

MODEL 2500 TWIN-LINE® PLANTER OPERATOR & PARTS MANUAL

M0157

Rev. 8/98

This manual is applicable to: Model: 2500 Twin-Line® Planters

Serial Number: 900040 and on

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

Model Number _____ 2500 _____

Serial Number _____

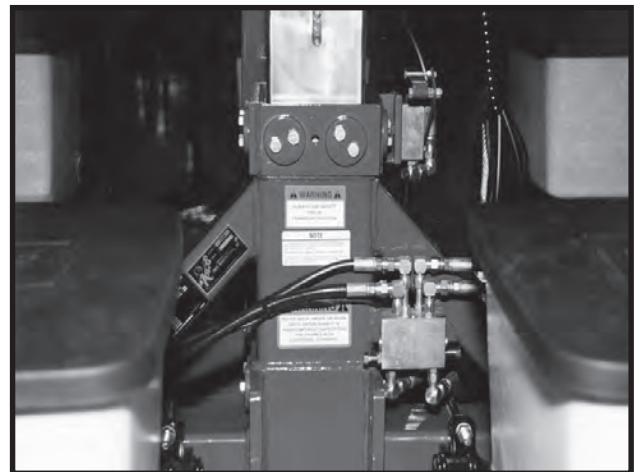
Date Purchased _____

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 be recorded above.

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

03279810



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The following marks are owned by their respective companies: John Blue®/John Blue Company and CDS®/CDS Ag Industries, Inc.*

Rev. 1/98

PREDELIVERY/DELIVERY CHECK LIST

TO THE DEALER

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

PREDELIVERY CHECK LIST

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

- Recheck to be sure row units and optional attachments are properly spaced and assembled.
- Be sure all grease fittings are in place and lubricated.
- Check planter and make sure all working parts are moving freely, bolts are tight and cotter pins are spread.
- Check all drive chains for proper tension and alignment.
- Check for oil leaks and proper hydraulic operation.
- Check to be sure hydraulic hoses are routed correctly to prevent damage to hoses.
- 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 safety/warning lights are installed correctly and working properly.
- Paint all parts scratched in shipment or assembly.
- Be sure all safety lockups are on the planter and correctly located.

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

(Signature Of Set-Up Person/Dealer Name/Date)

OWNER REGISTER

Name _____ Date Sold _____
Street Address _____ Model _____
City, State/Province & ZIP _____ Serial Number _____
Dealer Name _____ Dealer 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 & Parts Manual.
- Tell the customer about all applicable safety precautions.
- Along with the customer, check to be sure the red reflectors, amber reflectors and SMV sign are clearly visible with the planter in transport position and attached to the tractor. Check to be sure safety/warning lights are in working condition. Tell the customer to check federal, state/provincial and local regulations before towing or transporting on a road or highway.
- Give the Operator & Parts 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/Dealer Name/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 adherence with all 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/Dealer Name/Date)

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

Tear Along Perforation

TABLE OF CONTENTS

| | |
|---|--------------------------------|
| TO THE OWNER | 1-1 |
| WARRANTY | 1-2 |
| INTRODUCTION | 2-1 |
| SPECIFICATIONS | 3-1 |
| SAFETY PRECAUTIONS | 4-1 |
| SAFETY WARNING SIGNS | 5-1 |
| MACHINE OPERATION | |
| Adjustable Wear Pads | 6-15 |
| Checking Granular Chemical Application Rate | 6-27 |
| Checking Seed Population | 6-26 |
| Contact Drive Wheel Spring Adjustment | 6-3 |
| Double Disc Fertilizer Opener | 6-17 |
| Dry Fertilizer Attachment | 6-21 |
| Electronic Seed Monitor System | |
| KM1000 Monitor | 6-9 |
| KM3000 Monitor | 6-11 |
| KPM I/KPM II Monitor | See Assembly Instruction IS364 |
| Field Test | 6-16 |
| General Planting Rate Information | 6-28 |
| Half Rate (2 To 1) Drive | 6-3 |
| HD Single Disc Fertilizer Opener | 6-19 |
| Hitch Length Setting | 6-8 |
| Hydraulic Operation | 6-5 |
| Initial Preparation Of The Planter | 6-1 |
| Leveling The Planter | 6-2 |
| Liquid Fertilizer Attachment | 6-23 |
| Marker Adjustment | 6-6 |
| Marker Safety Lockup | 6-7 |
| Marker Speed Adjustment | 6-6 |
| Metric Conversion Table | 6-16 |
| Notched Single Disc Fertilizer Opener | 6-18 |
| Notched Single Disc Fertilizer Opener Mounted Residue Wheel | 6-18 |
| Planting And Application Rate Charts | 6-29 |
| Planting Speed | 6-15 |
| Push Row Unit Clutch Sprocket | 6-14 |
| Rear Trailer Hitch | 6-25 |
| Ridge Planting | 6-14 |
| Rock Guards | 6-14 |
| Safety Lockup Pin | 6-8 |
| Shear Protection | 6-4 |
| Standard Rate Drive | 6-3 |
| Tire Pressure | 6-2 |
| Transmission Adjustment | 6-3 |
| Tractor Preparation And Hookup | 6-1 |
| Tractor Requirements | 6-1 |
| Transport Latch Locking Pin | 6-7 |
| Transporting The Planter | 6-15 |
| ROW UNIT OPERATION | |
| Brush-Type Seed Meter | 7-4 |
| Coulter Mounted Residue Wheels | 7-13 |
| Covering Discs/Single Press Wheel Adjustment | 7-2 |
| Disc Furrowers (For Use With Frame Mounted Coulter) | 7-11 |
| Finger Pickup Seed Meter | 7-3 |
| Frame Mounted Coulter | 7-9 |
| Granular Chemical Banding Options | 7-16 |
| Granular Chemical Hopper | 7-15 |
| Granular Chemical Restrictor Plate | 7-15 |

TABLE OF CONTENTS

ROW UNIT OPERATION (Continued)

| | |
|---|------|
| Planting Depth | 7-1 |
| Push Row Unit Lockups | 7-14 |
| Quick Adjustable Down Force Springs | 7-8 |
| Row Unit Chain Routing | 7-7 |
| Row Unit Extension Brackets | 7-6 |
| Row Unit Gauge Wheel Cover | 7-7 |
| Row Unit Mounted Disc Furrower | 7-11 |
| Row Unit Mounted No Till Coulter | 7-13 |
| Row Unit Mounted Residue Wheel | 7-12 |
| Seed Firming Wheel | 7-14 |
| Seed Hopper | 7-5 |
| Seed Meter Drive Adjustment | 7-6 |
| Seed Meter Drive Release | 7-6 |
| Spring Tooth Incorporator | 7-16 |
| “V” Closing Wheel Adjustment | 7-1 |

LUBRICATION

| | |
|-------------------------------------|-----|
| Bushings | 8-4 |
| Center Post | 8-1 |
| Drive Chains | 8-1 |
| Grease Fittings | 8-5 |
| Liquid Fertilizer Piston Pump | 8-3 |
| Lubrication Symbols | 8-1 |
| Sealed Bearings | 8-1 |
| Wheel Bearings | 8-3 |

MAINTENANCE

| | |
|--|------|
| 15" Seed Opener Disc/Bearing Assembly | 9-8 |
| Brush-Type Seed Meter Maintenance | 9-5 |
| Brush-Type Seed Meter Troubleshooting | 9-7 |
| Chain Tension Adjustment | 9-1 |
| Closing Wheel Troubleshooting | 9-7 |
| Electrical Wiring Diagram For Light Package | 9-22 |
| Electronic Seed Monitor System Troubleshooting | 9-10 |
| Finger Pickup Seed Meter Cleaning | 9-3 |
| Finger Pickup Seed Meter Inspection/Adjustment | 9-2 |
| Finger Pickup Seed Meter Troubleshooting | 9-4 |
| Gauge Wheel Adjustment | 9-8 |
| Hydraulic Diagram | 9-23 |
| Marker Bearing Lubrication Or Replacement | 9-19 |
| Marker Operation Troubleshooting | 9-18 |
| Marker Sequencing/Flow Control Valve Inspection | 9-17 |
| Mounting Bolts And Hardware | 9-1 |
| Piston Pump Storage | 9-21 |
| Piston Pump Troubleshooting | 9-21 |
| Preparation For Storage | 9-22 |
| Row Unit Mounted No Till Coulter | 9-9 |
| Seed Monitor Display Backlite Bulb Replacement (KM3000 Only) | 9-16 |
| Seed Monitor Row Indicator Bulb Replacement (KM1000 Only) | 9-16 |
| Seed Tube Guard/Inner Scraper | 9-9 |
| Torque Values Chart | 9-1 |
| Wear Pad Replacement/Adjustment | 9-20 |
| Wheel Bearing Lubrication Or Replacement | 9-19 |

| | |
|-------------------------------|-----------|
| PARTS LIST INDEX | P1 |
|-------------------------------|-----------|


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|--|----------|
| PARTS SECTION NUMERICAL INDEX | a |
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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. It should be considered a permanent part of the machine and remain with the machine when you sell it.

It is the responsibility of the user to read and understand the Operator & Parts 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 & Parts Manual. We have attempted to cover all areas of safety, operation, lubrication and maintenance; however, there may be times when special care must be taken to fit your conditions.

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

NOTE: Indicates a special point of information.

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



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



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



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

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

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

WARRANTY

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

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

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

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

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

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

INTRODUCTION

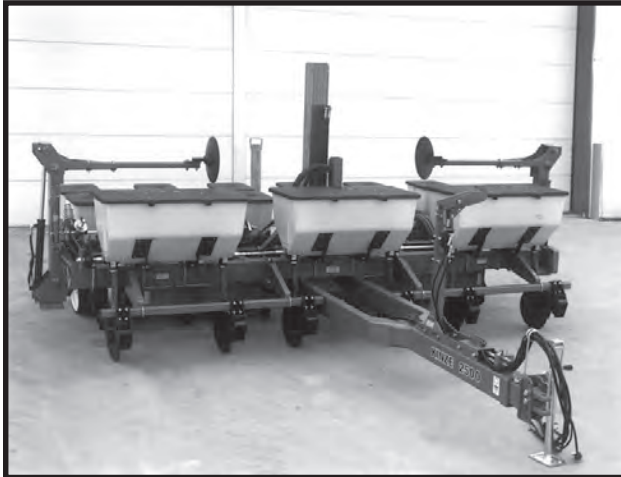
The Model 2500 Twin-Line® Planter is available in various row spacings and permits installation of various row unit attachments. Interplant®, liquid fertilizer and/or dry fertilizer options are available for use on the Model 2500 planter.

GENERAL INFORMATION

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

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

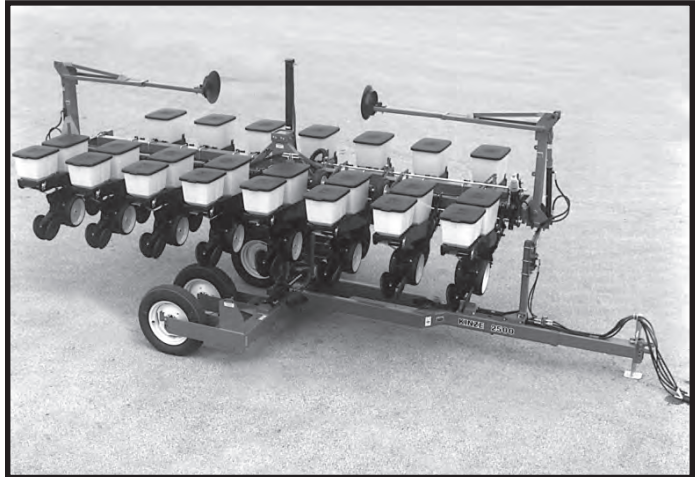
69797-89a



6 Row 30" Size

Planter is shown in field operation position with dry fertilizer and double disc fertilizer opener options installed.

67999-2



8 Row 30" Size

Planter is shown in transport position with the Interplant® option installed.

INTRODUCTION

SPECIFICATIONS

TYPE Pull-type, rigid frame. Rotating main frame for transport, hydraulic operation.

PLANTING UNIT TYPES Pull Row Units; Interplant® Push Row Units Optional

| | | |
|--------------------|-------------------------|------------------------------------|
| ROW SPACING | <u>Pull Row Units</u> | <u>Push Row Units</u> |
| | 6 Row Narrow - 30" Rows | 11 - 15" Rows (9 - 15" Skip Rows) |
| | 8 Row Narrow - 30" Rows | 15 - 15" Rows (13 - 15" Skip Rows) |

DRIVE SYSTEM

Two 4.10" x 6" spring-loaded contact drive tires. (Driven by two 7.50" x 20" rib implement 6 ply transport tires.)
 No. 40 chain with spring-loaded idlers.
 Quick-adjust end-mounted seed transmission with machined sprockets.
 7/8" hex drive and drill shafts.

TRANSPORT TIRES

Four 7.50" x 20" rib implement 6 ply tires.
 Adjustable height wheels for ridge planting.

LIFT One centrally located lift cylinder. (Front or rear mount.)

MARKERS Two-fold low profile with 16" concave, solid blade and cast iron hubs.

HYDRAULICS Dual SCV for independent operation of lift and markers.
 Manual hand valve selects marker/fold functions.
 Hydraulic alternating sequence valve with flow controls for markers.

