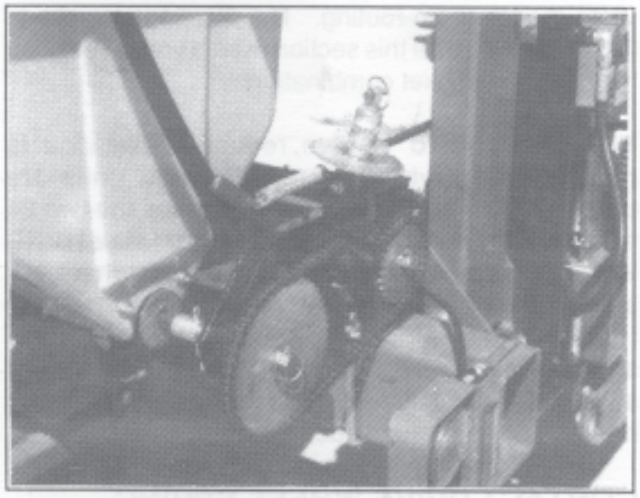


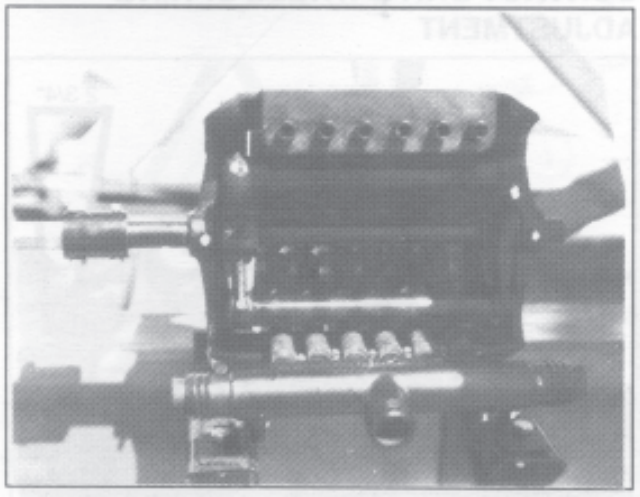
There are two down pressure springs on each contact drive wheel. The down pressure is factory preset and should need no further adjustment.

The spring tension is set leaving 2 3/4" 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, follow prescribed lubrication schedules.

Be sure universal joints on drives are in time.

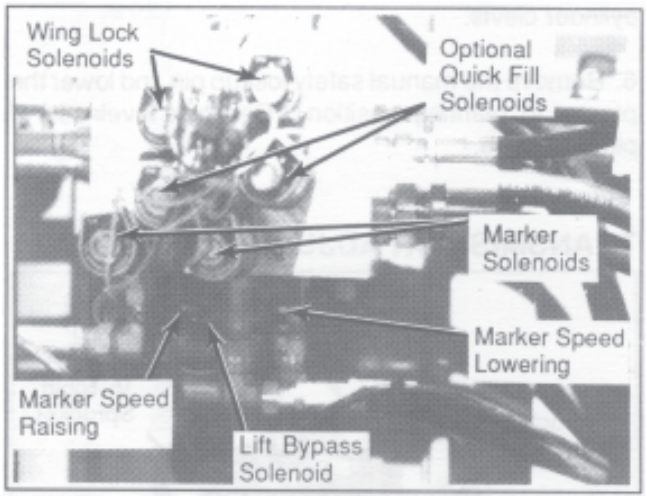
HYDRAULIC OPERATION

All Twin-Line planters are equipped for three dual remote hydraulic outlet operation.

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 to transport 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



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 coming up. The knob on the left side of the block will control the speed of the marker coming down.

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

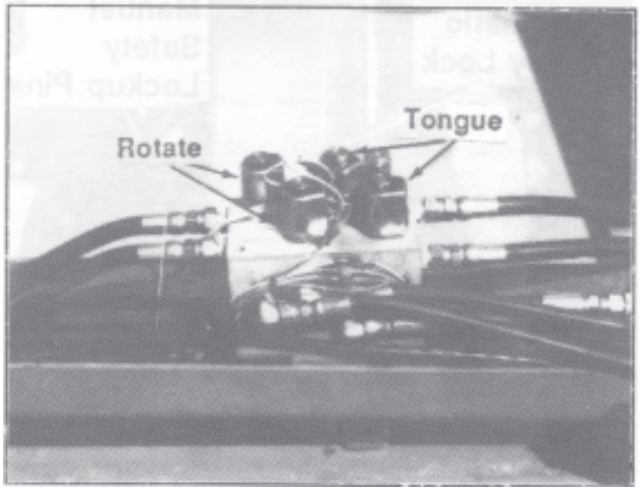
Screw the knobs all the way in and turn back out about 1 1/2 turns and check marker speed. Travel time should be approximately 6 seconds. To increase speed of the marker, turn the knob out. To decrease speed of the marker, turn the knob in. Temperature of the hydraulic oil will effect the marker speed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

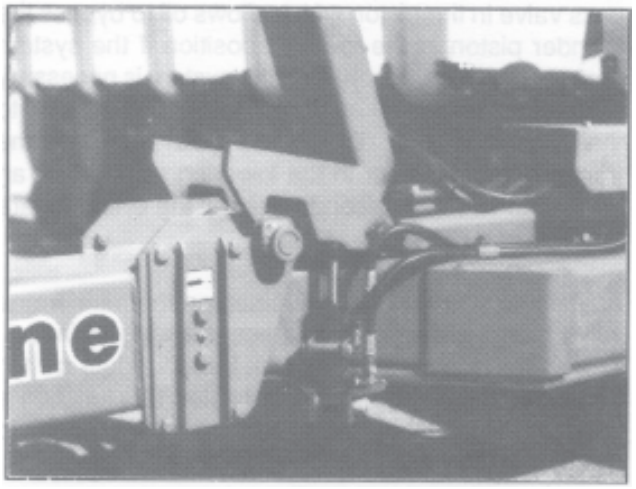
VALVE BLOCK LOCATED ON HITCH



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 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



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.

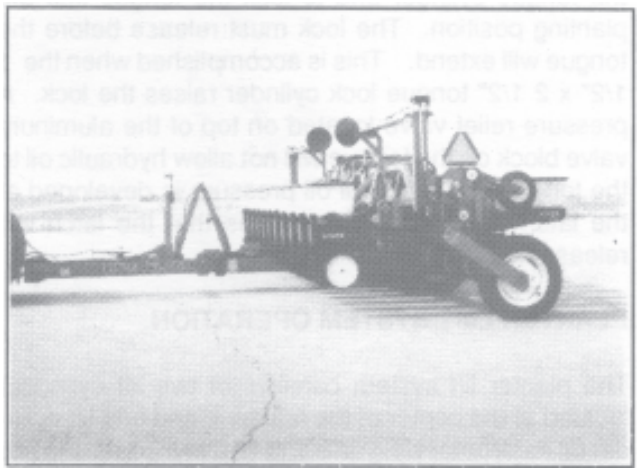
NOTE: On all 8 and 12 row models and the 16 row model, serial # 31200 and prior, the lift cylinders located at the center of the machine are referred to as the master cylinders and the lift cylinders located on each outer wing as the slave cylinders. On the 16 row model, serial # 31200 and on, the lift 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.

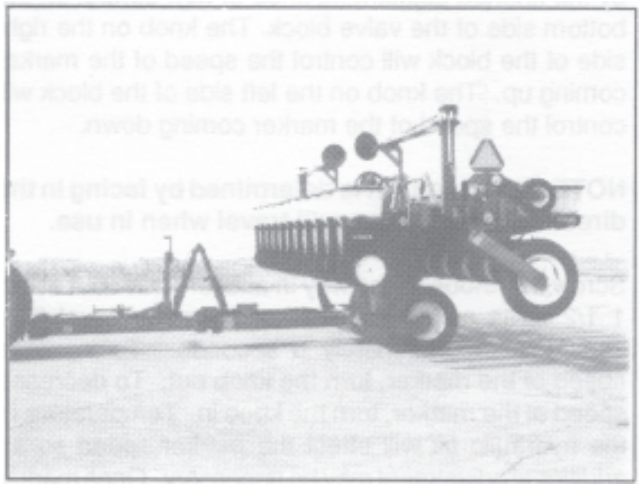
An electric solenoid valve, located on the main frame valve block, allows oil to bypass the wing cylinders. This valve is controlled by the "raise" toggle switch located on the planter control console. This function is used only when taking the planter from the raised field position to the raised transport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

Raised Field Position

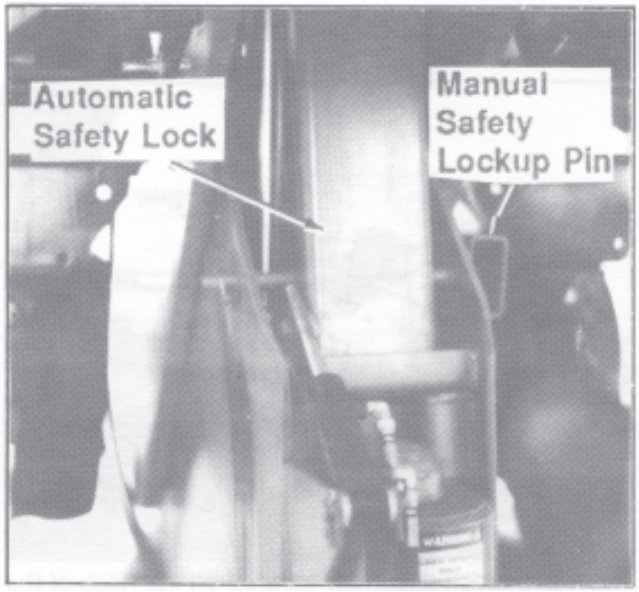


There are two raised positions on the planter. One is the raised field position which is when the planter wing cylinders are fully extended and the lift cylinders in the center are at half stroke, but because the bypass solenoid is not energized the wing cylinders can not bypass oil preventing the planter from raising any higher. This position will raise the row units approximately 20 inches off the ground. This position is used in making turns or passing over waterways during field operation.

Raised Transport Position

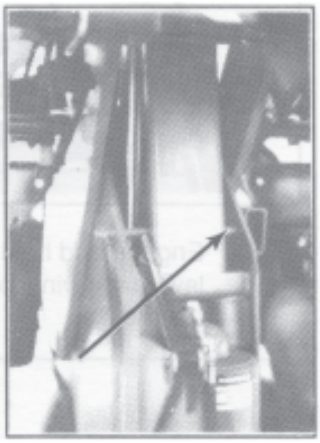


The other raised position is the raised transport position. In this position the planter must be raised high enough so the row units will clear the transport wheels when the planter is rotated. To do this the planter is first raised to raised field position and the wings locked in the rigid position. 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.



TRANSPORT TO PLANT OPERATION PROCEDURE

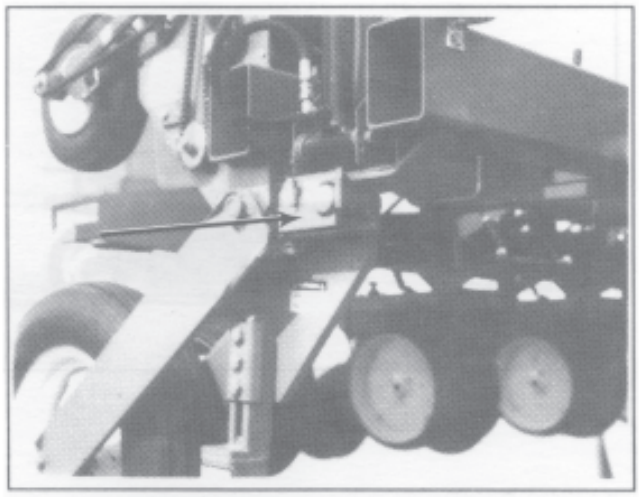
1. Remove safety pins in tongue and center frame. Store safety pins in storage positions provided.



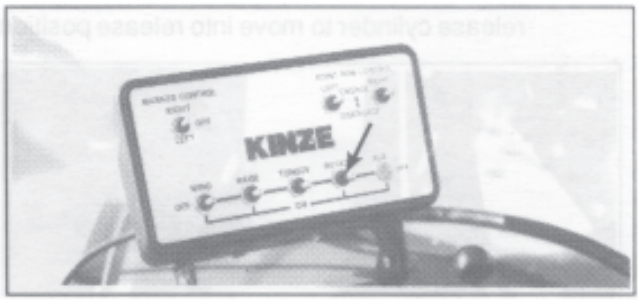
2. Release transport latch.
   A. Press "Tongue" switch and hold.

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

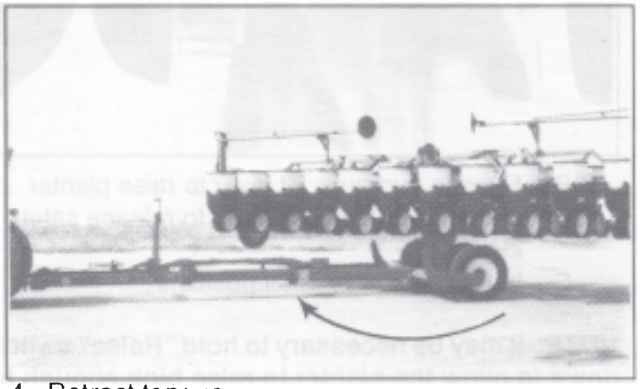
CAUTION: Retracting tongue too far at this point can cause the latch post on the tongue to strike attachments on the front tool bar.



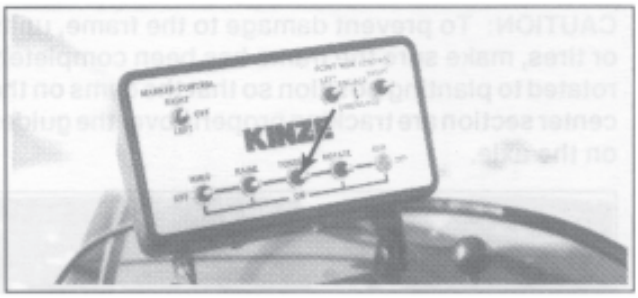
3. Rotate planter to field position.
   A. Press "Rotate" switch and hold.



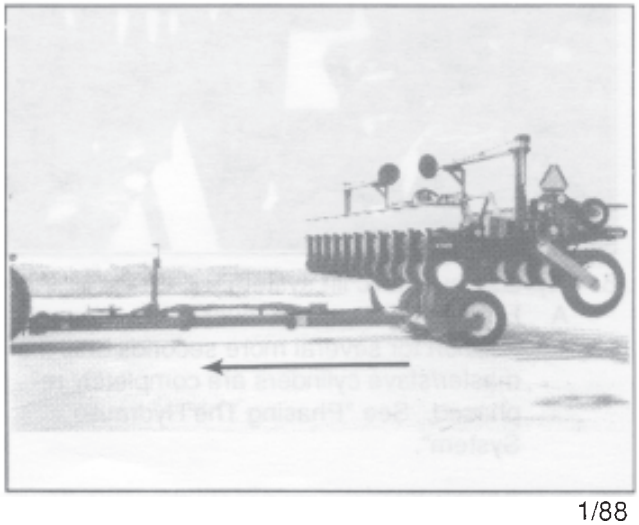
   B. Engage and hold hydraulic tongue/rotation lever until rotation cylinder is fully retracted.



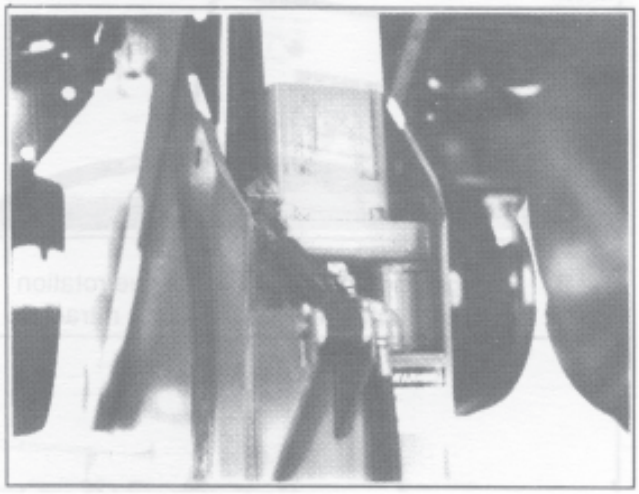
4. Retract tongue.
   A. Press "Tongue" switch and hold.



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



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.



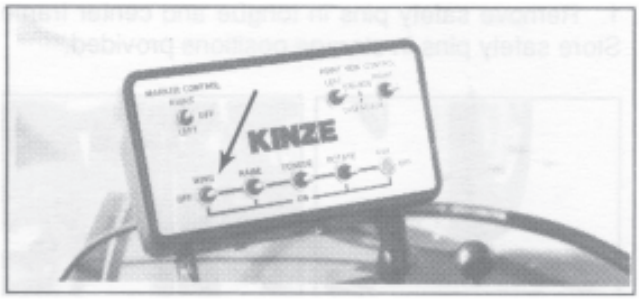
   B. Engage hydraulic lift lever to raise planter and allow release cylinder to release safety lock.
   C. Lower planter to plant position.

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

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.

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.

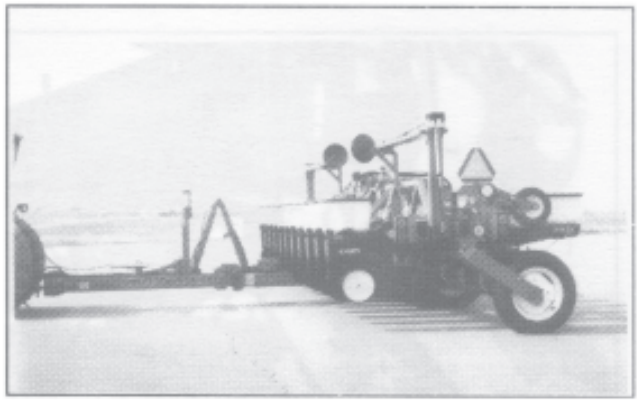


   B. Engage and hold hydraulic marker/wing lock lever until wing lock cylinders are fully retracted.

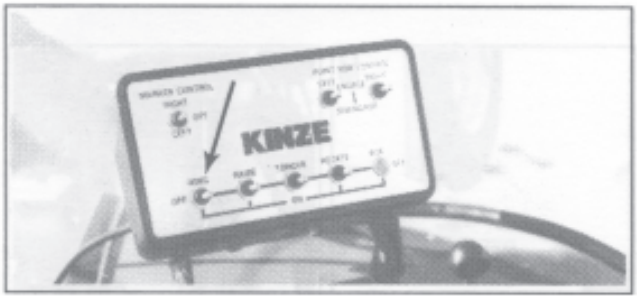
Unlocked For Planting

PLANT TO TRANSPORT OPERATION PROCEDURE

1. Raise planter to raised field position.



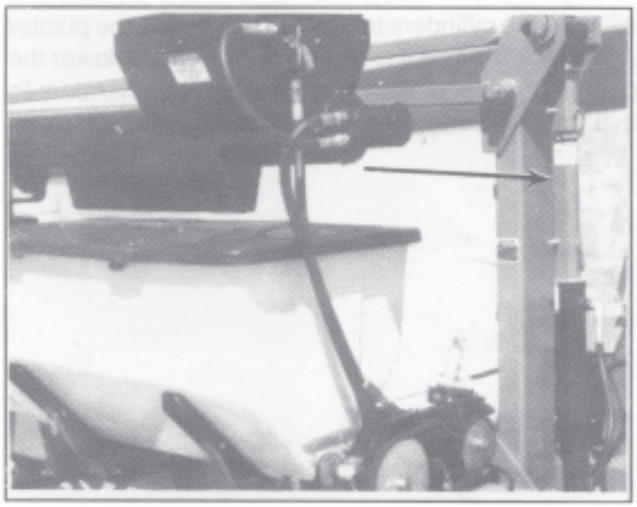
2. Lock wings in transport position.
   A. Press "Wing" switch down and hold.



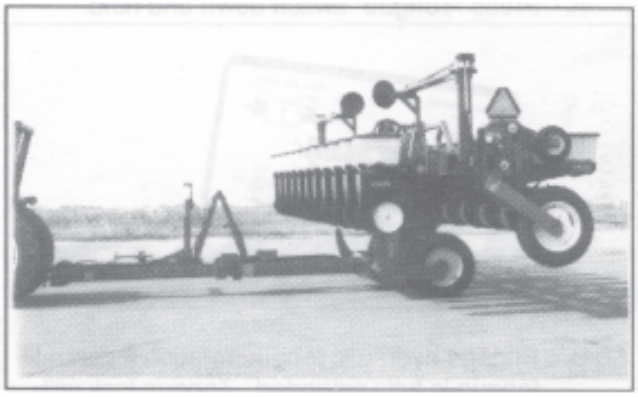
   B. Engage hydraulic marker/wing lock lever until wing lock cylinders are fully extended and wing locks are locked over center.

Locked For Transport

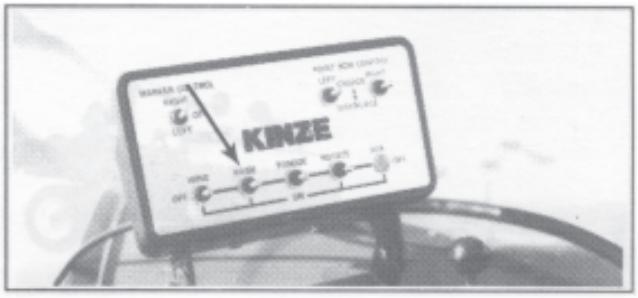
   C. Install marker lockups.



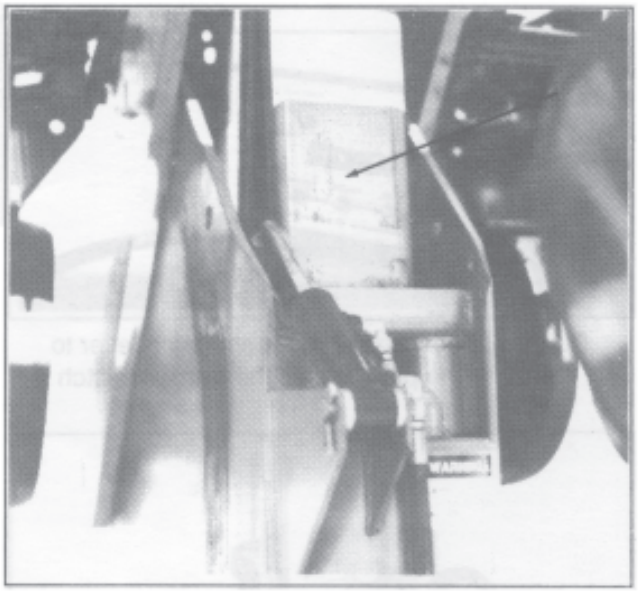
3. Raise planter to transport position.



   A. Press "Raise" switch down and hold.

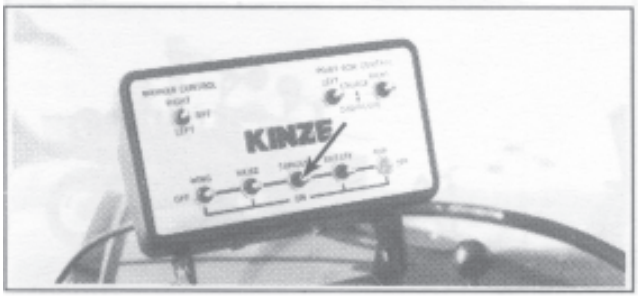


   B. Engage hydraulic lift lever until master cylinders are fully extended and the automatic safety lock is secured. Observe to be sure lock is secured.

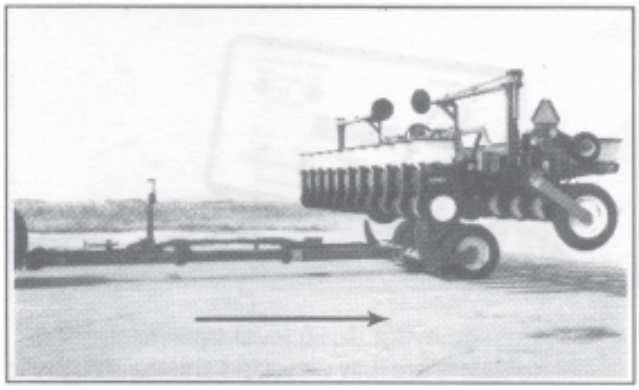


   C. Release "Raise" switch and lower planter onto safety stand using hydraulic lift lever.

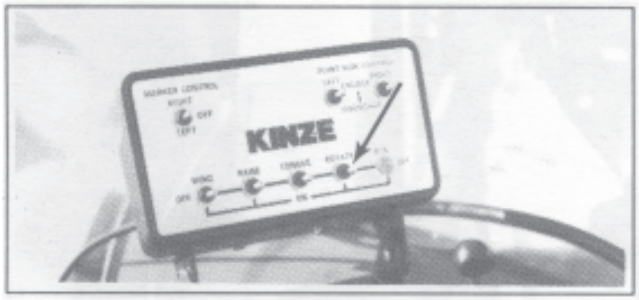
4. Extend tongue.
   A. Press "Tongue" switch down and hold.



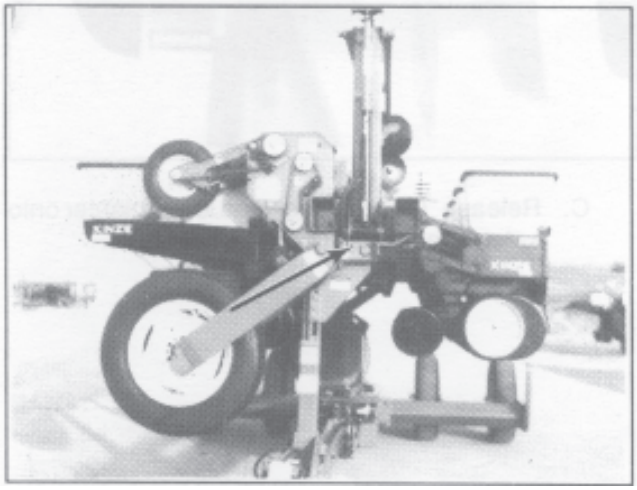
   B. Engage hydraulic tongue/rotation lever until tongue is fully extended. Tongue lock will automatically release.



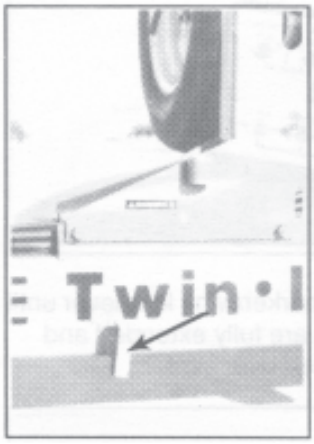
5. Rotate frame.
   A. Press "Rotate" switch and hold.



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



6. Install safety pins in tongue and center frame.



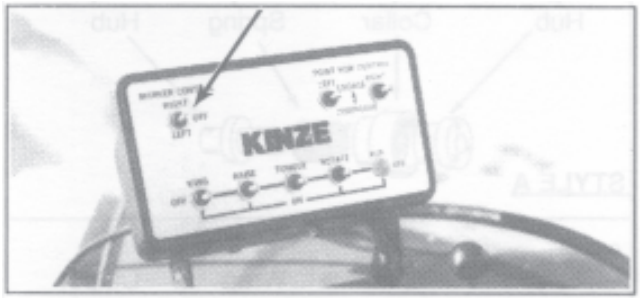
PHASING THE HYDRAULIC SYSTEM

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. Fifteen to twenty seconds is usually sufficient.

MARKER OPERATION



Two solenoid valves along with a three position selector switch permits the operator to raise or lower the desired marker.

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, flip 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: Switch should be left in "OFF" position when planter is not in use. If left in "ON" position overnight 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.

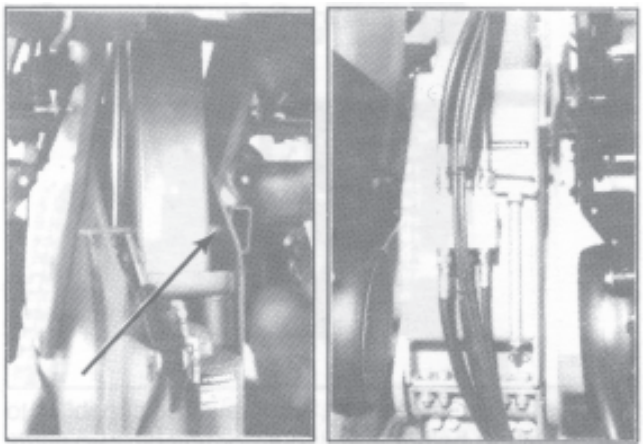
MARKER LOCKUP ⚠

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 ⚠

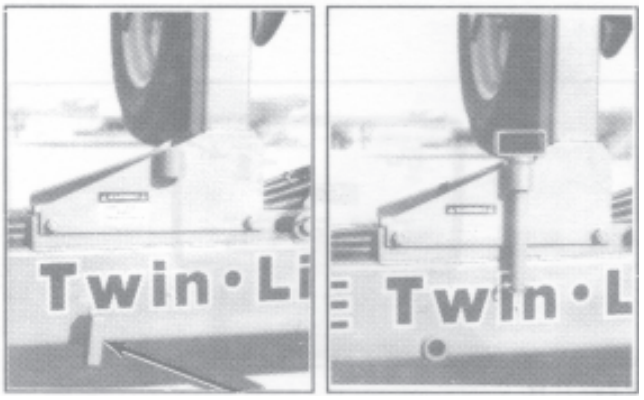
The manual safety lockup located on the front side of the center pivot assembly is an added safety device. Never allow anyone to work around or under the planter without first securing the manual safety lock in the locked position. If transporting the planter use the manual safety lockup for added safety.



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

TONGUE SAFETY PIN ⚠

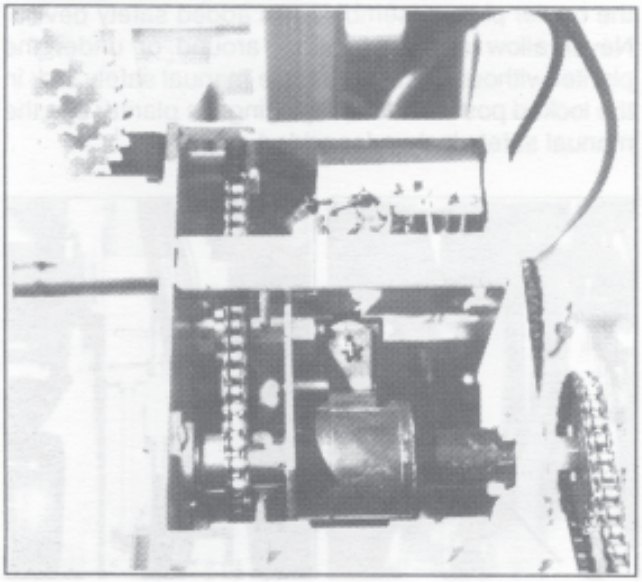
The tongue safety pin when installed will prevent the tongue cylinder from retracting far enough to release the transport latch should hydraulic pressure leak off or a sudden stop be made when transporting the planter. Never transport the planter without installing the tongue safety pin.



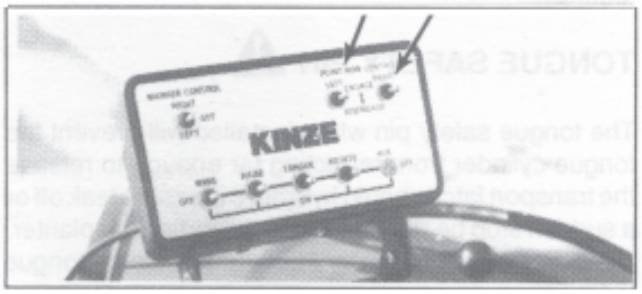
For normal operation remove the tongue safety pin and store in the bracket provided.

POINT ROW WRAP SPRING CLUTCH

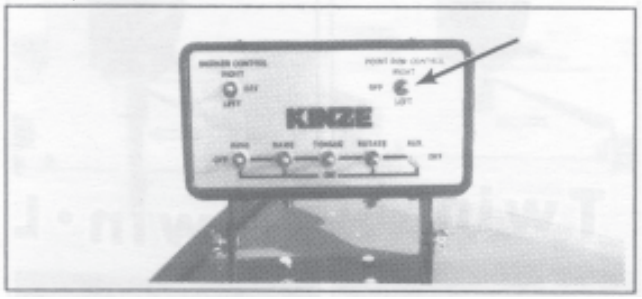
(Standard on 12 and 16 Row/Optional on 8 Row)



With the Twin-Line planter, you have the capability to shut off either half of the planter for finishing up fields or for long point row situations. This is done with the use of electric wrap spring clutches which disengage the drive on either half of the planter.

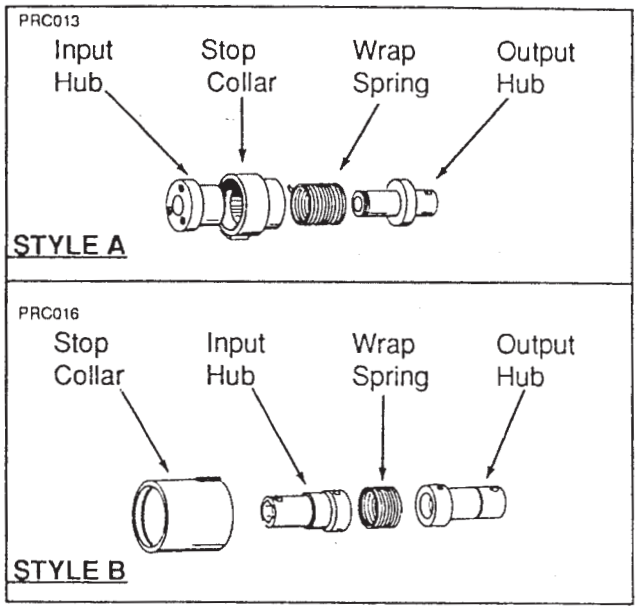


STYLE A



STYLE B

The operational switch(es) for the clutches are located on the planter control panel on the tractor.



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.

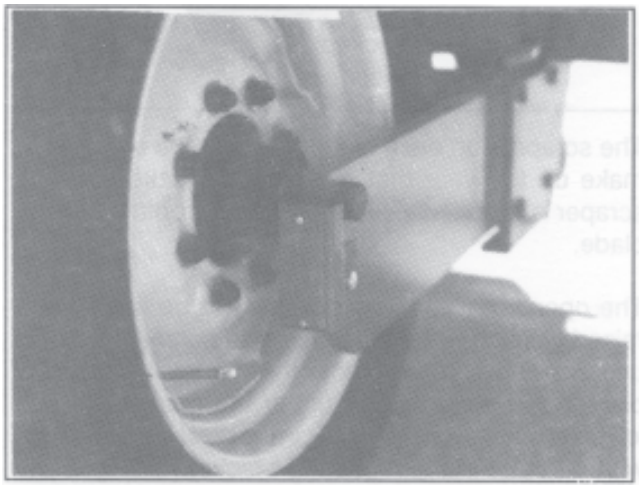
The input end of the spring is bent outward and is referred to as the control tang. The control tang fits into a slot in the stop collar that is located between the input and output hubs and over the wrap spring. If the stop collar is allowed to rotate with the input hub, the clutch is engaged. If the 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 operational switch on the tractor control panel is in the "ENGAGE" 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" 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.

RIDGE PLANTING

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



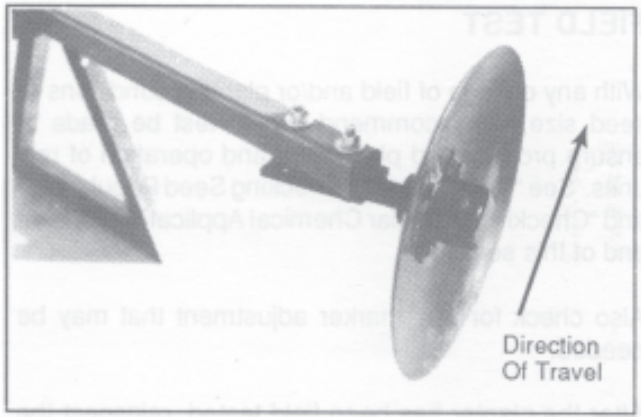
NOTE: Photo shows wheels mounted in the standard position.

MARKER ADJUSTMENT

To determine the correct length at which to set the marker assemblies, multiply the number of rows by the 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



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.

We recommend a field test be made 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 M.P.H. Variations in ground speed will produce variations in rates. Corn meter populations will tend to be disproportionately higher at high ground speeds. Soybean and milo seed cup populations will tend to be disproportionately lower at high 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

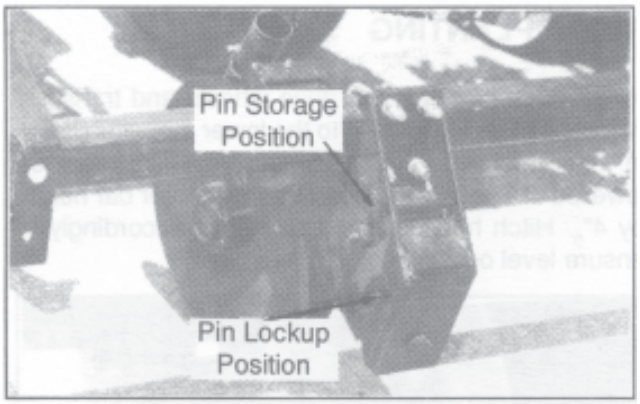
FERTILIZER OPENER

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 springs are 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.

The opener blades should have 1" of contact with each other. Blade adjustment can be made by moving inside spacer washers to the outer side of the blade. After making such an adjustment, check to be sure bearing assembly rivets are not hitting shank.

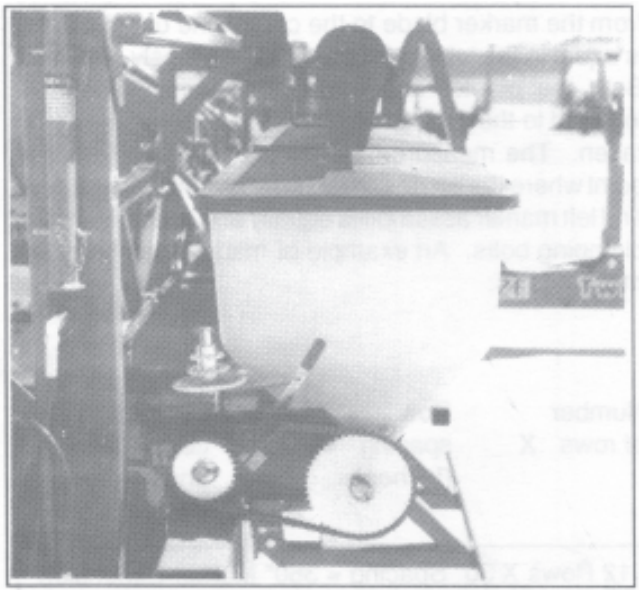


The scrapers on each blade may also be adjusted to make up for wear that may occur. Make sure the scraper is adjusted to allow only slight contact with the blade.

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.

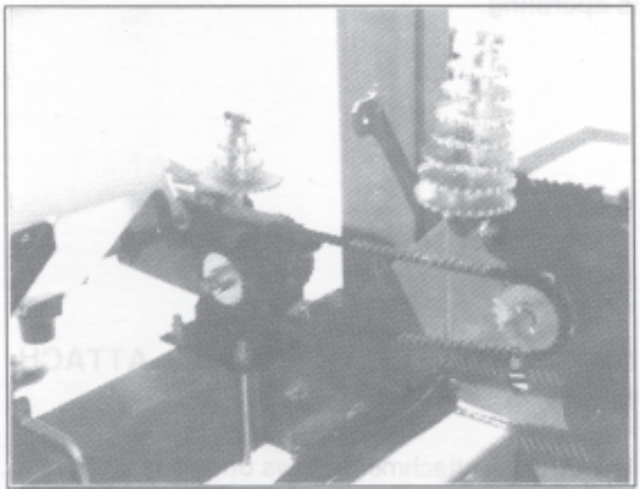
⚠ DANGER: Always install all cylinder lockup brackets before working under the unit.

DRY FERTILIZER ATTACHMENT



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

In most situations the regular rate auger assembly is most desirable and has a wide range of application rates. The high rate auger assembly should be considered where a very high rate (usually over 250 lbs. per acre) of fertilizer is required. Uneven delivery of fertilizer will occur if the high rate assembly 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.

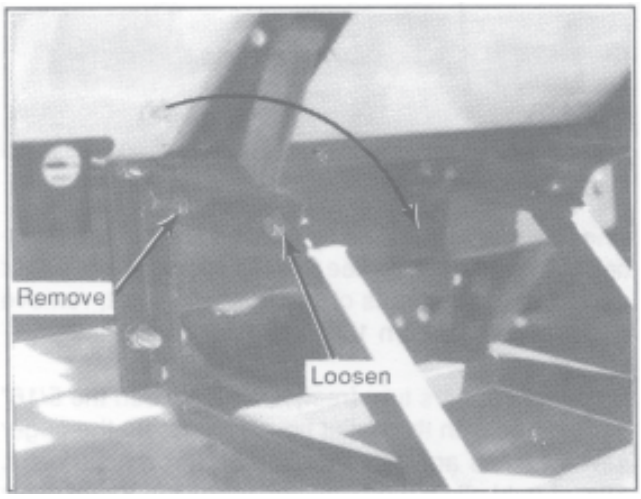
Since most fertilizers easily absorb moisture, it is important that fertilizer be kept dry during use and storage. In addition to waste, deposits of fertilizer left in the hopper can cause metal corrosion. Hoppers should be emptied at the end of each day's use.

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. 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.

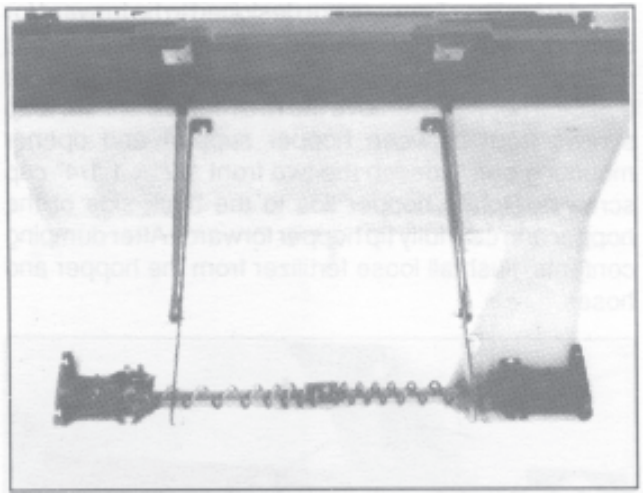


At the end of the planting season, or when fertilizer attachment is not going to be used for a period of time, the hoppers should be disassembled, cleaned and coated with a rust preventative.

To disassemble auger assemblies, remove 1/4" cotter pin and large flat washer from one end of the shaft. Replace cotter pin to prevent the assembly from coming apart as it is removed. Pull auger assembly from opposite end of hopper. Again remove cotter pin from end of auger shaft and remove all auger components for cleaning. Coat all parts with rust preventative before re-assembly.

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

NOTE: The auger assemblies can be installed on the auger shaft in one of two different positions depending on where the two cotter pins are placed. The correct position is determined by the location of the hoppers. In some applications the auger shaft may need to extend further out of the hopper on one side in order to couple with the next hopper.



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.

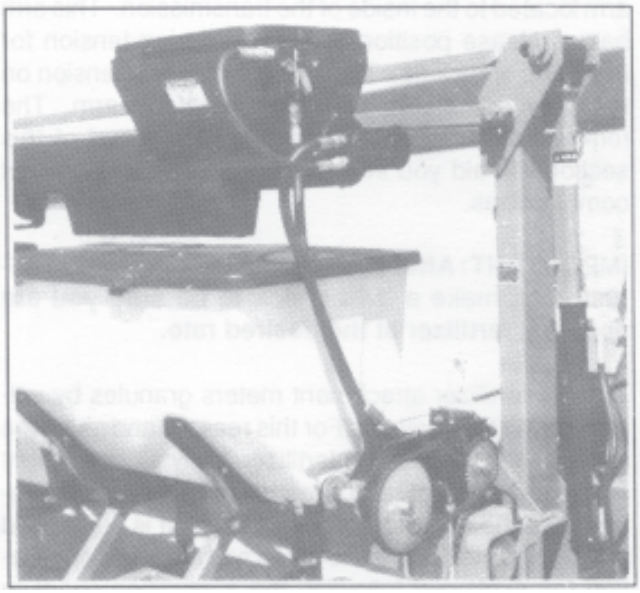
Install auger baffles over the augers and secure in place with two hair pin clips in each hopper. Do not operate fertilizer attachment without auger baffles in place.

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

NOTE: Make sure auger spring(s) carry fertilizer to the outer ends of the hopper when rotated in the direction of rotation they will turn when the planter is operating.

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 augers and also works as a safety valve for shutting off the augers. A pair of specially installed solenoid valves, controlled by the auxiliary switch on the control panel, operate the augers.



NOTE: The quick fill attachment comes equipped for use with a closed center hydraulic system. Before using the quick fill attachment with an open center hydraulic system, hydraulic hose routing changes are required. See Illustrations 1 and 2.

Illustration #1
Standard Closed Center System

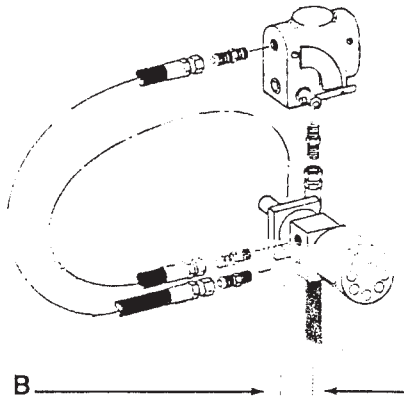
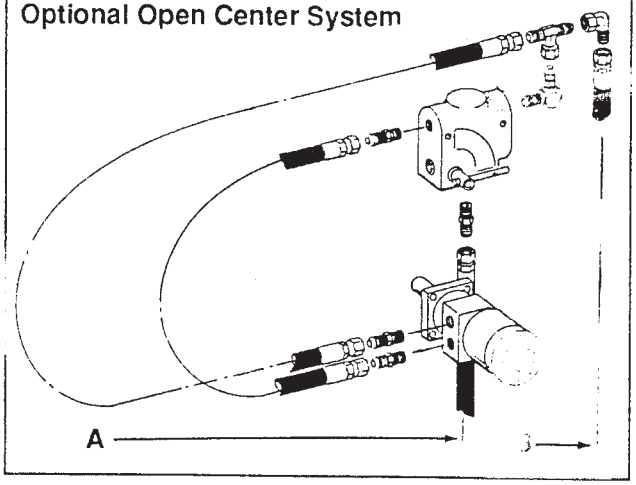
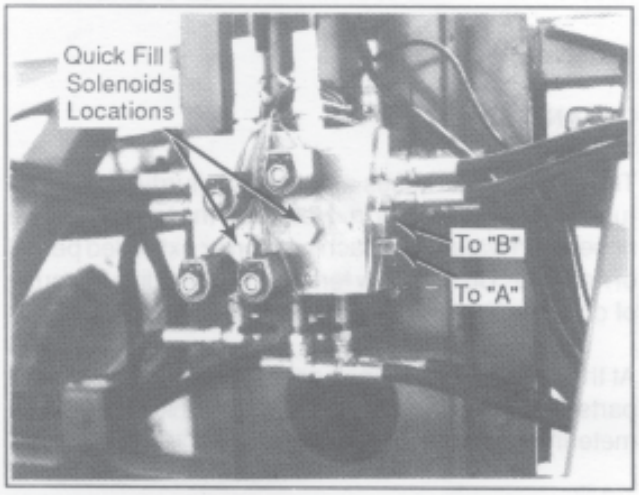


Illustration #2
Optional Open Center System

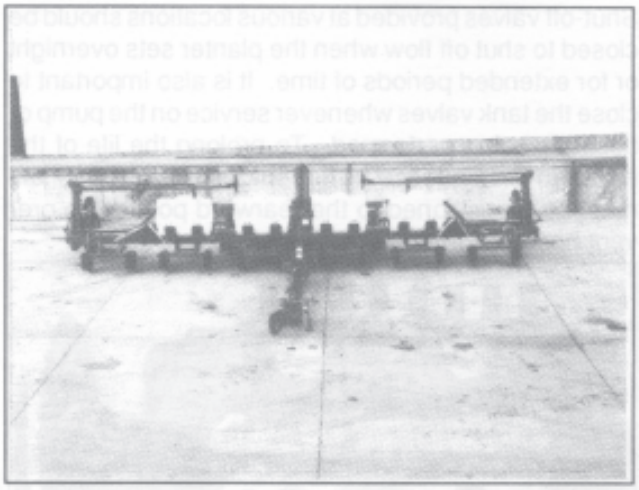


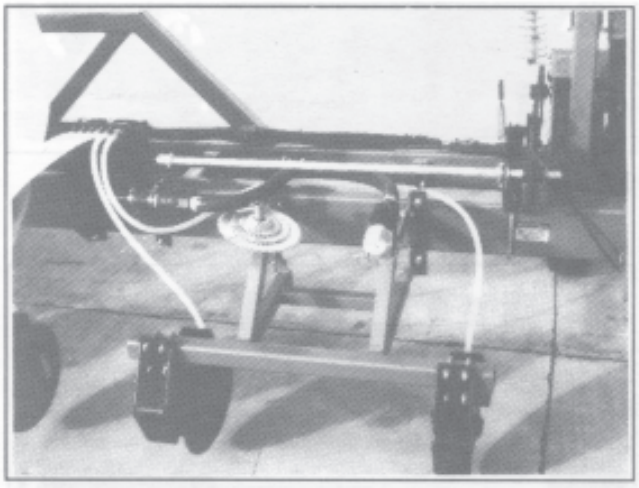


At the end of each season or if the quick fill attachments is not going to be used for a period of time, pull the augers from the quick fill tubes and thoroughly clean the augers and tubes and treat with a rust preventative.

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

LIQUID FERTILIZER ATTACHMENT





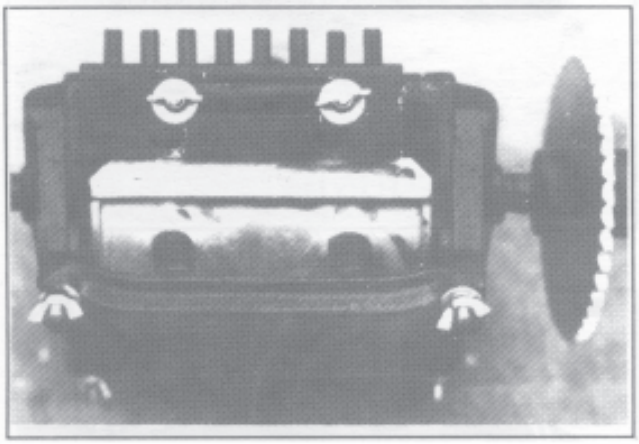
The rate of liquid fertilizer application is determined by the combination of sprockets on the squeeze pump driven and drive shafts. When changing sprocket combinations, make sure sprockets are in alignment, sprocket retaining collars are tight and chain tension is sufficiently restored.

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.

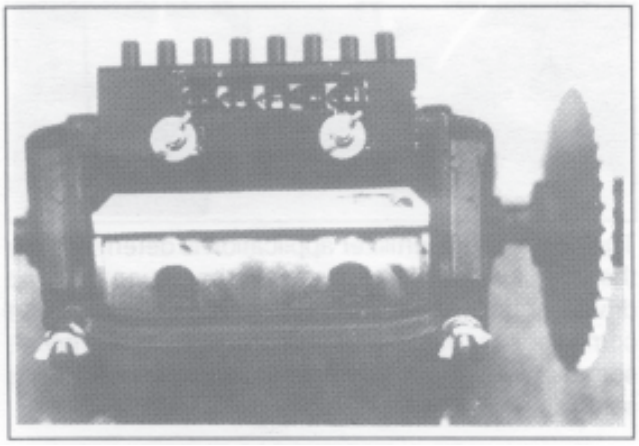
IMPORTANT: Certain analysis of fertilizer if placed too close to the seed may cause germination or seedling damage especially if used in amounts in excess of fertilizer manufacturers recommendations. Check with your fertilizer dealer or manufacturer for the correct amount and placement.

⚠ 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 to prevent hose distortion.



Discharge Manifold Rearward

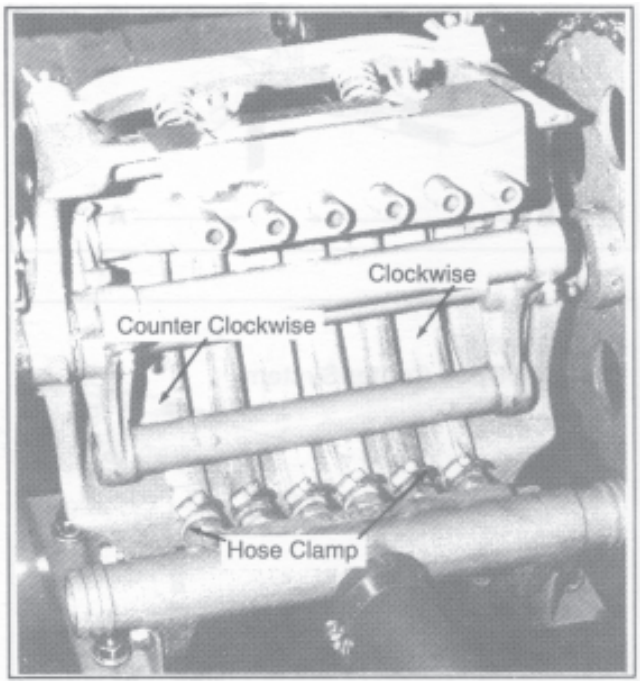


Discharge Manifold Forward

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.



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.

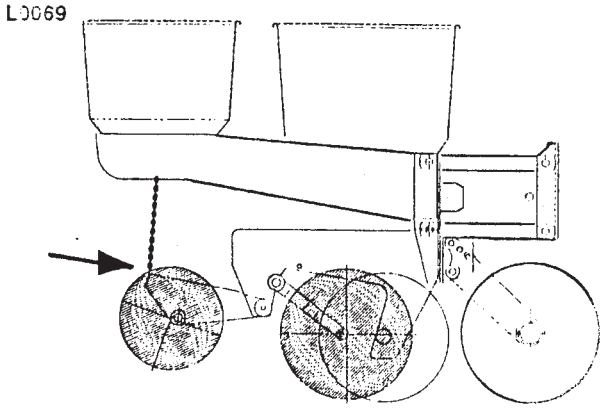
CLEANING

The tanks and all hoses are made of sturdy plastic and rubber to resist corrosion. However, the tank should be rinsed with water after each season or extended period of non-use. Do not allow fertilizer to crystalize because of cold temperature or evaporation.

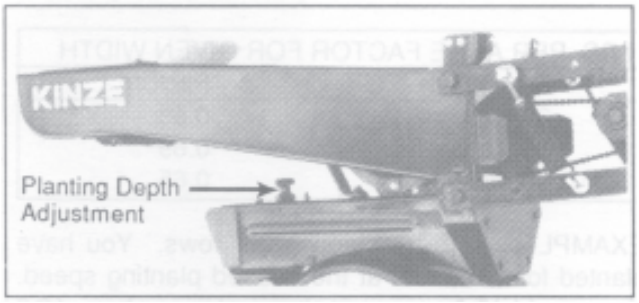
At the end of the planting season, thoroughly clean all parts with clean water and flush the tanks, hoses and metering pump prior to storage.

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.



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.



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. 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

Corn Meter

Seed count can be affected by two things; drive ratio between drive wheel and corn meter, and/or corn 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 corn meter. Check drive wheel pressure, check for incorrect sprocket(s) in drive line and check drive and driven sprockets in transmission for proper selection.

Second check for corn meter malfunction. FOR EXAMPLE, if spacing between kernels 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. Seed population will be less than the desired amount. If two seeds are found within a few inches of each other, the finger has metered two seeds instead of one.

See "Plateless Corn Meter Trouble Shooting" in your Kinze Row Unit Manual.

Soybean Feed Cup Meter

1. Check seeds per pound on seed bag.

2. Use seed rate chart closest to seed count per pound listed on bag. Use small seeds chart for 2700 or more seeds per pound, medium seeds chart for 2200 to 2700 seeds per pound and large seeds chart for 2200 and less seeds per pound.

3. To determine seeds per foot:

Seeds Per Lb.	x	Desired Lbs. Per Acre	=	Seeds Per Acre

Seeds Per Acre	÷	Ft. Of Row Per Acre	=	Seeds Per Ft.

34,800 Ft. = 1 Acre/15" Rows
24,000 Ft. = 1 Acre/18" Rows
27,600 Ft. = 1 Acre/19" Rows
17,400 Ft. = 1 Acre/30" Rows
14,500 Ft. = 1 Acre/36" Rows
13,800 Ft. = 1 Acre/38" Rows

4. To determine seeds per acre, count seeds in 1/1000 of an acre and multiply by 1000.

If seed check shows planting rate is significantly different than seed rate chart shows, see "Feed Cup Meter Trouble Shooting" in your Kinze Row Unit Manual.

Milo Feed Cup Meter

1. Check seeds per pound on seed bag.

2. Use seed rate chart for the rate milo meter being used and the desired pounds per acre. Use medium rate chart and medium rate milo meter for 4.3 lbs. per acre through 45.6 lbs. per acre. Use low rate chart and low rate milo meter for 1.3 lbs. per acre through 13.9 lbs. per acre.

3. To determine seeds per foot:

Seeds Per Lb.	x	Desired Lbs. Per Acre	=	Seeds Per Acre

Seeds Per Acre	÷	Ft. Of Row Per Acre	=	Seeds Per Ft.

34,800 Ft. = 1 Acre/15" Rows
24,000 Ft. = 1 Acre/18" Rows
27,600 Ft. = 1 Acre/19" Rows
17,400 Ft. = 1 Acre/30" Rows
14,500 Ft. = 1 Acre/36" Rows
13,800 Ft. = 1 Acre/38" Rows

4. To determine seeds per acre, count seeds in 1/1000 of an acre and multiply by 1000.

5. To determine pounds per acre, multiply seeds per acre planted by seeds per pound as stated on seed bag.

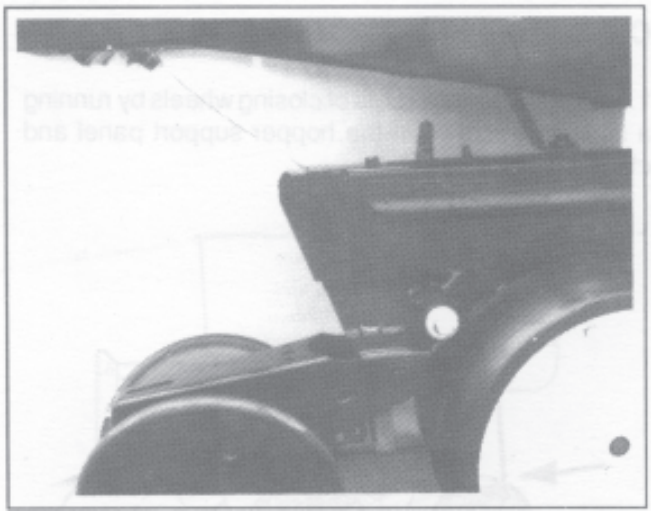
If seed check shows planting rate is significantly different than seed chart shows, see "Feed Cup Meter Trouble Shooting" in your Kinze Row Unit Manual.

NOTE: The milo meter is a volume type meter and the rate chart is a starting point only and actual rate may vary because of seed size, planting speed, meter wear, etc.

CHECKING GRANULAR CHEMICAL APPLICATION RATE

Many things can affect the rate of delivery. Temperature, humidity, speed, ground conditions, flow-ability of different material or any obstruction in the metering.

A field check is important for correct application rates.



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

Drive 1320 feet at planting speed. Weigh the chemical in ounces that was caught in one bag. 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 bag. 12.0 ounces times 0.88 equals 9.96 pounds per acre.

Metering Gate

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

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

GENERAL PLANTING RATE INFORMATION

These planting rate charts are for Kinze Series II 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 MISCALULATIONS, MAKE FIELD CHECKS TO BE SURE YOU ARE PLANTING AT THE DESIRED RATE.

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

Corn
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.

Soybeans
Soybeans vary in size from about 1800 seeds/lb. to approximately 3500 seeds/lb. The size marked on each bag is an average. Seeds within each bag may vary in size by as much as 50% greater or 50% smaller than the average. These charts are based on uniformly sized soybeans. Your actual planting rate will vary somewhat from the chart. Generally, larger beans will result in lower rates and smaller beans will result in higher rates.

Use small seed chart for 2700 or more seeds per pound, medium seed chart for 2200 to 2700 seeds per pound and large seed chart for 2200 and less seeds per pound.

Milo
Milo seeds vary in size from about 12,000 seeds/lb. to about 25,000 seeds/lb. The size marked on each bag is an average. Seeds within each bag may vary in size by as much as 50% greater or 50% smaller than average.

Use medium rate chart and medium rate milo meter for 4.6 pounds per acre through 30.4 pounds per acre. Use low rate chart and low rate milo meter for 1.4 pounds per acre through 9.2 pounds per acre.

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, so make a field check and adjust setting in the transmissions as needed to obtain the desired seed drop.

PLANTING RATES FOR PLATELESS CORN METERS
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 PLATELESS SOYBEAN METERS
APPROXIMATE POUNDS/ACRE FOR VARIOUS ROW WIDTH - MEDIUM SEEDS

15 Inch	18 Inch	19 Inch	30 Inch	36 Inch	38 Inch	Transmission Sprockets Drive	Transmission Sprockets Drive	Recomm. Speed Range (MPH)
77	64	60	38	32	30	17	28	4 to 8
79	66	62	40	33	31	17	27	4 to 8
83	68	66	41	34	33	17	26	4 to 8
86	72	68	43	36	34	19	28	4 to 8
89	74	70	44	37	35	19	27	4 to 8
89	74	70	45	37	35	17	24	4 to 8
93	78	74	47	39	37	17	23	4 to 8
96	80	76	48	40	38	19	25	4 to 8
100	84	78	50	42	39	19	24	4 to 8
104	86	82	52	43	41	23	28	4 to 8
104	86	82	52	43	41	19	23	4 to 8
108	90	86	54	45	43	24	28	4 to 8
112	94	88	56	47	44	24	27	4 to 8
113	94	90	56	47	45	17	19	4 to 7.5
116	98	92	58	49	46	24	26	4 to 7.5
117	98	92	59	49	46	26	28	4 to 7.5
121	100	96	61	50	48	24	25	4 to 7.5
122	102	96	61	51	48	26	27	4 to 7.5
126	106	100	63	53	50	23	23	4 to 7
131	110	104	66	55	52	27	26	4 to 7
132	110	104	66	55	52	24	23	4 to 7
137	114	108	69	57	54	25	23	4 to 6.5
141	118	112	71	59	56	19	17	4 to 6.5
142	118	112	71	59	56	27	24	4 to 6.5
147	122	116	74	61	58	28	24	3 to 6
153	128	120	76	64	60	23	19	3 to 5.5
154	128	122	77	64	61	28	23	3 to 5.5
159	132	126	80	66	63	24	19	3 to 5.5
166	138	132	83	69	66	25	19	3 to 5
171	142	134	85	71	67	23	17	3 to 5
173	144	136	86	72	68	26	19	3 to 5
179	150	142	90	75	71	27	19	3 to 5
186	154	146	93	77	73	28	19	3 to 4.5
193	160	152	96	80	76	26	17	3 to 4.5
200	168	158	100	84	79	27	17	3 to 4.5
208	174	164	104	87	82	28	17	3 to 4.5

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 PLATELESS SOYBEAN METERS
APPROXIMATE BEANS/ACRE FOR VARIOUS ROW WIDTHS - SMALL SEEDS

15 Inch	18 Inch	19 Inch	30 Inch	36 Inch	38 Inch	Transmission Sprockets Drive	Transmission Sprockets Driven	Recomm. Speed Range (MPH)	Seed Spacing (Inches)	Seeds/ Foot
289,615	241,346	228,644	144,808	120,673	114,322	17	28	4 to 8	1.4	8
300,342	250,284	237,112	150,171	125,142	118,556	17	27	4 to 8	1.4	9
311,893	259,912	246,232	155,947	129,956	123,116	17	26	4 to 8	1.3	9
323,688	269,740	255,542	161,844	134,870	127,771	19	28	4 to 8	1.3	9
335,676	279,730	265,008	167,838	139,865	132,504	19	27	4 to 8	1.2	10
337,884	281,570	266,750	168,942	140,785	133,375	17	24	4 to 8	1.2	10
352,575	293,812	278,348	176,288	146,906	139,174	17	23	4 to 8	1.2	10
362,530	302,108	286,208	181,265	151,054	143,104	19	25	4 to 8	1.2	10
377,636	314,696	298,134	188,818	157,348	149,067	19	24	4 to 8	1.1	11
391,832	326,528	309,342	195,916	163,264	154,671	23	28	4 to 8	1.1	11
394,055	328,378	311,096	197,027	164,189	155,548	19	23	4 to 8	1.1	11
408,869	340,724	322,790	204,434	170,362	161,395	24	28	4 to 8	1.0	12
424,012	353,344	334,746	212,006	176,672	167,373	24	27	4 to 8	1.0	12
426,801	355,668	336,948	213,401	177,834	168,474	17	19	4 to 7.5	1.0	12
440,320	366,934	347,622	220,160	183,467	173,811	24	26	4 to 7.5	1.0	13
442,941	369,118	349,690	221,470	184,559	174,845	26	28	4 to 7.5	0.9	13
457,933	381,610	361,526	228,966	190,805	180,763	24	25	4 to 7.5	0.9	13
459,346	382,788	362,642	229,673	191,394	181,321	26	27	4 to 7.5	0.9	13
477,013	397,512	376,590	238,507	198,756	188,295	23	23	4 to 7	0.9	14
495,360	412,800	391,074	247,680	206,400	195,537	27	26	4 to 7	0.8	14
497,753	414,794	392,962	248,877	207,397	196,481	24	23	4 to 7	0.8	14
518,493	432,078	409,336	259,246	216,039	204,668	25	23	4 to 6.5	0.8	15
533,133	444,278	420,894	266,566	222,139	210,447	19	17	4 to 6.5	0.8	15
536,640	447,200	423,664	268,320	223,600	211,832	27	24	4 to 6.5	0.8	15
556,516	463,762	439,354	278,258	231,881	219,677	28	24	3 to 6	0.8	16
577,437	481,198	455,872	288,719	240,599	227,936	23	19	3 to 5.5	0.7	17
580,712	483,926	458,456	290,356	241,963	229,228	28	23	3 to 5.5	0.7	17
602,543	502,120	475,692	301,272	251,060	237,846	24	19	3 to 5.5	0.7	17
627,649	523,040	495,512	313,825	261,520	247,756	25	19	3 to 5	0.7	18
645,371	537,810	509,504	322,686	268,905	254,752	23	17	3 to 5	0.6	19
652,755	543,962	515,332	326,378	271,981	257,666	26	19	3 to 5	0.6	19
677,861	564,884	535,154	338,931	282,442	267,577	27	19	3 to 5	0.6	19
702,967	585,806	554,974	351,484	292,903	277,487	28	19	3 to 4.5	0.6	20
729,550	607,958	575,960	364,775	303,979	287,980	26	17	3 to 4.5	0.6	21
757,609	631,342	598,112	378,805	315,671	299,056	27	17	3 to 4.5	0.6	22
785,669	654,724	620,266	392,835	327,362	310,133	28	17	3 to 4.5	0.5	23

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 PLATELESS SOYBEAN METERS
APPROXIMATE BEANS/ACRE FOR VARIOUS ROW WIDTHS - MEDIUM SEEDS

15 Inch	18 Inch	19 Inch	30 Inch	36 Inch	38 Inch	Transmisssion Sprockets Drive	Driven	Recomm. Speed Range (MPH)	Seed Spacing (Inches)	Seeds/ Foot
199,204	166,002	157,266	99,602	83,001	78,633	17	28	4 to 8	2.1	6
206,581	172,152	163,090	103,291	86,076	81,545	17	27	4 to 8	2.0	6
214,527	178,772	169,364	107,263	89,386	84,682	17	26	4 to 8	1.9	6
222,639	185,532	175,768	111,320	92,766	87,884	19	28	4 to 8	1.9	6
230,885	192,404	182,278	115,443	96,202	91,139	19	27	4 to 8	1.8	7
232,404	193,670	183,476	116,202	96,835	91,738	17	24	4 to 8	1.8	7
242,509	202,090	191,454	121,254	101,045	95,727	17	23	4 to 8	1.7	7
249,356	207,796	196,860	124,678	103,898	98,430	19	25	4 to 8	1.7	7
259,746	216,454	205,062	129,873	108,227	102,531	19	24	4 to 8	1.6	7
269,511	224,592	212,772	134,755	112,296	106,386	23	28	4 to 8	1.6	8
271,039	225,866	213,978	135,520	112,933	106,989	19	23	4 to 8	1.5	8
281,229	234,358	222,022	140,614	117,179	111,011	24	28	4 to 8	1.5	8
291,644	243,038	230,246	145,822	121,519	115,123	24	27	4 to 8	1.4	8
293,563	244,636	231,760	146,782	122,318	115,880	17	19	4 to 7.5	1.4	8
302,862	252,384	239,102	151,431	126,192	119,551	24	26	4 to 7.5	1.4	9
304,664	253,886	240,524	152,332	126,943	120,262	26	28	4 to 7.5	1.4	9
314,976	262,480	248,666	157,488	131,240	124,333	24	25	4 to 7.5	1.3	9
315,948	263,290	249,432	157,974	131,645	124,716	26	27	4 to 7.5	1.3	9
328,100	273,416	259,026	164,050	136,708	129,513	23	23	4 to 7	1.3	9
340,719	283,932	268,988	170,360	141,966	134,494	27	26	4 to 7	1.2	10
342,365	285,304	270,288	171,183	142,652	135,144	24	23	4 to 7	1.2	10
356,630	297,192	281,550	178,315	148,596	140,775	25	23	4 to 6.5	1.2	10
366,700	305,584	289,500	183,350	152,792	144,750	19	17	4 to 6.5	1.1	11
369,112	307,594	291,404	184,556	153,797	145,702	27	24	4 to 6.5	1.1	11
382,783	318,986	302,198	191,392	159,493	151,099	28	24	3 to 6	1.1	11
397,174	330,978	313,558	198,587	165,489	156,779	23	19	3 to 5.5	1.1	11
399,426	332,856	315,336	199,713	166,428	157,668	28	23	3 to 5.5	1.0	11
414,442	345,368	327,192	207,221	172,684	163,596	24	19	3 to 5.5	1.0	12
431,710	359,758	340,824	215,855	179,879	170,412	25	19	3 to 5	1.0	12
443,900	369,916	350,448	221,950	184,958	175,224	23	17	3 to 5	0.9	13
448,979	374,150	354,458	224,489	187,075	177,229	26	19	3 to 5	0.9	13
466,247	388,540	368,090	233,124	194,270	184,045	27	19	3 to 5	0.9	13
483,516	402,930	381,722	241,758	201,465	190,861	28	19	3 to 4.5	0.9	14
501,800	418,166	396,158	250,900	209,083	198,079	26	17	3 to 4.5	0.8	14
521,100	434,250	411,394	260,550	217,125	205,697	27	17	3 to 4.5	0.8	15
540,400	450,334	426,632	270,200	225,167	213,316	28	17	3 to 4.5	0.8	16

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 PLATELESS SOYBEAN METERS
APPROXIMATE BEANS/ACRE FOR VARIOUS ROW WIDTHS - LARGE SEEDS

15 Inch	18 Inch	19 Inch	30 Inch	36 Inch	38 Inch	Transmission Sprockets Drive	Transmission Sprockets Driven	Recomm. Speed Range (MPH)	Seed Spacing (Inches)	Seeds/ Foot
137,910	114,924	108,876	68,955	57,462	54,438	17	28	4 to 8	3.0	4
143,018	119,182	112,908	71,509	59,591	56,454	17	27	4 to 8	2.9	4
148,518	123,766	117,252	74,259	61,883	58,626	17	26	4 to 8	2.8	4
154,135	128,446	121,686	77,067	64,223	60,843	19	28	4 to 8	2.7	4
159,843	133,202	126,192	79,922	66,601	63,096	19	27	4 to 8	2.6	5
160,895	134,080	127,022	80,447	67,040	63,511	17	24	4 to 8	1.6	5
167,890	139,908	132,544	83,945	69,954	66,272	17	23	4 to 8	2.5	5
172,631	143,858	136,288	86,315	71,929	68,144	19	25	4 to 8	2.4	5
179,824	149,854	141,966	89,912	74,927	70,983	19	24	4 to 8	2.3	5
186,584	155,486	147,304	93,292	77,743	73,652	23	28	4 to 8	2.2	5
187,642	156,368	148,138	93,821	78,184	74,069	19	23	4 to 8	2.2	5
194,696	162,246	153,708	97,348	81,123	76,854	24	28	4 to 8	2.1	6
201,907	168,256	159,400	100,954	84,128	79,700	24	27	4 to 8	2.1	6
203,236	169,362	160,450	101,617	84,681	80,225	17	19	4 to 7.5	2.1	6
209,673	174,728	165,532	104,836	87,364	82,766	24	26	4 to 7.5	2.0	6
210,921	175,768	166,516	105,460	87,884	83,258	26	28	4 to 7.5	2.0	6
218,060	181,716	172,152	109,029	90,858	86,076	24	25	4 to 7.5	1.9	6
218,733	182,278	172,684	109,366	91,139	86,342	26	27	4 to 7.5	1.9	6
227,146	189,288	179,326	113,573	94,644	89,663	23	23	4 to 7	1.8	7
235,882	196,568	186,222	117,941	98,284	93,111	27	26	4 to 7	1.8	7
237,022	197,518	187,122	118,511	98,759	93,561	24	23	4 to 7	1.8	7
246,897	205,748	194,920	123,449	102,874	97,460	25	23	4 to 6.5	1.7	7
253,869	211,558	200,422	126,934	105,779	100,211	19	17	4 to 6.5	1.6	7
255,539	212,950	201,742	127,769	106,475	100,871	27	24	4 to 6.5	1.6	7
265,003	220,836	209,214	132,502	110,418	104,607	28	24	3 to 6	1.6	8
274,966	229,138	217,078	137,483	114,569	108,539	23	19	3 to 5.5	1.5	8
276,525	230,438	218,310	138,263	115,219	109,155	28	23	3 to 5.5	1.5	8
286,921	239,100	226,516	143,460	119,550	113,258	24	19	3 to 5.5	1.5	8
298,876	249,064	235,954	149,438	124,532	117,977	25	19	3 to 5	1.4	9
307,315	256,096	242,616	153,657	128,048	121,308	23	17	3 to 5	1.4	9
310,831	259,026	245,392	155,415	129,513	122,696	26	19	3 to 5	1.3	9
322,786	268,988	254,830	161,393	134,494	127,415	27	19	3 to 5	1.3	9
334,741	278,950	264,270	167,370	139,475	132,135	28	19	3 to 4.5	1.2	10
347,399	289,500	274,262	173,700	144,750	137,131	26	17	3 to 4.5	1.2	10
360,761	300,634	284,812	180,380	150,317	142,406	27	17	3 to 4.5	1.2	10
374,122	311,768	285,360	187,061	155,884	147,680	28	17	3 to 4.5	1.1	11

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 PLATELESS MEDIUM RATE MILO METERS
APPROXIMATE POUNDS/ACRE FOR VARIOUS ROW WIDTHS - MEDIUM SEEDS

15 Inch	18 Inch	19 Inch	30 Inch	36 Inch	38 Inch	Transmission Sprockets Drive	Transmission Sprockets Driven	Recomm. Speed Range (MPH)
12.1	10.2	9.6	6.1	5.1	4.8	17	28	4 to 8
12.6	10.4	10.0	6.3	5.2	5.0	17	27	4 to 8
13.1	10.8	10.4	6.5	5.4	5.2	17	26	4 to 8
13.6	11.2	10.8	6.8	5.6	5.4	19	28	4 to 8
14.1	11.8	11.2	7.0	5.9	5.6	19	27	4 to 8
14.2	11.8	11.2	7.1	5.9	5.6	17	24	4 to 8
14.8	12.4	11.6	7.4	6.2	5.8	17	23	4 to 8
15.2	12.6	12.0	7.6	6.3	6.0	19	25	4 to 8
15.8	13.2	12.4	7.9	6.6	6.2	19	24	4 to 8
16.4	13.6	13.0	8.2	6.8	6.5	23	28	4 to 8
16.5	13.8	13.0	8.3	6.9	6.5	19	23	4 to 8
17.1	14.2	13.6	8.6	7.1	6.8	24	28	4 to 8
17.8	14.8	14.0	8.9	7.4	7.0	24	27	4 to 8
17.9	14.8	14.2	8.9	7.4	7.1	17	19	4 to 7.5
18.4	15.4	14.6	9.2	7.7	7.3	24	26	4 to 7.5
18.6	15.4	14.6	9.3	7.7	7.3	26	28	4 to 7.5
19.2	16.0	15.2	9.6	8.0	7.6	24	25	4 to 7.5
19.2	16.0	15.2	9.6	8.0	7.6	26	27	4 to 7.5
20.0	16.6	15.8	10.0	8.3	7.9	23	23	4 to 7
20.8	17.2	16.4	10.4	8.6	8.2	27	26	4 to 7
20.9	17.4	16.4	10.4	8.7	8.2	24	23	4 to 7
21.7	18.0	16.2	10.9	9.0	8.6	25	23	4 to 6.5
22.3	18.6	16.6	11.2	9.3	8.8	19	17	4 to 6.5
22.5	18.8	16.8	11.2	9.4	8.9	27	24	4 to 6.5
23.3	19.4	18.4	11.7	9.7	9.2	28	24	3 to 6
24.2	20.2	19.0	12.1	10.1	9.5	23	19	3 to 5.5
24.3	20.2	19.2	12.2	10.1	9.6	28	23	3 to 5.5
25.2	21.0	20.0	12.6	10.5	10.0	24	19	3 to 5.5
26.3	22.0	20.8	13.2	11.0	10.4	25	19	3 to 5
27.0	22.6	21.4	13.5	11.3	10.7	23	17	3 to 5
27.3	22.8	21.6	13.7	11.4	10.8	26	19	3 to 5
28.4	23.6	22.4	14.2	11.8	11.2	27	19	3 to 5
29.4	24.6	23.2	14.7	12.3	11.6	28	19	3 to 4.5
30.6	25.4	24.2	15.3	12.7	12.1	26	17	3 to 4.5
31.7	26.4	25.0	15.9	13.2	12.5	27	17	3 to 4.5
32.9	27.4	26.0	16.5	13.7	13.0	28	17	3 to 4.5

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 PLATELESS LOW RATE MILO METERS
APPROXIMATE POUNDS/ACRE FOR VARIOUS ROW WIDTHS - MEDIUM SEEDS

15 Inch	18 Inch	19 Inch	30 Inch	36 Inch	38 Inch	Transmission Sprockets Drive	Transmission Sprockets Driven	Recomm. Speed Range (MPH)
3.7	3.0	3.0	1.9	1.5	1.5	17	28	4 to 8
3.8	3.2	3.0	1.9	1.6	1.5	17	27	4 to 8
4.0	3.4	3.2	2.0	1.7	1.6	17	26	4 to 8
4.1	3.4	3.2	2.1	1.7	1.6	19	28	4 to 8
4.3	3.6	3.4	2.2	1.8	1.7	19	27	4 to 8
4.3	3.6	3.4	2.2	1.8	1.7	17	24	4 to 8
4.5	3.8	3.6	2.3	1.9	1.8	17	23	4 to 8
4.6	3.8	3.6	2.3	1.9	1.8	19	25	4 to 8
4.8	4.0	3.8	2.4	2.0	1.9	19	24	4 to 8
5.0	4.2	4.0	2.5	2.1	2.0	23	28	4 to 8
5.0	4.2	4.0	2.5	2.1	2.0	19	23	4 to 8
5.2	4.4	4.2	2.6	2.2	2.1	24	28	4 to 8
5.4	4.6	4.2	2.7	2.3	2.1	24	27	4 to 8
5.5	4.6	4.4	2.7	2.3	2.2	17	19	4 to 7.5
5.6	4.6	4.4	2.8	2.3	2.2	24	26	4 to 7.5
5.7	4.8	4.4	2.8	2.4	2.2	26	28	4 to 7.5
5.9	4.8	4.6	2.9	2.4	2.3	24	25	4 to 7.5
5.9	4.8	4.6	2.9	2.4	2.3	26	27	4 to 7.5
6.1	5.0	4.8	3.1	2.5	2.4	23	23	4 to 7
6.3	5.2	5.0	3.2	2.6	2.5	27	26	4 to 7
6.4	5.4	5.0	3.2	2.7	2.5	24	23	4 to 7
6.6	5.6	5.2	3.3	2.8	2.6	25	23	4 to 6.5
6.8	5.6	5.4	3.4	2.8	2.7	19	17	4 to 6.5
6.9	5.8	5.4	3.4	2.9	2.7	27	24	4 to 6.5
7.1	6.0	5.6	3.6	3.0	2.8	28	24	3 to 6
7.4	6.2	5.8	3.7	3.1	2.9	23	19	3 to 5.5
7.4	6.2	5.8	3.7	3.1	2.9	28	23	3 to 5.5
7.7	6.4	6.0	3.9	3.2	3.0	24	19	3 to 5.5
8.0	6.6	6.4	4.0	3.3	3.2	25	19	3 to 5
8.3	6.8	6.6	4.1	3.4	3.3	23	17	3 to 5
8.3	7.0	6.6	4.2	3.5	3.3	26	19	3 to 5
8.7	7.2	6.8	4.3	3.6	3.4	27	19	3 to 5
9.0	7.4	7.0	4.5	3.7	3.5	28	19	3 to 4.5
9.3	7.8	7.4	4.7	3.9	3.7	26	17	3 to 4.5
9.7	8.0	7.6	4.8	4.0	3.8	27	17	3 to 4.5
10.0	8.4	8.0	5.0	4.2	4.0	28	17	3 to 4.5

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

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

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

DRY INSECTICIDE APPLICATION RATES
APPROXIMATE POUNDS/ACRE AT 5 MPH FOR DIFFERENT 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	25.8	17.2	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.