Dimensions

| PLANTER SIZE | 6 Row 30" | 8 Row 30" |
|------------------|-----------|-----------|
| Operating Width | 16' 10" | 21' 10" |
| Transport Width | 11' 2" | 11' 2" |
| Transport Height | 10' 6" | 10' 6" |
| Weight | 5155 lbs. | 5852 lbs. |

* Base machine weights include planter frame including row markers, hydraulic cylinders, hoses, fittings, tires, wheels, drive and drill shafts, sprockets, chains and required drive components, parking jack, safety/warning lights, SMV sign, and KINZE® pull row units (closing wheel arms less closing wheels) with seed hopper and lid and dual quick adjustable down force springs.

SPECIFICATIONS

MACHINE OPTIONS

- Electronic Seed Monitors - KM1000, KM3000 With Magnetic Distance Sensor Or KM3000 With Radar Distance Sensor (KPM I/KPM II Monitor - See Assembly Instruction IS364)
- Half Rate (2 To 1) Drive Reduction Package
- Rock Guard Package (Transport Wheel Arm)
- Rear Trailer Hitch
- Interplant®
- Liquid Fertilizer With Fertilizer Opener And Pump Options
- Dry Fertilizer With Fertilizer Opener Options


ROW UNIT OPTIONS/ATTACHMENTS

- Finger Pickup Or Brush-Type Seed Meters
- Closing Wheels - Rubber "V", Cast Iron "V" Or Covering Discs/Single Press Wheel
- Gauge Wheel Covers
- Granular Chemical Application Options
- Spring Tooth Incorporator
- Row Unit Mounted No Till Coulter
- Row Unit Mounted Disc Furrowers
- Row Unit Mounted Residue Wheel
- Coulter Mounted Residue Wheels
- Frame Mounted No Till Coulter
- Disc Furrowers For Frame Mounted Coulter
- Seed Firming Wheel
- Row Unit Extension Bracket Package

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 and on the warning signs. Listed below are other safety suggestions that should become common practice.

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


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


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


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


 Always keep hands, feet and clothing away from moving parts. Do not wear loose-fitting clothing which may catch in moving parts.

 Always wear protective clothing, substantial shoes and suitable hearing and eye sight protectors applicable for the situation.

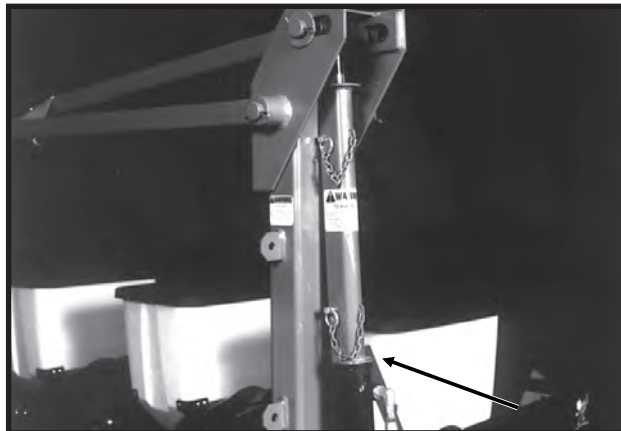
 Be aware of bystanders, particularly children! Always look around to make sure it is safe to start the engine of the towing vehicle or move the planter. This is particularly important with higher noise levels and quiet cabs, as you may not hear people shouting.

 The left outer transport wheel is bolt-on to allow legal width truck shipment. Install outer transport wheel assembly prior to unloading. Do not remove this assembly after planter is assembled for use. Do not fold planter or tow planter while the outer transport wheel is removed. Tipping may occur because of narrow wheel base.


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

 Install safety lockup brackets on marker cylinders prior to transporting the planter or working around the unit.

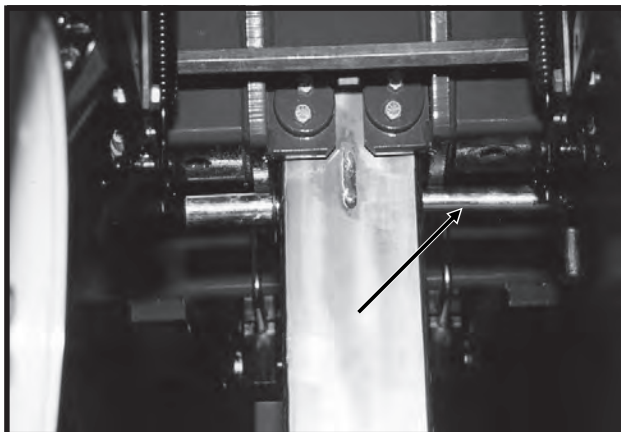
79421-8



Marker Safety Lockup Bracket

 Always install all safety lockups before transporting the planter.

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Safety Lockup Pin

SAFETY PRECAUTIONS



Never work under the planter while in raised position without installing safety lockup pin.



If the planter is going to be transported on a public highway, a safety chain should be obtained and installed. Always follow federal, state/provincial and local regulations regarding a safety chain when towing farm equipment on a public highway. Only a safety chain (not an elastic or nylon/plastic tow strap) should be used to retain the connection between the towing and towed machines in the event of separation of the primary attaching system.



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



Use a tractor equipped with a roll-over-protective-system and fasten your seat belt prior to starting engine



Do not allow anyone to stand between the tongue or hitch and the towing vehicle when backing up to the planter.



Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc.



Always drive at a safe speed relative to local conditions and ensure your speed is low enough for an emergency stop to be safe and secure. Keep speed to a minimum.



Reduce speed prior to turns to avoid the risk of overturning.



Allow for unit length when making turns.



Avoid sudden uphill turns on steep slopes.



Always keep the tractor in gear to provide engine braking when going downhill. Do not coast.



Limit towing speed to 15 MPH. Tow only with farm tractor of minimum 70 HP.



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



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



Make sure the parked machine is on a hard level surface. Wheel chocks may be needed to prevent unit from rolling.



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. Do not make any alterations or changes to this machine. Any alteration to the design or construction may create hazards.



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



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



Store the planter in an area away from human activity. **DO NOT PERMIT** children to play in or around the stored unit.



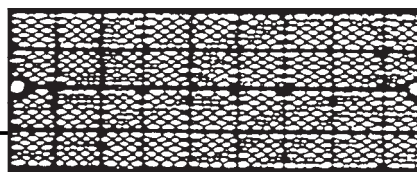
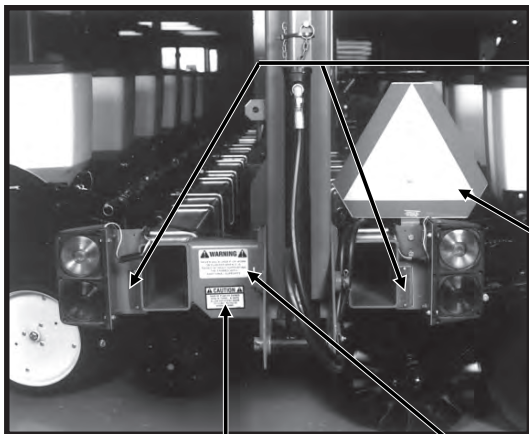
Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.

SAFETY WARNING SIGNS

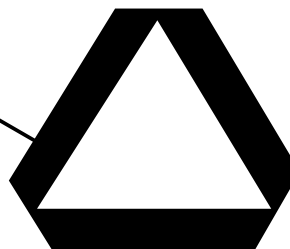
The “WARNING” signs illustrated on these pages are placed on the machine to warn of hazards. The warnings found on these signs are for your personal safety and those around you. OBSERVE THESE WARNINGS!

- Keep these signs clean so they can be readily observed. Wash with soap and water or cleaning solution as required.
- Replace “WARNING” signs should they become damaged, painted over or if they are missing.
- Check the SMV decal periodically. Replace if it shows loss of any of its reflective property.
- When replacing decals, clean the machine surface thoroughly using soap and water or cleaning solution to remove all dirt and grease.

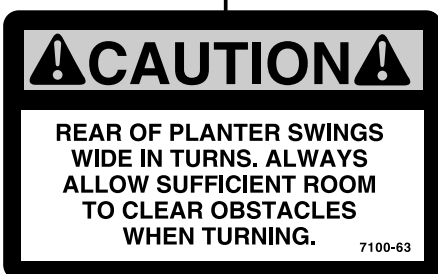
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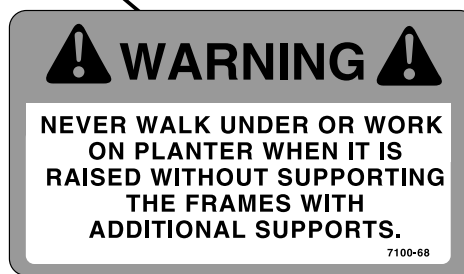
Part No. G7200-03 Red Reflector (Qty. 2)



Part No. GD2199 SMV Emblem (Qty. 1)



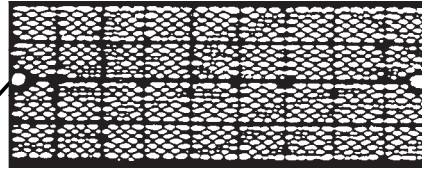
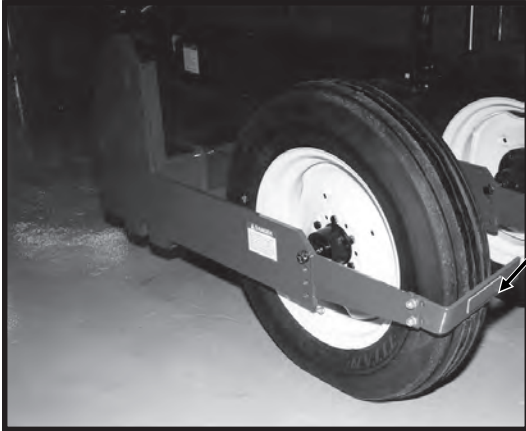
Part No. G7100-63 (Qty. 2)
1 On Each End Of Planter Frame



Part No. G7100-68 (Qty. 2)
1 On Each End Of Planter Frame

SAFETY WARNING SIGNS

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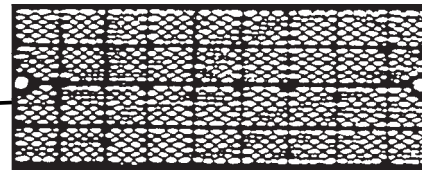
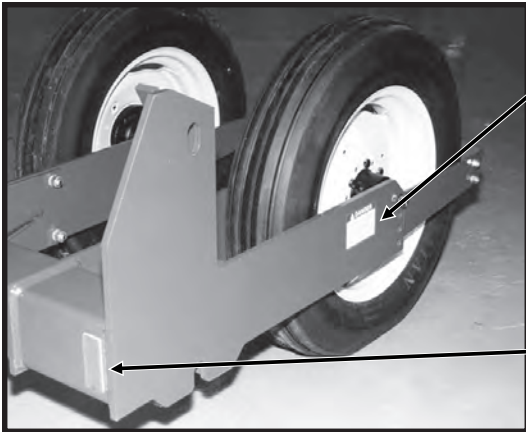


Part No. G7200-03 Red Reflector (Qty. 2)



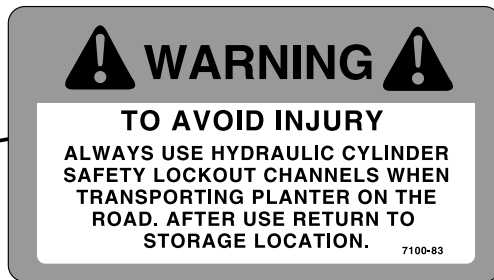
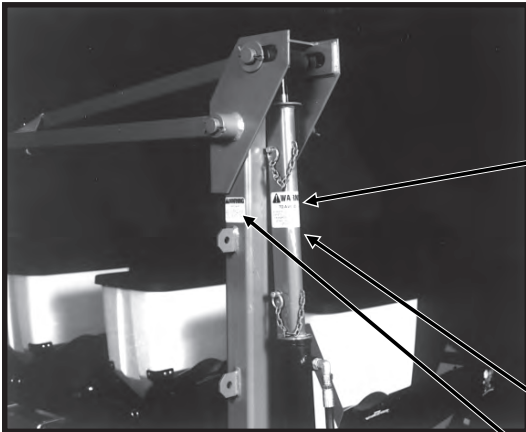
Part No. G7100-215 On Machines With Bolt-On Axle Stub (Qty. 1)

03279801a



Part No. G7200-02 Amber Reflector (Qty. 2)

79421-8



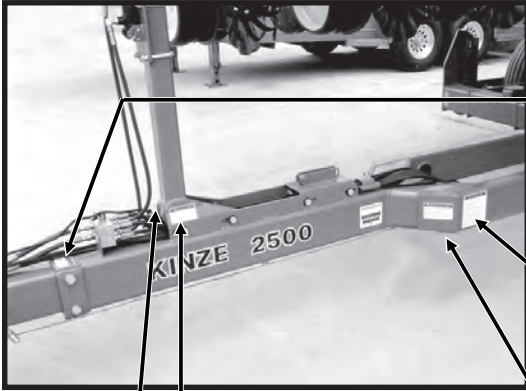
Part No. G7100-83 (1 Per Marker Lockup)



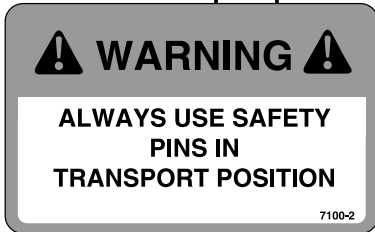
Part No. G7100-42 (2 Per Marker Assembly)