Rates for 15, 18 and 19 inch row spacing are two times 30, 36 and 38 inch row spacing.

DRY HERBICIDE APPLICATION RATES

APPROXIMATE POUNDS/ACRE AT 5 MPH FOR DIFFERENT 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.

Rates for 15, 18 and 19 inch row spacing are two times 30, 36 and 38 inch row spacing.

DRY FERTILIZER APPLICATION RATES

APPROXIMATE RATE IN POUNDS PER ACRE

DRIVE SPROCKET	DRIVEN SPROCKET	30 INCH ROWS	36 INCH ROWS	38 INCH ROWS
		REGULAR RATE AUGERS		
15	50	112	94	87
19	50	139	119	109
15	33	158	132	123
19	33	200	168	156
30	50	216	180	169
33	50	238	220	178
15	19	283	238	222
30	33	317	267	246
		***HIGH RATE AUGERS**		
15	33	238	198	185
19	33	300	253	234
30	50	324	271	253
33	50	356	300	267
15	19	425	356	333
30	33	475	400	370

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

Above chart for planters equipped with Kinze 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. Weight 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 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 Kinze 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.

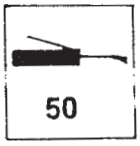
LUBRICATION

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.

Refer to the Kinze Row Unit Manual for lubrication of all row units.

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

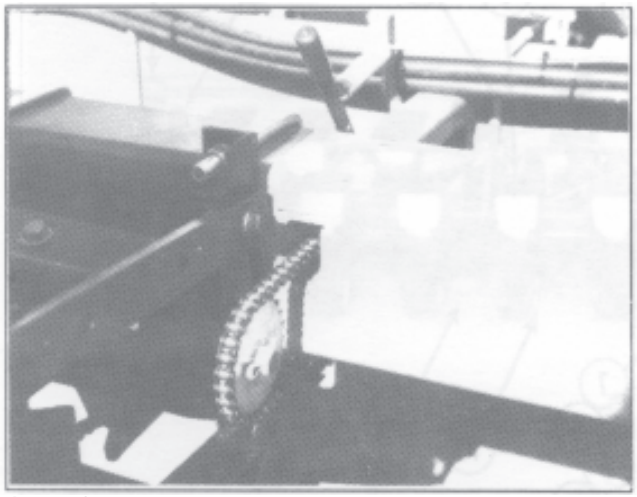
LUBRICATION SYMBOLS



Lubricate at frequency (Hours) indicated with an SAE multipurpose type grease.

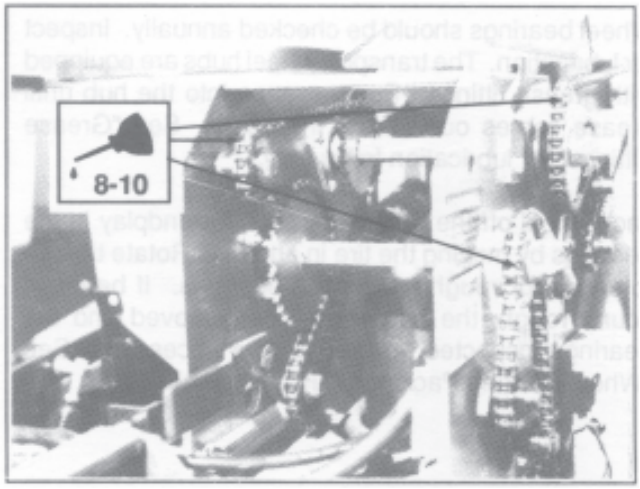
Lubricate at frequency (Hours) indicated with a high quality SAE 10 weight oil or a quality spray lubricant.

SEALED BEARINGS



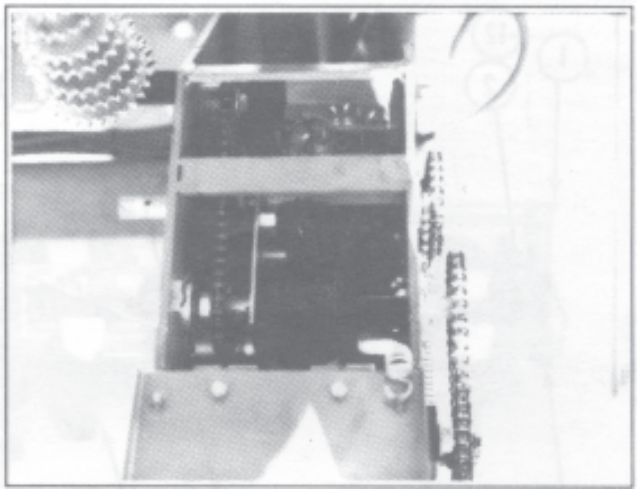
A number of sealed bearings are used on your Kinze planter to provide trouble free operation. These are located in such areas as the drive shaft, row units and transmission bearings. Sealed bearings are lubricated for life, and due to the seals, relubrication is not practical.

DRIVE CHAINS



All transmission and drive chains should be lubricated approximately every 8-10 hours 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



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

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.

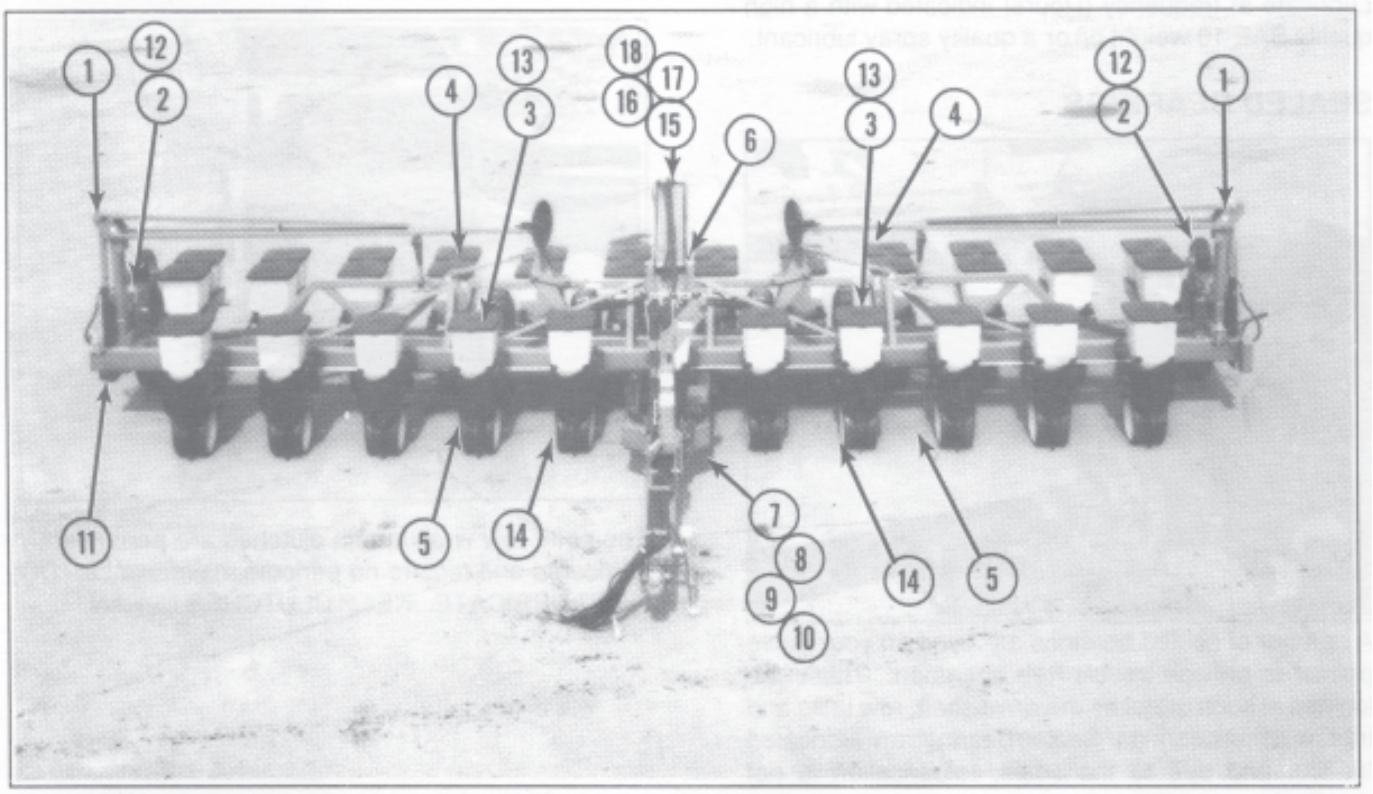
Jack wheel off the ground. Check for endplay in the bearings by moving the tire in and out. Rotate the tire to check for roughness in the bearings. If bearings sound rough, the hub should be removed and the bearings inspected and replaced if necessary. See "Wheel Bearing Packing Or Replacement".

GREASE FITTINGS

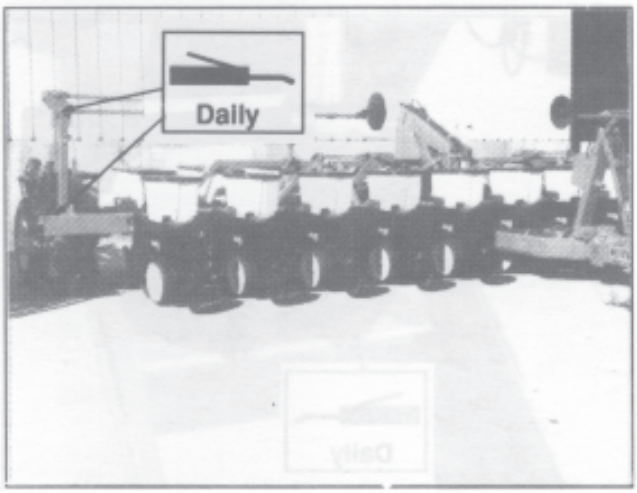
Those parts equipped with grease fittings should be lubricated at the frequency indicated with an SAE multipurpose type grease. Be sure to clean the fitting thoroughly before using grease gun. The frequency of lubrication recommended is based on normal operating conditions. Severe or unusual conditions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

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

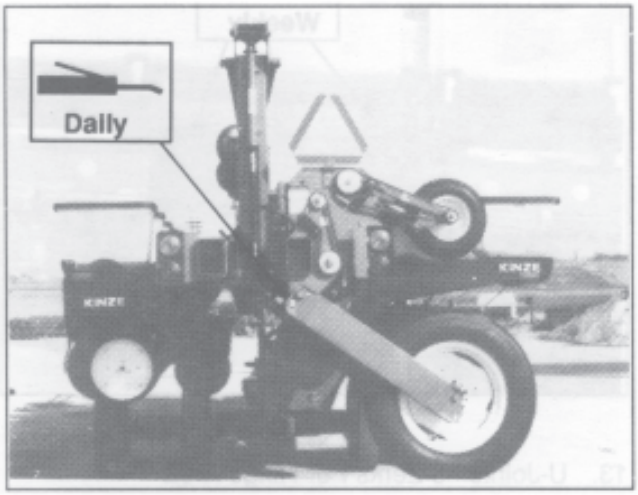
12 Row Shown



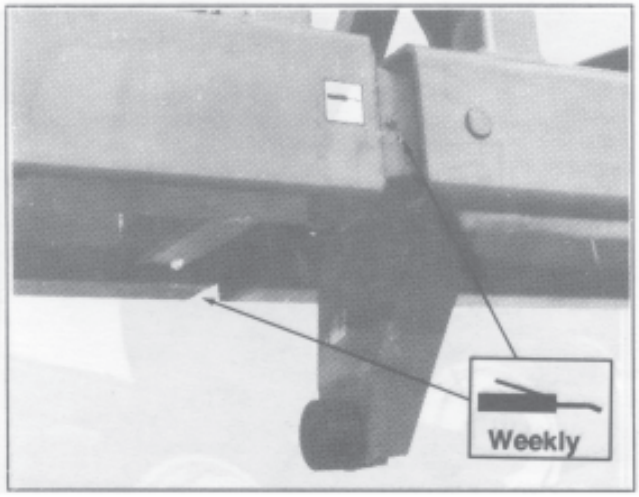
LUBRICATION



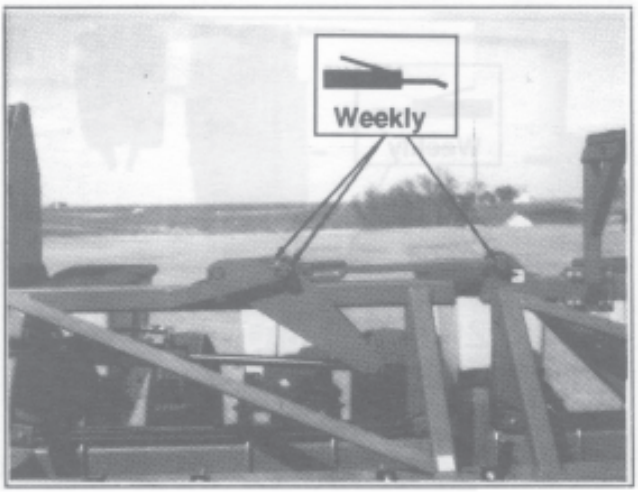
1. Marker Assemblies - 4 Zerks Per Assembly On 8 Row 30, 8 Row Wide & 12 Row 30. 2 Zerks Per Assembly On 12 Row Wide & 16 Row 30.



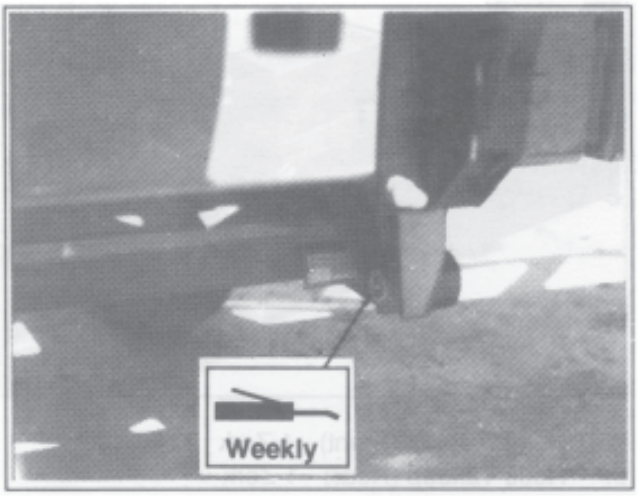
2. Driver Wheel Pivot - 2 Zerks Per Wheel Module



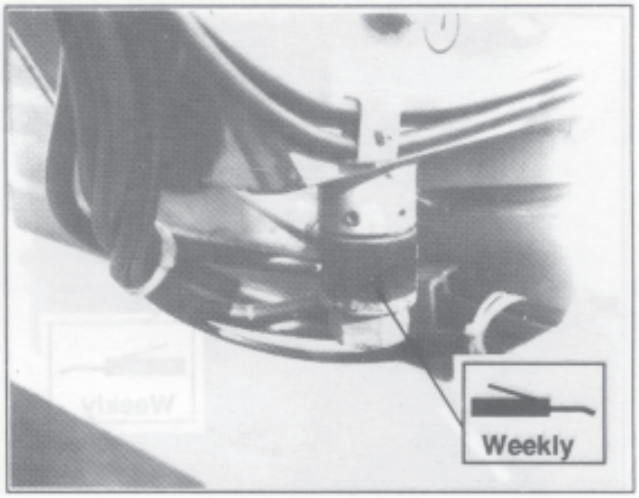
3. Wing Hinges - 2 Zerks Per Wing



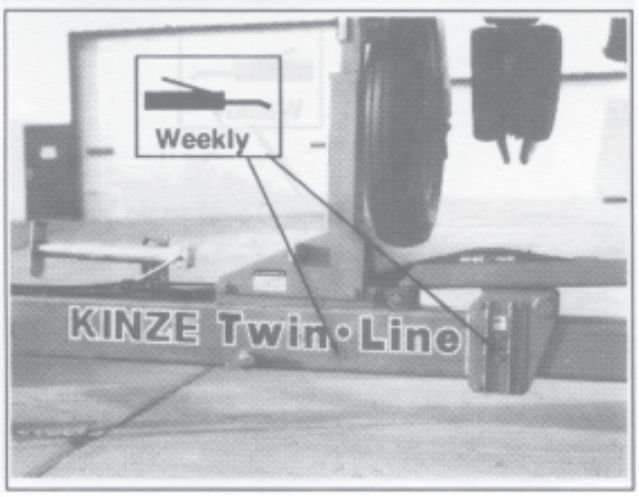
4. Wing Locks - 3 Zerks Per Wing



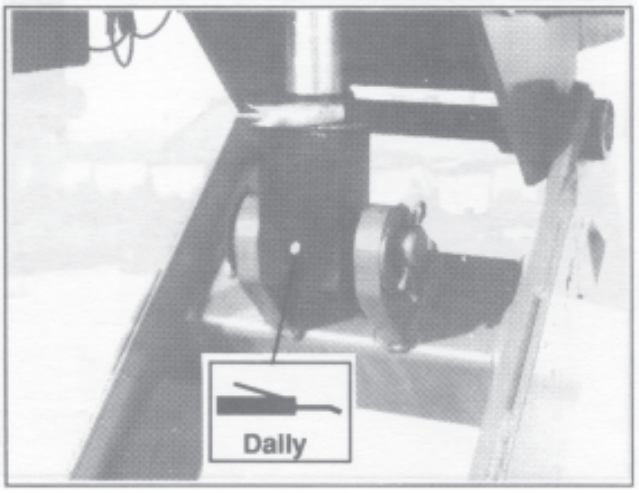
5. Cam Follower - 1 Zerk Per Follower



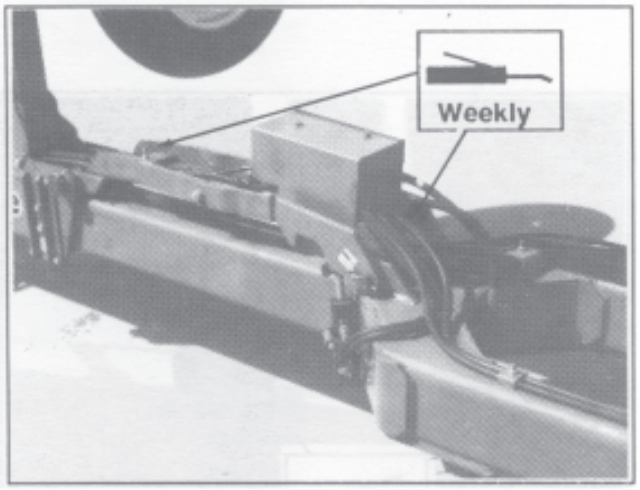
6. Rotation Cylinder - 1 Zerk



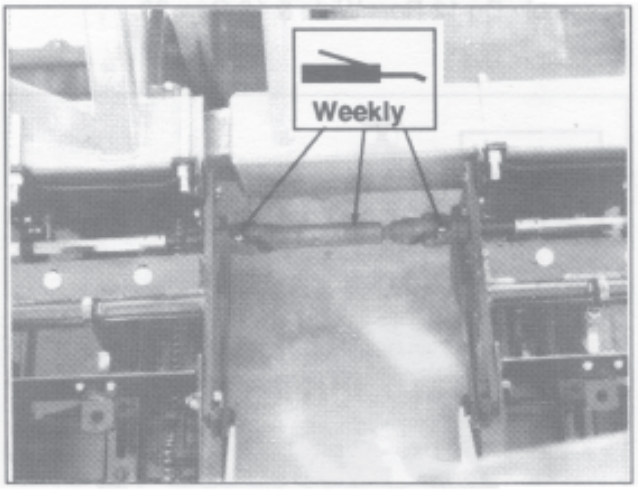
7. Hitch Slide - 4 Zerks



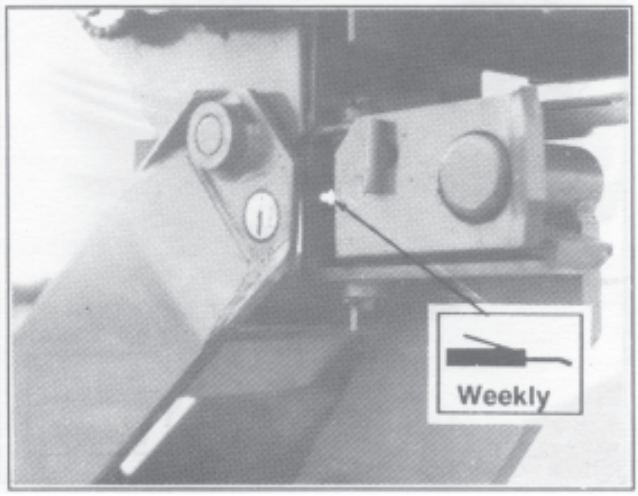
12. Slave Cylinders (On Wings) - 1 Zerk Per Cylinder



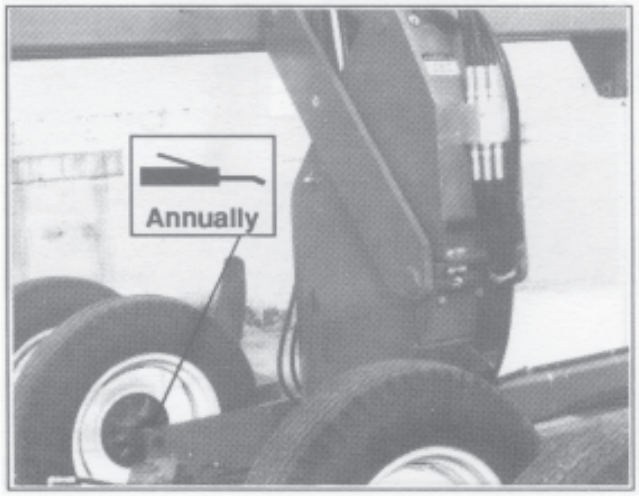
8. Hose Takeup (Front) - 1 Zerk
9. Hose Takeup (Rear) - 1 Zerk
10. Tongue Hook - 2 Zerks



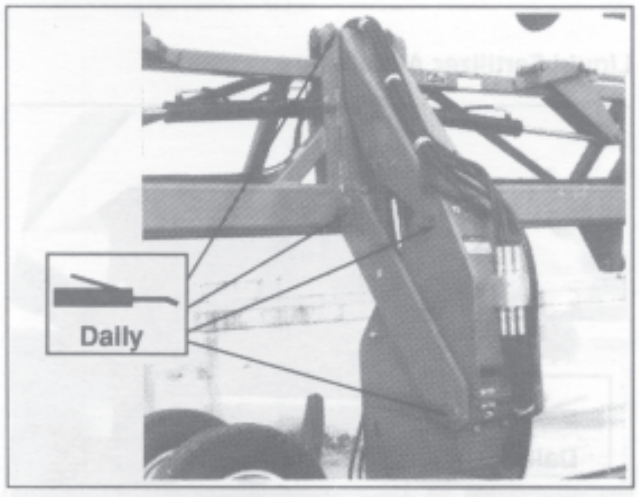
13. U-Joints - 3 Zerks Per Hinge Area



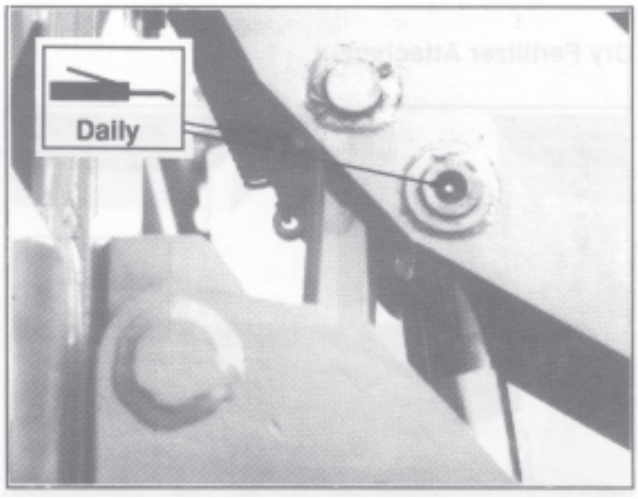
11. Transport Latch - 1 Zerk



14. Transport Wheel Bearings - 1 Zerk Per Hub

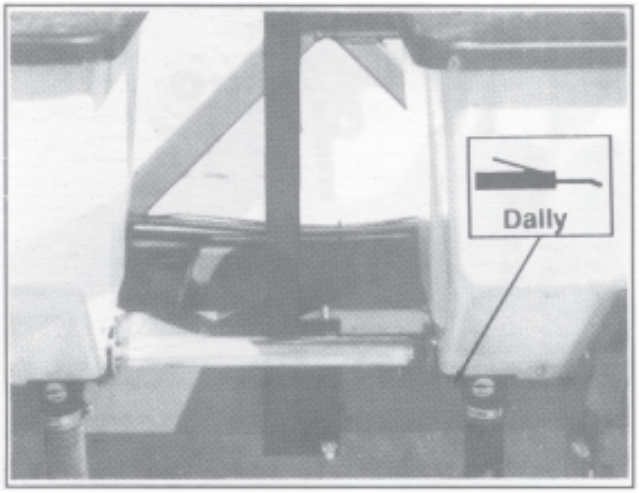


15. Upper Lift Arm - 2 Zerks
16. Lower Lift Arm - 5 Zerks

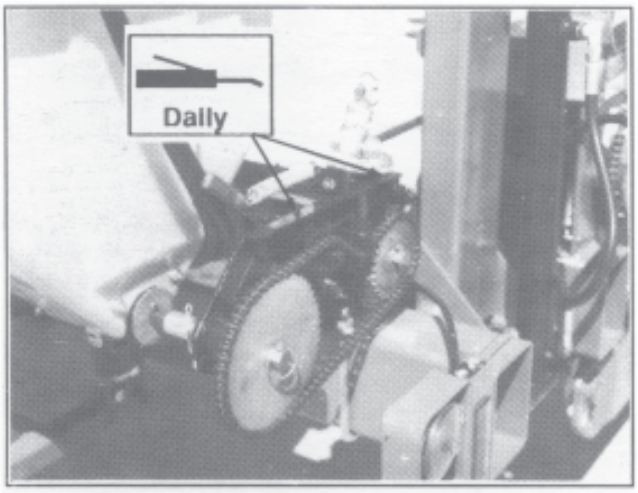


17. Safety Lock - 1 Zerk
18. Pivot Pin - 2 Zerks

Dry Fertilizer Attachment

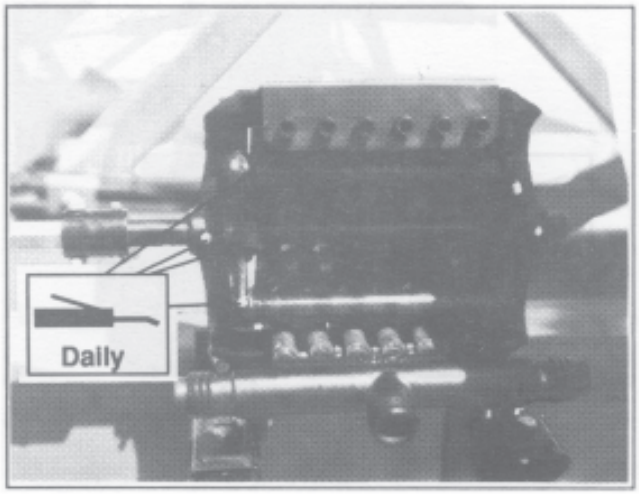


1. Fetilizer Hopper - 2 Zerks Per Hopper

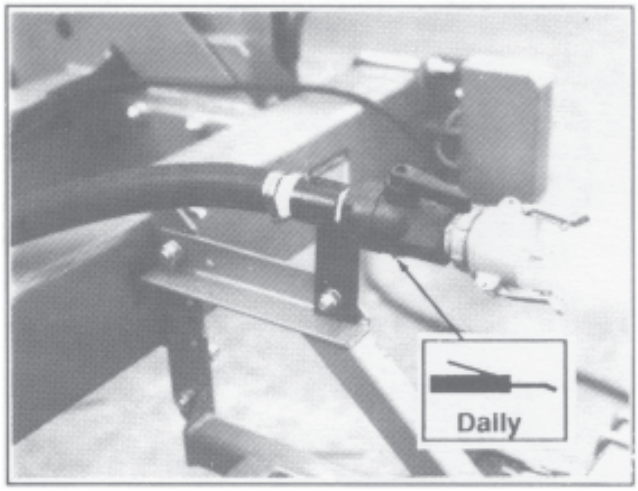


2. Fertilizer Transmission - 2 Zerks Per Transmission

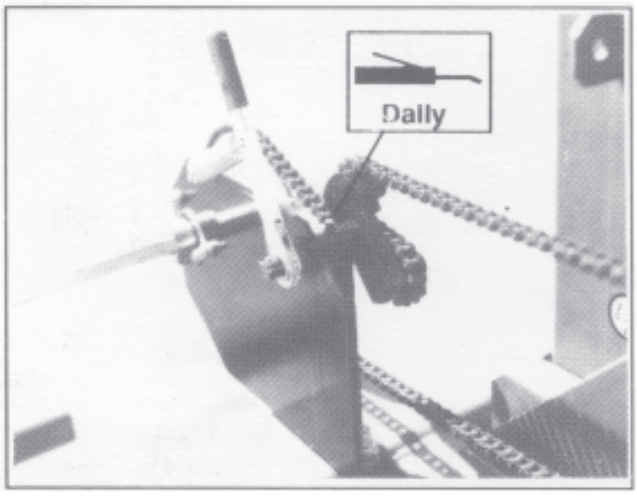
Liquid Fertilizer Attachment



1. Squeeze Pump - 8 Zerks Per Pump



2. Shut Off Valves - 1 Zerk Per Valve



3. Drive Plate - 1 Zerk Per Plate

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 going to be transported for a long distance.

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

TORQUE VALUES CHART - PLATED HARDWARE

Bolt Diameter	Grade 2		Grade 5		Grade 8	
	Course	Fine	Course	Fine	Course	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

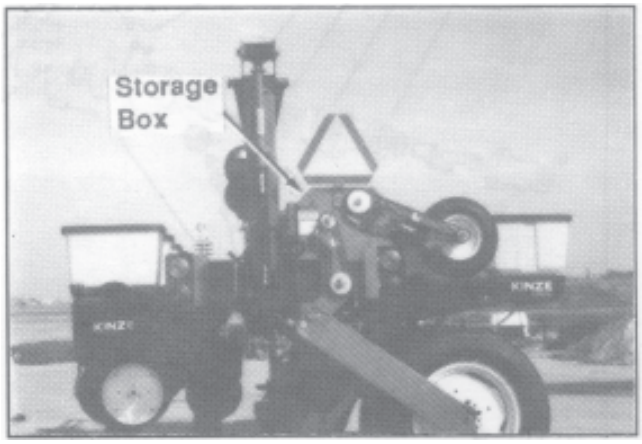

GRADE 5
3 Marks


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.

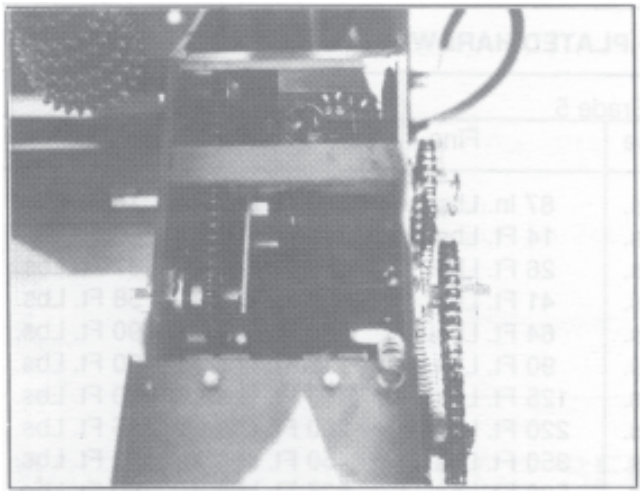


POINT ROW WRAP SPRING CLUTCH INSPECTION

Standard On 12 And 16 Row/Optional On 8 Row

The point row wrap spring clutch is permanently lubricated and requires no periodic maintenance. DO NOT LUBRICATE. KEEP CLUTCHES CLEAN. To clean, blow air through the clutch.

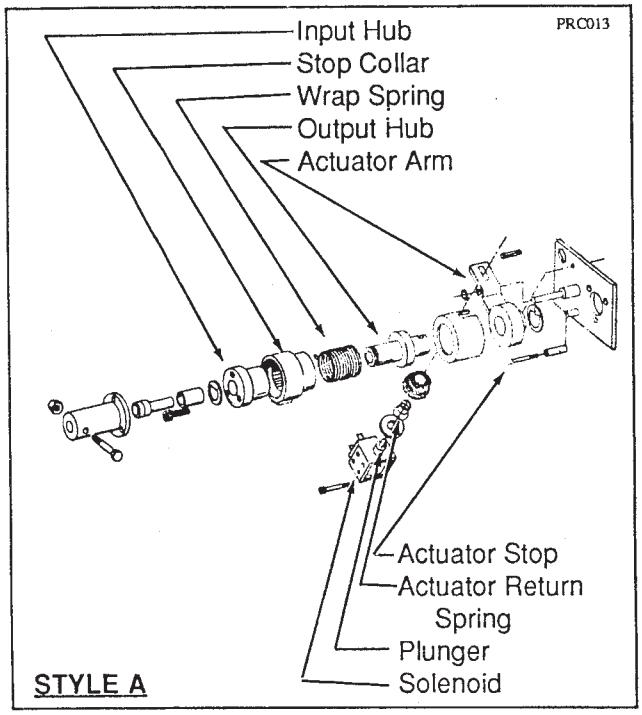
Should the clutch be disassembled, a small amount (Approx. 1/4 tsp.) of graphite should be used to coat the wrap spring and output hub (Style B Only).

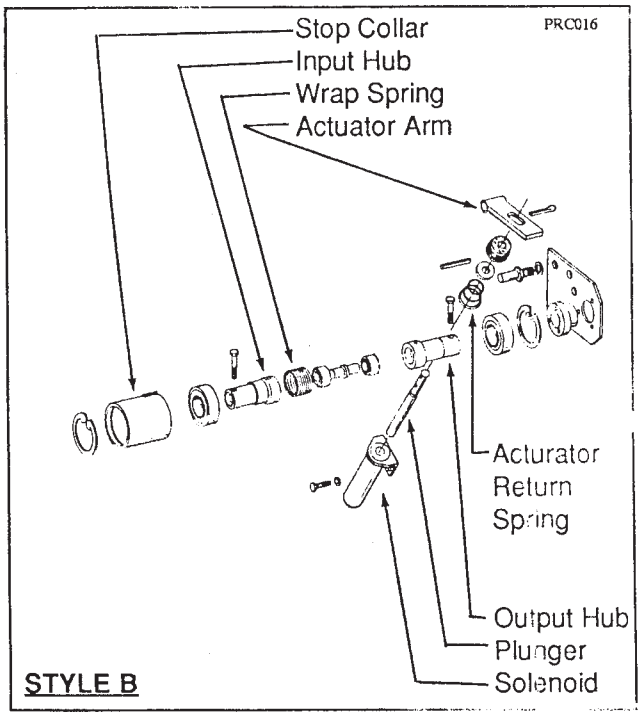


The right hand clutch operates clockwise and the left hand clutch operates counterclockwise. Therefore, some of the parts of the clutch such as the wrap spring differ from one side of the planter to the other. Be sure to use the correct repair part for the clutch being repaired.

If the clutch or clutches fail to operate first determine if the problem is electrical or mechanical. Place the operational switch in the "Engage/R or L" position. This should energize the solenoid coil. If the solenoid is operating properly, the plunger on the solenoid will retract causing a clicking sound. If the plunger does not retract, check the coil for power either with a test light or by touching the plunger with a metal object. If the coil is working properly, the plunger will be magnetized. If the plunger is not magnetized, check the wiring harness at the coil terminals with a test tight or volt meter. Power at this point would indicate that the coil is defective and must be replaced. Should there be no power at this point, check the wiring harness back to the tractor until the problem is located.

If power is getting to the solenoid coil and the plunger will not retract, place the operation switch in the "ON" position and check to see if the plunger can move in and out freely. if not, move the plunger in and out until it is freed up or replace the solenoid assembly. Corrosion or foreign material can cause the plunger to stick.





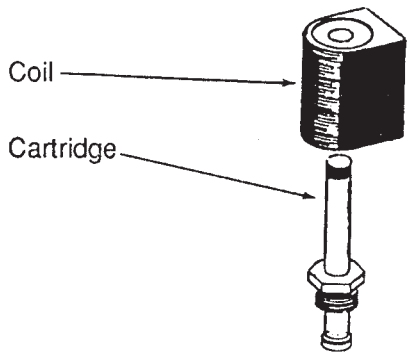
TROUBLE SHOOTING		
PROBLEM	**POSSIBLE CAUSE**	**POSSIBLE SOLUTION**
Neither clutch will disengage.	Fuse blown in control box. Poor terminal connection in wiring harness. Wiring damage in wiring harness. Low voltage at coil. (12 volts required.)	Replace fuse. Repair or replace. Repair or replace. Check 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.	Actuator arm and plunger stuck in disengaged position. Actuator arm stop out of adjustment Wrap spring broken or stretched. (The coils near the center of a stretched spring will be uneven with the rest of the coils.) Foreign substance such as oil or grease on the input or output hubs. Something touching the stop collar. Clutch assembled incorrectly.	Remove, free up and reinstall. Adjust actuator limit stop/sleeve 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.	Foreign substance such as oil or grease on the input or output on the hub. Wrap spring stretched.	Disassemble clutch and clean hubs and spring. Reassemble. Disassemble clutch and inspect spring for uneven coils near the center of the spring. Replace spring.
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.

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.

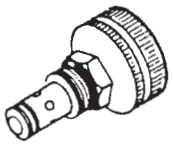
VVB019



TROUBLE SHOOTING		
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 volt 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

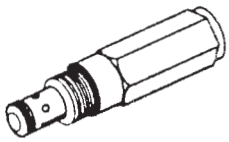
VVB020



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 REPLACMENT

1. Remove marker blade.

2. Remove hub cap from hub.

3. Remove cotter pin, nut and washer.

4. Slide hub from spindle.

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

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

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

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

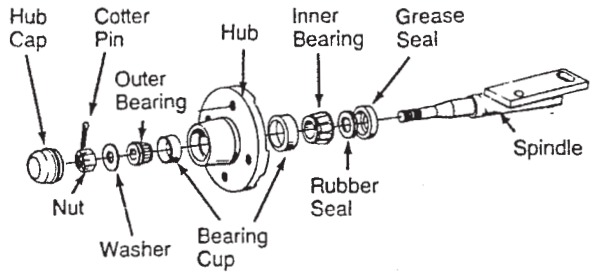
9. Clean spindle and install hub.

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

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

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

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

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

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

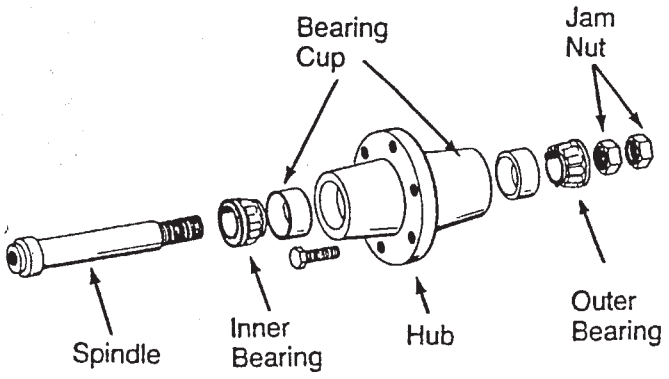
6. Place inner bearing in place.

7. Clean axle and install hub.

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

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

PTD057



PREPARATION FOR STORAGE

Store the planter in a dry sheltered area if possible.

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

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

Lubricate planter and row units at all lubrication points.

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

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

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

Clean seed meters and store in a dry area. (Refer to row unit manual for proper procedures)

Grease exposed areas of cylinder rods before storing planter.

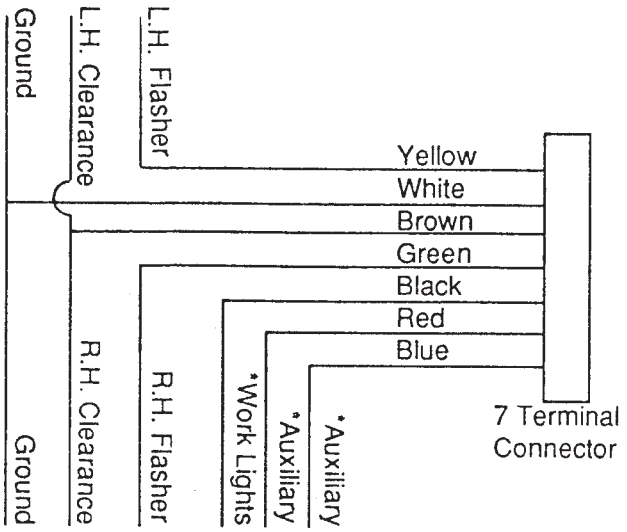
Grease or paint disc openers to prevent rust.

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

If the planter is equipped with a dry fertilizer attachment, clean the fertilizer hoppers, openers and all rubber spouts.

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

WIRING DIAGRAM

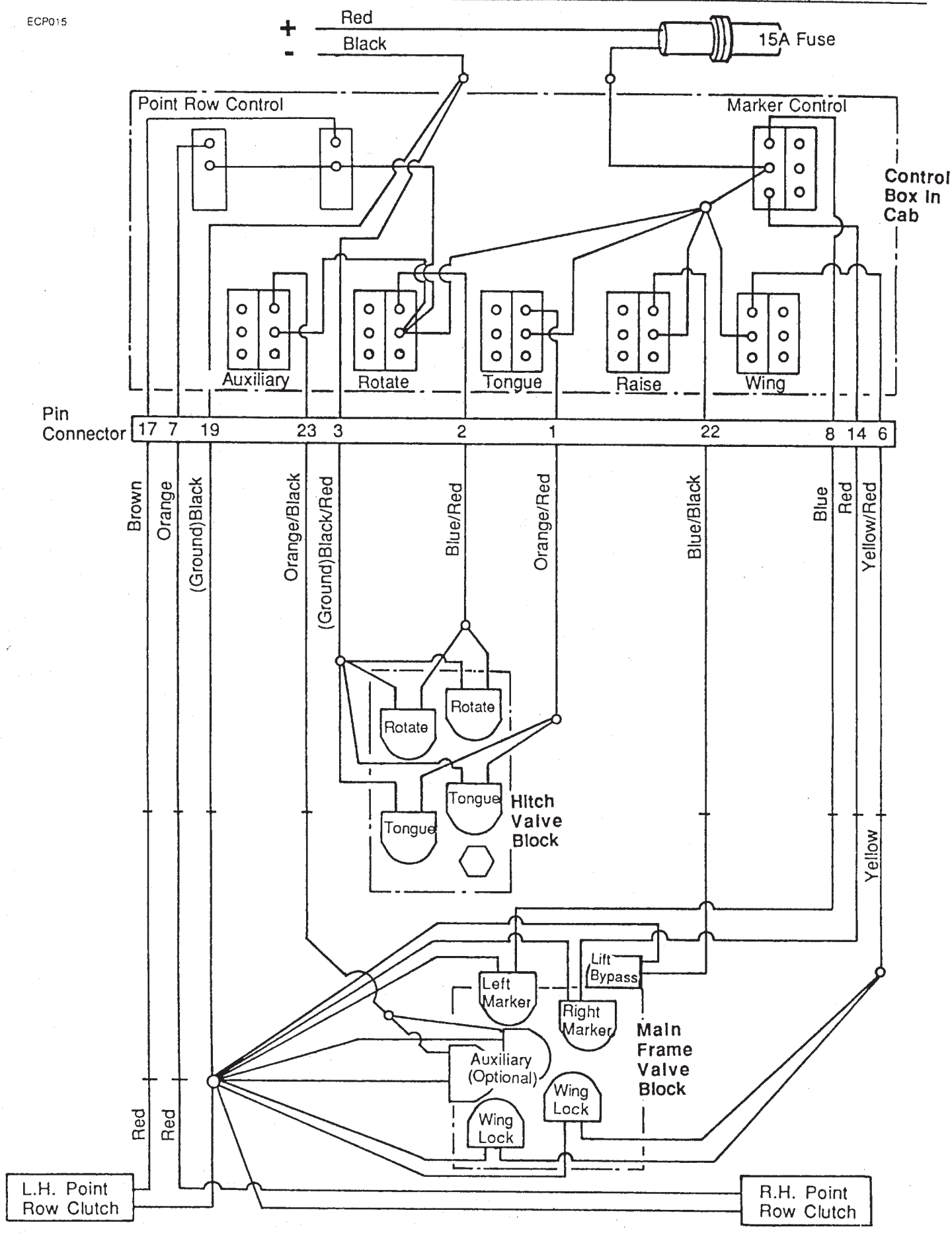


*Optional lights and wires (to be supplied by customer) may be wired into existing plug terminals.

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

WIRING DIAGRAM, STYLE A

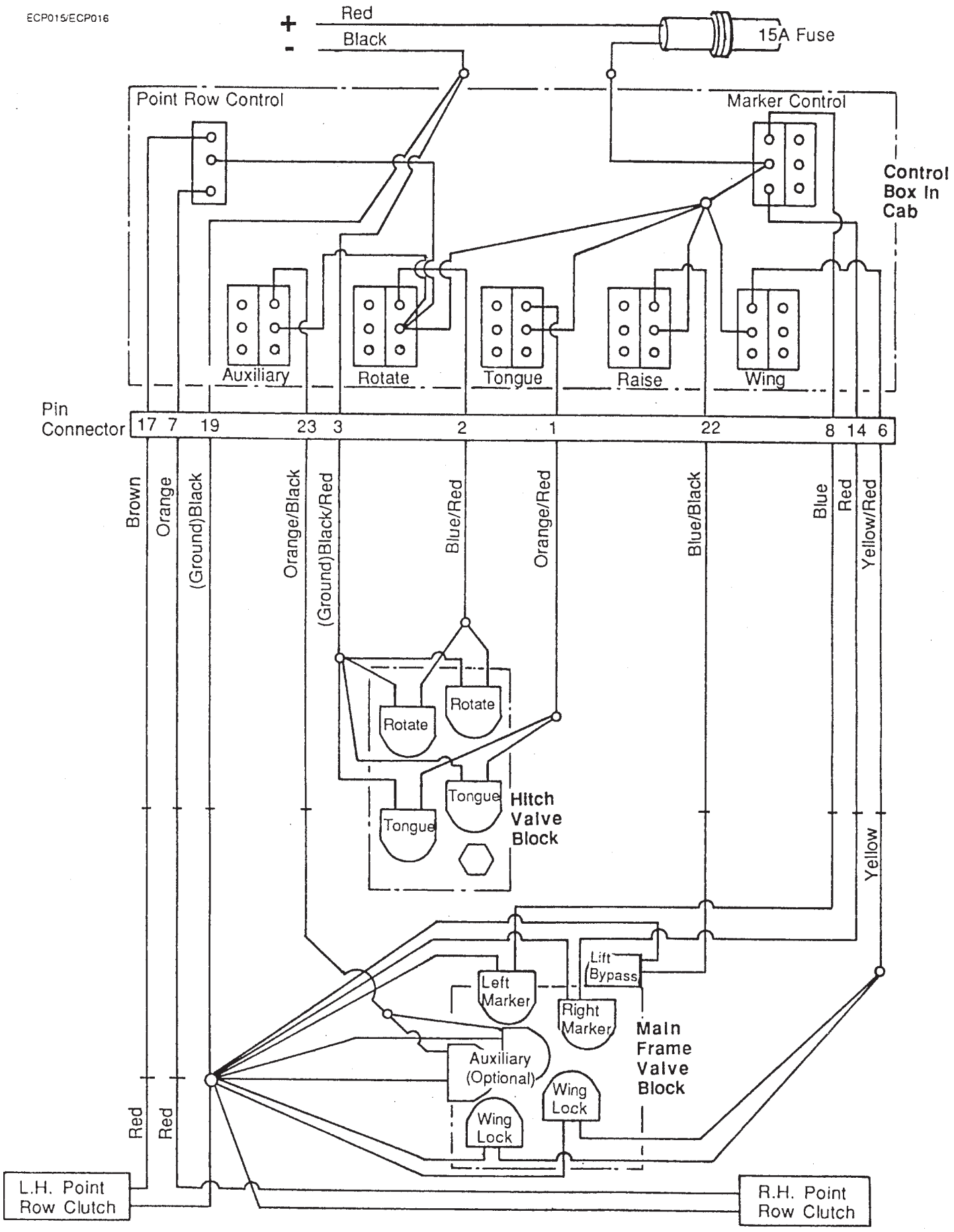
(Two Point Row Clutch Control Switches)



WIRING DIAGRAM, STYLE B

(One Point Row Clutch Control Switch)

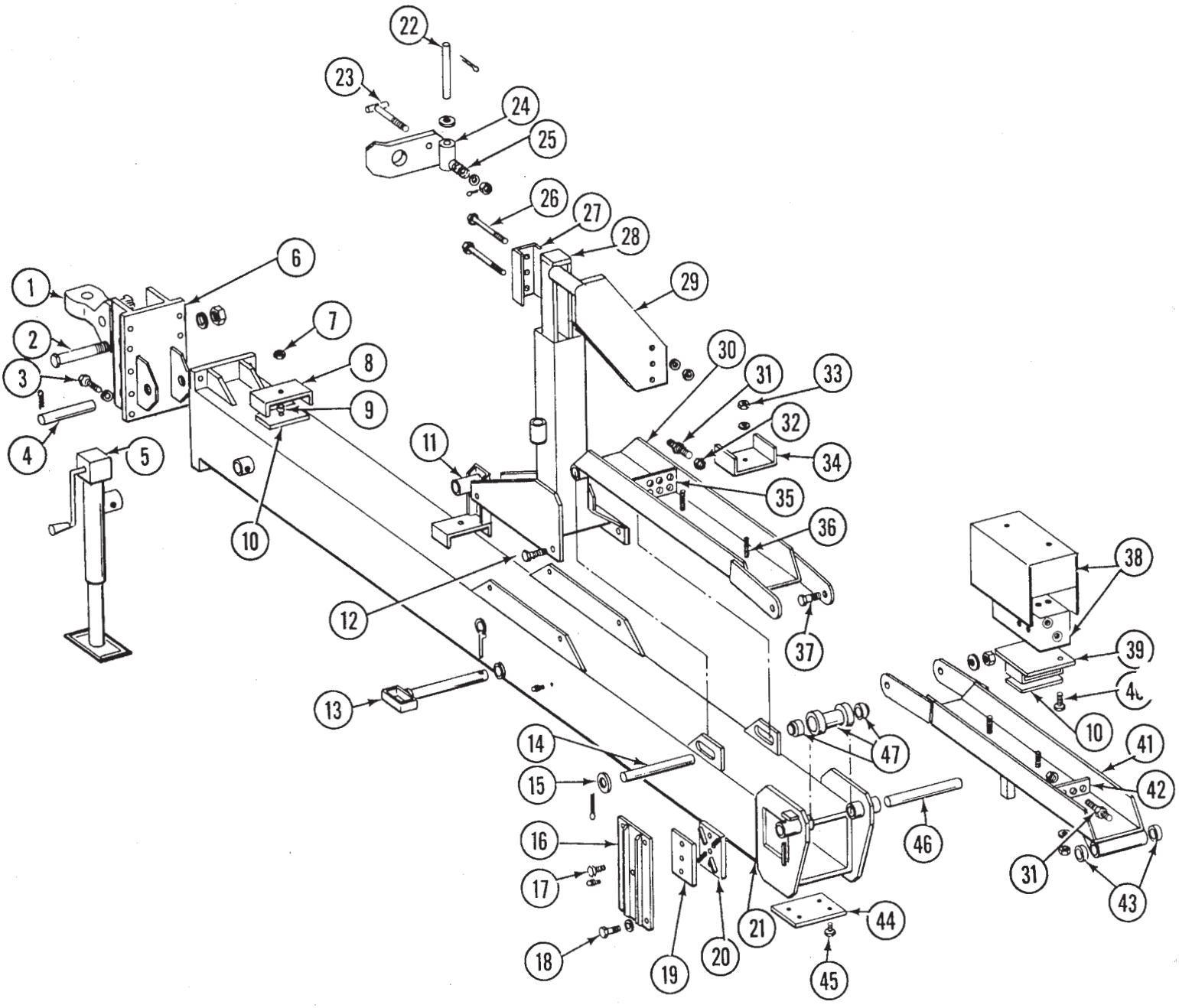
ECP015/ECP016



PARTS LIST INDEX

OUTER HITCH

PHA021



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

OUTER HITCH

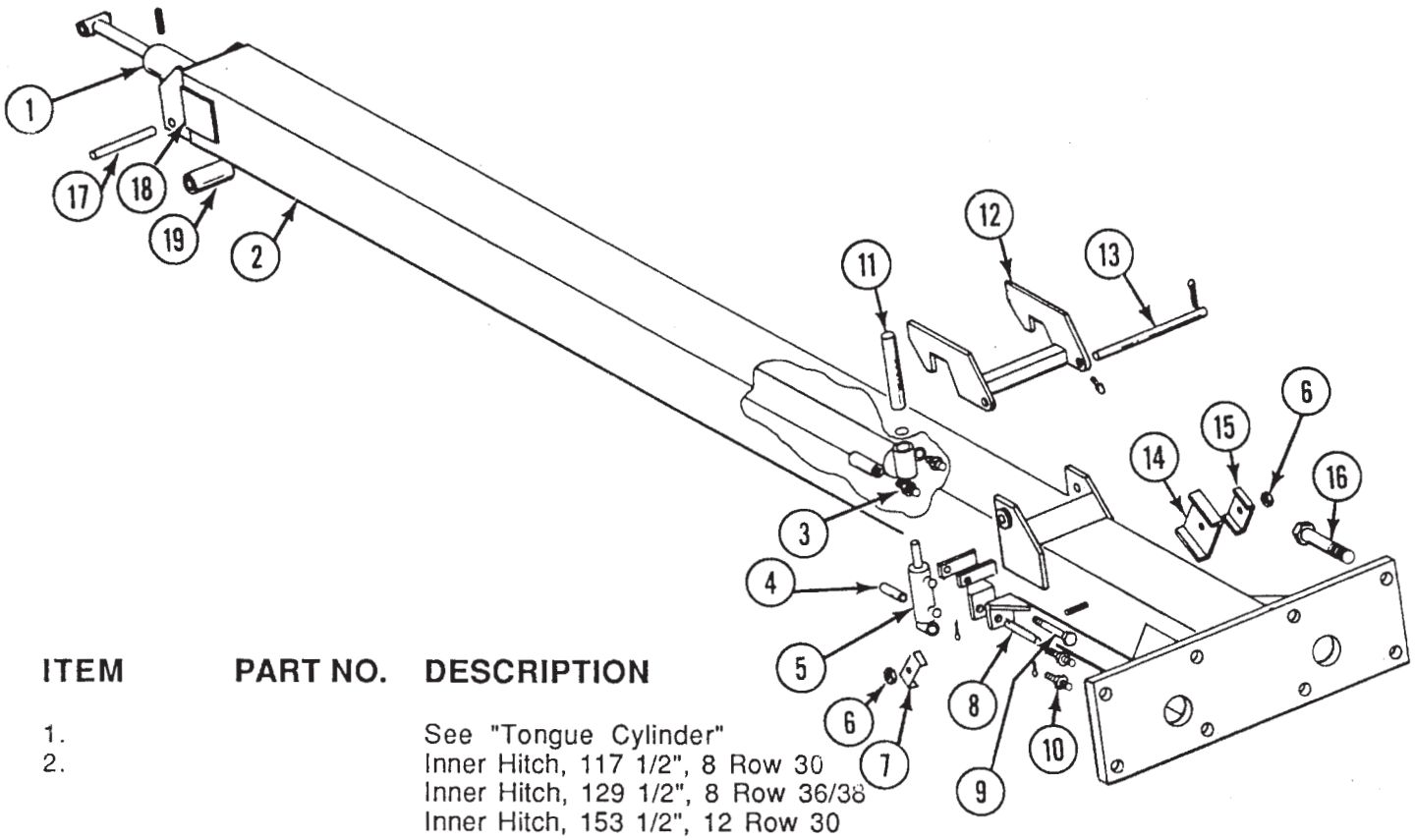
ITEM	PART NO.	DESCRIPTION
4.	D5173	Pin, 1 1/4" x 5 1/8"
	10462	Cotter Pin, 3/16" x 2"
5.	A4544	Jack Assembly Complete (Shown)
	A4994	Jack Assembly Complete
	A4995	Detent Pin Assembly (Used On A4994 Only)
	R0517	Pin
	R0516	Crank Assembly
	R0515	Bevel Gears
6.	A4420	Mount, 8/12 Row(Shown)
	A4839	Mount, 16 Row
7.	10111	Lock Nut, 1/2"-12
8.	D3548	Clamp
9.	D3788-01	Plastic Tubing
10.	D3552	Rubber Strap
11.	A2749	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 /12 Row
	A4845	Pin, 14 3/4", 16 Row
	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, 8/12 Row
	A2653	Wear Mount W/Grease Fitting, L.H., 16 Row
	A4882	Wear Mount W/Grease Fitting, R.H., 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) 8/12 Row
	D3501	Shim (As Required) 16 Row
20.	D5153	Wear Pad, Bronze, 8/12 Row
	D3478	Wear Pad, Bronze, 16 Row
21.		Outer Hitch, "Y", 61", 8 Row 30
		Outer Hitch, Narrow, 85", 8 Row 30
		Outer Hitch, "Y", 73", 8 Row 36/38
		Outer Hitch, Narrow, 97", 8 Row 36/38
		Outer Hitch, "Y", 97", 12 Row 30
		Outer Hitch, Narrow, 121", 12 Row 30(Shown)
		Outer Hitch, "Y", 121", 12 Row 36/38
		Outer Hitch, "Y" and Narrow, 127 1/2", 16 Row 30 (Prior To SN 31200)
		Outer Hitch, Narrow, 151 1/2", 16 Row 30 (SN 31200 And On)
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"

OUTER HITCH

ITEM	PART NO.	DESCRIPTION
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
27.	D6730	Bar
28.	A4401	Transport Post
29.	A4399	Latch Post
30.	A5469	Takeup, 15 1/2", 8 Row 30 W/"Y" Hitch
	A4605	Takeup W/Grease Fitting, 35", 8 Row 30 W/Narrow Hitch
	A4598	Takeup W/Grease Fitting, 21 1/2", 8 Row 36/38 W/"Y" Hitch
	A4412	Takeup W/Grease Fitting, 41", 8 Row 36/38 W/Narrow Hitch And 12 Row 30 (Shown) W/"Y" Hitch
	A4415	Takeup W/Grease Fitting, 53", 12 Row 30 W/Narrow Hitch And 12 Row36/38 And 16 Row 30 W/"Y" And Narrow Hitch (Prior To SN 31200)
	A5587	Tapkeup W/Grease Fitting, 65", 16 Row 30 W/Narrow Hitch (SN 31200 And On)
	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.	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
34.	D3560	Clamp
35.	A2627	Bulkhead
36.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10048	Hex Head Cap Screw, 3/8"-16 x 2"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
37.	D4695	Hex Head Cap Screw, Special
	10230	Lock Washer, 5/8"
	10217	Washer, 5/8" USS
	10104	Hex Nut, 5/8"-11
38.		See "Valve Block - Located On Hitch"
39.	A4608	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 W/"Y" Hitch
	A4606	Takeup W/Grease Fitting, 35", 8 Row 30 W/Narrow Hitch
	A4599	Takeup W/Grease Fitting, 21 1/2", 8 Row 36/38 W/"Y" Hitch
	A4414	Takeup W/Grease Fitting, 41", 8 Row 36/38 W/Narrow Hitch And 12 Row 30 W/"Y" Hitch(Shown)
	A4417	Takeup W/Grease Fitting, 53", 12 Row 30 W/Narrow Hitch And 12 Row 36/38 W/"Y" Hitch
	A5498	Takeup W/Grease Fitting, 53", 16 Row 30 W/"Y" And Narrow Hitch (Prior To SN 31200)
	A5586	Takeup W/Grease Fitting, 65", 16 Row 30 W/Narrow Hitch (SN 31200 And On)
	10641	Grease Fitting, 1/8" NPT
42.	A4607	Bulkhead
43.	D0752-15	Sleeve, 1", 16 Row Only
44.	D3488	Shim, 5" x 6 1/2", 16 Row Only
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	Roll Pin, 3/8" x 2'
47.	A4418	Roller W/Bronze Bushings, 8/12 Row
	A4842	Roller W/Bronze Bushings, 16 Row
	D6556	Bronze Bushing

INNER HITCH, NARROW

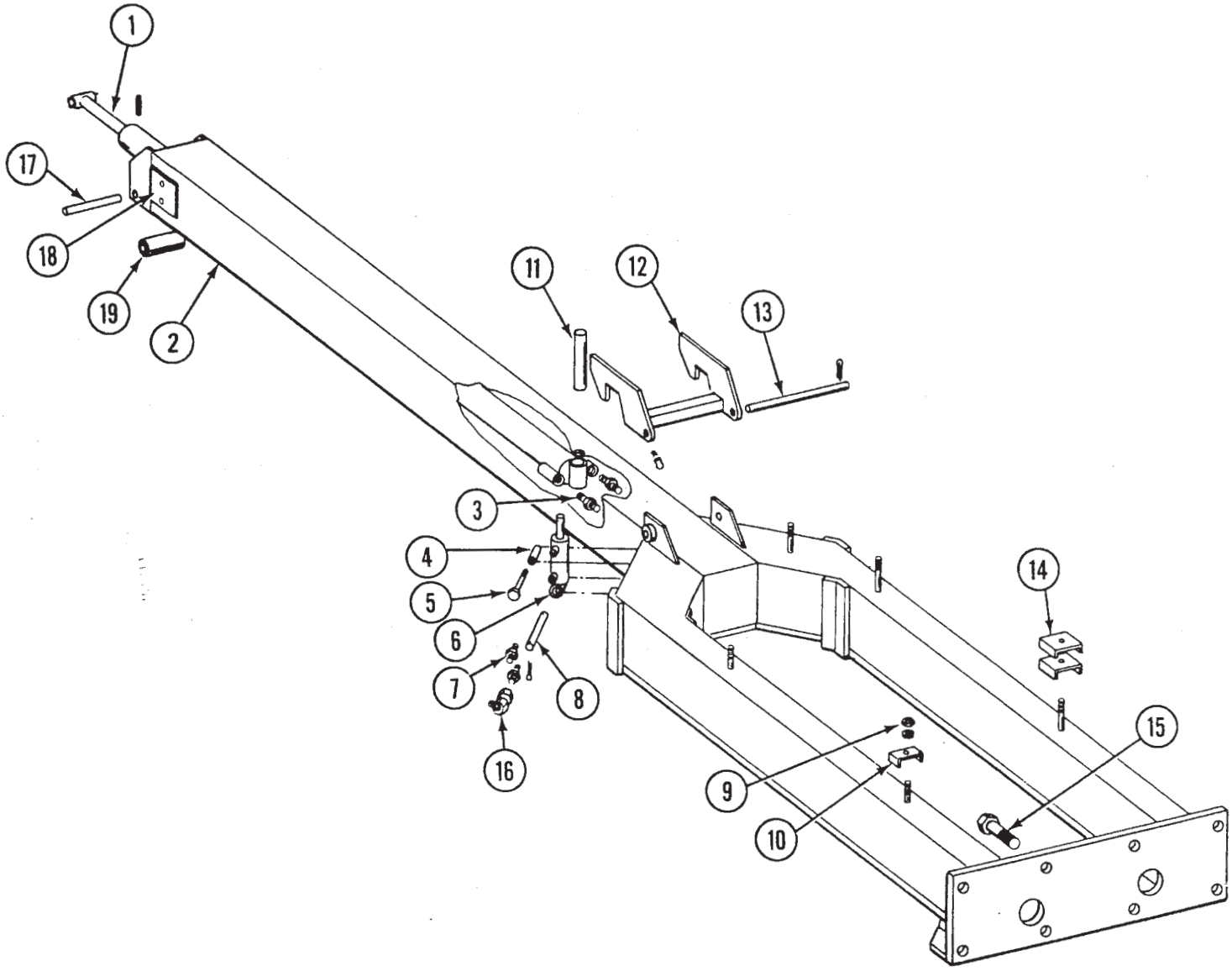
PHA022



ITEM	PART NO.	DESCRIPTION
1.		See "Tongue Cylinder"
2.		Inner Hitch, 117 1/2", 8 Row 30
		Inner Hitch, 129 1/2", 8 Row 36/38
		Inner Hitch, 153 1/2", 12 Row 30
		Inner Hitch, 212 1/4", 16 Row 30 (Prior To SN 31200)
		Inner Hitch, 188 1/4", 16 Row 30 (SN 31200 And On)
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.	D5892	Clamp, 1 1/2" x 1 1/2"
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
11.	D3537-07	Shaft, 1 1/4" x 6 5/8"
12.	A4407	Tongue Hook W/Grease Fittings
	10641	Grease Fitting, 1/8" NPT
13.	D5804	Shaft, 1 1/4" x 12", 8/12 Row
	D7883	Shaft, 1 1/4" x 14 1/2", 16 Row
	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	Roll 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

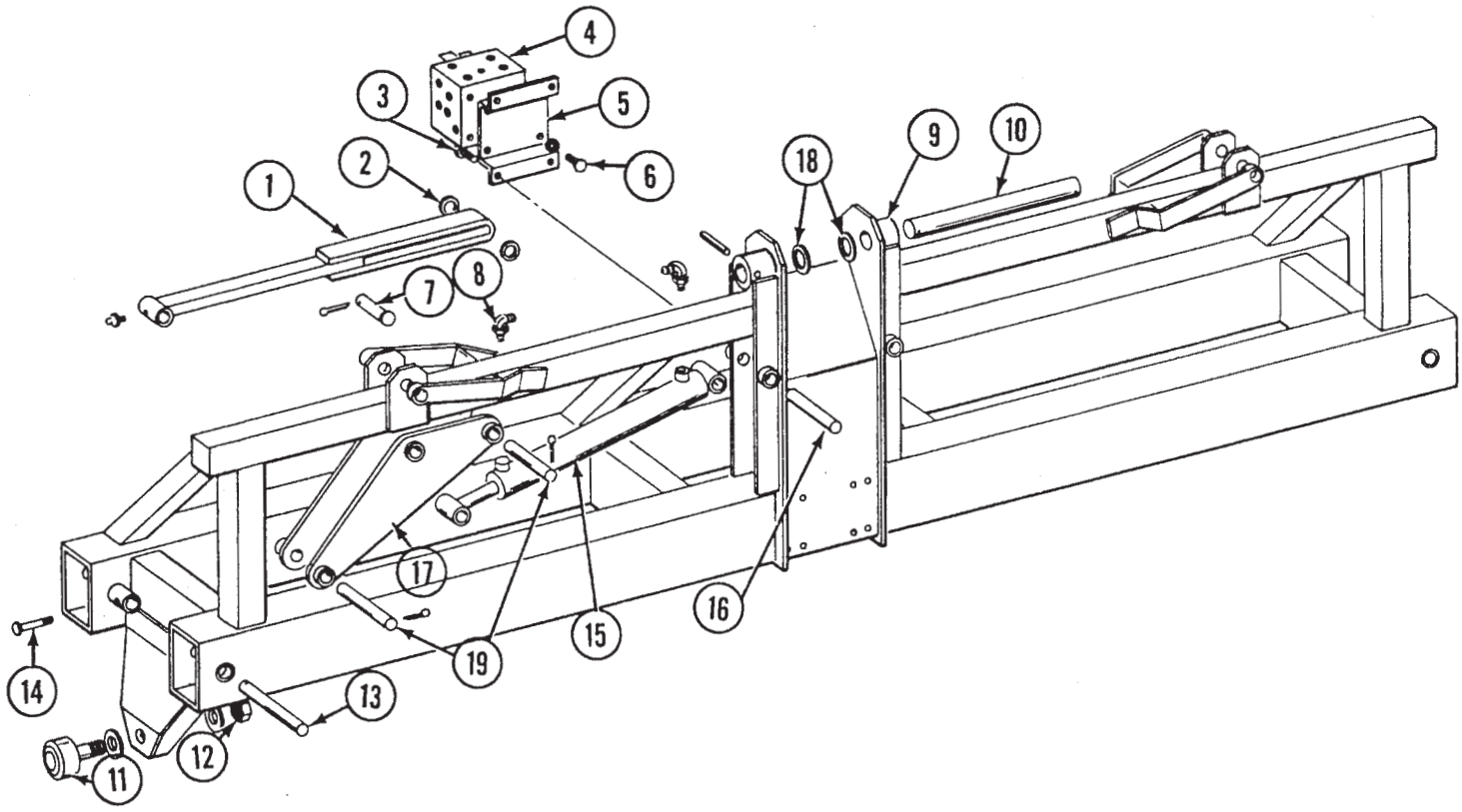


INNER HITCH, "Y"

ITEM	PART NO.	DESCRIPTION
1.		See "Tongue Cylinder"
2.		Inner Hitch, 140 1/4", 8 Row 30
		Inner Hitch, 152 1/4", 8 Row 36/38
		Inner Hitch, 176 1/2", 12 Row 30(Shown)
		Inner Hitch, 198 1/2", 12 Row 36/38
		Inner Hitch, 212 1/4", 16 Row 30
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, 8/12 Row
	A4841	Tongue Hook W/Grease Fittings, 16 Row
	10641	Grease Fitting, 1/8" NPT
13.	D5804	Shaft, 1 1/4" x 12", 8/12 Row
	D7883	Shaft, 1 1/4" x 14 1/2", 16 Row
	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	Roll 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

CENTER FRAME

PFA038

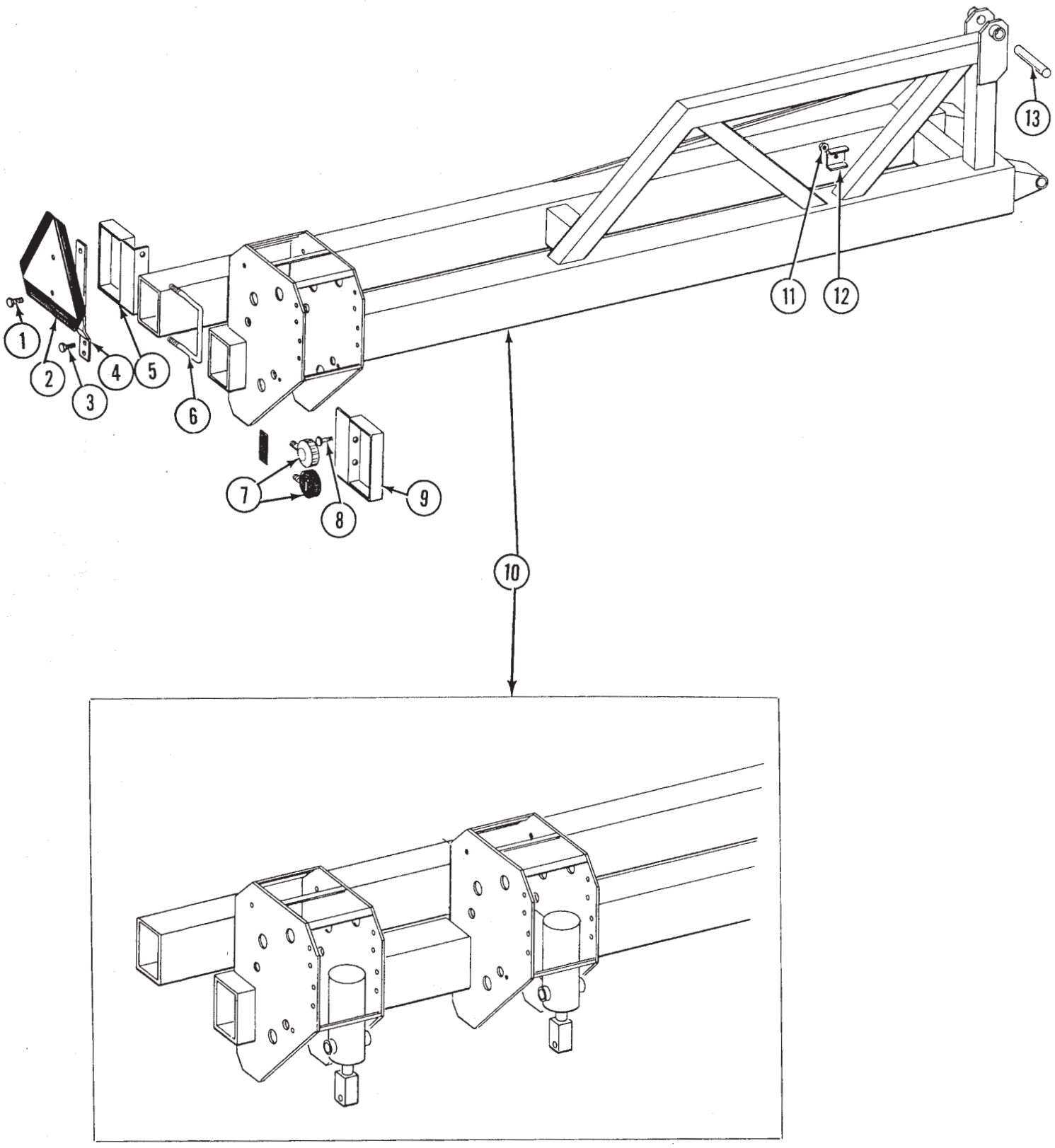


CENTER FRAME

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"
	10219	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, 12 Row 30 And 16 Row 30
		Frame, 165", 8 Row 36/38 And 12 Row 36/38
10.	D6659	Pin, 2 1/8" x 16"
	10285	Roll Pin, 1/2" x 3"
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"