SAFETY WARNING SIGNS

83663-9



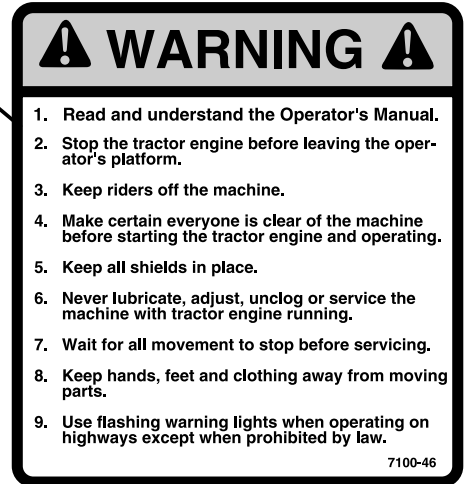
Part No. G7100-56 (Qty. 1)



Part No. G7100-02 (Qty. 2)

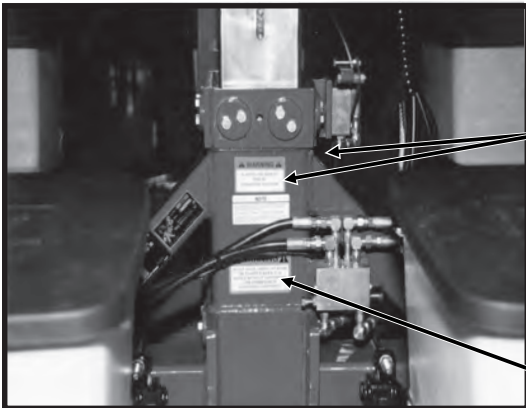


Part No. G7100-90 (Qty. 1)



Part No. G7100-46 (Qty. 1)

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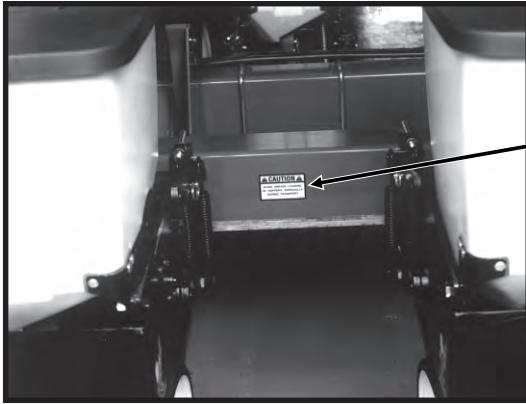
Part No. G7100-02 (Qty. 2)
Front And Rear



Part No. G7100-68 (Qty. 1)

SAFETY WARNING SIGNS

79421-5



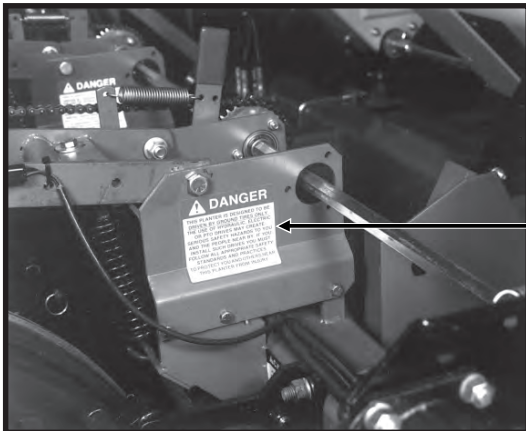
Part No. G7100-75 (Qty. 4)
43" From Each End Of Front Planter Frame And
28" From Each End Of Rear Planter Frame

69797-58



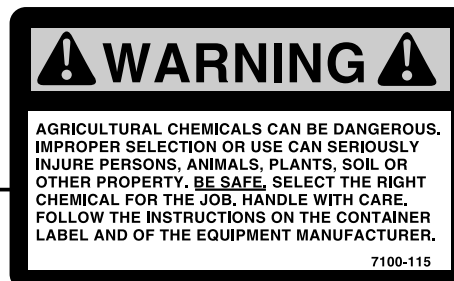
Part No. G7100-68 (Qty. 1)

69797-49



Part No. G7100-89 (Qty. 2)

77178-17a



Part No. G7100-115
Located On Under Side Of Granular Chemical
Hopper Lid

MACHINE OPERATION

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

CAUTION: Always raise the planter out of the ground when making sharp turns or backing up.

INITIAL PREPARATION OF THE PLANTER

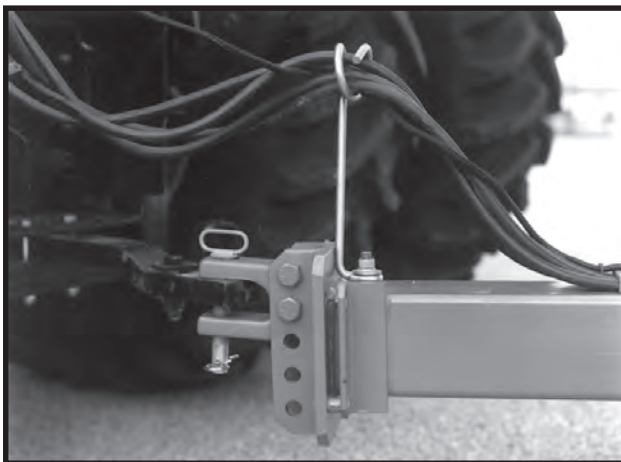
Lubricate the planter and row units per the lubrication information in this manual. Make sure all tires have been properly inflated. Check all drive chains for proper tension, alignment and lubrication.

TRACTOR REQUIREMENTS

Consult your dealer for information on horsepower requirements and tractor compatibility. Requirements will vary with planter options, tillage and terrain. Two dual remote hydraulic outlets (SCV) are required on all sizes. A 12 volt DC electrical system is required on all sizes to operate planter safety/warning lights.

TRACTOR PREPARATION AND HOOKUP

67999-18



1. Adjust tractor drawbar to 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. Back tractor to planter and connect with a **minimum 3/4" diameter** hitch pin. Make sure hitch pin is secured with locking pin or cotter pin.
3. Connect hydraulic hoses to tractor ports in a sequence which is both familiar and comfortable to the operator.



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

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

4. Connect ASAE Standards 7 terminal connector for warning lights on planter to ASAE Standards receptacle on tractor. If your tractor is not equipped with an ASAE Standards receptacle, check with your tractor manufacturer for availability. Check to be sure warning lights on planter are working in conjunction with warning lights on tractor.
5. Raise parking jack and remount horizontally on storage bracket.
6. Lower planter to the planting position and check to be sure the hitch is level. If hitch slopes up or down, disconnect planter and adjust hitch clevis up or down as necessary.

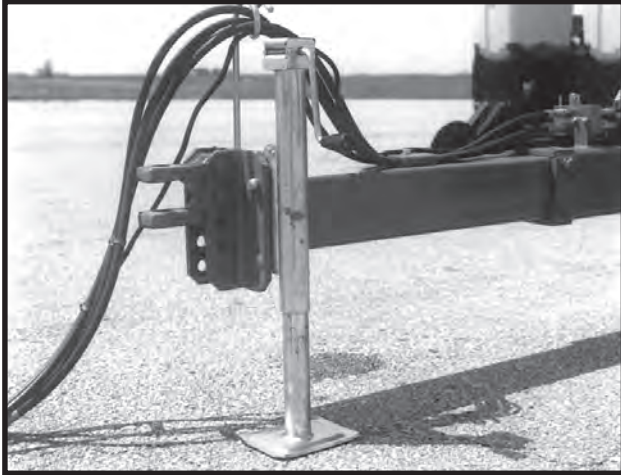
NOTE: If using an auxiliary attaching system to retain the connection between the planter and tractor hitch, be sure the auxiliary attaching system is of sufficient strength and length and correctly attached. An auxiliary attaching system (safety chain) is available from KINZE® Repair Parts through your KINZE® Dealer.

MACHINE OPERATION

LEVELING THE PLANTER

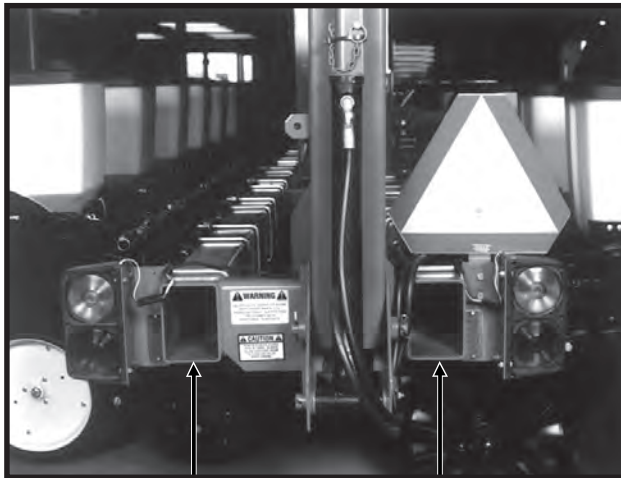
For proper operation of the planter and row units, it is important that the planter frame and row unit parallel arms be level. The toolbar should operate at a 20"-22" height, measured to the bottom of the toolbar.

67999-26



Five 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 bolts, make sure lock nuts are tightened to proper torque setting.

79421-15

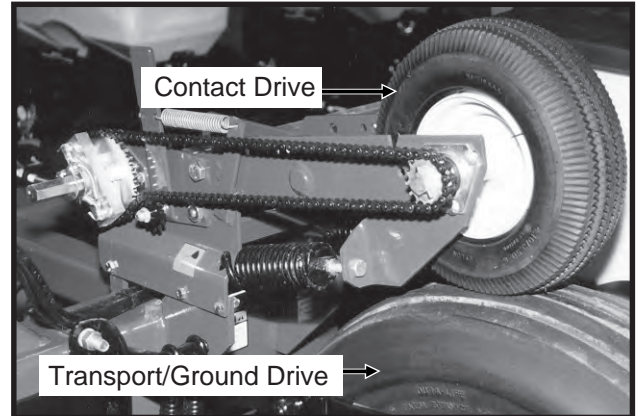


With the planter lowered to proper operating depth, check to be sure the frame is level fore and aft. Recheck once planter is in the field.

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

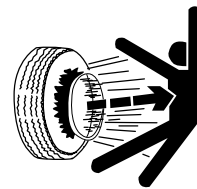
TIRE PRESSURE

03279803



Tire pressure should be checked regularly and maintained as follows:

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



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

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

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

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

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

MACHINE OPERATION

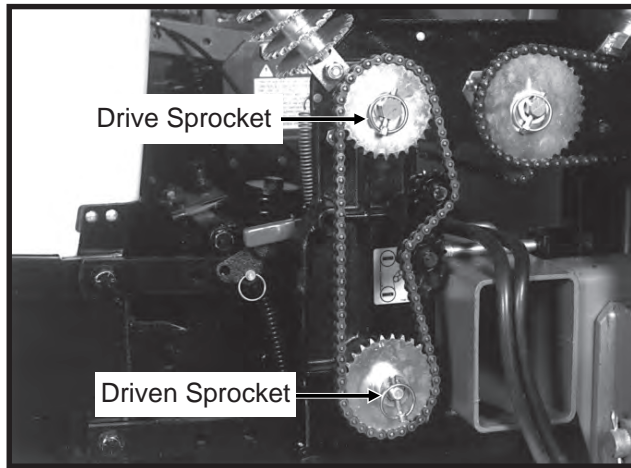
TRANSMISSION ADJUSTMENT

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

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

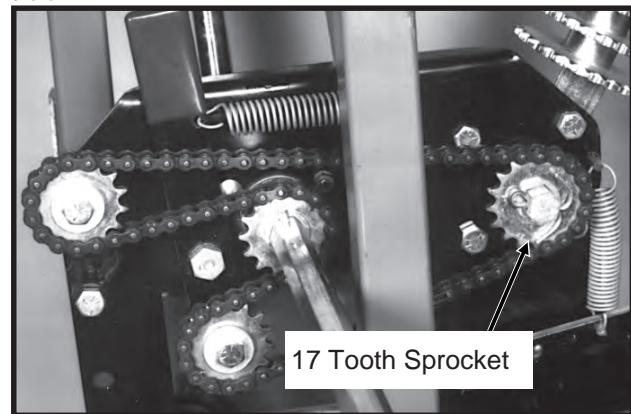
The planting rate charts found at the back of this section will aid you in selecting the correct sprocket combinations.

69797-7



STANDARD RATE DRIVE

61010-41



Seed planting rate charts are based on the standard rate drive. The standard rate drive uses a 17 tooth sprocket as shown above. Using the 34 tooth half rate (2 to 1) drive reduction sprocket in place of the 17 tooth sprocket will reduce the planting rate by approximately 50%. See "Half Rate (2 To 1) Drive".

HALF RATE (2 TO 1) DRIVE

69797-16



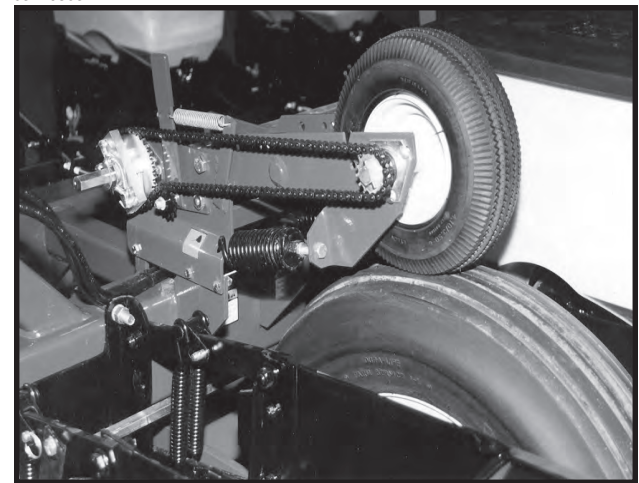
It is suggested that a half rate (2 to 1) drive ratio be used when using push row units.