WING

PFA039/PFA046

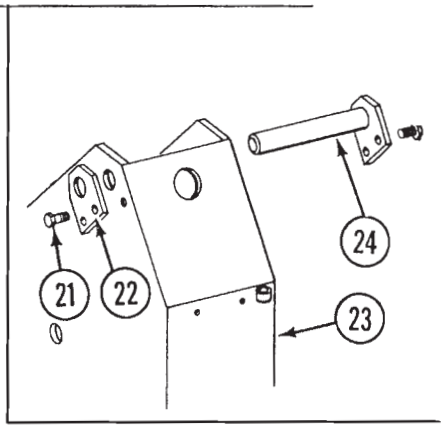


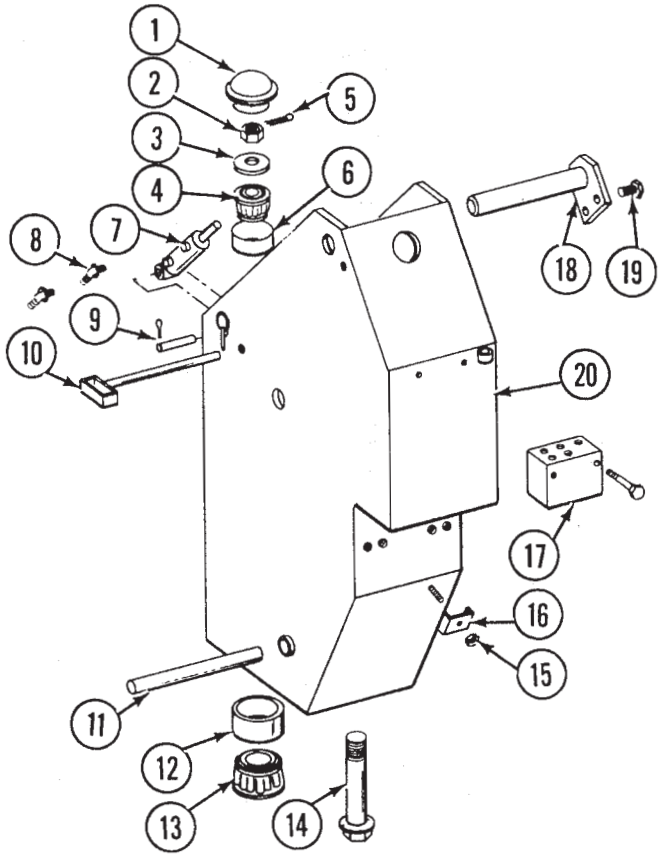
WING

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"
	Not Available	Rubber Washer
	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
		Wing, R.H., 67 1/4", 8 Row 30
		Wing, L.H. And R.H., 71 1/4", 8 Row 36
		Wing, L.H. And R.H., 79 1/4", 8 Row 38
		Wing, L.H. And R.H., 123 1/4", 12 Row 30
		Wing, L.H. And R.H., 139 1/2", 12 Row 36
		Wing, L.H. And R.H., 150 1/2", 12 Row 38
		Wing, L.H. And R.H., 183 1/4", 16 Row 30 (Two Wheel Towers Per Wing)
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

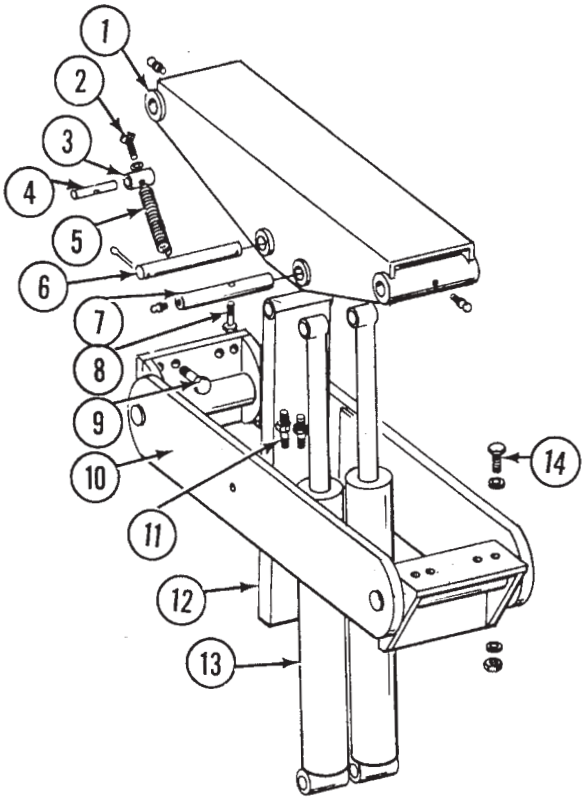




ITEM	PART NO.	DESCRIPTION
1.	D4927	Cap
2.	10070	Hex Jam Nut, 1 1/4"-12, Grade 2
3.	D4171	Hardened Washer, 1 1/4"
4.	A0705	Cone
5.	10460	Cotter Pin, 1/4" x 2"
6.	R0322	Cup
7.		See "Lift Lock Cylinder"
8.	6801-06-08	Elbow, 3/4"-16 O-Ring To 9/16"-18 JIC
9.	D7137	Pin, 3/4" x 3 1/4"
	10457	Cotter Pin, 5/32" x 1 1/2"
10.	A4436	Pin
	D2558	Lynch Pin, 1/4"
11.	D6660	Pin, 1 1/2" x 13 5/8"
12.	D6554	Cup
13.	A4288	Cone
14.	A4375	Pivot Bolt, Straight (SN 31001-37053)
	A4746	Pivot Bolt, Tapered (SN 37054 And On)
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
21.	10026	Hex Head Cap Screw, 3/4"-10 x 2", 16 Row
22.	D7210	Plate, 16 Row Only
23.		Rotating Housing, 16 Row
24.	A4875	Pin, 12", 16 Row

CENTER LIFT ARMS

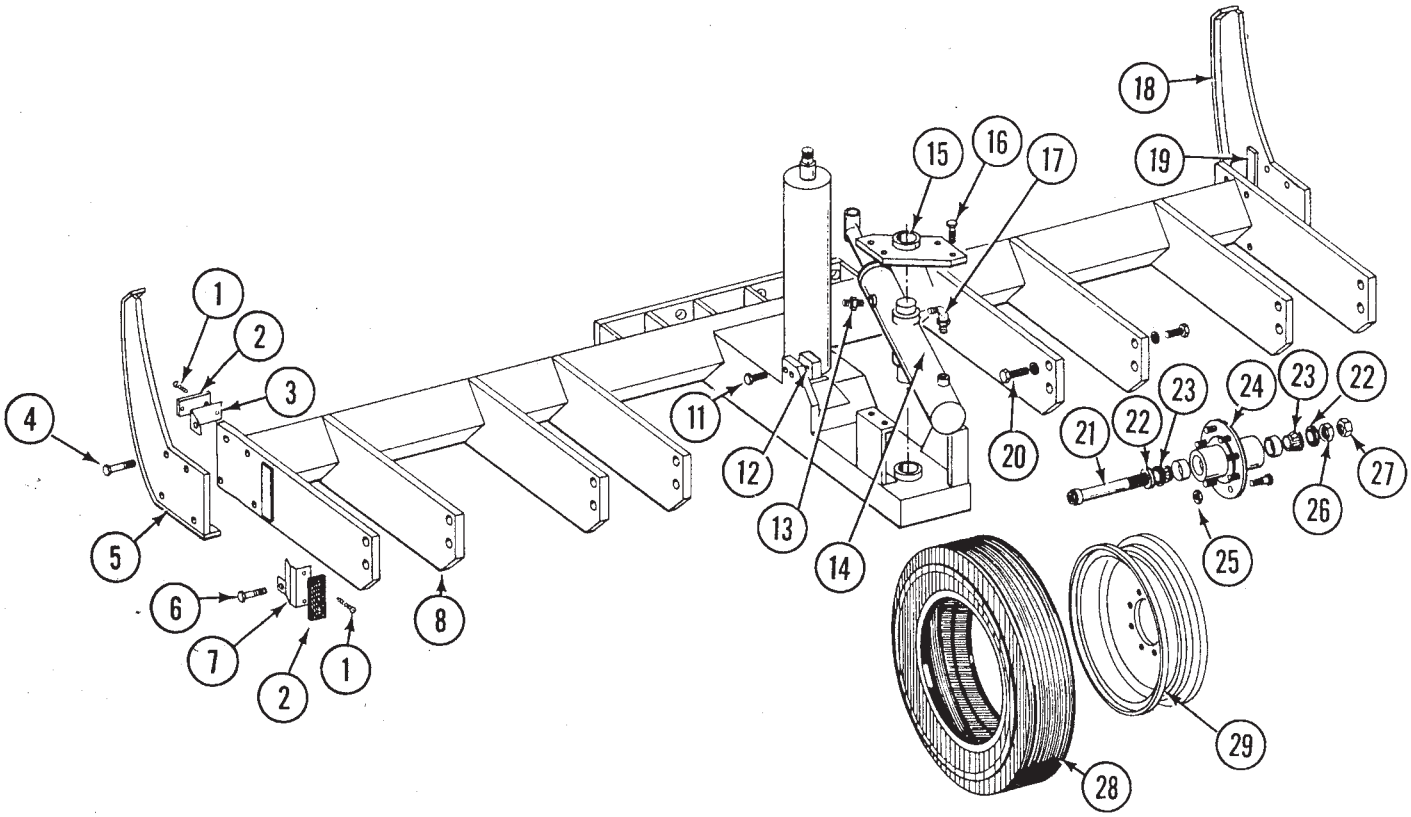
PFA041

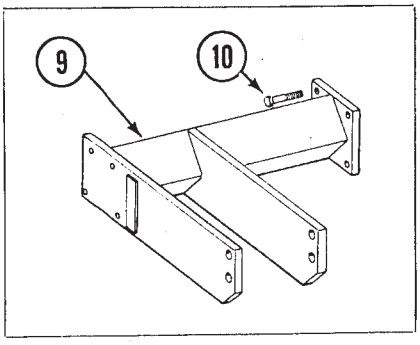


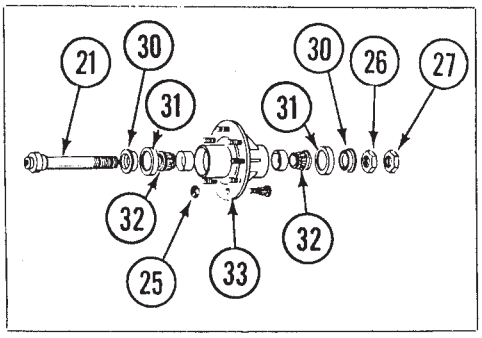
ITEM	PART NO.	DESCRIPTION
1.	A4360	Upper Lift Arm W/Grease Fittings
	10641	Grease Fitting, 1/8" NPT
2.	10077	Hex Head Cap Screw, 7/16"-14 x 4 1/4"
	10081	Washer, 7/16" USS
3.	D6701	Sleeve, 1 1/2"
4.	D6700	Pin, 3/4" x 2 1/2"
5.	A2052	Spring W/Plug
6.	D6657	Pin, 1 1/2" x 9 3/4"
	10462	Cotter Pin, 3/16" 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.	10480	Hex Head Cap Screw, 3/4"-16 x 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
12.	A4347	Safety Lock W/Grease Fitting
	10641	Grease Fitting, 1/8" NPT
13.		See "Master Lift Cylinder"
14.	10097	Hex Head Cap Screw, 3/4"-16 x 2 1/2"
	D2169	Special Washer
	10098	Hex Nut, 3/4"-16

AXLE AND TRANSPORT WHEELS

HTA029/HTA031/HTA032







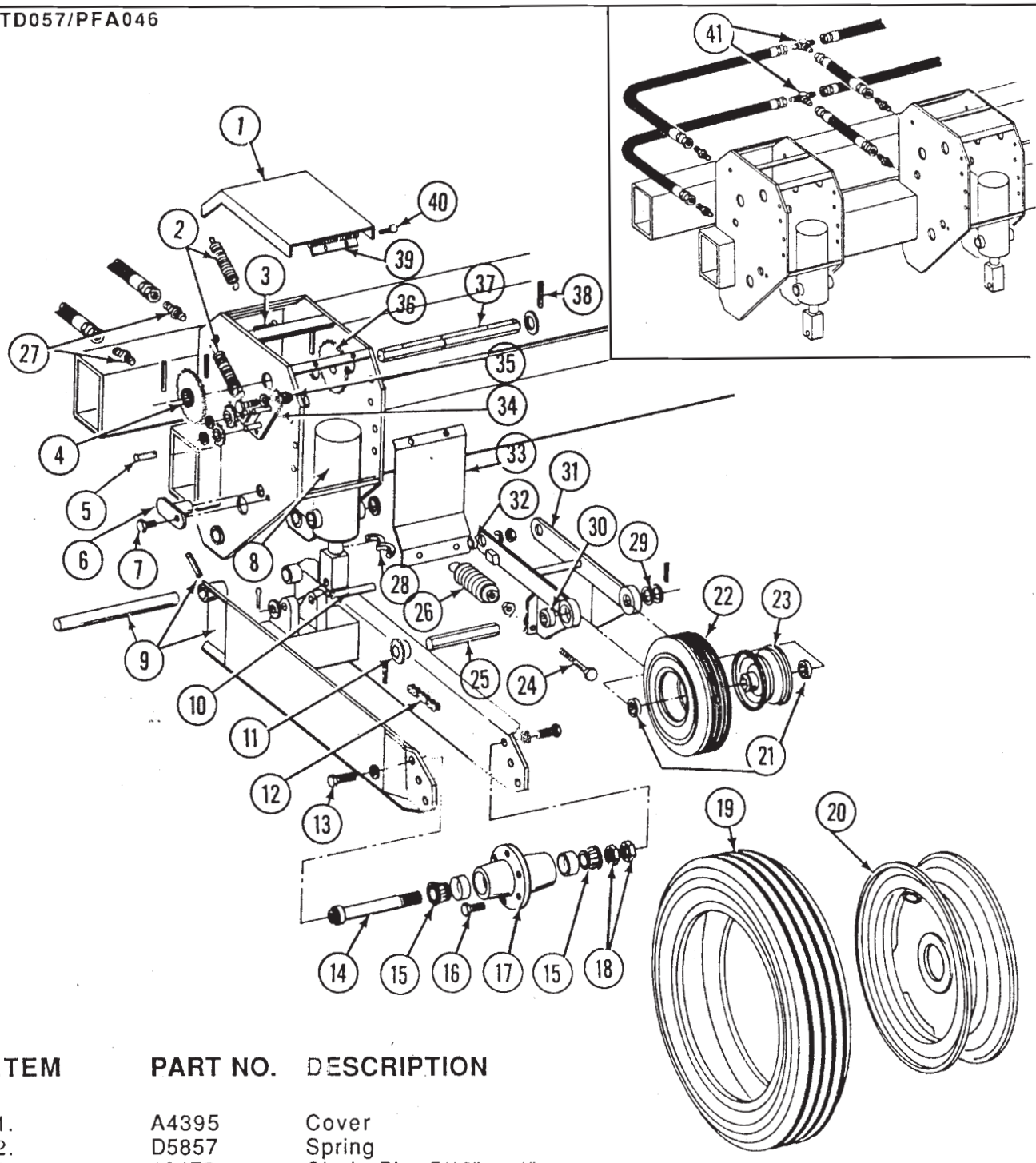
ITEM	PART NO.	DESCRIPTION
1.	10482	Slotted Screw, #8 x 3/4"
2.		See "SMV, Decals, Reflectors And Tie Straps"
3.	D6955	Mount, L.H. (Shown)
	D6956	Mount, R.H.
4.	10010	Hex Head Cap Screw, 5/8"-11 x 3"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
5.	A4367	Anti-Rotation Track, L.H.
6.	10039	Hex Head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

AXLE AND TRANSPORT WHEELS

ITEM	PART NO.	DESCRIPTION
9.	A4627	Axle Stud, L.H., Wide Row Models Only (Shown)
	A4628	Axle Stud, 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"
	A4824	Spindle, 1 1/2"
22.	A4722	Seal, 1 3/4"
	A4286	Seal, 1 1/2"
23.	A4723	Cone, 1 3/4"
	A4287	Cone, 1 1/2"
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
	A4333	Hub W/Cups, Bolts And Grease Fitting, 8 Bolt, 1 1/2" Bore, 8/12 Row
	10641	Grease Fitting, 1/8" NPT
	D6553	Cup
	R0528	Lug Bolt
25.	R0531	Nut, 5/8"-18 UNF
26.	D7089	Special Nut, 1 3/4"-12 UNF
	D6629	Special Nut, 1 1/2"-12, Grade 2
27.	D7864	Special Hex Nut, 1 3/4"-12 UNF
	10087	Hex Jam Nut, 1 1/2"-12, Grade 2
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

CONTACT DRIVE WHEEL

PTD057/PFA046



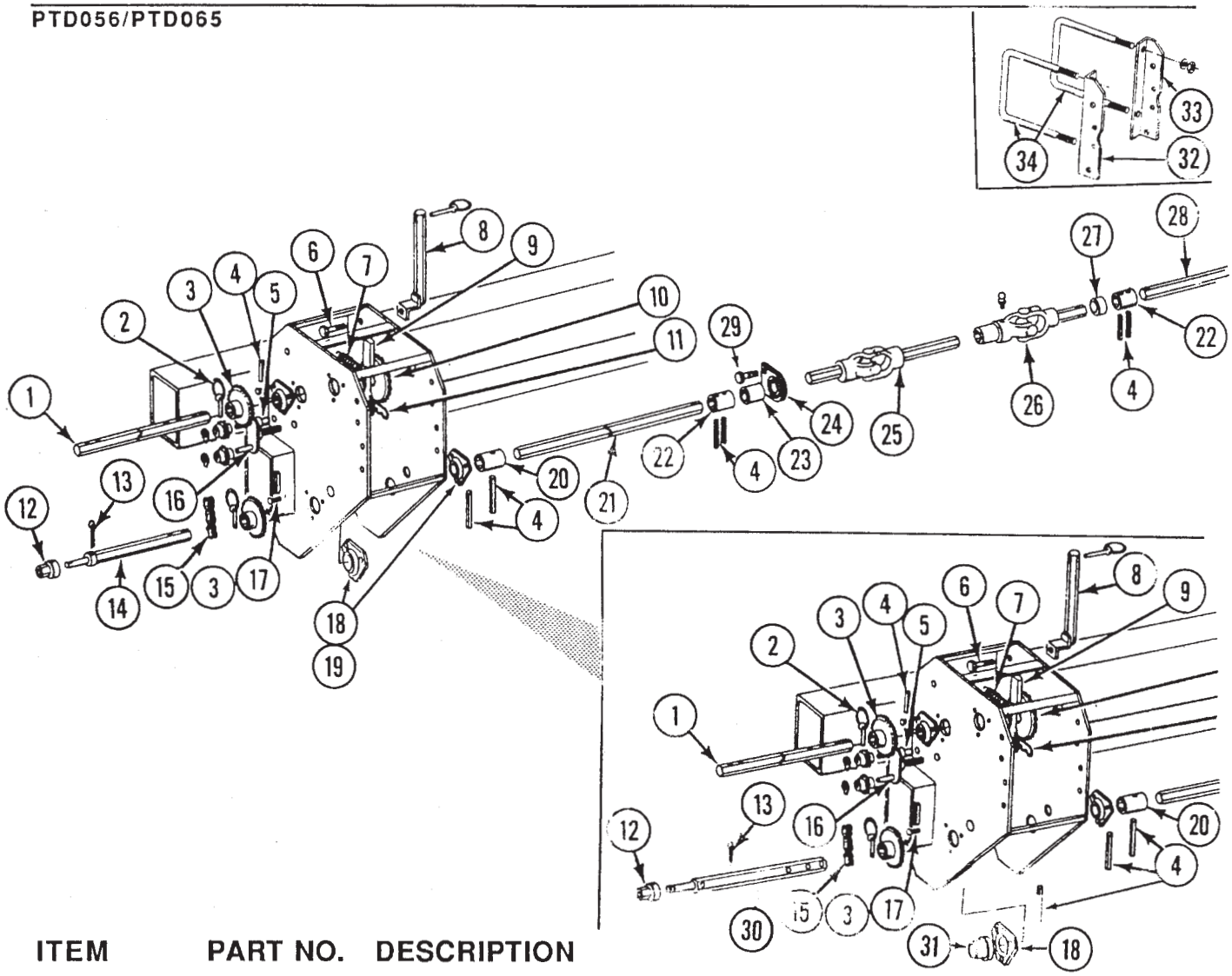
ITEM	PART NO.	DESCRIPTION
1.	A4395	Cover
2.	D5857	Spring
3.	10478	Clevis Pin, 5/16" x 1"
	10409	Ring
4.	A5109	Sprocket, 24 Tooth, 8/12 Row
	A5114	Sprocket, 30 Tooth-2 To 1 Reduction, 8/12 Row(Shown)
		See "Ratchet/Sprocket Assembly", 16 Row
5.	10408	Clevis Pin, 5/16" x 3/4"
	10409	Ring
6.	A5121	Pin
7.	10037	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
8.		See "Slave Lift Cylinder"

CONTACT DRIVE WHEEL

ITEM	PART NO.	DESCRIPTION
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"
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
	3310-132	Chain, No. 40, 132 Pitch Including Connector Link, 16 Row
	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 3/4"-16 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.	B0123	Bushing
33.	D6895	Shield
34.	A4429	Idler W/Sprockets, Rings And Strap
	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.	D6784	Shaft, 7/8" x 13", Used On 8 Row Models Without Point Row Clutches
	D7763	Shaft, 7/8" x 14", Used On 8 Row Models Without Point Row Clutches And With Magnetic Distance Sensor (See "Point Row Clutch, Style A Or Style B" For Models Equipped With Point Row Clutches.)
38.	10602	Roll 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

TRANSMISSION AND ROW UNIT DRILL SHAFT

PTD056/PTD065



ITEM	PART NO.	DESCRIPTION
1.	D6780	Shaft, 7/8" x 15", 8/12 Row
	D7264	Shaft, 7/8" x 45", 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	Roll 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

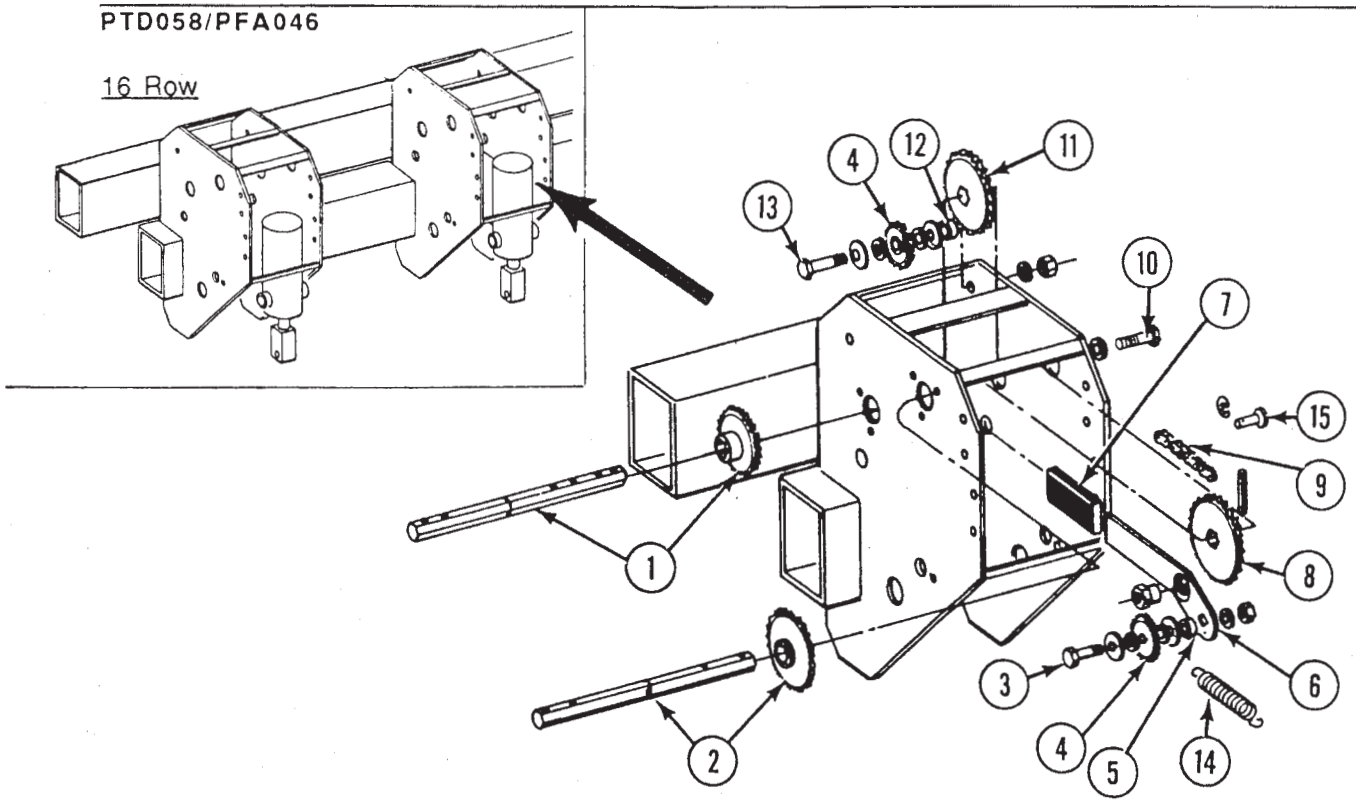
TRANSMISSION AND ROW UNIT DRILL SHAFT

ITEM	PART NO.	DESCRIPTION
12.	D7127	Shear Coupler
13.	10462	Cotter Pin, 3/16" x 2"
14.	A4760	Shaft, 7/8" x 13 1/2"
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
	D5887-49.75	Drill Shaft, Wing, 8 Row 36 (Prior To SN 31265)
	D5887-52.75	Drill Shaft, Wing, 8 Row 38 (Prior To SN 31265)
	D5887-54.25	Drill Shaft, Wing, 8 Row 36/38 (SN 31265 And On)
	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 W/Grease Fitting, 14 3/4", 8 Row 30, 12 Row 30 And 16 Row 30
	A4637	U-Joint W/Grease Fitting, 21 3/4", 8 Row 36 (Prior To SN 31265) And 12 Row 36
	A4638	U-Joint W/Grease Fitting, 23 3/4", 8 Row 38 (Prior To SN 31265)And 12 Row 38
	A5647	U-Joint W/Grease Fitting, 19 3/4", 8 Row 36/38 (SN 31265 And On)
	10343	Grease Fitting, 1/8"-27, 90°
26.	A4393	U-Joint W/Grease Fittings, 15"
	10343	Grease Fitting, 1/2"-27, 90°
	10643	Grease Fitting, 1/4"-28
27.	D1199-03	Spacer, 5/8"
28.	D5887-38.5	Drill Shaft, Main Frame, 8 Row 30, 12 Row 30 And 16 Row 30 (With 13" Row Unit Extensions Or No Row Unit Extensions)
	D5887-36	Drill Shaft, Main Frame, 8 Row 30, 12 Row 30 And 16 Row 30 (With 15" Row Unit Extensions)
	D5887-46	Drill Shaft, Main Frame, 8 Row 36 (Prior To SN 31265)
	D5887-48	Drill Shaft, Main Frame, 8 Row 38 (Prior To SN 31265) And 12 Row 36/38 (With 13" Row Unit Extensions Or No Row Unit Extensions)
	D5887-44	Drill Shaft, Main Frame, 8 Row 36/38 (SN 31265 And On) And 12 Row 36/38 (With 15" Row Unit Extensions)
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.	A5548	Special Bearing
32.	D1022L	Support Angle (8 Row 38)
33.	D2298	Support Angle (8 Row 38)
34.	D1113	U-Bolt, 5" x 7" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11

INNER MODULE DRIVE

PTD058/PFA046

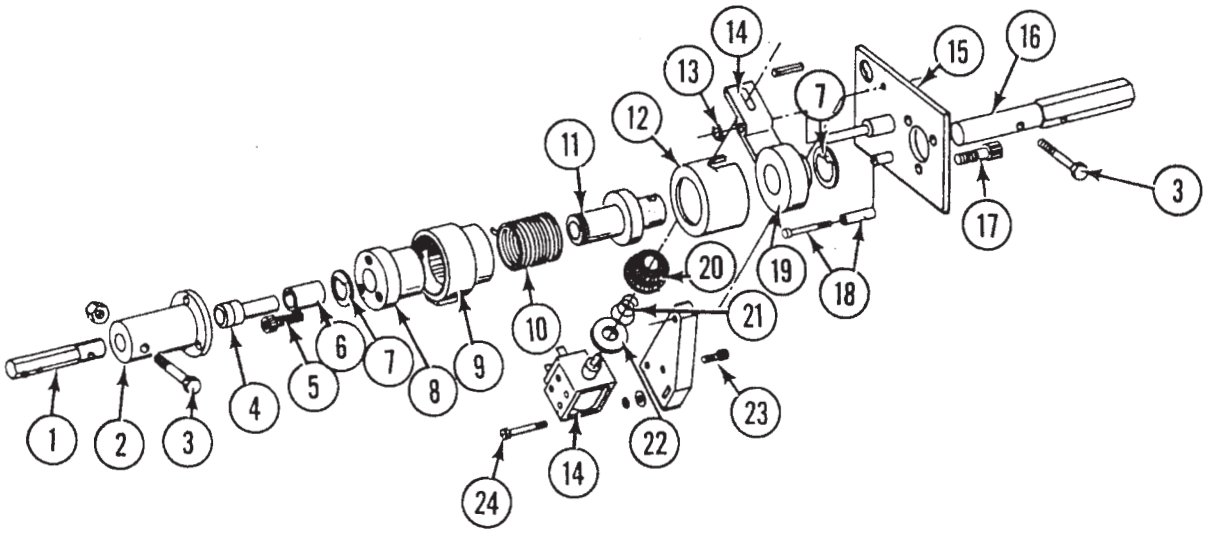
16 Row



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 STYLE A

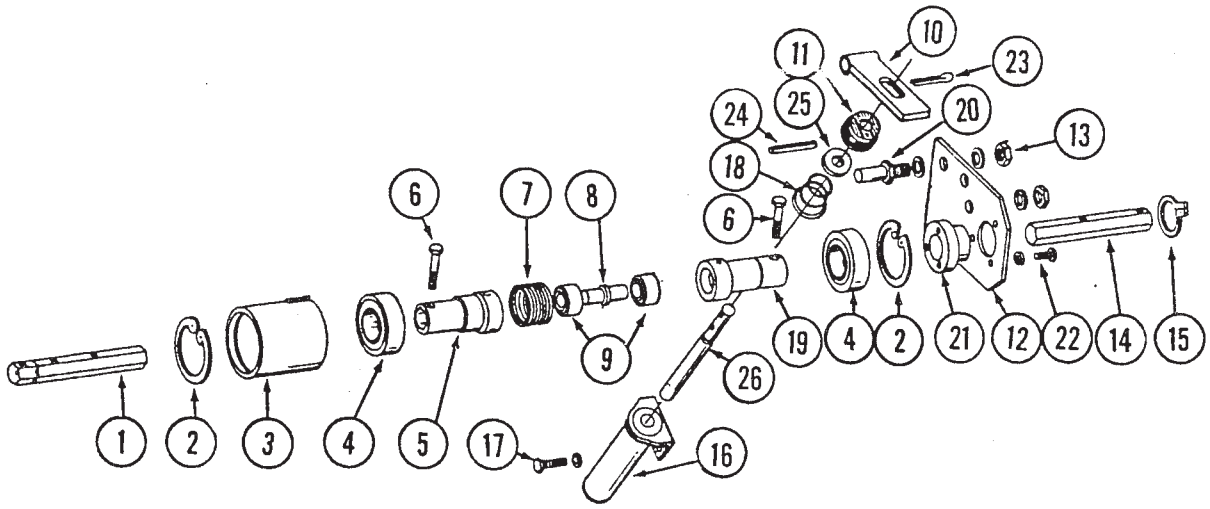
PRC013



ITEM	PART NO.	DESCRIPTION
1.	D7133	Input Shaft, 4 1/2", 8(Optional)/12 Row
2.	A4765	Housing
3.	10041	Hex Head Cap Screw, 5/16"-18 x 2"
	10109	Lock Nut, 5/16"-18
4.	A2022	Bearing
5.	10474	Socket Head Cap Screw, 5/16"-18 x 3/8"
6.	D5329	Sleeve
7.	R0478	Retaining Ring
8.	D6562	Input Hub
9.	R0471	Stop Collar
10.	R0470	Wrap Spring, CW, 2"
	R0469	Wrap Spring, CCW, 2"
11.	R0462	Output Hub
12.	R0472	Dust Cover
13.	R0479	Retaining Ring
14.	R1002	Coil Assembly W/Actuator Arm (1/4" Spades)
15.	D6566	Plate (Shown)
	D6565	Plate
16.	D6886	Output Shaft, 5 3/8"
17.	10260	Socket Head Cap Screw, 1/4"-20 x 1/2"
18.	R0475	Actuator Limit Stop
19.	R0468	Plate Bearing
20.	R0646	Boot
21.	R0474	Spring
22.	R0647	Sleeve
23.	10261	Socket Button Hex Screw, No. 10-32 x 3/8"
24.	10259	Socket Button Hex Screw, No. 10-32 x 7/8"
	10257	Lock Washer, No. 10
	10243	Flat Washer, No. 10
25.	A4616	Wiring Harness, 210", 12 Row 30, 2 Per Machine (1/4" Spades)
	A4585	Wiring Harness, 180", 8 Row Models, 2 Per Machine (1/4" Spades) (Not Shown)

POINT ROW CLUTCH STYLE B

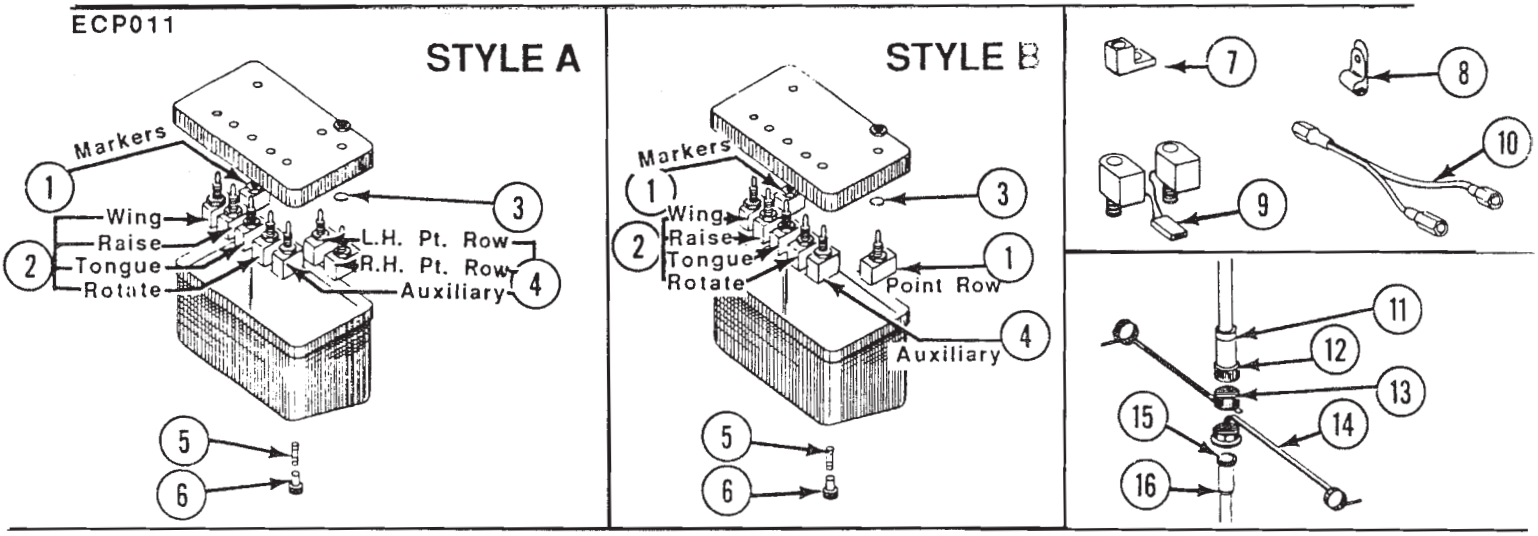
PRC016



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.	D7319	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"
	D7762	Shaft, 6 3/8" (Used with Magnetic Distance Sensor)
15.	10496	Snap Ring, External Inverted
16.	A5557	Solenoid
17.	10023	Hex Head Cap Screw, 1/4"-20 x 3/4"
	10227	Lock Washer, 1/4"
	10103	Hex Nut, 1/4"-20
18.	D1075	Spring
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.	10451	Cotter Pin, 1/8" x 1"
24.	10187	Slotted Spring Pin, 5/32" x 2"
25.	10370	Machine Bushing
26.	D7623	Plunger
27.	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, 1 Per Machine (3/16" Spades)
	A4817	Wiring Harness, 240", 16 Row Model, 2 Per Machine, (3/16" Spades) (Not Shown)

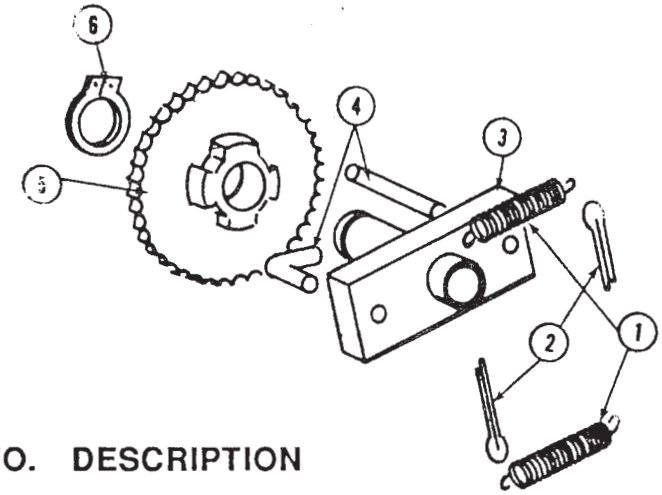
ELECTRICAL COMPONENTS

ECP011



ITEM	PART NO.	DESCRIPTION
1.	A2528	Switch, 3 Position Toggle
2.	A2526	Switch, 2 Way Momentary Contact
3.	D3860	O-Ring
4.	A2527	Switch, 2 Position Toggle
5.	D2829	Fuse, AGC-15
6.	A2612	Fuse Holder
7.	A3584	Ground Clamp
8.	D6291	Insulated Clamp
9.	10269	Male Tab Terminal
10.	A3589	Harness
11.	A3492	Cable Clamp With Screws And Inserts
12.	A3491	Connector With Coupling Ring
	R0807	Coupling Ring
13.	D4564	Dust Cover
14,	D4563	Dust Cap
15.	D4613	Peripheral Seal
16.	D4565	Connector
A.	A4443	Control Box Assembly With Short Harness, Style A
	A4866	Control Box Assembly With Short Harness, Style B
B.	A4487	Wiring Harness, 132", 8 Row 30 "Y" Hitch
	A4490	Wiring Harness, 164", 8 Row 30 Narrow Hitch
	A4504	Wiring Harness, 150", 8 Row 36/38 "Y" Hitch
	A4516	Wiring Harness, 180", 8 Row 36/38 Narrow Hitch
	A4438	Wiring Harness, 198", 12 Row 30 "Y" Hitch
	A4440	Wiring Harness, 228", 12 Row 30 Narrow Hitch, 12 Row36/38 And 16 Row30 "Y" Hitch
	A5717	Wiring Harness, 300", 16 Row 30 Narrow Hitch (Not Shown) TRACTOR TO VALVE BLOCK
C.	A4437	WIring Harness, 277", 8 Row Models "Y" Hitch
	A4813	Wiring Harness, 290", 12/16 Row "Y" Hitch
	A4439	Wiring Harness, 216", All Models Narrow Hitch (Not Shown) VALVE BLOCK ON HITCH TO VALVE BLOCK ON FRAME
D.	A4859	Wiring Harness, 552", 8 Row 30
	A4858	Wiring Harness, 612", 8 Row 36/38
	A4857	Wiring Harness, 684", 12 Row 30
	A4997	Wiring Harness, 768", 12 Row 36/38
	A4815	Wiring Harness, 780", 16 Row 30 (Not Shown) WARNING LIGHTS

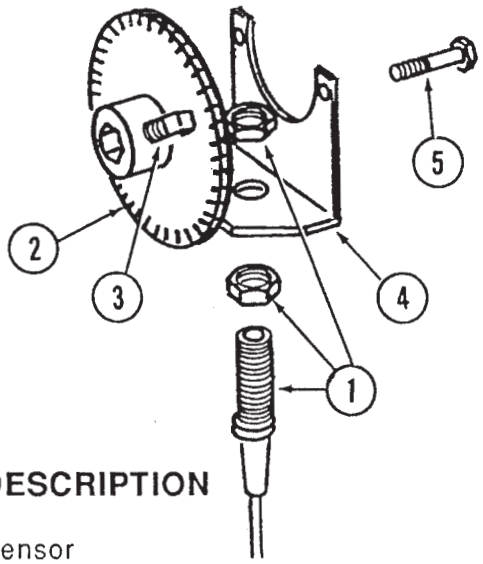
PTD032



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

MAGNETIC DISTANCE SENSOR

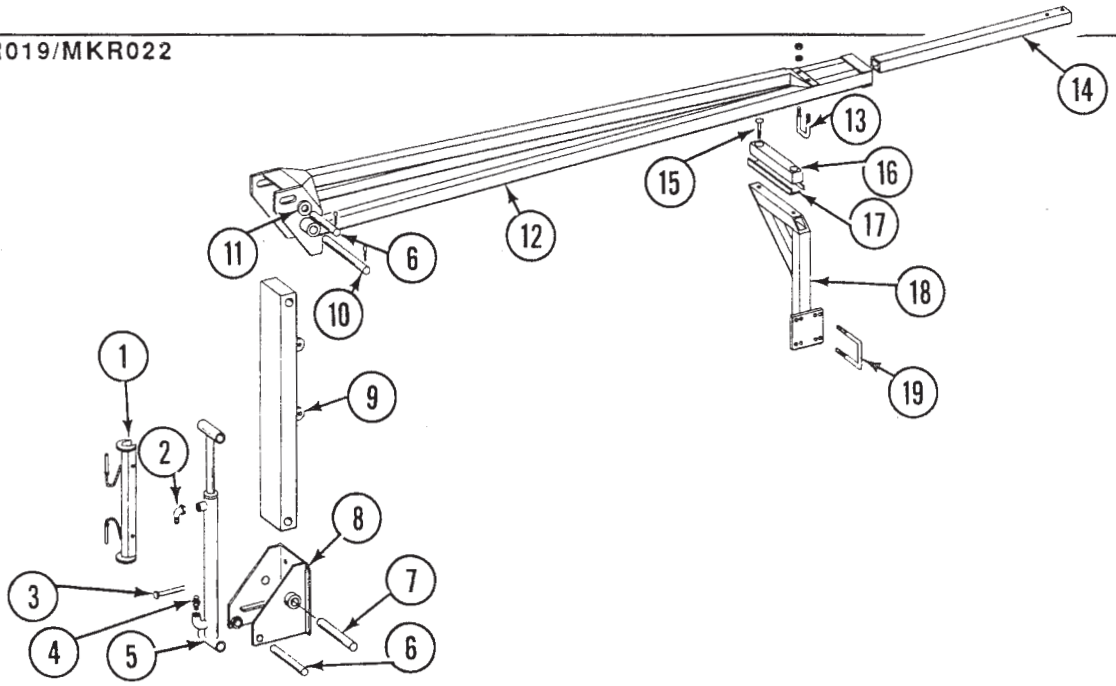
ECP017



ITEM	PART NO.	DESCRIPTION
1.	A5600	Sensor
2.	A5549	Pulse Wheel
3.	10145	Set Screw, 5/16"-18 x 1/2"
4.	D7632	Bracket
5.	10043	Hex Head Cap Screw, 5/16"-18 x 3/4"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18

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

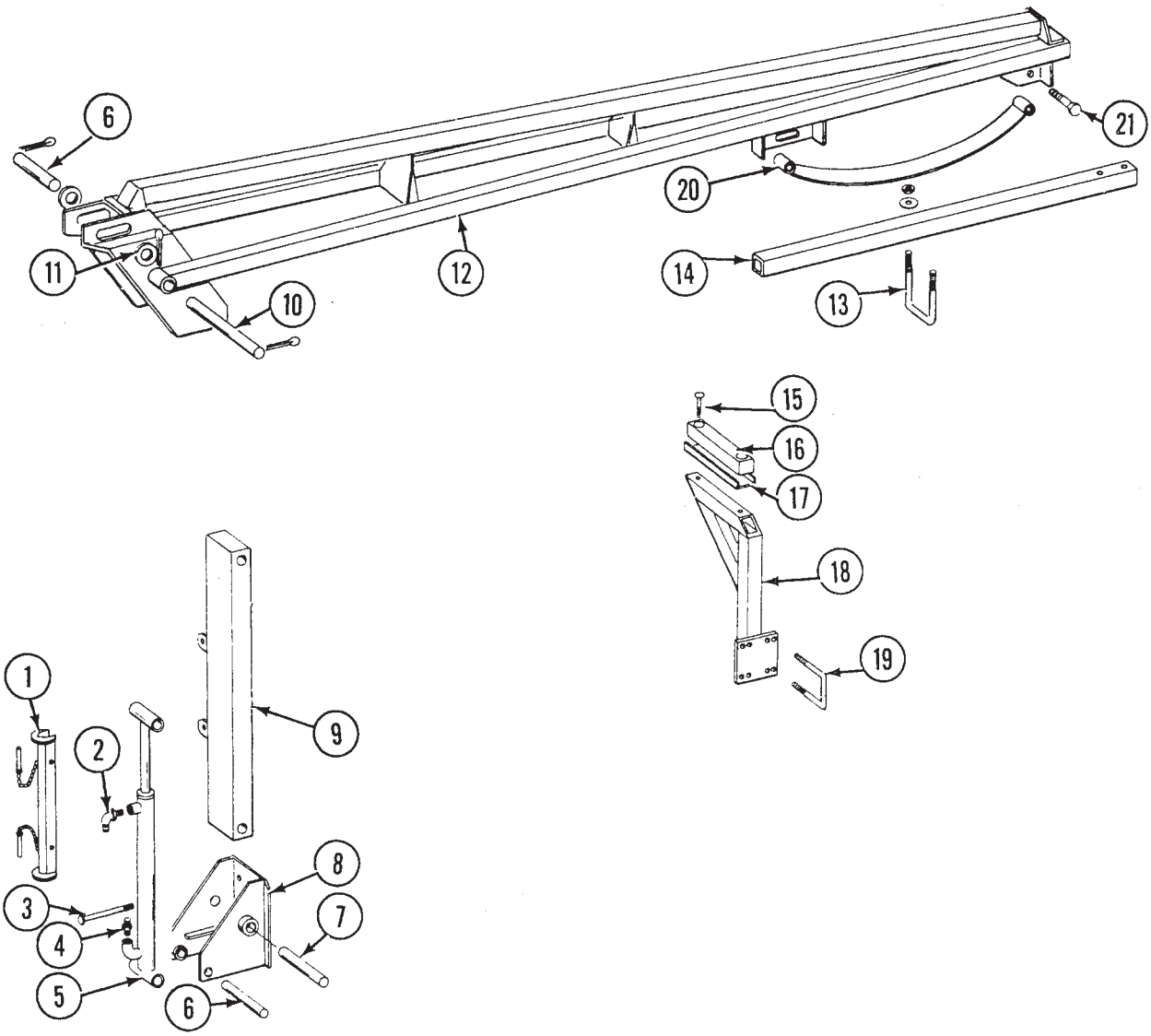
MKR019/MKR022



ITEM	PART NO.	DESCRIPTION
1.	A4612	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 And 8 Row 36
	D0453-04	Extension Tube, 60", 8 Row 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
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



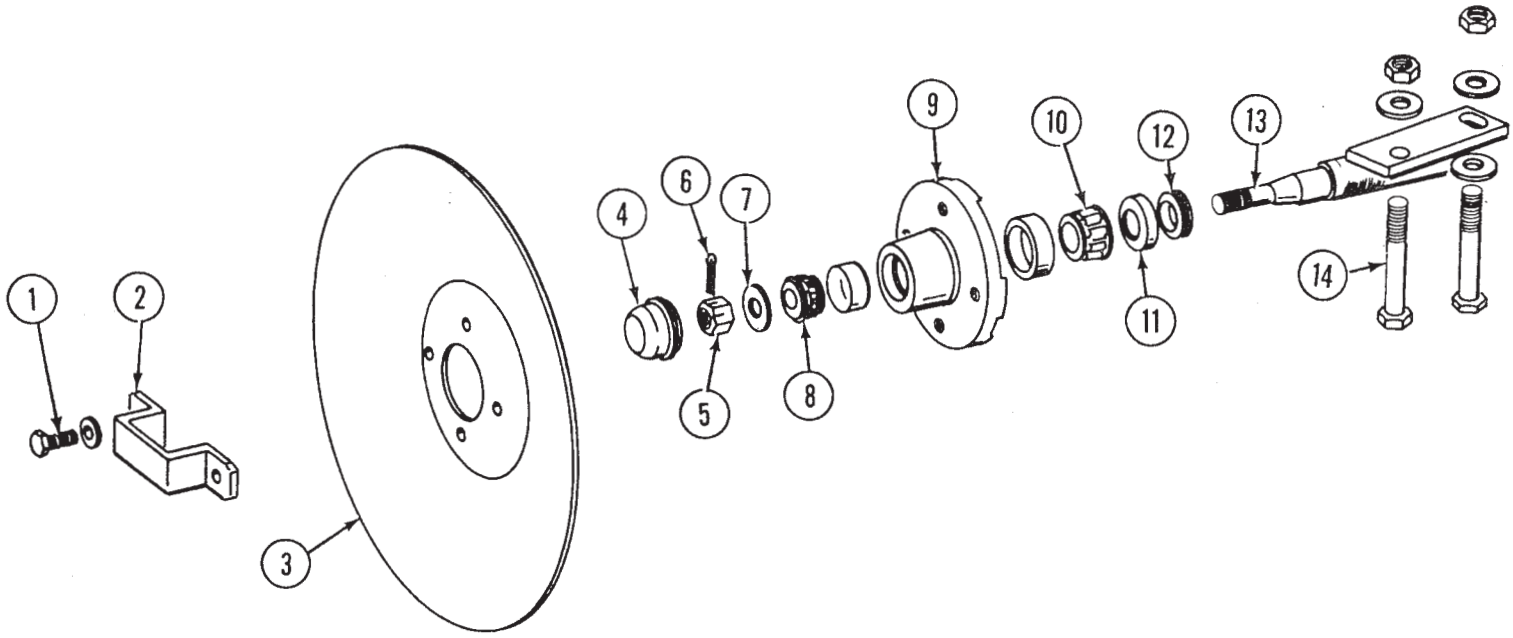
12 Row Shown

MARKER ASSEMBLY 12 ROW 36/38 AND 16 ROW 30

ITEM	PART NO.	DESCRIPTION
1.	A4612	Lockup, 12 Row 36/38
	A4816	Lockup, 16 Row 30
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
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"
	10516	Lock Washer, 9/16"
	10517	Washer, 9/16" USS

MARKER SPINDLE/HUB/BLADE

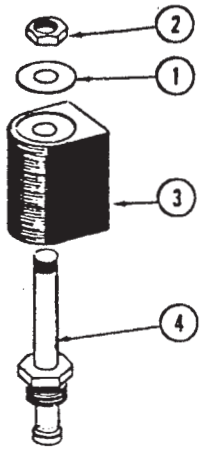
MKR020



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.	10470	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
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

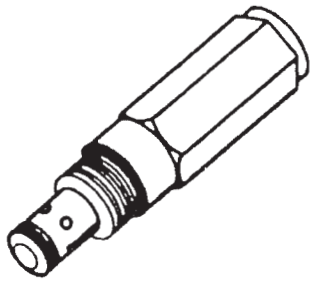
FLOW CONTROL VALVE

VVB020

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

PRESSURE RELIEF VALVE

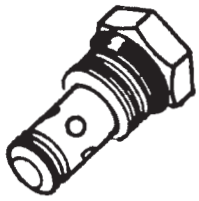
VVB020



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

CHECK VALVE

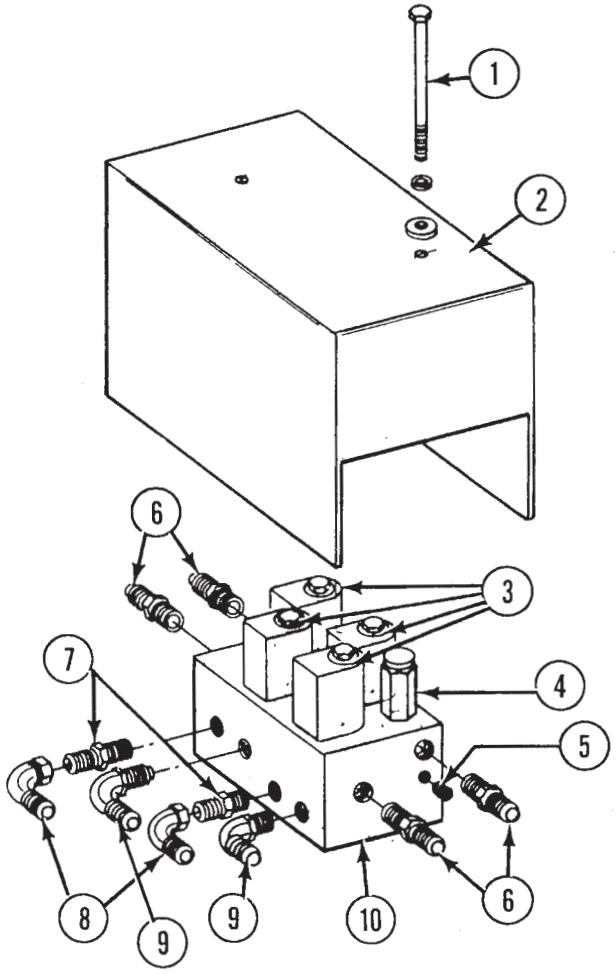
VVB020



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

VALVE BLOCK - LOCATED ON HITCH

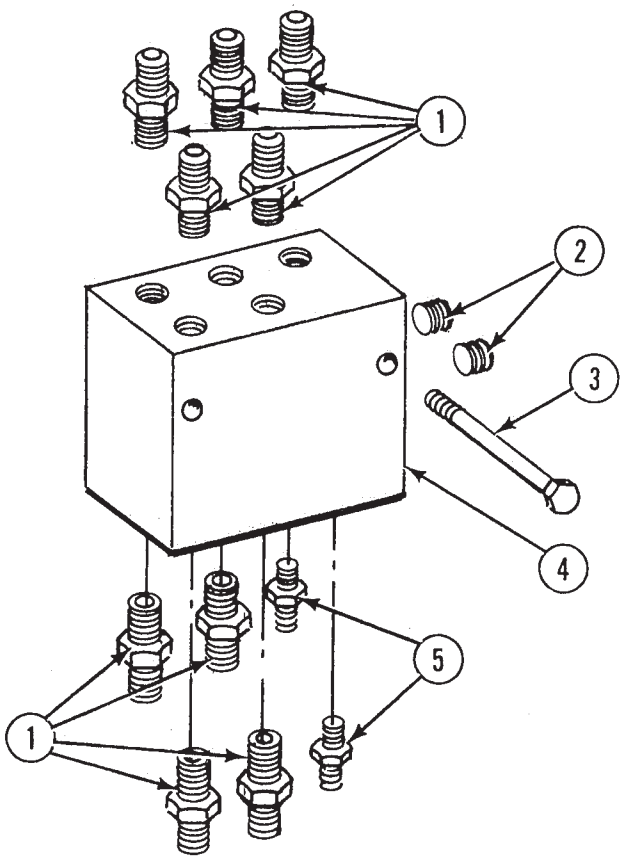
VVB021



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 Narrow Hitch, 8 Row 36/38 Narrow Hitch, 12 Row 30 "Y"/Narrow Hitch, 12 Row 36/38 "Y" Hitch And 16 Row 30 "Y" Hitch
	A4663	Cover, 12 3/16" x 5 1/4", 8 Row 30/36/38 "Y" Hitch
3.		See "Solenoid Valve"
4.		See "Pressure Relief Valve"
5.	10350	Plug, 1/4" Hex Socket Head
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

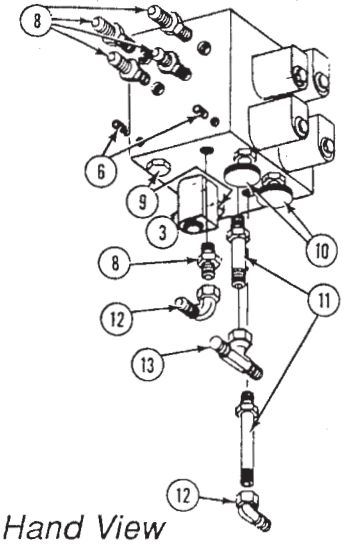


ITEM	PART NO.	DESCRIPTION
1.	6400-10	Connector, 7/8"-14 JIC To O-Ring
2.	10350	Plug, 1/4" Hex Socket Head
3.	10172	Hex Head Cap Screw, 3/8"-16 x 5"
4.	D6713	Block
5.	6400-06-08	Connector, 9/16"-18 JIC To 3/4"-16 O-Ring

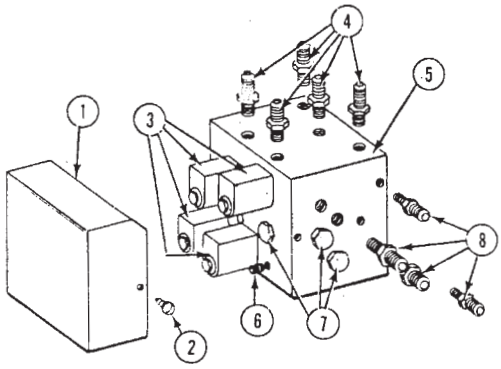
VALVE BLOCK - LOCATED ON FRONT SIDE OF CENTER FRAME

VVB022/VVB023

All 8 And12 Row, 16 Row (Prior To SN 31200)

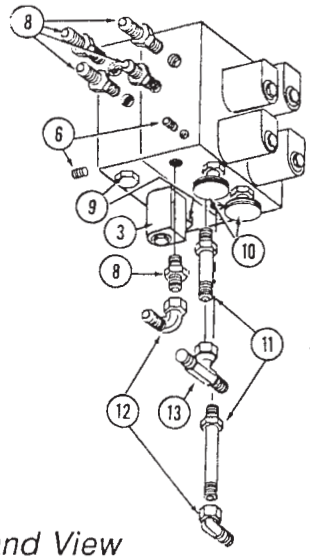


Right Hand View

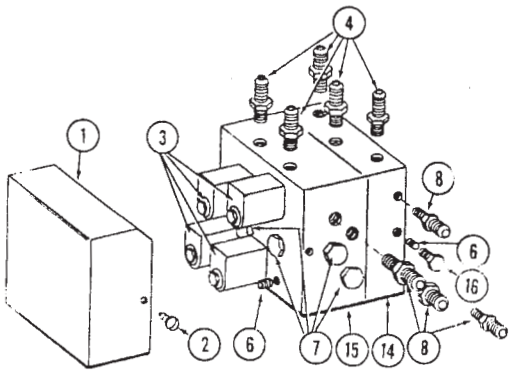


Left Hand View

16 Row (SN 31200 And On)



Right Hand View

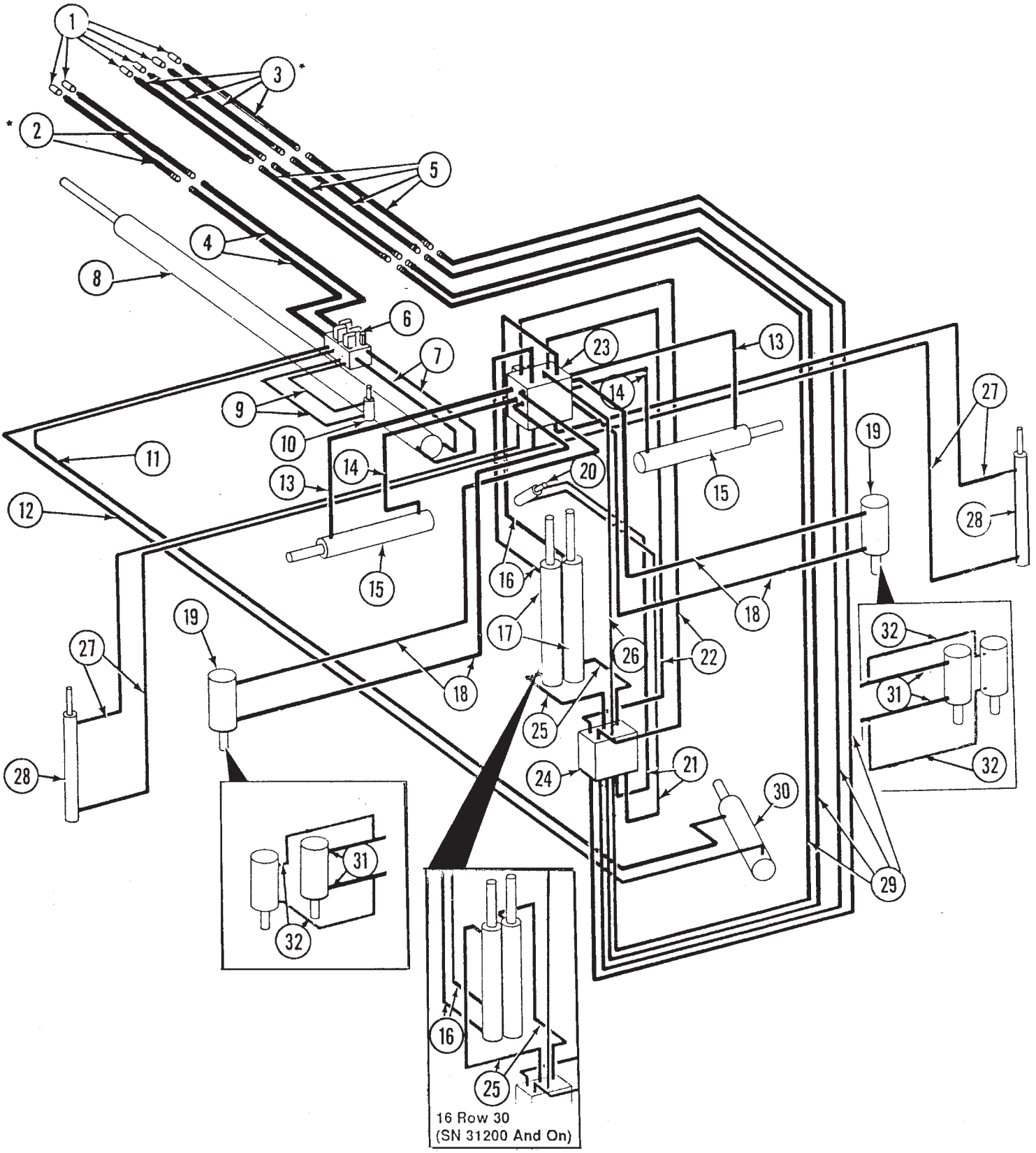


Left Hand View

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	Plug, 1/4" Hex Socket Head
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
16.	6408-08	Plug, 3/4"-16 O-Ring

HYDRAULIC SYSTEM

PHS032



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

HYDRAULIC SYSTEM

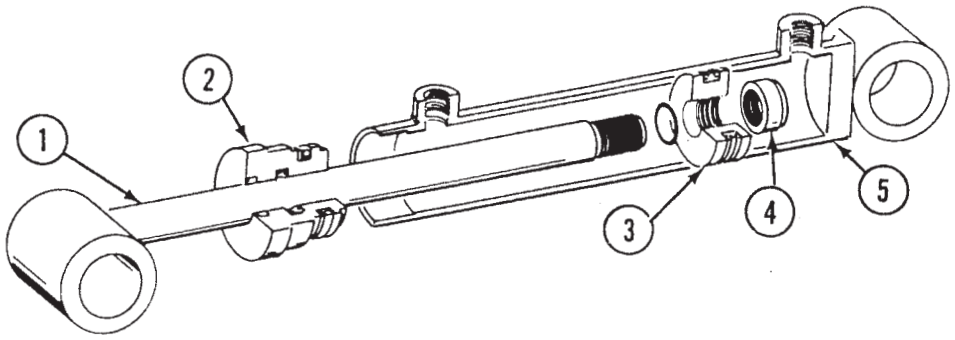
ITEM	PART NO.	DESCRIPTION
1.	D4086	Tip, Pioneer
2.	A1015	Hose Assembly, 3/8" x 138", *8 Row 30
	A1012	Hose Assembly, 3/8" x 140", *8 Row 36/38
	A1081	Hose Assembly, 3/8" x 168", 12 Row 30/36/38 And 16 Row 30 (Prior To SN 31200)
	A3130	Hose Assembly, 3/8" x 173", 16 Row 30 "Y" Hitch (SN 31200 And On)
	A3134	Hose Assembly, 3/8" x 198", 16 Row 30 Narrow Hitch (SN 31200 And On)
3.	A1417	Hose Assembly, 1/2" x 138", *8 Row 30
	A1423	Hose Assembly, 1/2" x 140", *8 Row 36/38
	A1470	Hose Assembly, 1/2" x 168", 12 Row 30/36/38 And 16 Row 30 (Prior To SN 31200)
	A1476	Hose Assembly, 1/2" x 173", 16 Row 30 "Y" Hitch (SN 31200 And On)
	A1477	Hose Assembly, 1/2" x 198", 16 Row 30 Narrow Hitch (SN 31200 And On)
4.	A1001	Hose Assembly, 3/8" x 135", 8 Row 30 "Y" Hitch
	A1044	Hose Assembly, 3/8" x 34", 8 Row 30 Narrow 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 Narrow Hitch And 12 Row 30 "Y" Hitch
	A3157	Hose Assembly, 3/8" x 70", 12 Row 30 Narrow Hitch, 12 Row 36/38 "Y" Hitch And 16 Row 30 Narrow/"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 Narrow 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 Narrow Hitch And 12 Row 30 "Y" Hitch
	A1465	Hose Assembly, 1/2" x 84", 12 Row 30 Narrow Hitch And 12 Row 36/38 "Y" Hitch And 16 Row 30 Narrow/"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 Narrow 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", 16 Row 30 Narrow/"Y" Hitch
8.		See "Tongue Cylinders"
9.	A1139	Hose Assembly, 1/4" x 40", 8 Row 30/36/38, 12 Row 30 Narrow 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", 16 Row 30 Narrow/"Y" Hitch
10.		See "Tongue Lock Cylinder"
11.	A1102	Hose Assembly, 1/4" x 95", 8 Row 30/36/38, 12 Row 30 Narrow 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
	A1110	Hose Assembly, 1/4" x 150", 16 Row 30 Narrow Hitch (Prior To SN 31200)
	A1150	Hose Assembly, 1/4" x 103", 16 Row 30 Narrow Hitch (SN 31200 And On)
12.	A1134	Hose Assembly, 1/4" x 116", 8 Row 30/36/38, 12 Row 30 Narrow 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
	A1121	Hose Assembly, 1/4" x 180", 16 Row 30 "Y" Hitch
	A1184	Hose Assembly, 1/4" x 173", 16 Row 30 Narrow Hitch (Prior To SN 31200)
	A1168	Hose Assembly, 1/4" x 120", 16 Row 30 Narrow Hitch (SN 31200 And On)
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 Narrow 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
	A1472	Hose Assembly, 1/2" x 176", 16 Row 30 Narrow Hitch (Prior To SN 31200)
	A1478	Hose Assembly, 1/2" x 128", 16 Row 30 Narrow Hitch (SN 31200 And On)
30.		See "Rotation Cylinder"
31.	A3122	Hose Assembly, 3/8" x 10 1/2", 16 Row 30
32.	A1018	Hose Assembly, 3/8" x 40", 16 Row 30

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

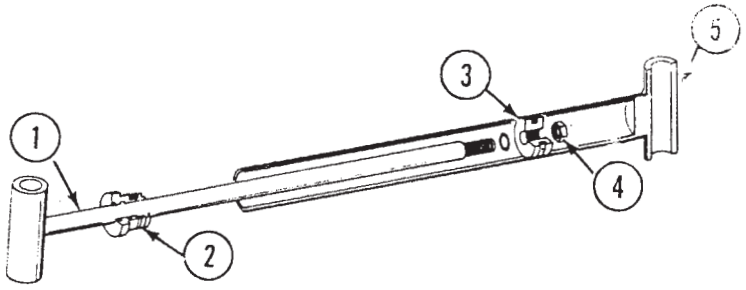
CYL032



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

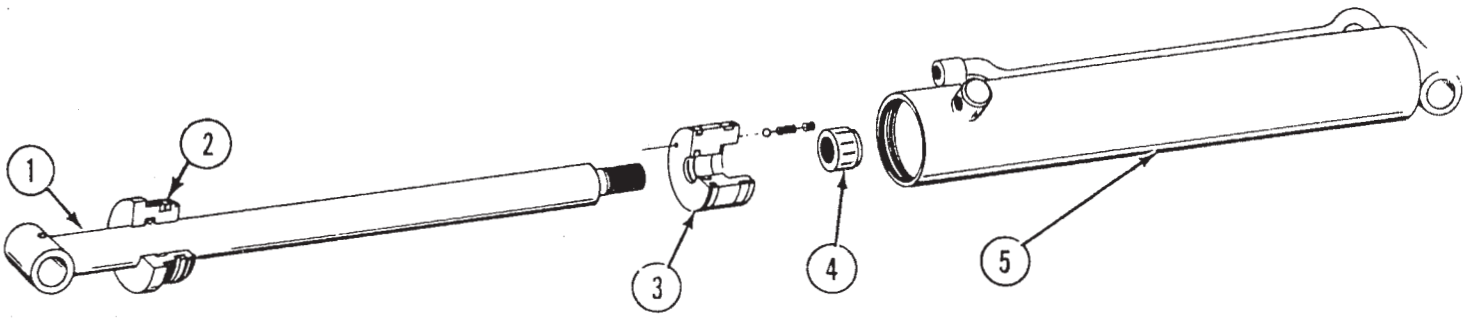
CYL039



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

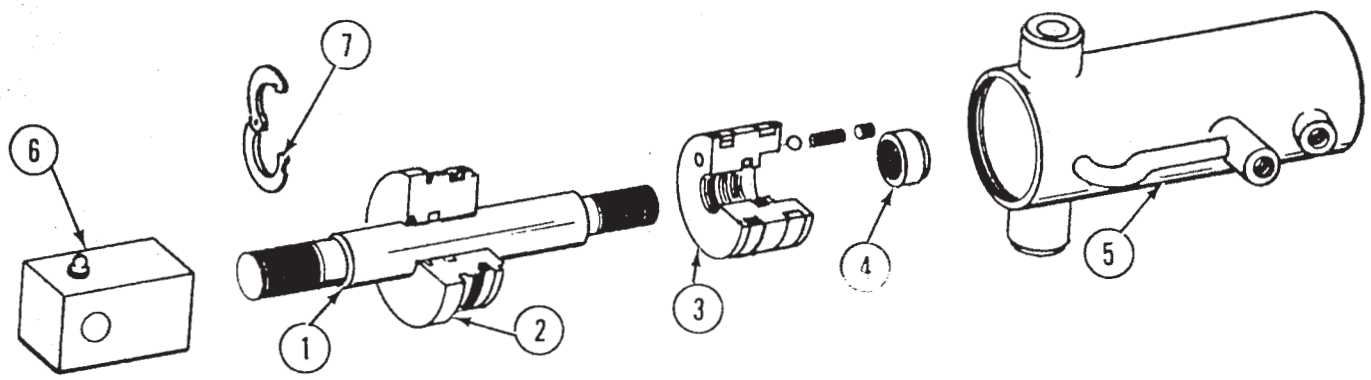
CYL033



ITEM	PART NO.	DESCRIPTION
1.	A4908	Rod Assembly
2.	D7132	Gland
3.	A4327	Piston
4.	R0993	Lock Nut, 1 1/8"-12
5.	A4761	Barrel
A.	A4204	Cylinder Complete, 4" x 20"
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

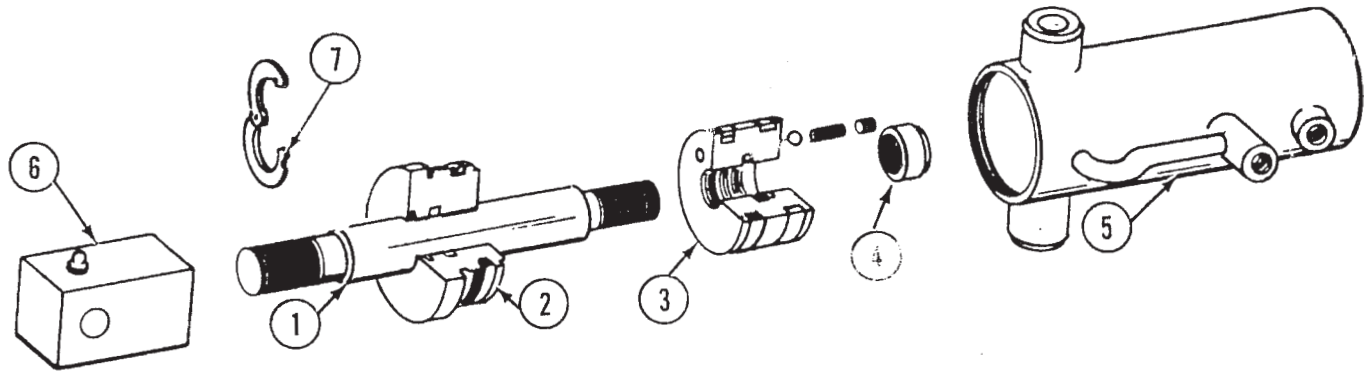
CYL031



ITEM	PART NO.	DESCRIPTION
1.	D7166	Rod
2.	D7164	Gland
3.	A4327	Piston
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"
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 (Prior To SN 31200)

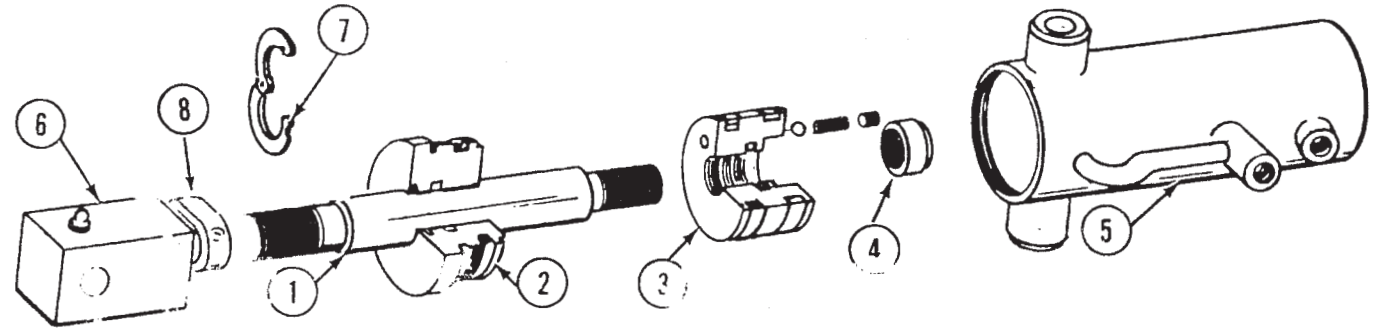
CYL031



ITEM	PART NO.	DESCRIPTION
1.	D7296	Rod
2.	D7297	Gland
3.	A4907	Piston
4.	R0959	Lock Nut, 3/4"-16
5.	A4906	Barrel
6.	A4797	Clevis
7.	D6959	Split Washer
A.	A4498	Cylinder Complete With Split Washer, 2 3/4" x 5 1/2"
B.	R1013	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 (SN 31200 And On)