Replacing the 17 tooth drive sprocket located on the inner side of the top transmission shaft, with the 34 tooth half rate (2 to 1) drive reduction sprocket will reduce the planter transmission speed and planting rates by approximately 50%.

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

CONTACT DRIVE WHEEL SPRING ADJUSTMENT

03279803



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 1 1/2" between the spring plug and the bolt head.

MACHINE OPERATION

SHEAR PROTECTION

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

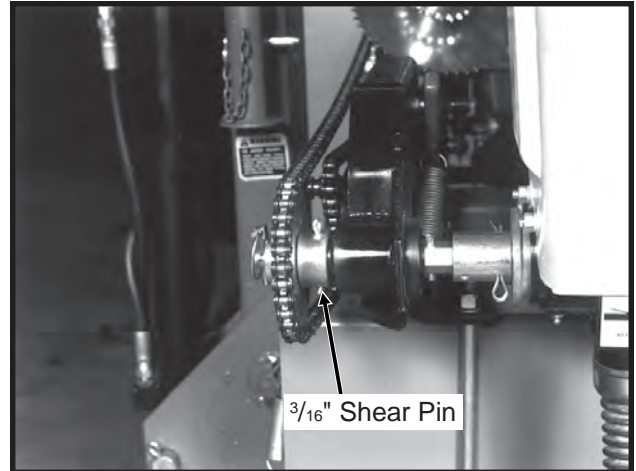
If excessive load should cause a pin to shear, it is important to determine where binding has occurred before replacing the pin. Replace shear pins with same size and type.

Additional shear pins can be found in the storage area located in the R.H. end of the front toolbar.

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

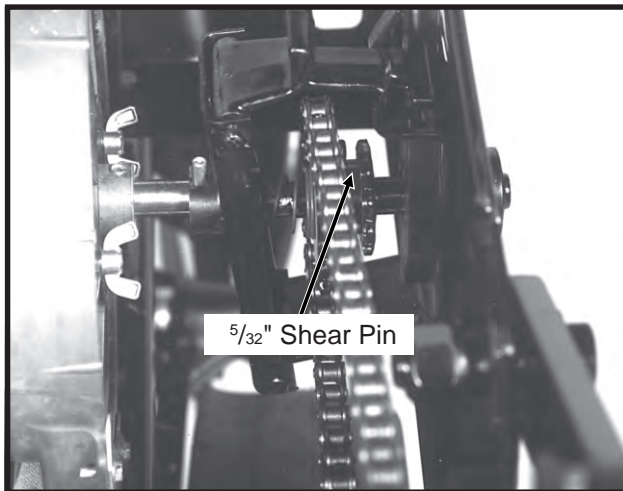
NOTE: Drill shaft/transmission coupler alignment is critical.

69797-9



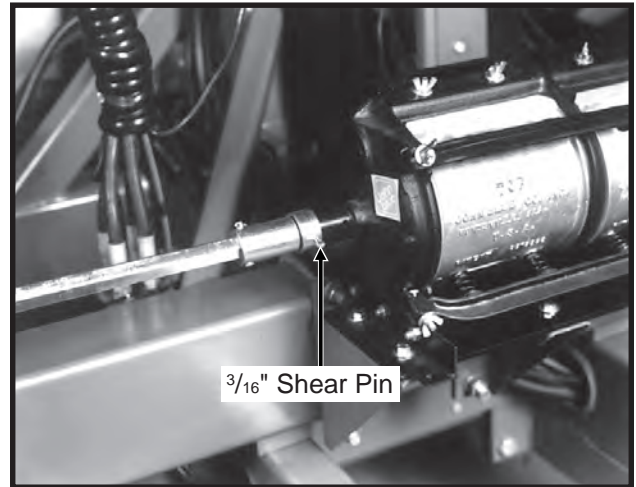
Dry Fertilizer Attachment Transmission

61658-27



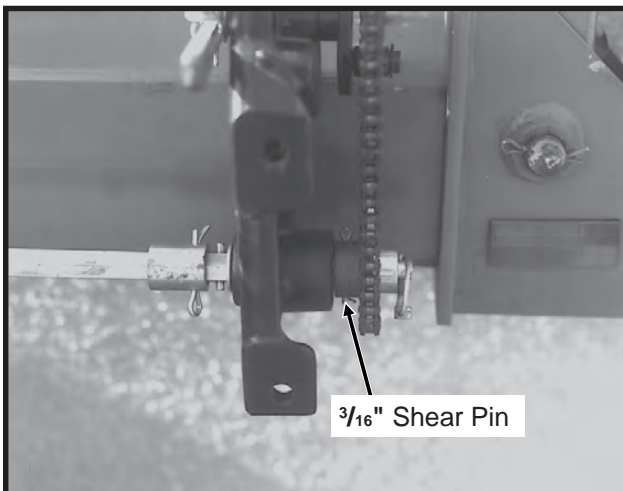
Row Unit Seed Meter Drive

69922-6



Liquid Fertilizer Squeeze Pump Drive

55702-10



Transmission Shaft

MACHINE OPERATION

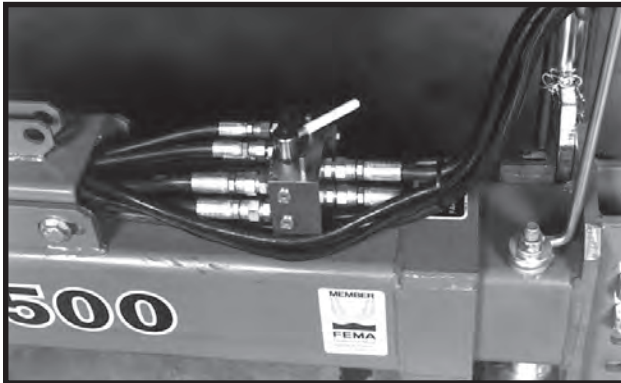
HYDRAULIC OPERATION

All Model 2500 planters are equipped for operation from two dual remote hydraulic outlets (SCV).

One set of outlets is used to raise and lower the planter and one set is used to operate the markers and fold functions. A hand operated selector valve on the hitch allows selection of marker or fold functions.

NOTE: Release hydraulic pressure from the system before moving the selector handle.

69797-67

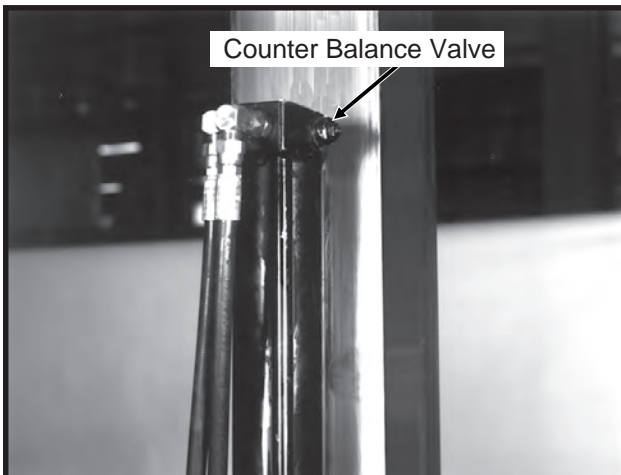


PLANTER LIFT SYSTEM OPERATION

The planter lift system consists of one lift cylinder located at the center of the machine. Mounts for this cylinder are located ahead and behind the center post. For planters with rear mounted row units only, the cylinder may be installed in the rear position. For planters with front mounted options (push units, fertilizer, etc.), the cylinder must be installed in the front position.

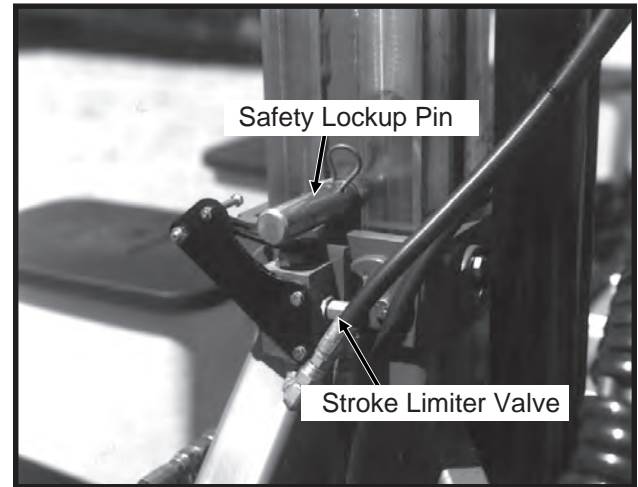
NOTE: The planter lift cylinder is equipped with a counter balance valve. Hydraulic pressure is required to lower the planter.

69797-74a



Raised Field Position

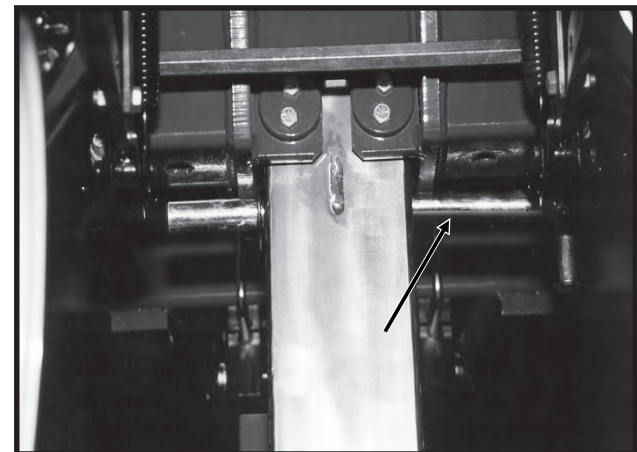
76445-4



There are two raised positions on the planter. The first position is with the safety lockup pin installed above the frame assembly to make contact with the stroke limiter valve. This will allow the row units to raise approximately 14 inches off the ground and the toolbar approximately 40 inches. This position is used in making turns or passing over waterways during field operation.

Raised Transport Position

03279813



The second raised position is the raised transport position. In this position the planter is allowed to raise high enough to permit the row units to clear the transport wheels as the planter is rotated. To raise the planter to the raised transport position: (1) Remove the safety lockup pin. (2) Raise the planter until the lift cylinder is fully extended. (3) Reinstall the safety lockup pin in the same hole which is now below the frame assembly. (4) Lower planter onto safety lockup pin.



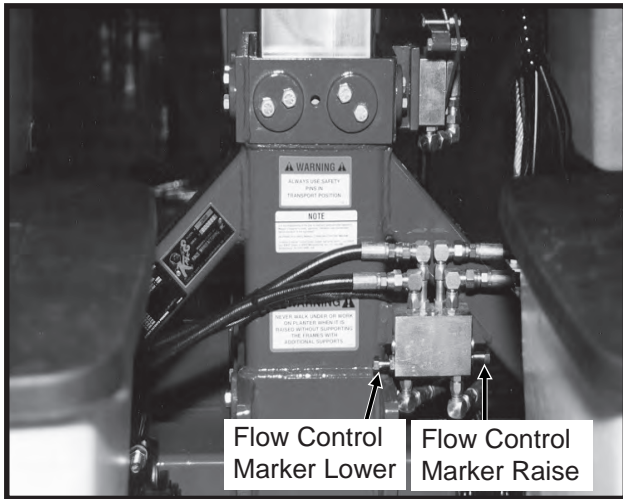
DANGER: Never work under the planter while in raised position without installing safety lockups.

MACHINE OPERATION

MARKER SPEED ADJUSTMENT

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

03279810



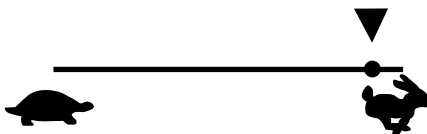
⚠ DANGER: The flow controls should be properly adjusted before the marker assembly is first put into use. Excessive travel speed of the markers can be dangerous and/or damage the marker assembly.

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

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

On tractors with a closed center hydraulic system, the tractor's hydraulic flow control should be adjusted to the full flow position. If oil is restricted, the sequencing valve may not shift properly.

(PLTR78)



MARKER ADJUSTMENT

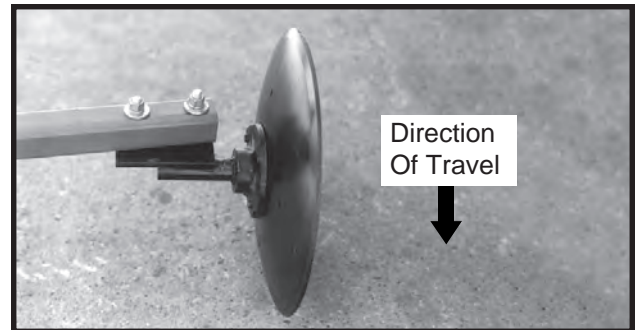
To determine the correct length at which to set the marker assemblies, multiply the number of rows by the average row spacing in inches. This provides the total planting width. Adjust the marker extension so the distance from the marker blade to the center line of the planter is equal to the total planting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

| | | |
|---------|-----------|-----------------------|
| Number | Row | Dimension Between |
| Of Rows | x Spacing | = Planter Center Line |
| | (Inches) | And Marker Blade. |

8 Rows x 30" Spacing = 240" Marker Dimension

NOTE: To allow correct marker adjustment, 6 row 30" machines setup with 15" row spacing require the use of shorter marker extensions which are supplied in the Interplant® Package.

72359-61



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" hardware and move the bracket as required. Tighten bolts to the specified torque.

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

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

A notched marker blade is available from KINZE® Repair Parts for use in severe no till conditions.

MACHINE OPERATION

MARKER SAFETY LOCKUP

Install marker safety lockups over marker cylinder rods when transporting the planter or working around the planter. When lockups are not in use, store in the storage position provided as shown below.

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

79421-29



Lockup Stored For Marker Operation

79421-8



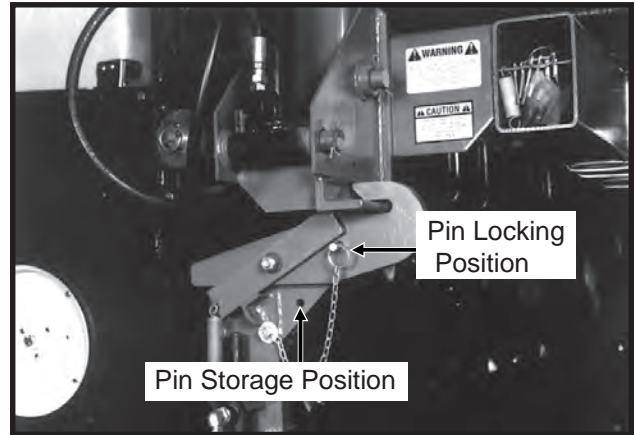
Marker Locked Up For Transport Or Working Around The Machine

TRANSPORT LATCH LOCKING PIN

When the planter is rotated to the transport position, the transport latch located on the hitch of the planter locks in place under the marker mount.

Prior to transporting the planter, install the transport latch locking pin to lock the latch.

79421-26



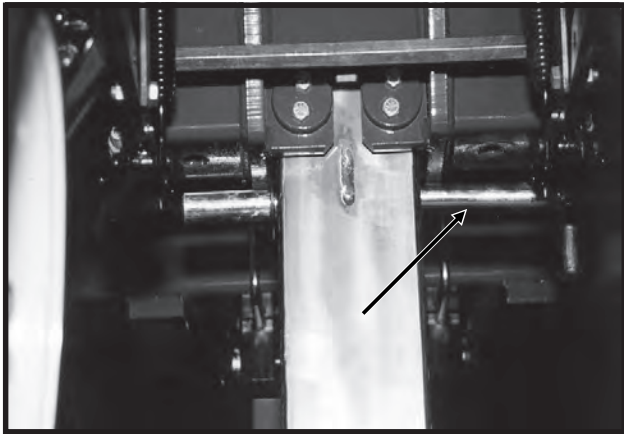
Pin In Locking Position To Secure Planter During Transport

MACHINE OPERATION

SAFETY LOCKUP PIN

The safety lockup pin located on the center frame assembly is an added safety device. Never allow anyone to work around or under the planter without first installing the safety lockup pin in place. When transporting the planter use the safety lockup pin for added safety.

03279813



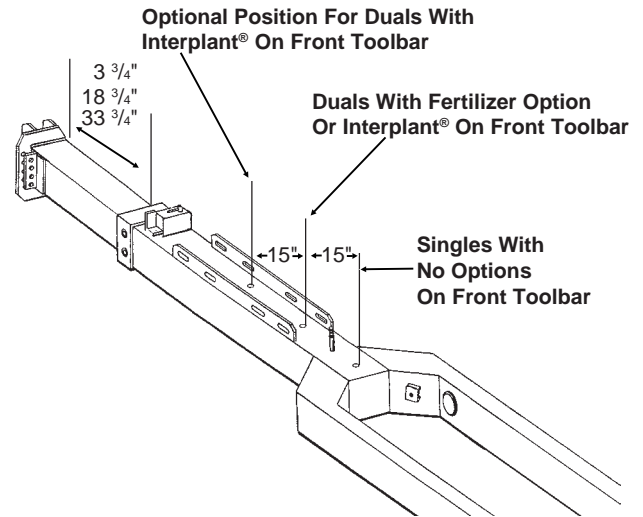
NOTE: The center post is clad with stainless steel. To prolong service life keep stainless steel surface clean and free of any lubrication.

CENTER POST AND POLY WEAR PADS REQUIRE NO LUBRICATION. ANY OIL OR GREASE WILL ATTRACT DIRT AND ACCELERATE WEAR ON THE CENTER POST AND ON THE POLY WEAR PADS.

HITCH LENGTH SETTING

The hitch length can be adjusted in 15" increments to accommodate the tractor tire options being used and attachments installed on the planter.

(TWL49d)



The hitch consists of a rear section of 7" square tube and a front section of 6" square tube. To adjust the length, lower the machine to the field position and block the transport wheels. Support the 7" square tube with a minimum 5000 pound rated jack to take the weight off the 6" square tube. Remove the 1 1/4" x 9" hex head cap screw, loosen the two 5/8" hex head cap screws on the front end of the 7" square section and reposition the 6" square section to the desired length.

CAUTION: DO NOT set the hitch so short that turning ability is limited when the machine is in road transport position.

Reinstall and tighten hardware to specified torque values.

MACHINE OPERATION

ELECTRONIC SEED MONITOR SYSTEM

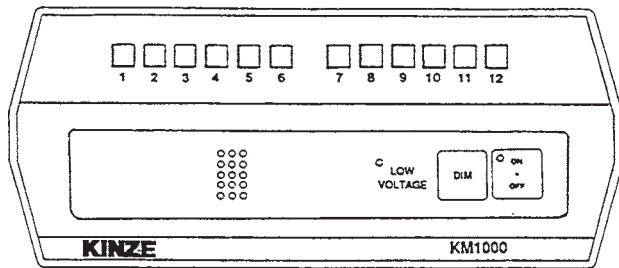
The electronic seed monitor system consists of a console, which is mounted on the tractor; seed tubes with sensors, one of which is installed in each planter row unit; and a planter harness (harness, Y-connector and/or extension cable where applicable), which connects the individual seed tube sensors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

The monitor system is powered by the tractor battery (requires 12 volts DC). The console receives information from each of the sensors and translates this information for the operator, to let him know whether or not all rows are planting.

Located on the bottom of the monitor console is the sound alarm which is equipped with an adjustable sound baffle.

KM1000 MONITOR

(PLTR1)



STEP 1 Turn the console ON by pressing the ON/OFF switch.

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

STEP 2 Begin planting and observe the row indicator lamps.

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

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

STEP 3 Lift the planter at the end of the row. When the seed flow stops in all planter units, the alarm will sound and all row indicator lamps will stop flashing. After approximately 2-4 seconds the alarm will stop sounding.

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

If you are only using a portion of the number of rows on your planter, the alarm can be silenced by disconnecting the seed sensors of the unused rows (Disconnect Interplant[®] rows at "Y" harness.) and turning the monitor OFF then back ON. The monitor will then ignore these unused rows and monitor the other rows normally.

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

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

MACHINE OPERATION

10/96

KM1000 Bezel Decal Selection Chart

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

Row lamp indicates planter row in use.

Row lamp not used.

* With Y-connector.

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

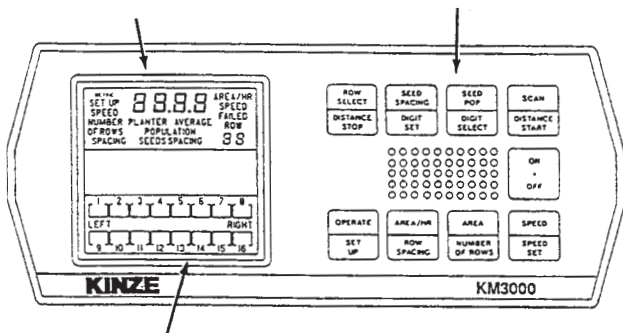
MACHINE OPERATION

KM3000 MONITOR

D-0841-0001(PLTR2)

Upper Display

Pressure Sensitive Switches



Lower Display

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

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

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

STEP 1 Turn console ON by pressing the ON-OFF switch. Note that the upper display shows random segments for a short time then sequences through all entered SET UP constants (SPEED, NUMBER OF ROWS and ROW SPACING). If the constants are not valid the alarm will sound for approximately four seconds and the monitor will enter the SET UP mode. See "Entering Constants". If all constants are valid (as previously entered) the alarm will sound momentarily and the monitor will enter the OPERATE mode.

NOTE: Monitor will not go from "SET UP" to "OPERATE" unless the planter harness is connected.

STEP 2 Select the desired OPERATE function to be displayed by pressing the labeled switch.

In the **ROW SELECT** mode a specific row can be selected and continuously monitored.

SEED SPACING displays the seed spacing of each planter row in inches or centimeters.

SEED POP displays the seed population of each planter row in thousands of seeds per acre or hectare.

In the **SCAN** mode the display will sequence through all planter rows. The display message will be SEED POP or SEED SPACING as previously selected. With SEED POP selected, after the population for the highest planter row number is displayed, the average population for the total planter is shown. With SEED SPACING selected, after the seed spacing for the highest planter row number is displayed, the average seed spacing for the total planter is shown.

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

AREA displays the actual area covered in acres or hectares since the last reset. To reset area to .0, press and hold the AREA switch for approximately 5 seconds.

SPEED displays current vehicle ground speed in MPH or KmPH.

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

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

MACHINE OPERATION

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

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

The monitor can be used to count seeds in a selected row by performing the following:

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

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

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

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

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

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

ENTERING CONSTANTS (KM3000 Only)

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

1. **ROW SPACING** - *The distance between the rows on your planter.*

Press the "row spacing" switch. The upper display will show "set up", "row spacing" and "000.0".

Press the "digit select" switch (a short alarm burst will be heard each time the switch activates) until the second "0" to the left of the decimal point is flashing.

Press the "digit set" switch until a "3" is shown in this location: 030.0.

NOTE: Holding the "digit set" switch will cause the digit to increment from 0 through 9.

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

MACHINE OPERATION

EXAMPLE: 8 row 30" planter with 13 row 15" skip row Interplant™

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

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

Step 3. $210" \div 12 = 17.5"$ average row spacing

Step 4. Program 17.5 (round to closest tenth)

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

Press the "number of rows" switch. The upper display will show "set up", "number of rows" and "00". Press the "digit select" switch until the right hand "0" is flashing.

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

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

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

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

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

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

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

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

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

SPEED SET NUMBER _____

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

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

RADAR VIBRATION TEST (KM3000 With Radar Sensor Only)

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

INTERPLANT® ROWS

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

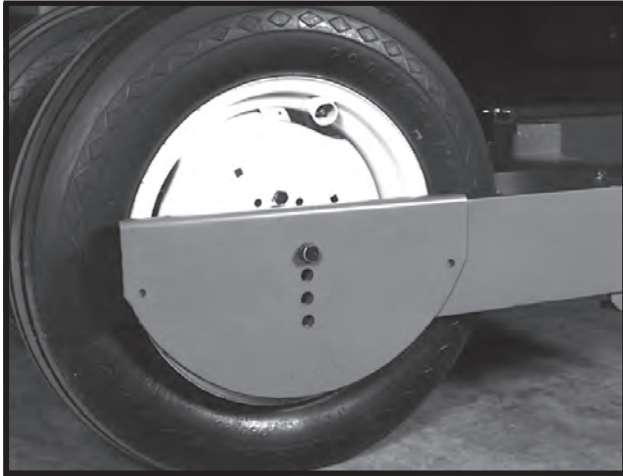
1. Press "SET UP" switch.
2. See ROW SPACING and NUMBER OF ROWS in "Entering Constants".
3. After entering constants press "OPERATE" switch to return to operation mode.

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

MACHINE OPERATION

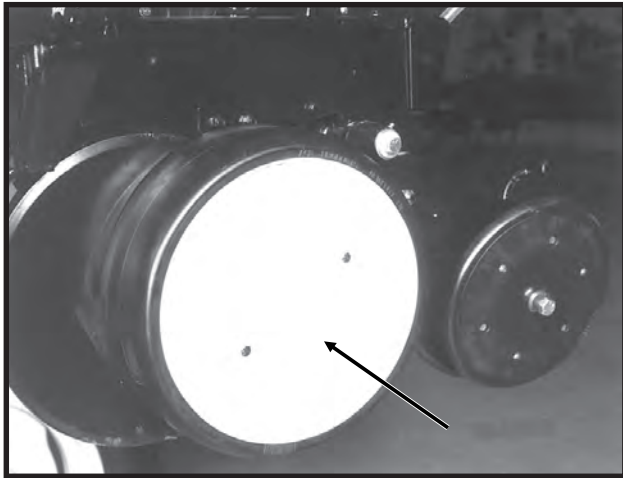
ROCK GUARDS

69797-65a



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

78896-6

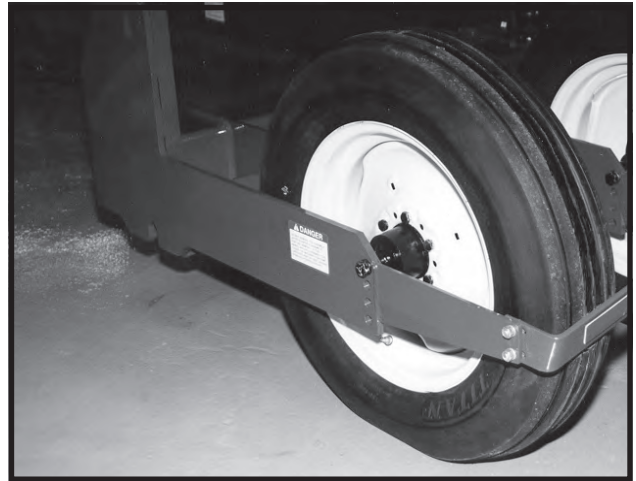


Row unit gauge wheel covers may be used in conjunction with transport wheel rock guards on row unit gauge wheels next to transport wheels.