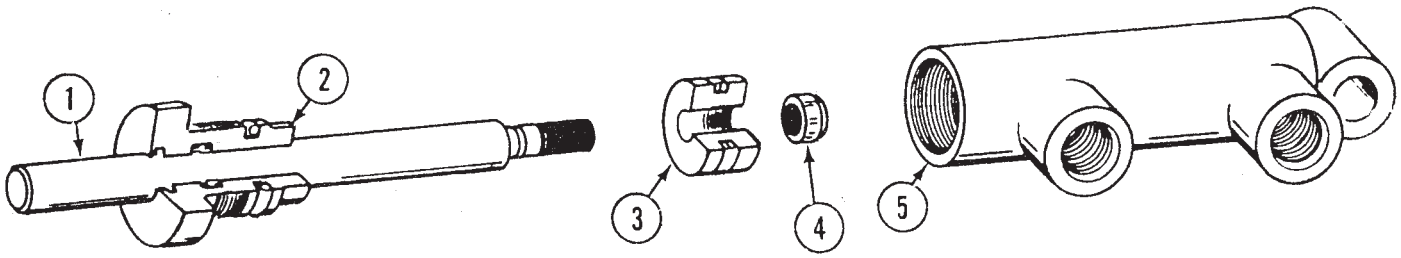
CYL031



ITEM	PART NO.	DESCRIPTION
1.	D7801	Rod
2.	D7800	Gland
3.	A5618	Piston
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"
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
TONGUE LOCK CYLINDER, 16 ROW (Prior To SN 31200)

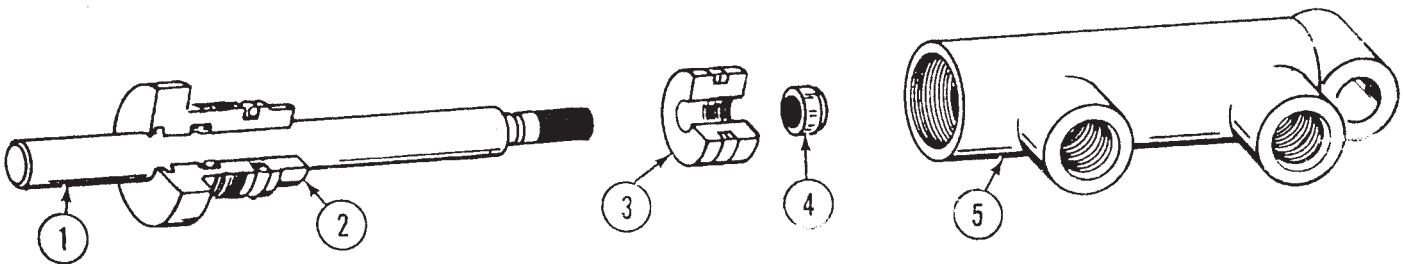
CYL035



ITEM	PART NO.	DESCRIPTION
1.	D7124	Rod
2.	D7122	Gland
3.	D7120	Piston
4.	R0999	Lock Nut, 1/2"-20
5.	A4755	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, 8/12 ROW AND 16 ROW (SN 31200 And On)

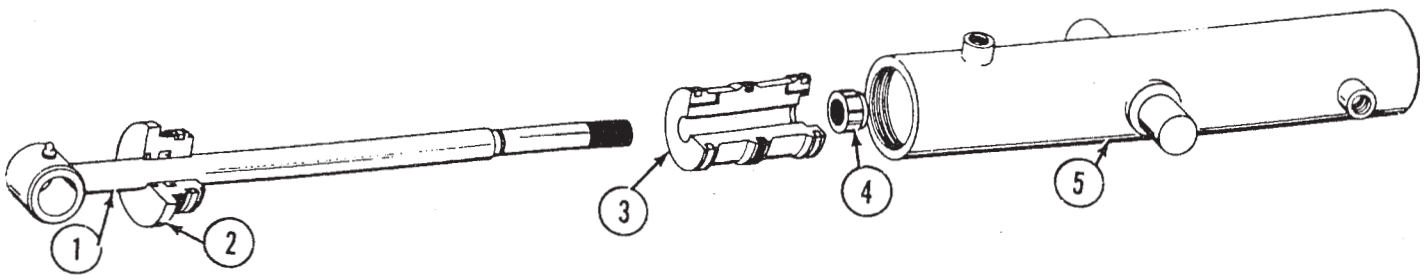
CYL035



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

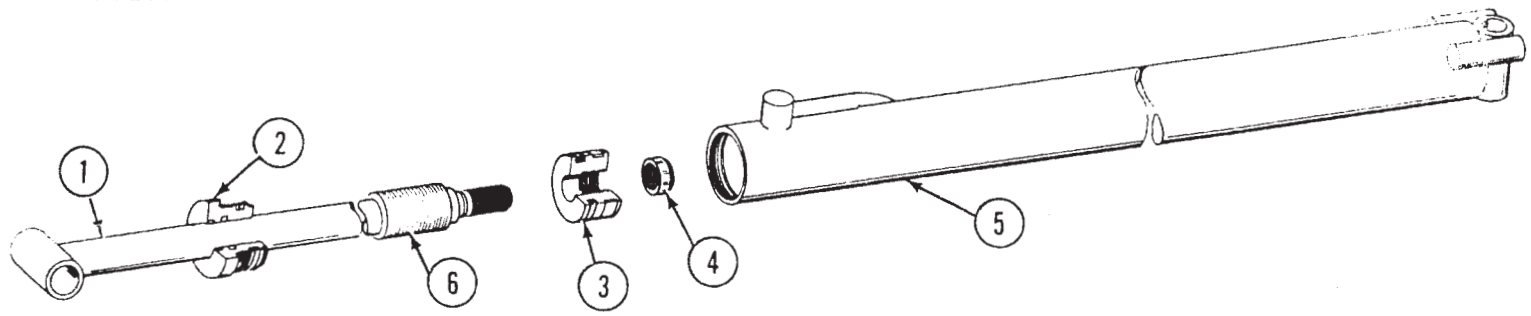
CYL034



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
12 ROW 30 WITH NARROW HITCH
12 ROW 36/38, 16 ROW 30 WITH "Y" HITCH
16 ROW 30 WITH NARROW HITCH (Prior To SN 31200)

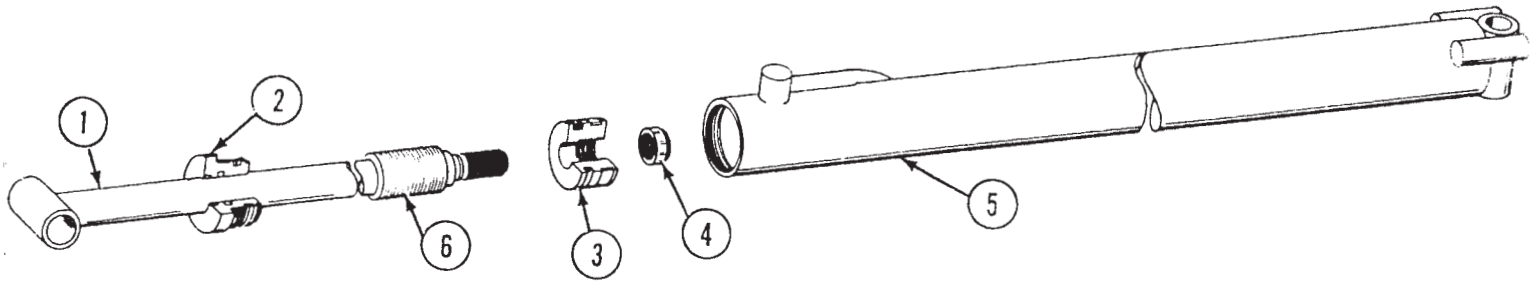
CYL036



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
16 ROW 30 WITH NARROW HITCH (SN 31200 And On)

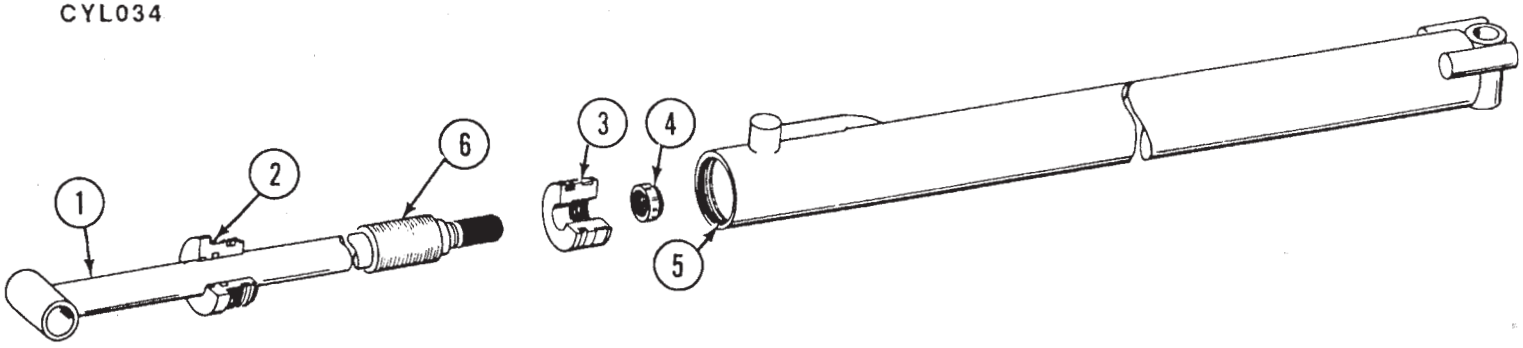
CYL036



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

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

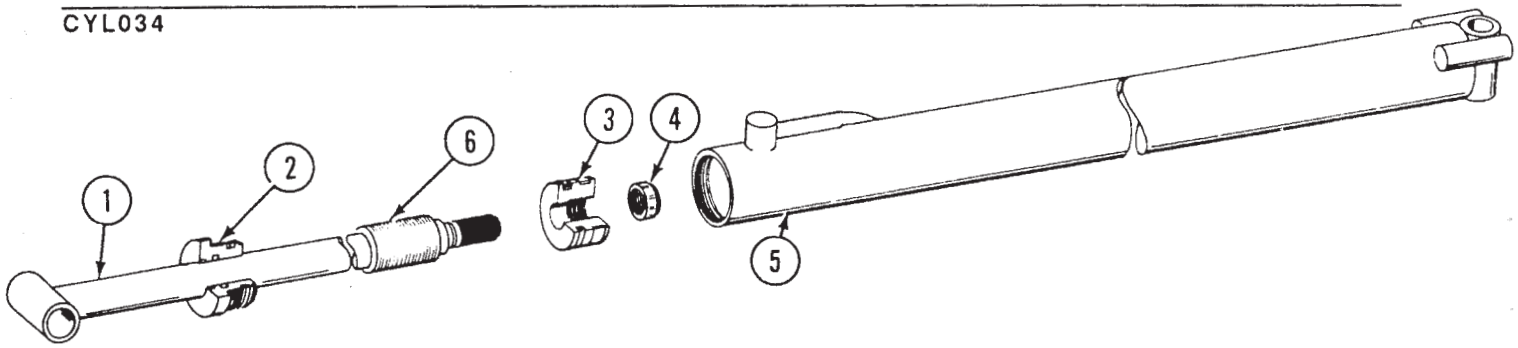
CYL034



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
8 ROW 30 WITH NARROW HITCH

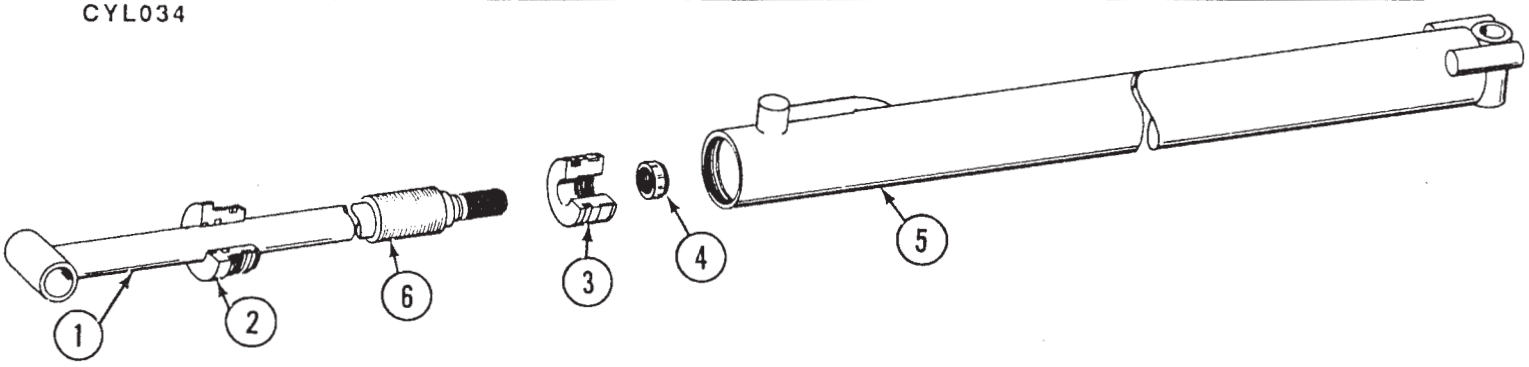
CYL034



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 30 WITH "Y" HITCH

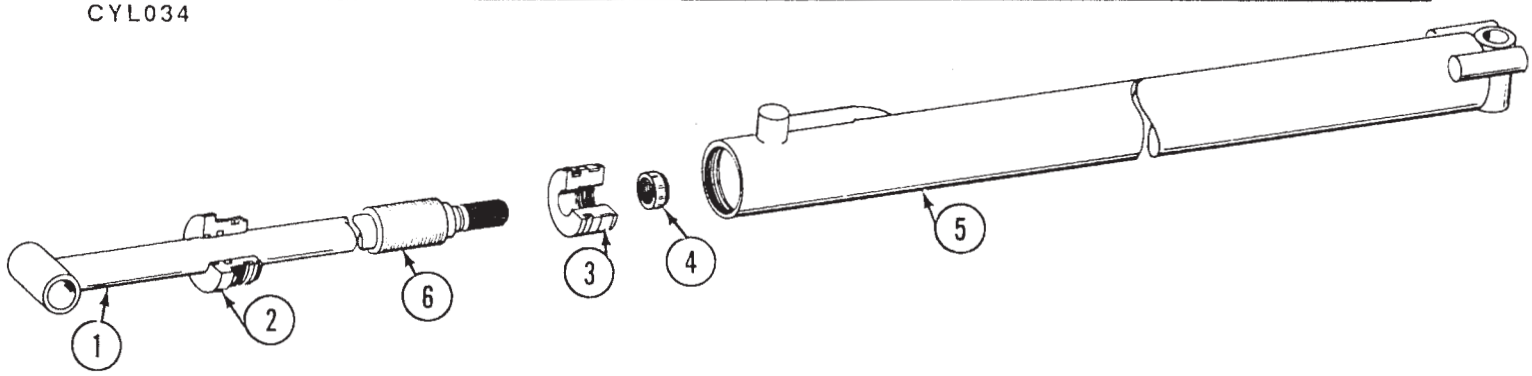
CYL034



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 36/38 WITH "Y" HITCH

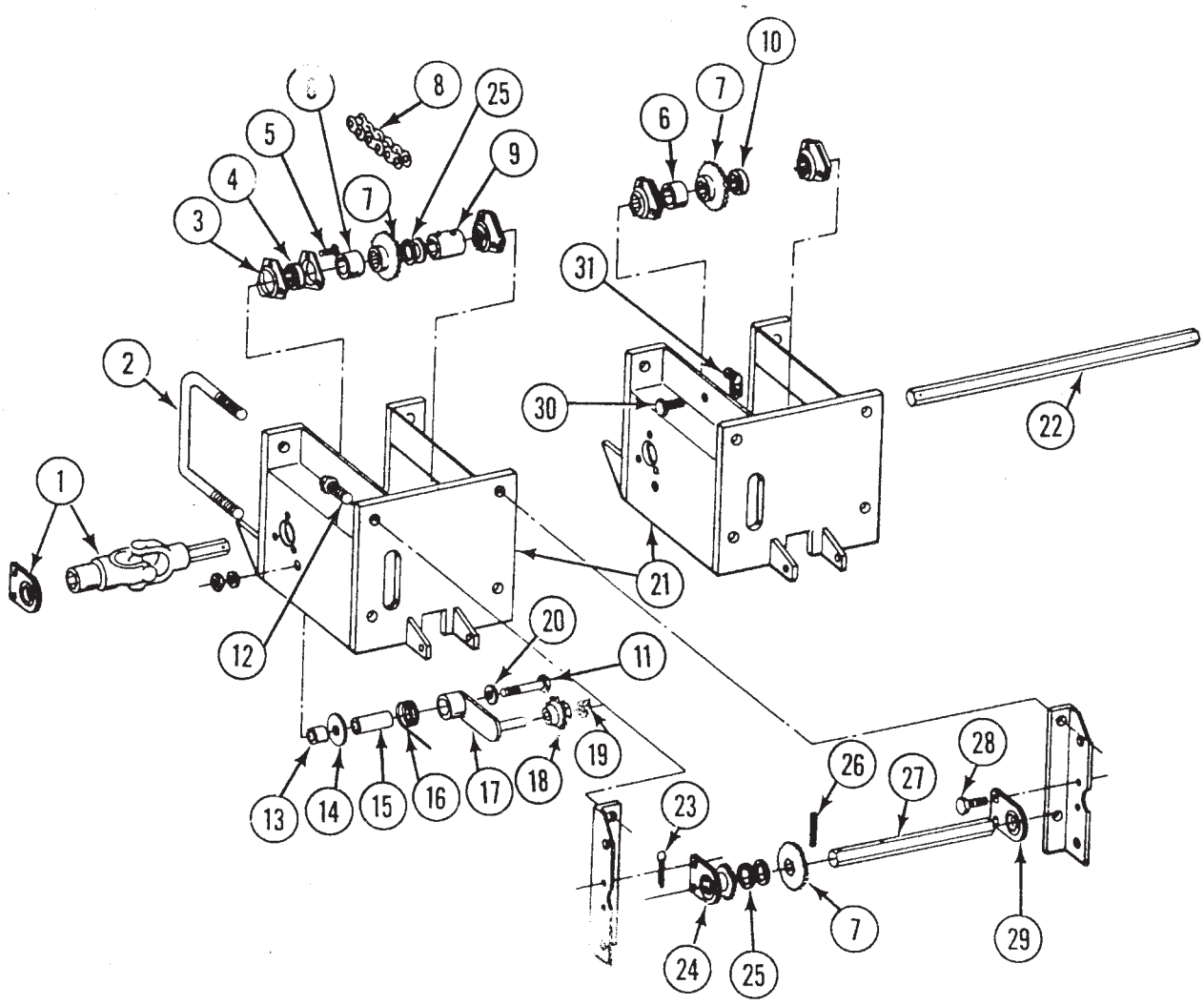
CYL034

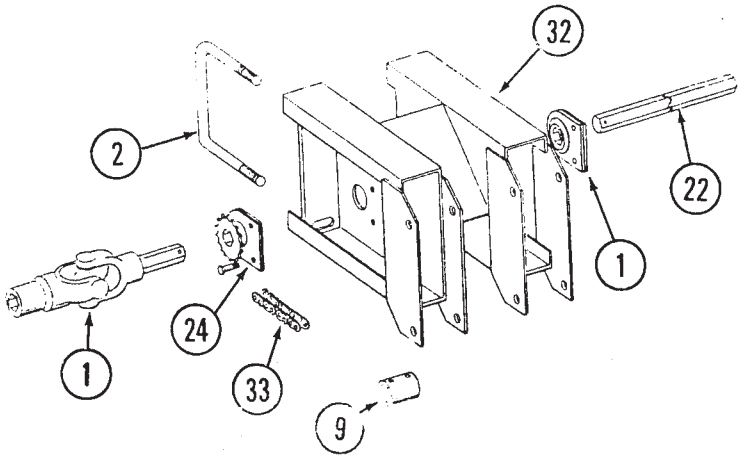


ITEM	PART NO.	DESCRIPTION
1.	A4791	Rod Assembly
2.	D7146	Gland
3.	D4527	Piston
4.	R0987	Lock Nut, 1 1/4"-12 Thin
5.	A4792	Barrel
6.	D7147	Spacer
A.	A4484	Cylinder Complete, 3" x 36"
B.	R1004	Seal Kit, Includes: (2)O-Rings, (1)BU Ring, (1)Wear Ring, (1)Wiper, (1)U-Cup, (1)T Seal W/BU Rings

ROW UNIT EXTENSIONS

PTD061/PTD067



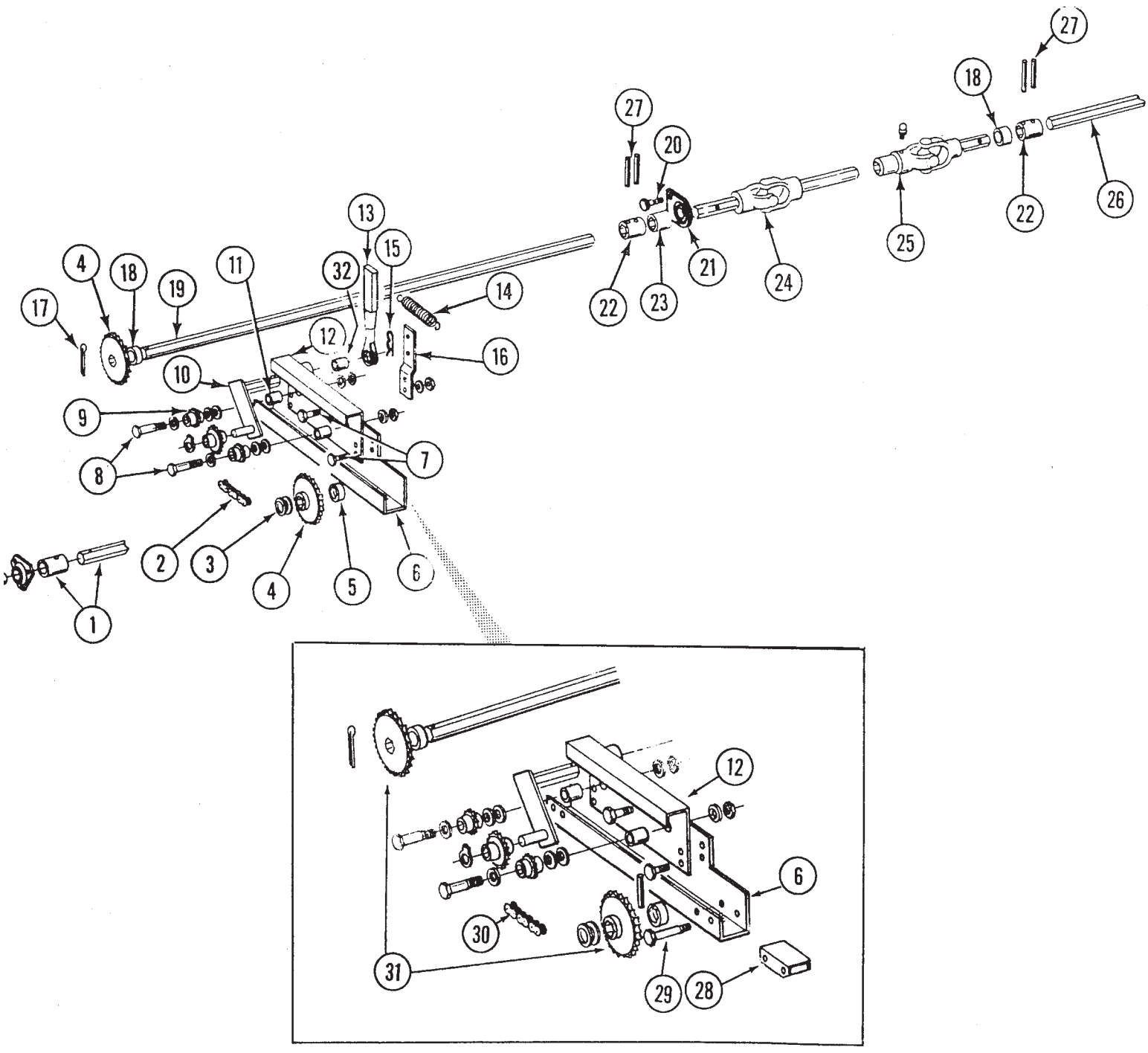


ROW UNIT EXTENSIONS

ITEM	PART NO.	DESCRIPTION
1.		See "Transmission And Row Unit Drill Shaft"
2.	D1747	U-Bolt, 5" x 7" x 3/4"-10
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10
3.	3400-01	Flangette
4.	2100-03	Bearing, 7/8" Hex
5.	10303	Carriage Bolt, 5/16"-18 x 1"
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
6.	D1199-02	Spacer, 3/4"
7.	2500-19	Sprocket, 19 Tooth
8.	3303-72	Chain, No. 41, 72 Pitch Including Connector Link
	R0196	Connector Link, No. 41
9.		See "Transmission And Row Unit Drill Shaft"
10.	D0917	Lock Collar, Less Set Screws
	10145	Set Screw, 5/16"-18 x 1/2"
11.	10049	Hex Head Cap Screw, 3/8"-16 x 2 1/2"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
12.	10005	Hex Head Cap Screw, 5/8"-11 x 1 3/4"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
13.	D1110	Bushing, 1/2"
14.	10201	Washer, 3/8", Special
15.	D1026	Bushing, 1 1/16"
16.	D1065	Spring
17.	A2056	Arm
18.	D7426	Idler Sprocket
19.	10435	Ring
20.	10210	Washer, 3/8" USS
21.	A4631	Extension Bracket, 13"
22.		Main Frame Drill Shaft - See "Transmission And Row Unit Drill Shaft"
23.	10463	Cotter Pin, 1/4" x 1 1/2"
24.	A1720	Bearing And Sprocket, 7/8" Hex Bore
25.	10233	Machine Bushing
26.	10602	Roll Pin, 1/4" x 1 1/2"
27.	D6932	Shaft, 7/8" x 13"
28.	10001	Hex Head Cap Screw, 3/8"-16 x 1"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
29.	A2180	Bearing Hanger, 7/8" Hex Bore
30.	10002	Hex Head Cap Screw, 3/8"-16 x 3/4"
	10229	Lock Washer, 3/8"
	10101	Hex Nut, 3/8"-16
31.	D6291	Clamp
32.	A5639	Extension Bracket, 15"
33.	3303-52	Chain, No. 41, 41 Pitch Including Connector Link (Add to row unit drive chain)
	R0196	Connector Link, No. 41

PUSH UNIT DRIVE

PTD059



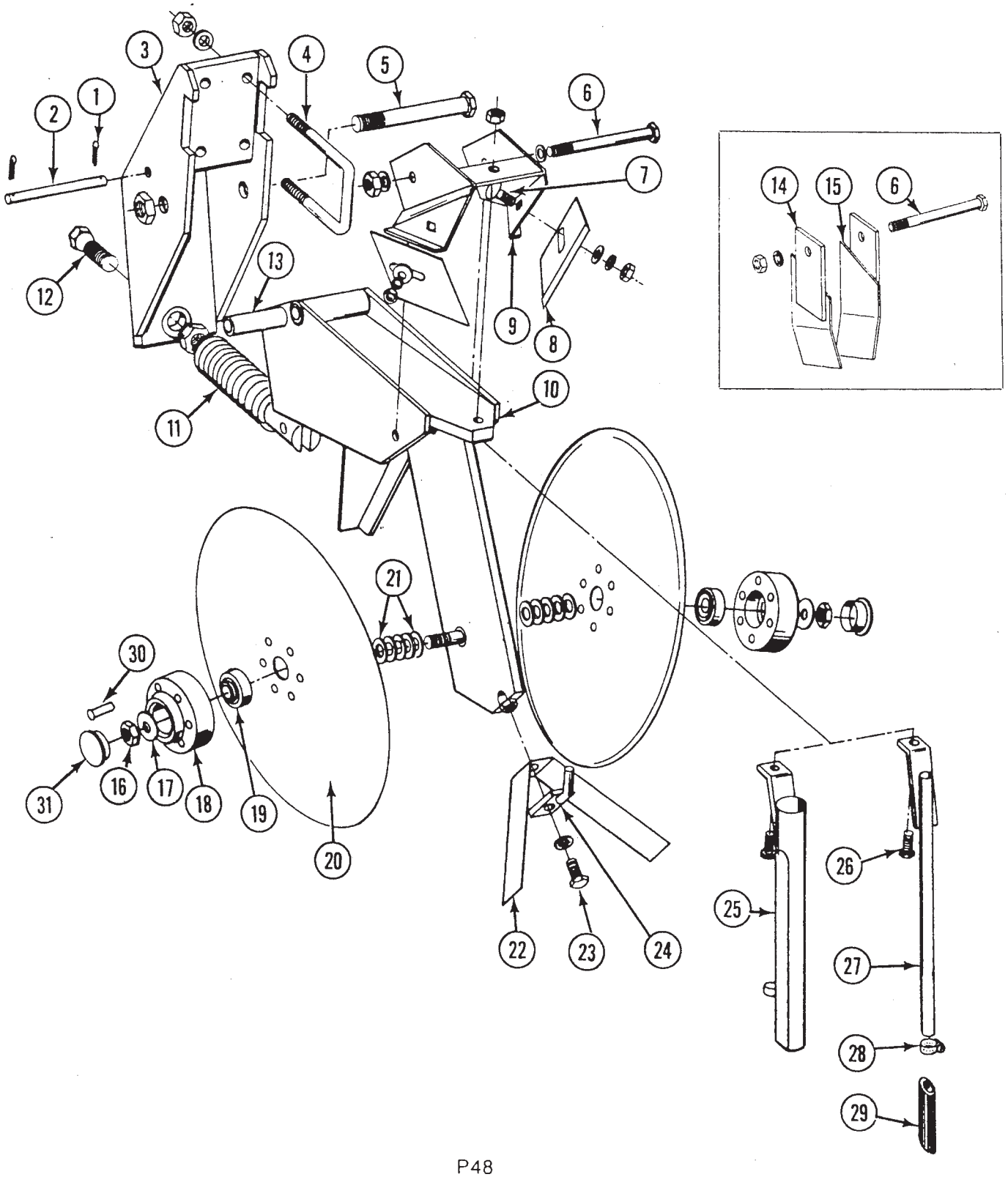
ITEM	PART NO.	DESCRIPTION
1.		See "Transmission And Row Unit Drill Shaft"
2.	3310-144	Chain, No. 40, 144 Pitch Including Connector Link
	R0912	Connector Link, No. 40
3.	10233	Machine Bushing (As Required)
4.	A5111	Sprocket, 26 Tooth

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 With Grease Fitting, 23 3/4", 8 Row 38 And 12 Row 36/38
	A4637	U-Joint With Grease Fitting, 21 3/4", 8 Row 36
	A4394	U-Joint With Grease Fitting, 14 3/4", 8 Row 30, 12 Row 30 And 16 Row 30
	10343	Grease Fitting, 1/8"-27, 90°
25.	A4393	U-Joint With Grease Fittings, 15"
	10343	Grease Fitting, 1/2"-27, 90°
	10643	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.	3310-138	Chain, No. 40, 138 Pitch Including Connector Link
	R0912	Connector Link, No. 40
31.	A5107	Sprocket, 19 Tooth
32.	D6819	Sleeve

FERTILIZER OPENER

FOC007/FOC010

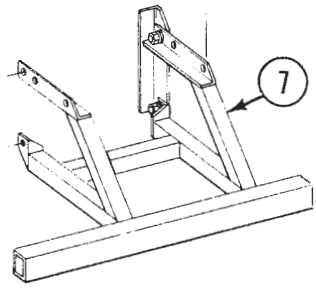


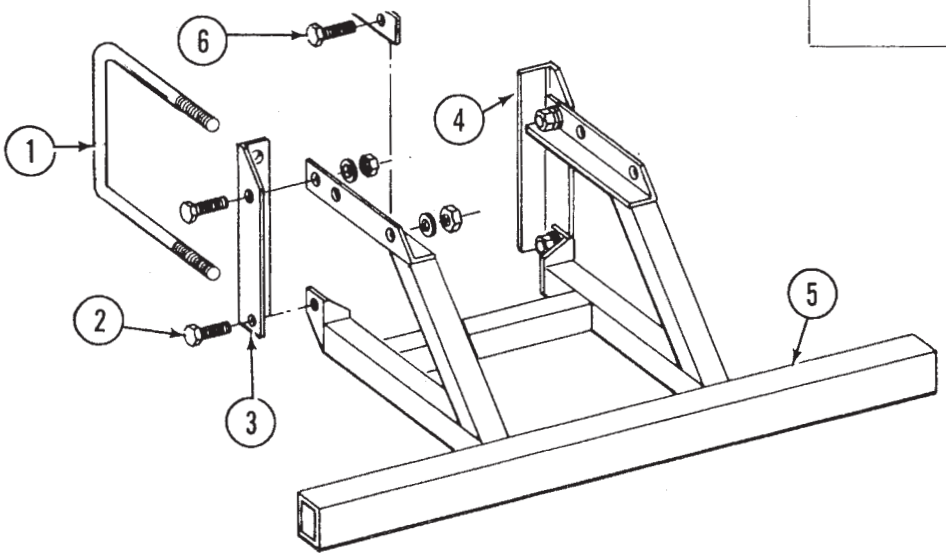
FERTILIZER OPENER

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"
	10216	Washer, 1/2" USS
	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.	10495	Rivet, 1/4" x 1 1/4"
31.	D1132	Cap
A.	A0320	Disc And Bearing Assembly (Items 18-20)
B.	1K139	Bearing With Cap And Rivets (Items 19, 30 And 31)

FERTILIZER OPENER MOUNT (DRY AND LIQUID)

DFC015

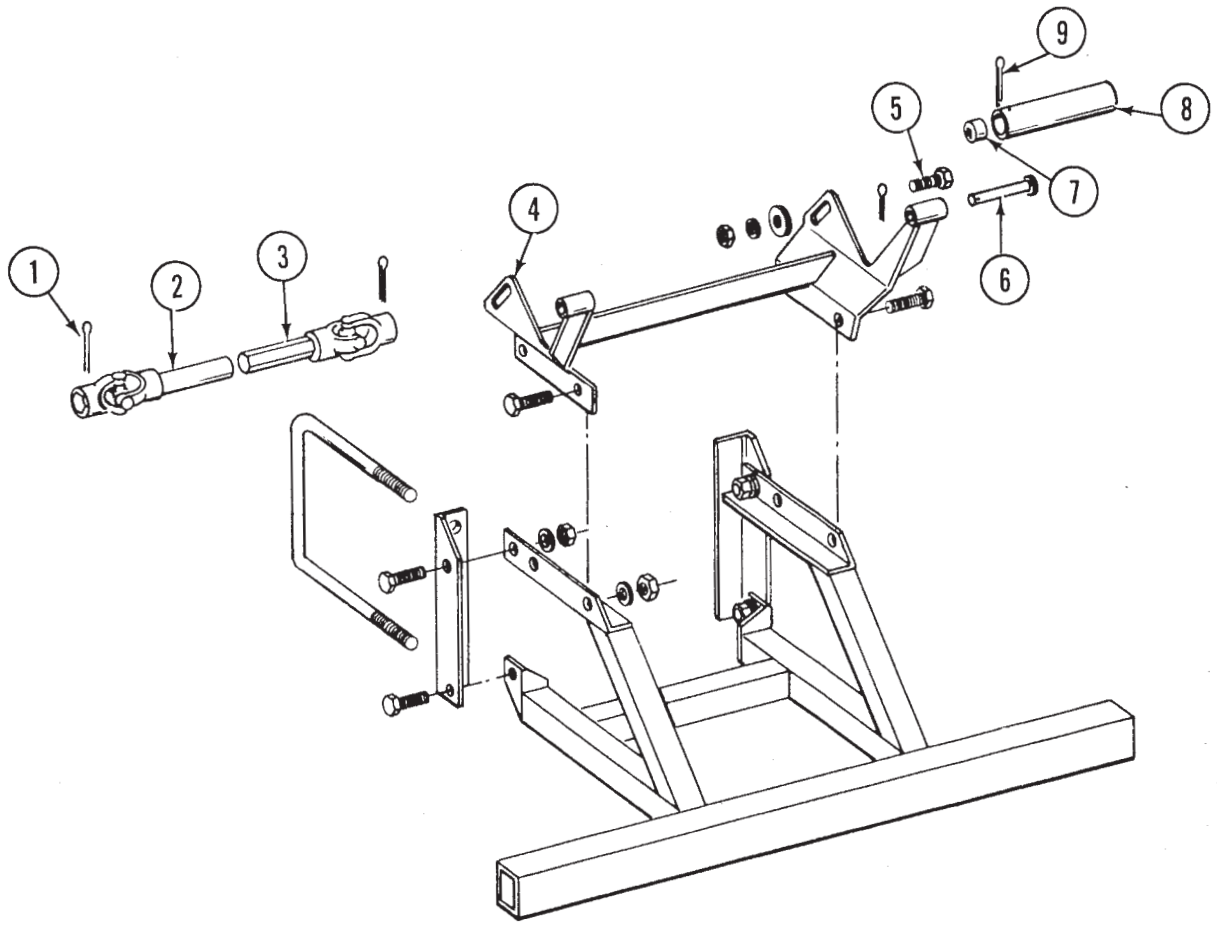




ITEM	PART NO.	DESCRIPTION
1.	D1747	U-Bolt, 5" x 7" x 3/4"-10
	10231	Lock Washer, 3/4"
	10105	Hex Nut, 3/4"-10
2.	10007	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
3.	D4782	Angle, R.H.
4.	D4781	Angle, L.H.
5.	A3624	Opener Mount
6.	10017	Hex Head Cap Screw, 1/2"-13 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 FERTILIZER HOPPER MOUNT AND COUPLERS