RIDGE PLANTING

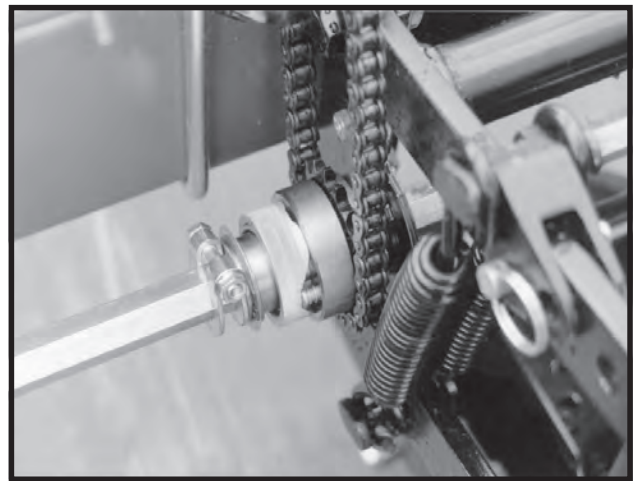
When ridge planting, the transport wheels can be lowered to the lower mounting holes in the wheel arms to increase the planter bar height. Hitch height should be raised accordingly to ensure level operation.

03279802a



PUSH ROW UNIT CLUTCH SPROCKET

06309716



The push row unit clutch sprocket is designed to allow the push row unit drill shaft to be disengaged when only the pull row units are being used.

To engage or disengage the push row unit drill shaft using the clutch sprocket, rotate the knurled collar on the clutch sprocket $\frac{1}{4}$ turn. Then using a $\frac{7}{8}$ " wrench on the drill shaft, rock the drill shaft slightly to take pressure off of the spring loaded pins in the clutch to allow the clutch to engage or disengage.

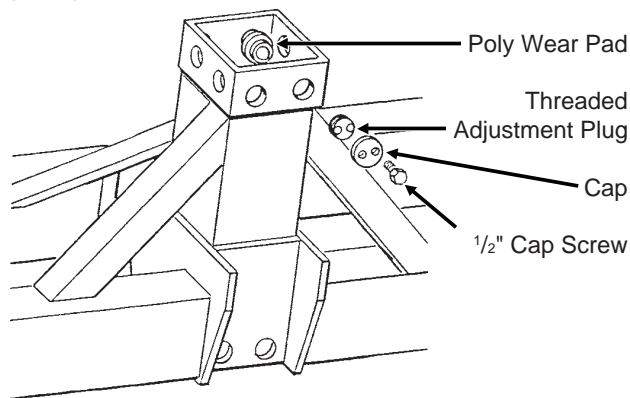


DANGER: Always install all safety lockups or lower planter to the ground before working under or around the machine.

MACHINE OPERATION

ADJUSTABLE WEAR PADS

(PLTR80)



The center section of the planter consists of a steel tubular frame equipped with 16 adjustable wear pad assemblies which travel up and down over a stainless steel clad center post. Each adjustable wear pad assembly consists of a poly wear pad, a threaded adjustment plug and a cap. The assembly is held in place by the threaded adjustment plug and locked in place by the cap and two 1/2" hex head cap screws.

Check pad adjustment and wear annually. See "Wear Pad Replacement/Adjustment" for additional information.

TRANSPORTING THE PLANTER



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



DANGER: Install all safety lockups and safety lock pins.

PLANTING SPEED

Planters are designed to operate within a speed range of 2 to 8 MPH (See "Rate Charts"). Variations in ground speed will produce variations in rates. Finger pickup seed meter populations will tend to be disproportionately higher at high ground speeds.

NOTE: Due to a multitude of variables, seed spacing can be adversely affected at speeds above 5.5 MPH.

MACHINE OPERATION

FIELD TEST

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

- Check the planter for fore to aft and lateral level operation. See “Leveling The Planter”.
- Check all row units to be certain they are running level. When planting, the row unit parallel arms should be approximately parallel to the ground.
- Check row markers for proper operation and adjustment. See “Marker Adjustment” and “Marker Speed Adjustment”.
- Check for proper application rates and placement of granular chemicals on all rows. See “Checking Granular Chemical Application Rate”.
- Check for desired depth placement and seed population on all rows. See “Checking Seed Population”.
- Check for proper application rates of fertilizer on all rows. See proper “Fertilizer Application Rate Chart”.

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

- Hoses and fittings
- Bolts and nuts
- Cotter pins and spring pins
- Drive chain alignment

METRIC CONVERSION TABLE

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

MACHINE OPERATION

DOUBLE DISC FERTILIZER OPENER

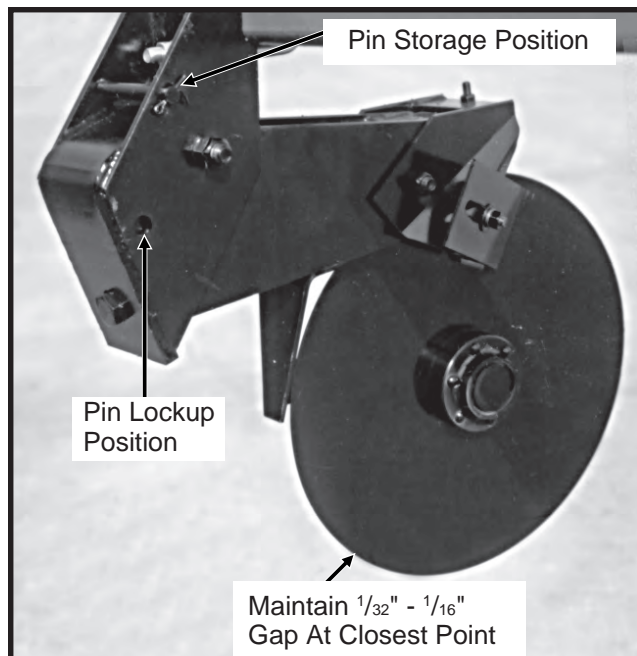
The double disc fertilizer openers should be positioned during assembly to **place the fertilizer no closer than 2" to either side of the row**. If planter frame is level and at proper 20" planting height, fertilizer depth will be approximately 4". Soil conditions can affect depth slightly.

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

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

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

60389-23



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

The opener assembly is designed to be locked in a raised position when the fertilizer attachment is not in use or during storage. To lock the opener up, 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.

MACHINE OPERATION

NOTCHED SINGLE DISC FERTILIZER OPENER

The notched single disc fertilizer opener is designed for use in minimum and no till soil conditions. Placement of fertilizer with the 16 ³/₄" notched single disc fertilizer opener is recommended at 2 ¹/₂" - 3" from the row. **Never locate the opener to place fertilizer closer than 2".**

Adjust blade depth on each row using the cap screws and jam nuts located on the opener pivot shaft. The blade can be adjusted to allow a maximum 4" blade depth. Be sure the spring pin holes in the pivot post remain parallel with the opener mounting plate. Check fertilizer hose clearance (if applicable) after adjusting opener depth by swiveling the opener left and right. Torque cap screws and jam nuts to 57 ft. lbs.

The opener spring is factory preset at 350 lbs. and requires no additional adjustment.



WARNING: Spring under pressure. DO NOT disassemble.

Adjust knife/scrapper leading edge contact on each row so blade will turn by hand with slight resistance, but will not coast or freewheel. In dry loose soil, knife/scrapper adjustment is critical. If adjustment is not maintained, soil or residue may wedge causing the blade to push. If the knife/scrapper is adjusted too tight, the blade will not turn causing the blade to push soil and residue. Knife/scrapper leading edge adjustment is made using the two lower ³/₈" mounting carriage bolts and pivot pad on the knife/scrapper. Because of blade runout, rotate blade one full revolution after adjustment. Readjust knife/scrapper-to-blade contact at tight spot as required. **Never strike the knife/scrapper with a heavy object or damage may occur.**

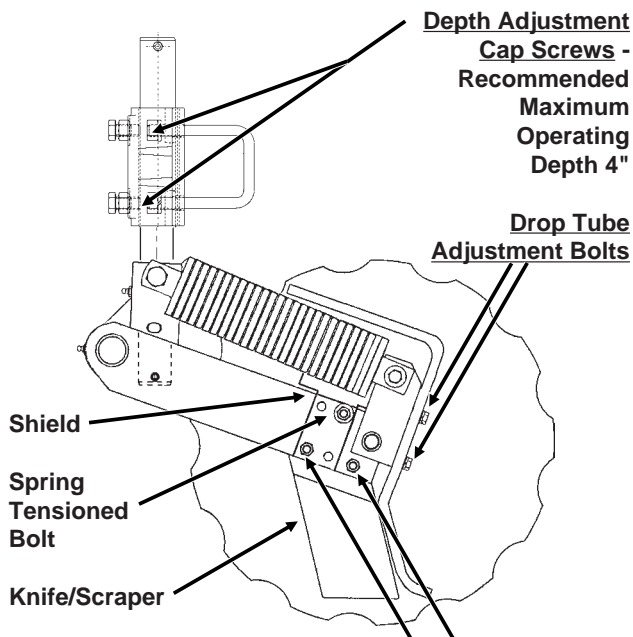
Adjust drop tube on each row using the slotted mounting holes in the drop tube. Adjust drop tube so it is protected by the knife/scrapper from soil contact and wear. The liquid drop tube should be adjusted as far from the opener blade as possible while keeping it behind the knife/scrapper. This adjustment prevents the liquid fertilizer from contacting the opener blade.

NOTCHED SINGLE DISC FERTILIZER OPENER MOUNTED RESIDUE WHEEL

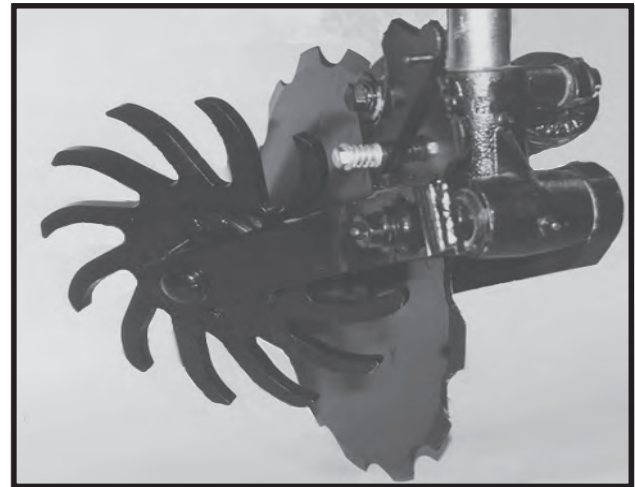
12229798

(FRTZ155)

← DIRECTION OF TRAVEL



Knife/Scrapper Leading Edge Adjustment Bolts (If not equipped with a shield and spring tensioned bolt, the third knife/scrapper attachment bolt is also an adjustment bolt.)



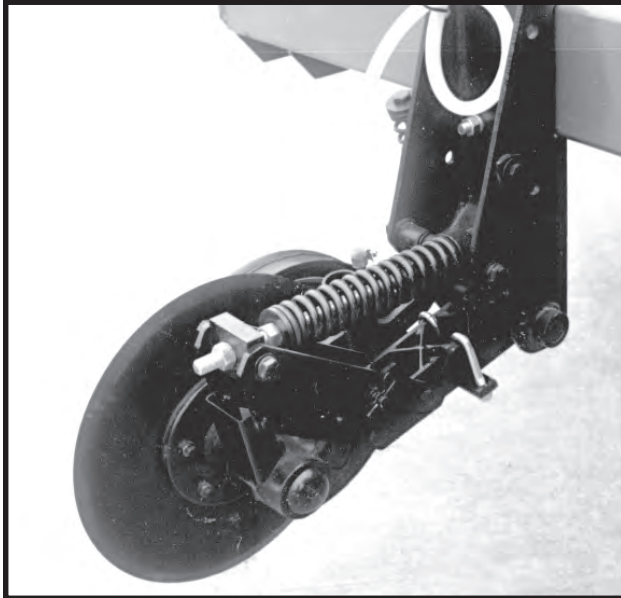
The notched single disc fertilizer opener mounted residue wheel is designed for applications where row unit mounted residue wheel attachments cannot be installed. The residue wheel is attached to the notched single disc fertilizer opener using ⁵/₈" x 3 ¹/₂" and ¹/₂" x 1 ³/₄" hardware.

Depth adjustment is made by lifting the residue wheel and moving the adjustment lever down to increase depth or up to decrease depth in 1" increments. Adjust all rows the same.

MACHINE OPERATION

HD SINGLE DISC FERTILIZER OPENER

77899-7



Placement of fertilizer with the HD single disc fertilizer opener is recommended at 3 1/2" - 4" from the row. **Never locate the opener to place fertilizer closer than 3".**

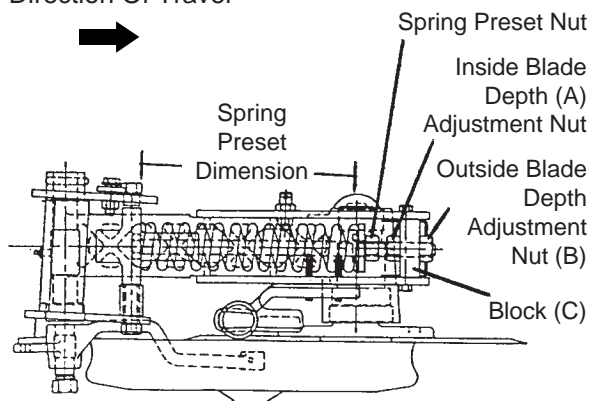
If planter frame is level and at approximately 20" operating height, maximum blade depth for placement of fertilizer is approximately 5". Soil conditions can affect depth slightly.

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

L0114(PLTR3)

(Overhead View)

Direction Of Travel



R.H. Configuration Shown

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

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

* Suggested initial setting.

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

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



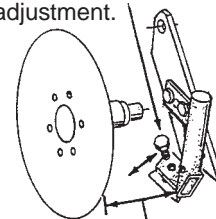
DANGER: Always install all lockup brackets before working under the machine.

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

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

Loosen scraper adjustment bolt. Slotted hole in scraper allows up or down adjustment.

FOC016(PLTR4)

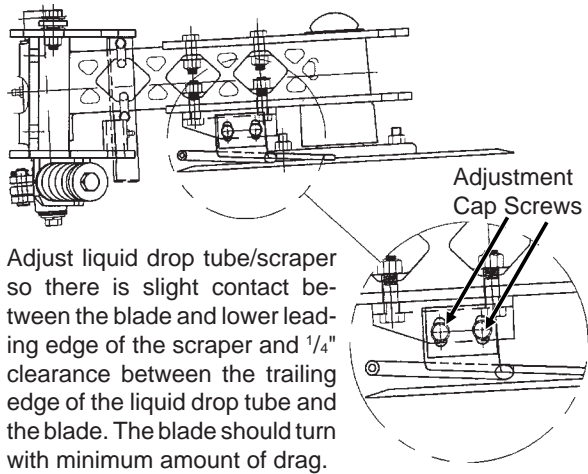


Adjust scraper to maintain 1/8" gap between drop tube and opener blade. Distance is exaggerated in above illustration.

MACHINE OPERATION

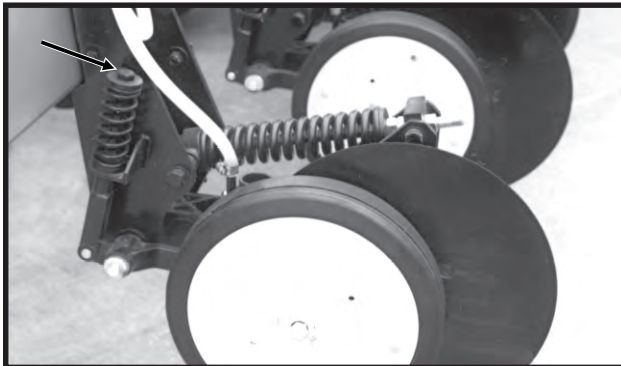
Maintain liquid fertilizer drop tube/scrapper adjustment as shown below.

(INS16a)



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

77899-4



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

The HD single disc fertilizer opener is designed to be locked in a raised position when the fertilizer attachment is not in use or during storage.

To lock the HD single disc fertilizer opener in the raised position, proceed as follows:

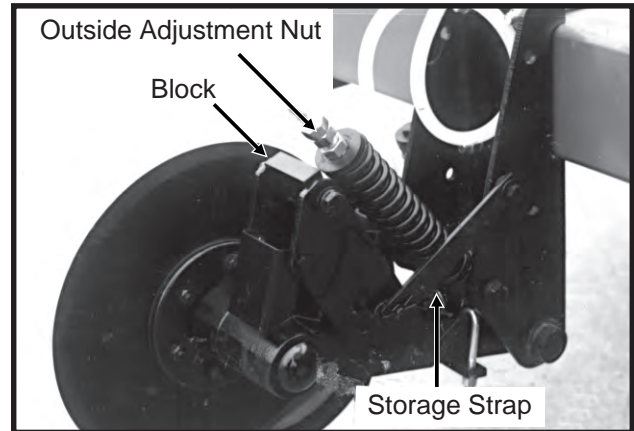
Step 1. With the planter in the planting position, remove outside blade depth adjustment nut. ("B" in illustration on previous page.)

Step 2. Raise planter until adjustment bolt clears adjustment block.

Step 3. Raise spring to clear blade assembly and at the same time raise blade assembly until storage strap can be positioned onto lockup pin and install hair pin clip.

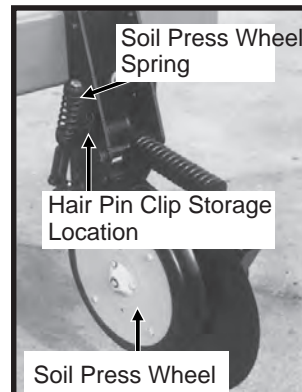
Step 4. Re-install depth adjustment nut and tighten.

77899-12



Step 5. (Where Applicable - If the HD single disc fertilizer opener is equipped with a lockup bar the soil press wheel is raised and locked automatically when the blade assembly is raised and this step is not necessary.) Raise soil press wheel until lockup hole in soil press wheel spring adjustment bolt is visible. Remove hair pin clip from storage position and install in lockup hole.

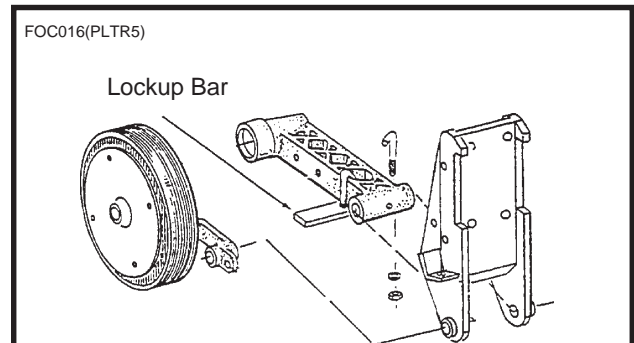
60389-63



60355-32



Manual Soil Press Wheel Lockup

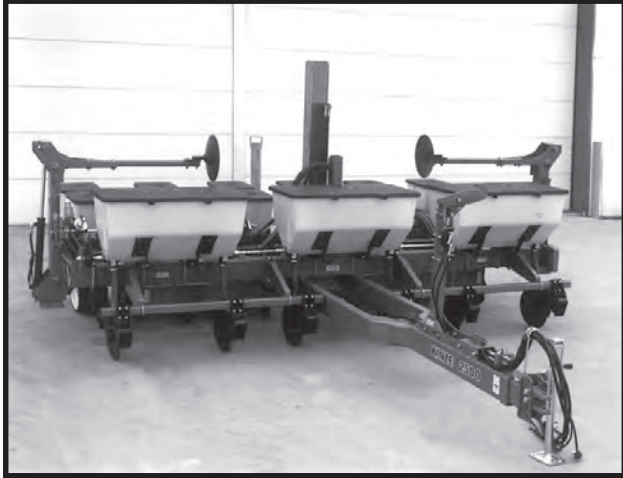


Automatic Soil Press Wheel Lockup

MACHINE OPERATION

DRY FERTILIZER ATTACHMENT

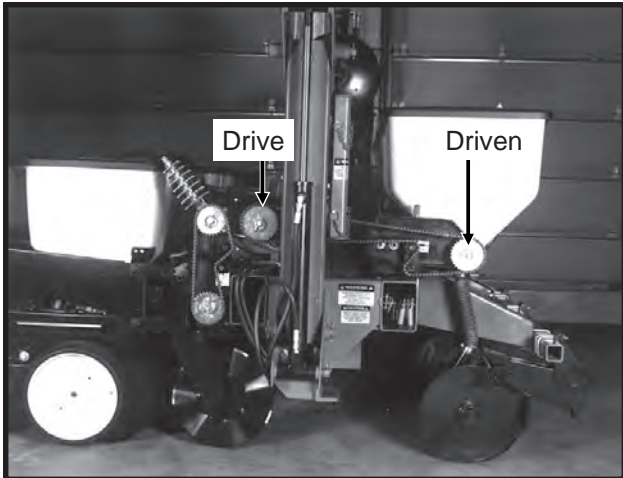
69797-89a



Shown With Optional Double Disc Openers

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

69797-4



(PLTR7)



Shown with augers positioned for low rate delivery

(PLTR6)



Shown with augers positioned for high rate delivery

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

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

A fertilizer transmission is located on the R.H. side of the planter directly ahead of the row unit transmission on all sizes. 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.



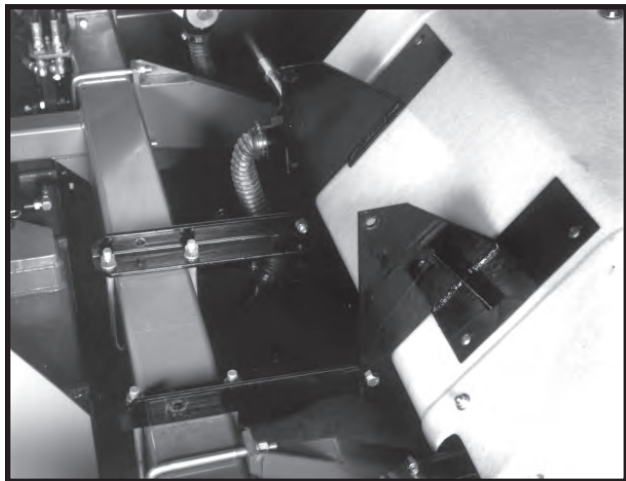
WARNING: Agricultural chemicals can be dangerous if not selected and handled with care. Always read and follow directions supplied by the chemical manufacturer.

MACHINE OPERATION

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 and/or adjacent hopper. Remove the two rear $\frac{1}{2}$ " x $1\frac{1}{4}$ " cap screws from between hopper mounts and mounting angles. 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.

69797-85



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

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

59542-38



Be sure the auger assembly is installed so the flighting on the augers move material to the outer openings in the hopper when the augers are rotated in the direction they will turn when the planter is in operation. **NOTE: THE FERTILIZER TRANSMISSION ROTATES IN THE OPPOSITE DIRECTION OF PLANTER TRAVEL.**

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

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

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

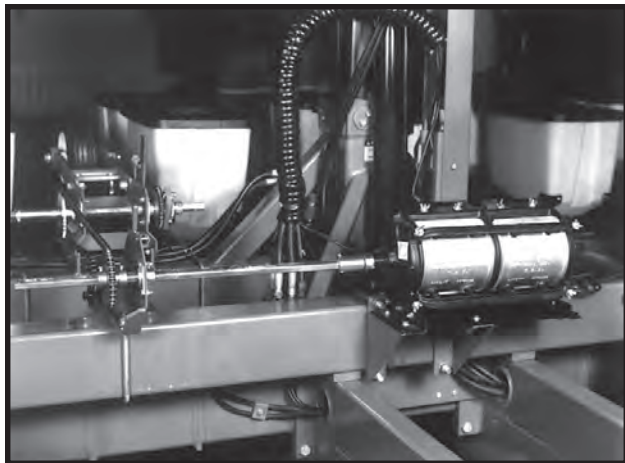
NOTE: Be sure the auger assembly is installed so the flighting on the augers move material to the outer openings in the hopper when the augers are rotated in the direction they will turn when the planter is in operation.

MACHINE OPERATION

LIQUID FERTILIZER ATTACHMENT

OPTIONAL SQUEEZE PUMP

69922-26



On machines equipped with the squeeze pump option, the rate of liquid fertilizer application is determined by the combination of sprockets on the squeeze pump drive and driven 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.

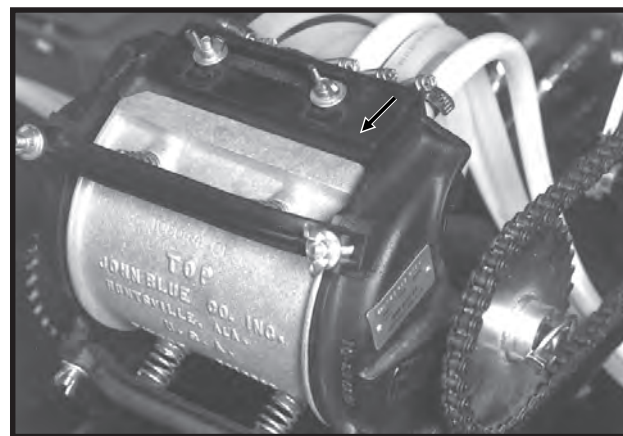
IMPORTANT: Certain analysis of fertilizer, if placed too close to the seed, may cause germination or seedling damage especially if used in amounts in excess of fertilizer manufacturers recommendations. Check with your fertilizer dealer or manufacturer for the correct amount and placement.