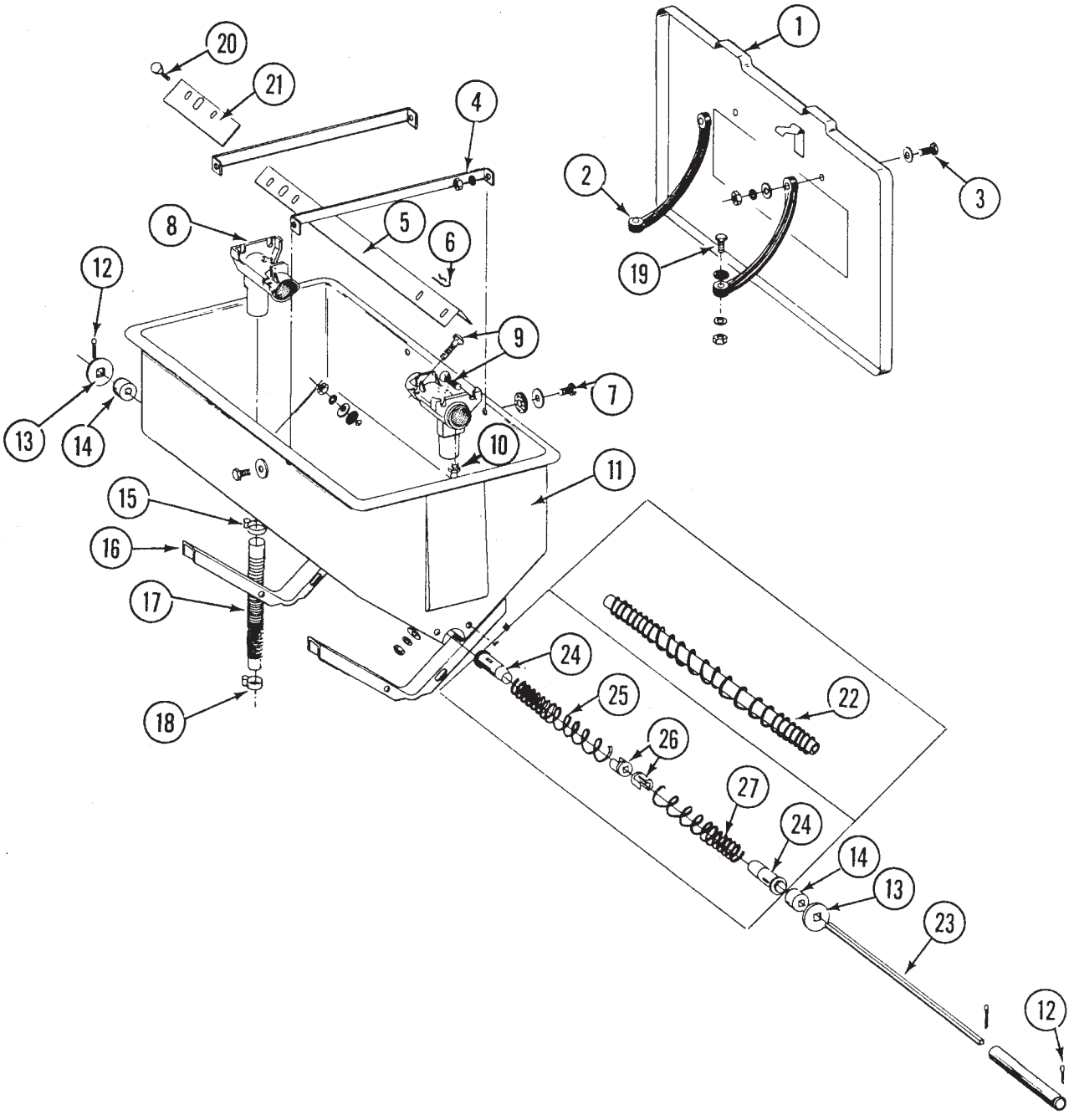
DFC015



ITEM	PART NO.	DESCRIPTION
1.	10460	Cotter Pin, 1/4" x 2"
2.	A3655	U-Joint With Grease Fittings, 9 5/8"
	10343	Grease Fitting, 1/8"-27, 90°
	10641	Grease Fitting, 1/8" NPT
	10640	Grease Fitting, 1/4"-28
3.	A3654	U-Joint With Grease Fitting, 10 5/8", 8 Row 30, 12 Row 30 And 16 Row 30
	A3767	U-Joint With Grease Fitting, 25 5/8", 8 Row 36/38 And 12 Row 36/38
	10343	Grease Fitting, 1/8"-27, 90°
4.	A3627	Hopper Support
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.	D2768	Square Insert
8.	A2309	Coupler, 16 1/8", 12 Row 30 And 16 Row 30
	A3768	Coupler, 31 5/8", 12 Row 38
	A3770	Coupler, 27 5/8", 12 Row 36
9.	10462	Cotter Pin, 3/16" x 2"

DRY FERTILIZER HOPPER AND MOUNTS

DFC009/DFC010

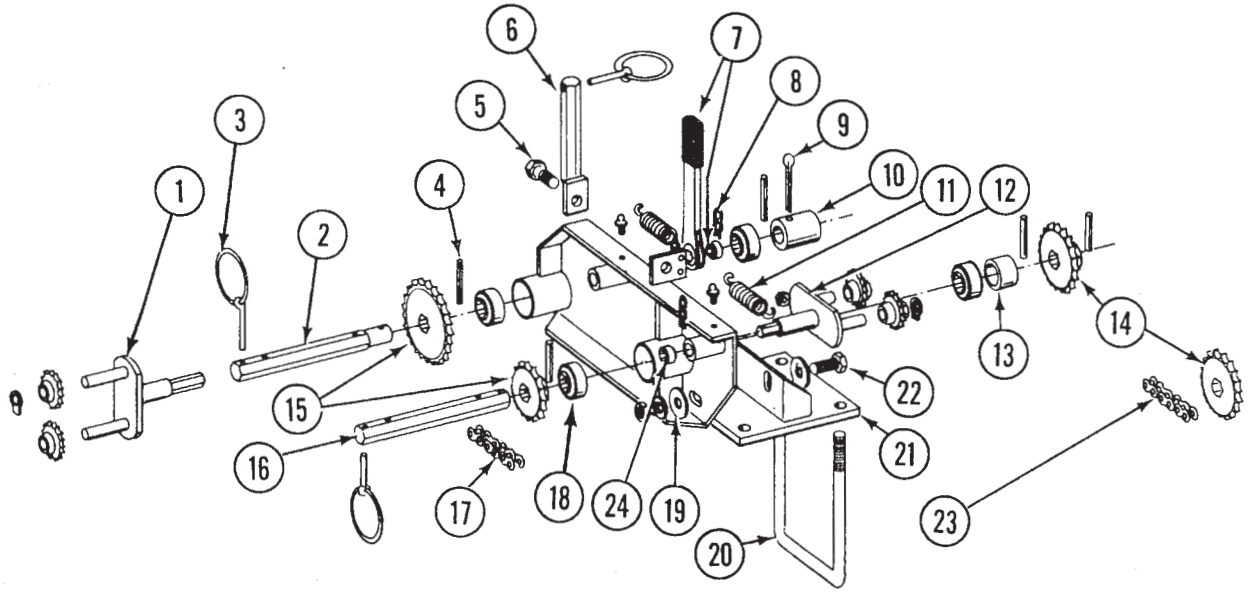


DRY FERTILIZER HOPPER AND MOUNTS

ITEM	PART NO.	DESCRIPTION
1.	A2101	Lid With Clips And Rivets
	D1380	Clip
	10655	Rivet, 3/16" x 13/32"
2.	D1210	Rubber Strap
3.	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
4.	D1209	Strap
5.	D1207	Baffle
6.	10670	Hair Pin Clip, No. 3
7.	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
8.	D1200	Outlet Housing
9.	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
10.	10641	Grease Fitting, 1/8" NPT
11.	D1379	Hopper
12.	10464	Cotter Pin, 3/16" x 1"
13.	D1212	Special Washer
14.	D1206	Bearing
15.	10676	Clamp, No. 36
16.	D1208	Saddle
17.	D3790	Rubber Tube
18.	10672	Clamp, No. 28
19.	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
20.	10019	Hex Head Cap Screw, 5/16"-18 x 1"
	10219	Washer, 5/16" USS
	10232	Lock Washer, 5/16"
	10106	Hex Nut, 5/16"-18
21.	D4667	Extension Plate (Optional)
22.	A5238	Auger Assembly, High Rate
23.	D1201	Shaft, 47"
	D3709	Shaft, 45 1/2"
	D3708	Shaft, 46"
24.	D1202	Guide
25.	D1204	Spring, R.H., Regular Rate
26.	D1203	Plug
27.	D1205	Spring, L.H., Regular Rate

DRY FERTILIZER DRIVE

DFC016

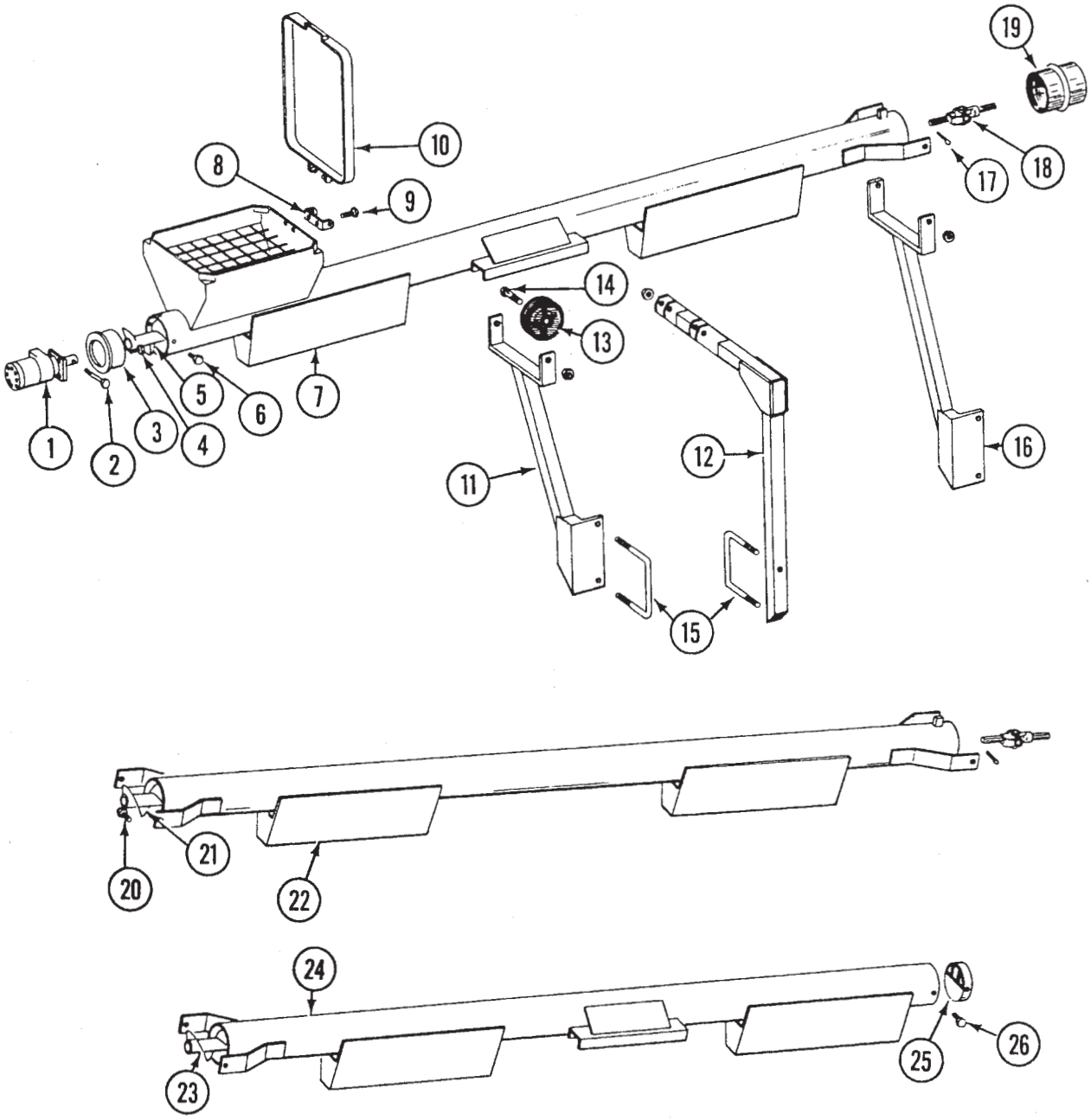


DRY FERTILIZER DRIVE

ITEM	PART NO.	DESCRIPTION
1.	A5136	Idler With Sprockets And Rings
	D7426	Sprocket
	10435	Ring
2.	D5215	Shaft, 7/8" x 6 3/8"
3.	D2558	Lynch Pin, 1/4"
4.	10602	Spring Pin, 1/4" x 1 1/2"
5.	10037	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	10111	Lock Nut, 1/2"-13
6.	A5229	Rod
7.	1K162	Ratchet Wrench Kit With Protective Closure And Sleeve
	10445	Protective Closure
	D6819	Sleeve
8.	10670	Hair Pin Clip, No. 3
9.	10460	Cotter Pin, 1/4" x 2"
10.	D5970	Coupler, 1 5/8", 8 Row 30, 12 Row 30 And 16 Row 30
	D6029	Coupler, 8", 8 Row 36/38 And 12 Row 36/38
	A5653	Coupler, 12 1/2" (As required on 8 Row 36 Models)
11.	D5857	Spring
12.	A4626	Idler With Sprockets And Rings
	D7426	Sprocket
	10435	Ring
13.	D1199-03	Spacer, 5/8"
14.	A5109	Sprocket, 24 Tooth
15.	A5105	Sprocket, 15 Tooth
	A5107	Sprocket, 19 Tooth
	A5114	Sprocket, 30 Tooth
	A5115	Sprocket, 33 Tooth
	A5194	Sprocket, 50 Tooth
16.	D6902	Shaft, 7/8" x 7 3/4"
17.	3310-88	Chain, No. 40, 88 Pitch Including Connector Link
	R0912	Connector Link, No. 40
18.	A5116	Bearing, 7/8" Hex
19.	A4623	Transmission Plate With Grease Fittings, L.H.
	A4622	Transmission Plate With Grease Fittings, R.H.
	10640	Grease Fitting, 1/4"-28
20.	D1134	U-Bolt, 7" x 5" x 5/8"-11
	10230	Lock Washer, 5/8"
	10104	Hex Nut, 5/8"-11
21.	A4624	Mount
22.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10216	Washer, 1/2" SAE
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
23.	3310-118	Chain, No. 40, 118 Pitch Including Connector Link
	R0912	Connector Link, No. 40
24.	D6819	Sleeve

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

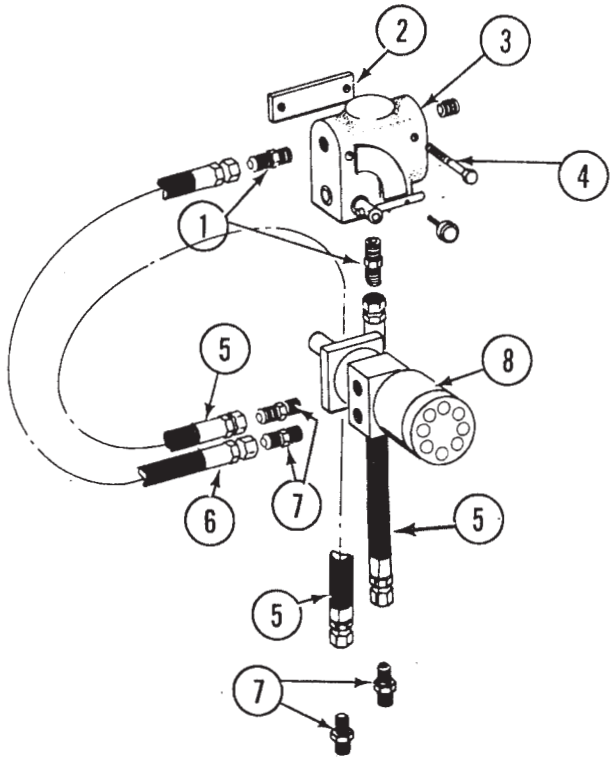
DRY FERTILIZER QUICK FILL

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	Wing Mount, R.H., 12 Row 30 And 16 Row 30
	A4641	Wing Mount, L.H., 12 Row 30 (Shown) And 16 Row 30
12.	A4652	Wing Mount, R.H., 8 Row 30/36/38
	A4651	Wing 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	Ayger 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

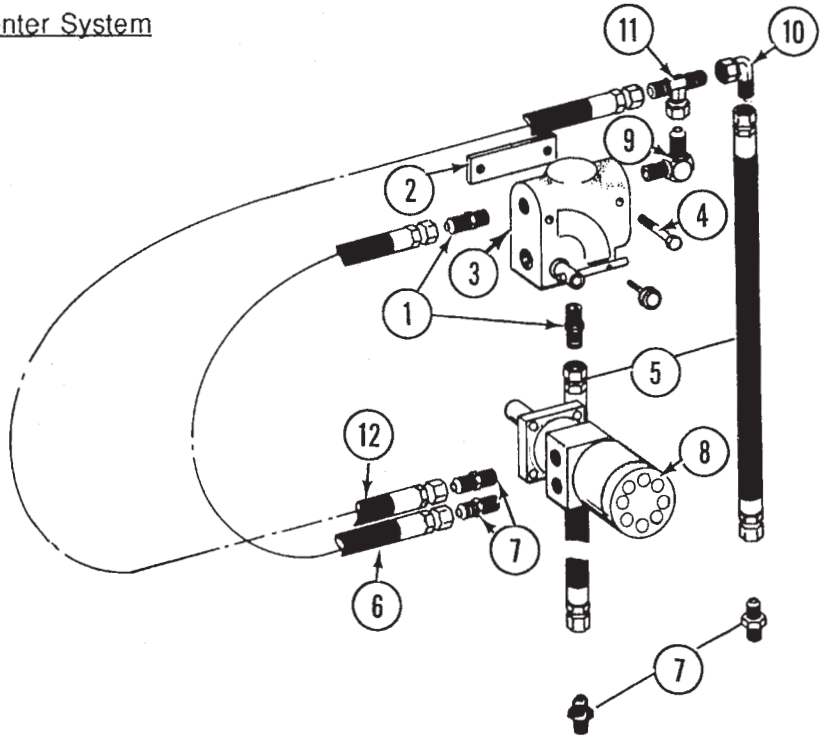
DRY FERTILIZER QUICK FILL HYDRAULIC SYSTEM

PHS030/PHS031

Closed Center System



Open Center System

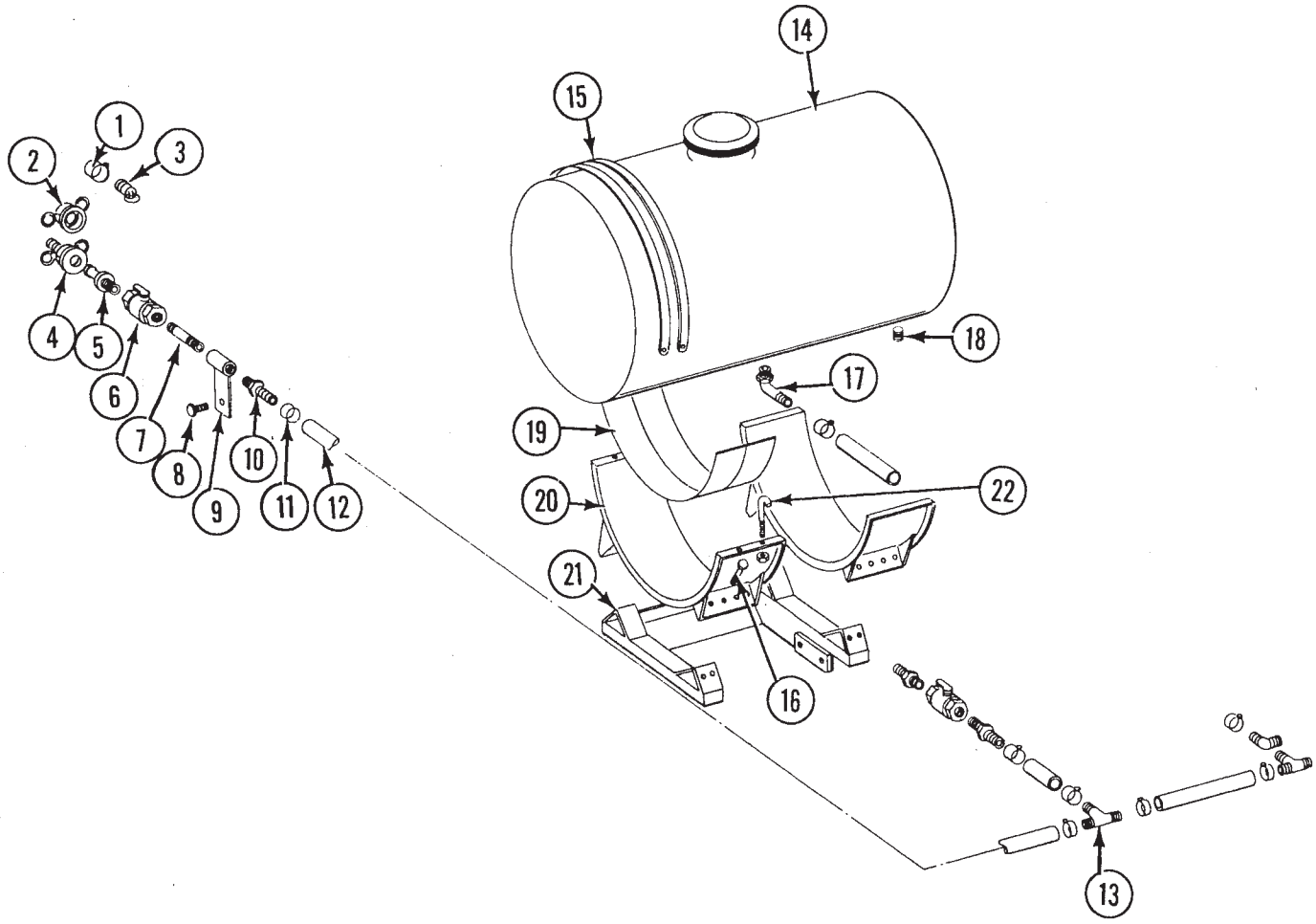


DRY FERTILIZER QUICK FILL HYDRAULIC SYSTEM

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

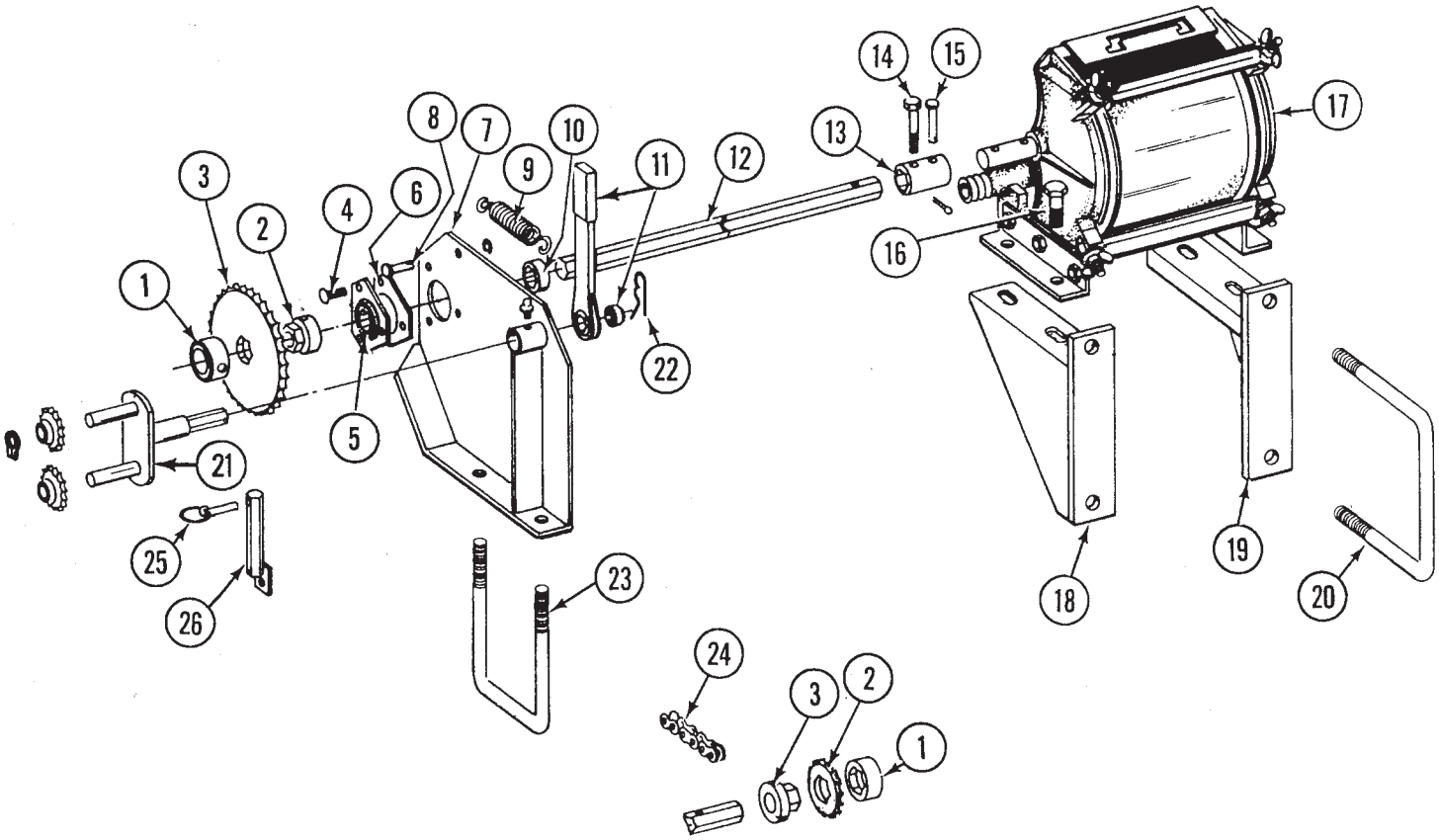


LIQUID FERTILIZER TANKS, SADDLES, SADDLE MOUNTS AND HOSES

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.	A0499	Nylon Ball Valve, 1 1/4"
	A4976	Ball Valve, Full Port(Repairable)
	R1015	Body O-Ring (Use With A4976)
	R1016	Stem O-Ring (Use With A4976)
	R1017	Teflon Seat (Use With A4976)
	R1018	Ball (Use With A4976)
	R1019	Handle (Use With A4976)
7.	10270	Pipe Nipple, 1 1/4" x 3"
8.	10017	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	10228	Lock Washer, 1/2"
	10102	Hex Nut, 1/2"-13
9.	A0918	Quick Fill Mount
10.	10745	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.	10750	Nylon 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.	10742	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 DRIVE

LFC022



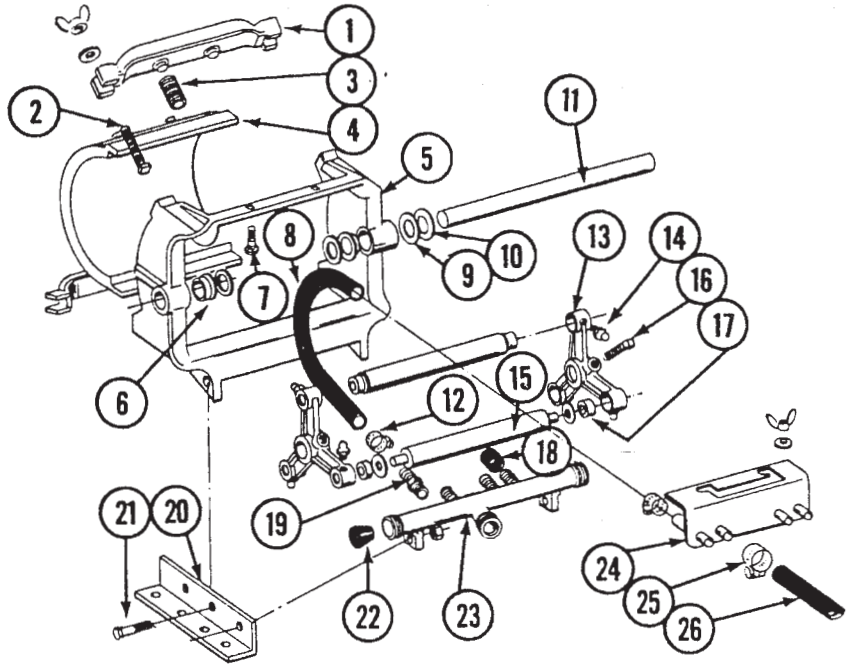
ITEM	PART NO.	DESCRIPTION
1.	A2355	Lock Collar With Set Screws
	10120	Set Screw, 3/8"-16 x 1/2"
2.	A2354	Adapter With Set Screws
	10120	Set Screw, 3/8"-16 x 1/2"
3.	2500-70	Sprocket, 16 Tooth
	2500-71	Sprocket, 18 Tooth
	2500-72	Sprocket, 20 Tooth
	2500-73	Sprocket, 30 Tooth
	2500-74	Sprocket, 44 Tooth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

LIQUID FERTILIZER 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.	10558	Clevis Pin, 5/16" x 1 3/4"
	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.	1K162	Ratchet Wrench Kit With Protective Closure And Sleeve
	10445	Protective Closure
	D6819	Sleeve
12.	D2548-48	Shaft, 7/8" x 48", 8 Row 30/36/38 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.	10478	Clevis Pin, 5/16" x 1"
	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
	D5815	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
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

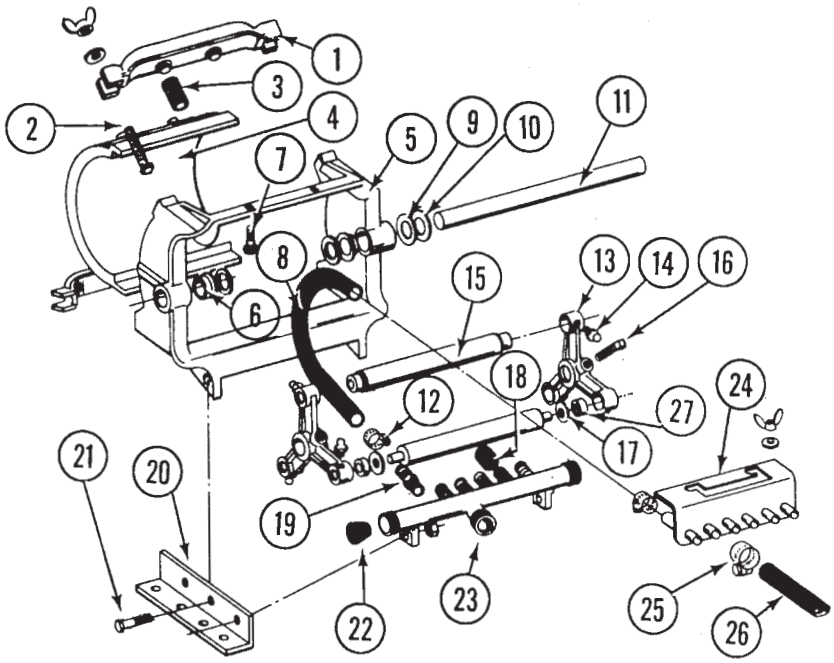
LFC011



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

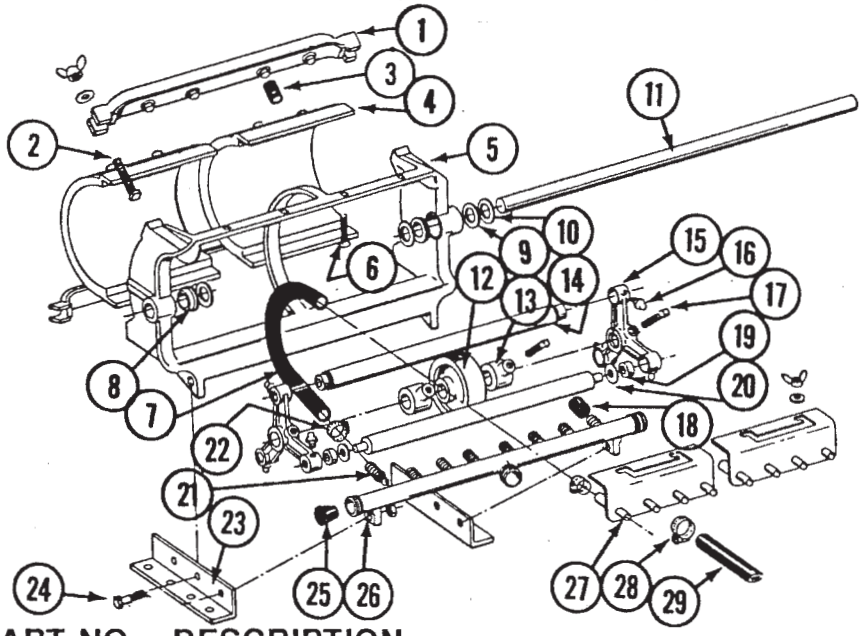
LFC011



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

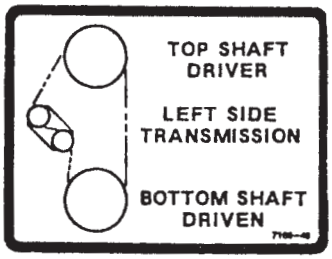


ITEM	PART NO.	DESCRIPTION
1.	R0221	Spring Anchor Bar
2.	10130	Square Head Machine Bolt, 5/16"-18 x 1 3/4"
	10219	Washer, 5/16" USS
	10144	Wing Nut, 5/16"-18
3.	R0214	Spring
4.	R0212	Plate
5.	R0222	Frame
6.	10303	Round Head Machine Bolt, 5/16"-18 x 1"
	10219	Washer, 5/16" USS
	10144	Wing Nut, 5/16"-18
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.
	Ro280	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.	10681	Clamp, No. 6
29.	4300-05	Hose, 1/2" x 100'
A.	A0323	Squeeze Pump Complete, 8 Rows (Items 1 - 27)

SMV, DECALS, REFLECTORS AND TIE STRAPS

1

3



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KINZE®

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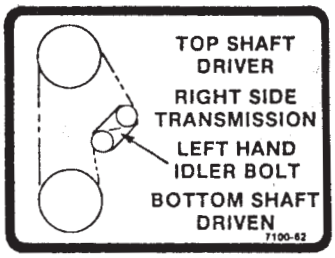

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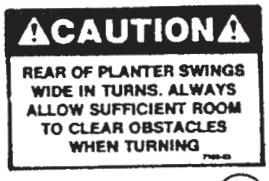

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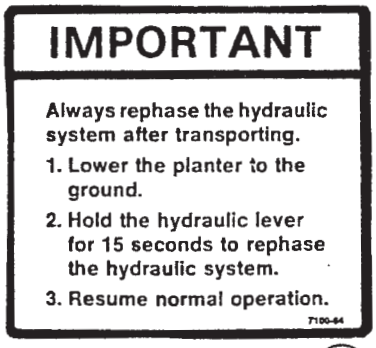

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Twin • Line

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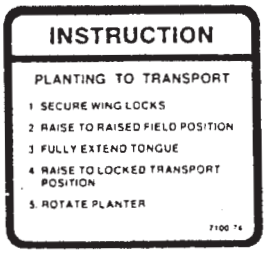

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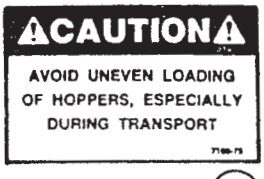

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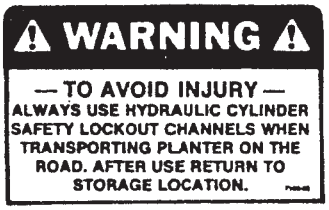
SMV, DECALS, REFLECTORS AND TIE STRAPS



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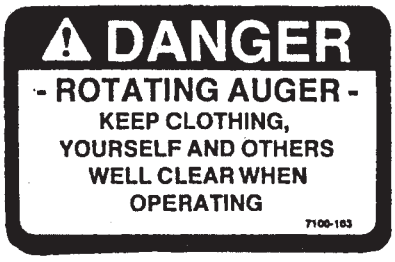

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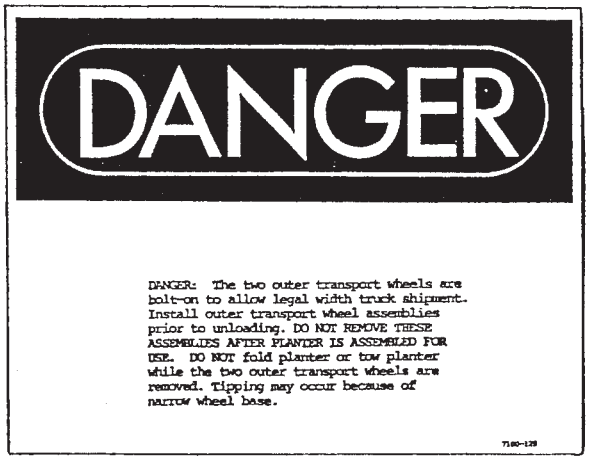

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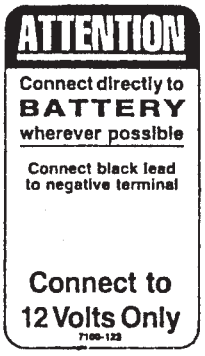

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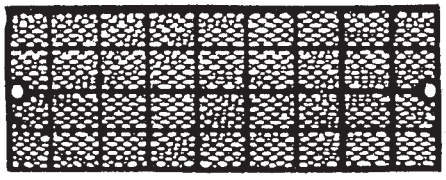

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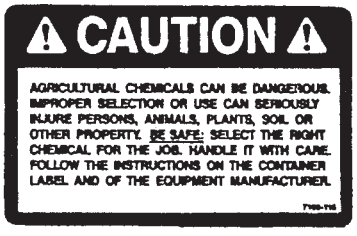

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SMV, DECALS, REFLECTORS AND TIE STRAPS

29

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.	7100-65	Decal, Twin-Line
11.	7100-68	Decal, Warning
12.	7100-73	Decal, Transport To Planting
13.	7100-74	Decal, Planting To Transport
14.	7100-75	Decal, Caution
15.	7100-83	Decal, Warning
16.	7100-89	Decal, Danger
17.	7100-90	Decal, Warning
18.	7100-103	Decal, Danger
19.	7100-110	Decal, Grease Weekly
20.	7100-111	Decal, Oil Daily
21.	7100-116	Decal, Grease Daily
22.	7100-117	Decal, Danger
23.	7100-129	Decal, Danger
24.	7100-123	Decal, Attention
25.	7200-03	Reflector, Red
	7200-04	Reflector, Amber
26.	D2199	SMV Sign
27.	7100-115	Decal,
28.	D1512	Tie Strap, 7"
	D2117	Tie Strap, 14 1/2"
	D1162	Tie Strap, 28"
	D2984	Tie Strap, 33"
29.	D7638-01	LineLoc, Red
	D7638-02	LineLoc, Blue
	D7638-03	LineLoc, Green
30.	R0155	Blue Paint, Aerosol (Not Shown)
	R0439	Blue Paint, Quart
	R0440	Blue Paint, Gallon

NOTES

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