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

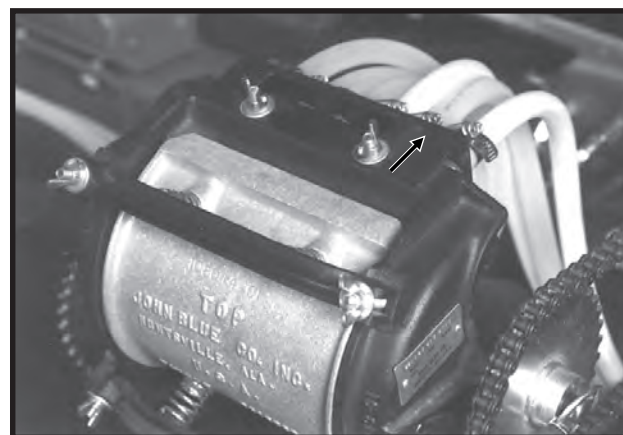
Shut-off valves provided at various locations should be closed to shut off flow when the planter sits overnight or for extended periods of time. It is also important to close the tank valves whenever service on the pump or hoses is being performed. To prolong the life of the hoses in the squeeze pump,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

81689-16



Discharge Manifold Rearward

81689-19



Discharge Manifold Forward

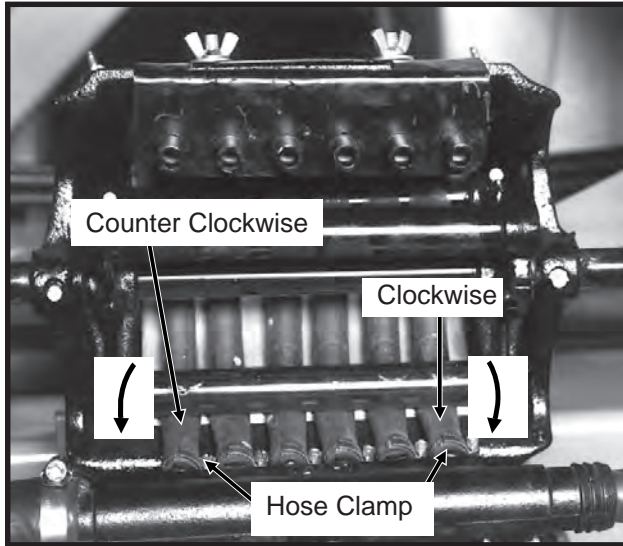
The discharge manifold must be in the forward position when the pump is in operation. To reposition the manifold, loosen the wing nuts and slide the manifold forward and sideways or rearward as required and retighten nuts.

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

MACHINE OPERATION

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.

61010-5



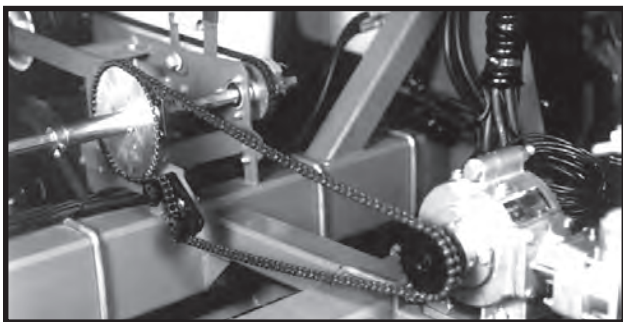
For the right hand hose (facing the pump from front of planter) twist the hose 1/4 turn in the clockwise direction.

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

Retighten hose clamp.

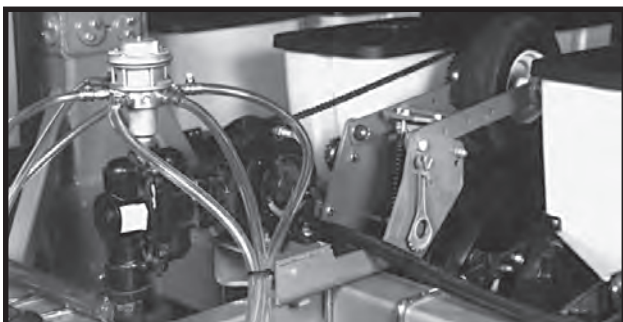
OPTIONAL PISTON PUMP

69922-32



Style A Piston Pump Drive Shown

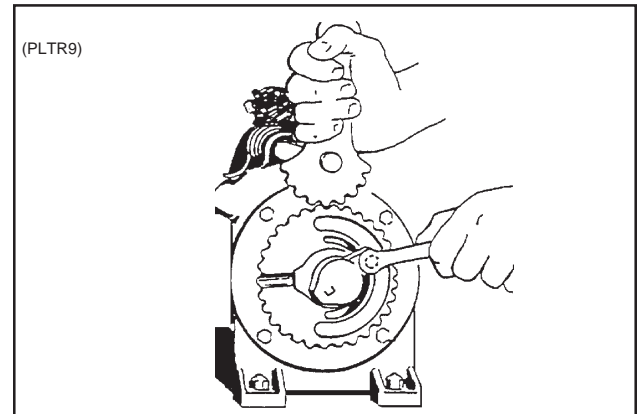
81999-8



Style B Piston Pump Drive Shown

If the machine is equipped with the piston pump option, the rate of liquid fertilizer application is determined by the piston pump settings. The delivery rate charts found at the end of this section provide approximate application rate only. Actual delivery will vary with temperature and the particular fertilizer being used.

To adjust delivery rate, loosen the 3/8" lock nut that secures the arm with the pointer and rotate the scale flange until the pointer is over the desired scale setting. The adjustment wrench will facilitate rotation of the scale flange. Tighten the 3/8" lock nut being careful not to over tighten.



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

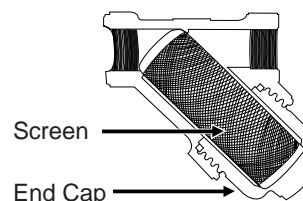
NOTE: Periodically check flow to all rows. If one or more lines are plugged, set rate will be delivered to remaining rows.

CLEANING

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

The strainer, located between the piston pump and ball valve (On machines equipped with the piston pump.), should be taken apart and cleaned daily. Remove the end cap to clean the screen.

(INS220)

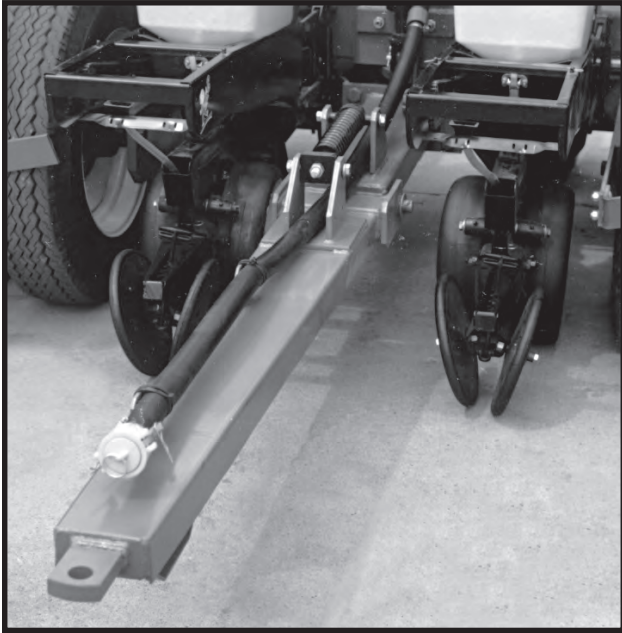


See "Piston Pump Storage" (If Applicable) in the Maintenance Section of this manual.

MACHINE OPERATION

REAR TRAILER HITCH

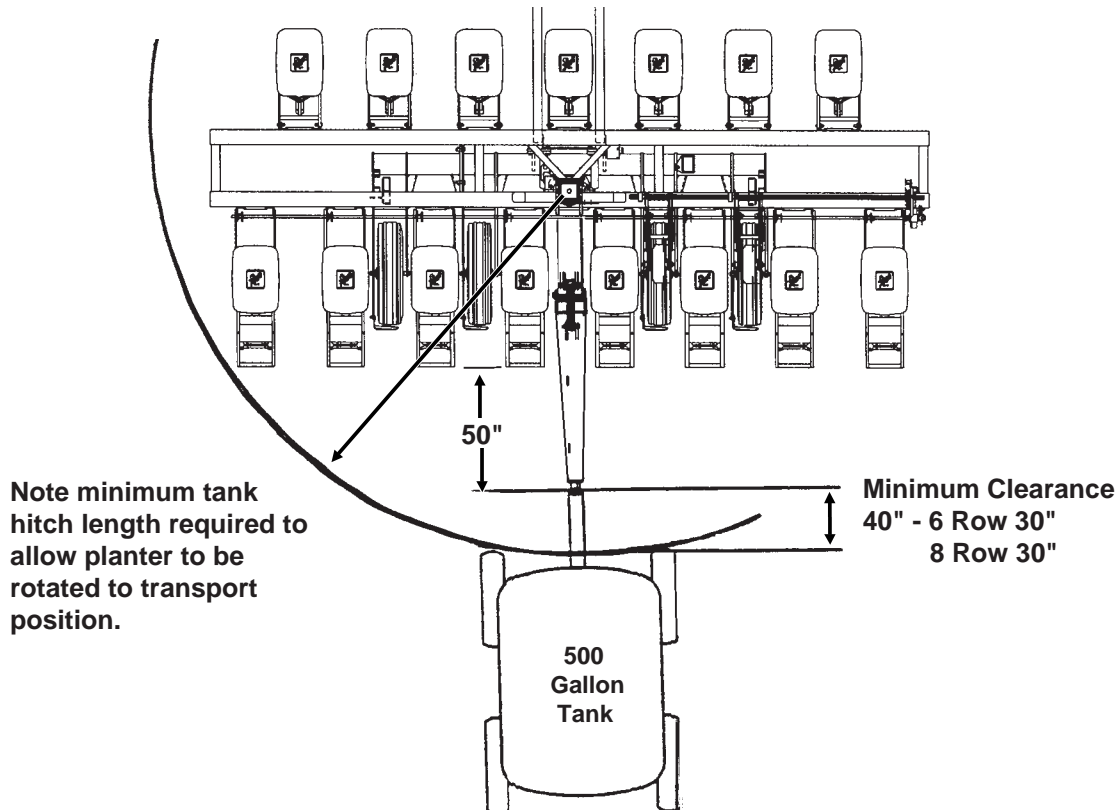
76782-70



The Rear Trailer Hitch is used to tow a 3 or 4 wheel wagon behind the planter.

NOTE: The rear trailer hitch is designed for use with piston pump only. Maximum allowable hitch weight is 200 lbs. Gross towing weight should not exceed 6000 lbs. or the equivalent of a loaded 500 gallon tank and running gear.

(PLTR134)

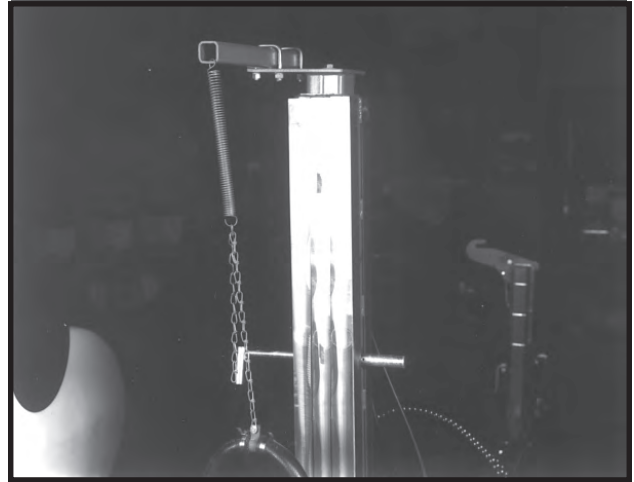


Note minimum tank hitch length required to allow planter to be rotated to transport position.

Minimum Clearance
40" - 6 Row
30" - 8 Row
30"

A spring, chain and mounting bracket are used to support the 1 1/4" feed hose from the hitch to the piston pump. This extra length or loop is required to allow the planter to be moved into transport position without stretching the hose.

78495-5a



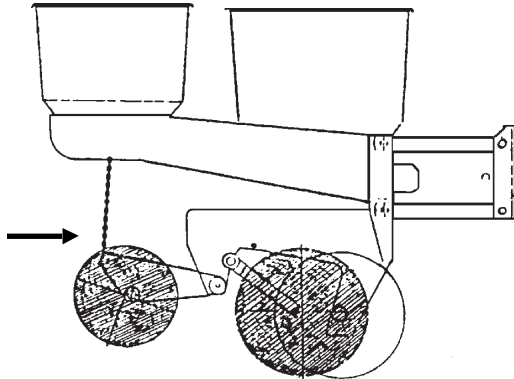
NOTE: Periodically check feed hose for kinks to prevent restricted delivery rate.

MACHINE OPERATION

CHECKING SEED POPULATION

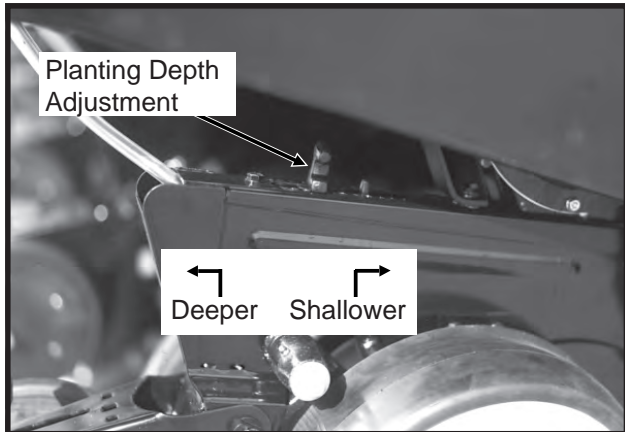
1. Tie up one or more sets of closing wheels by running a light chain or rubber tarp strap between the hopper support panel and closing wheels. It may be necessary to decrease closing wheel arm spring tension.

L0069(PLTR10)



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.

72359-108



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

| LENGTH OF ROW IN FEET AND INCHES | | |
|----------------------------------|-----------|--------|
| Fraction Of Acre | Row Width | |
| | 15" | 30" |
| $\frac{1}{1000}$ | 34' 10" | 17' 5" |

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

4. Count seeds in measured distance.

5. Multiply the number of seeds placed in the $\frac{1}{1000}$ of an acre by 1000. This will give you total population.

EXAMPLE: With 30" row spacing 17' 5" equals $\frac{1}{1000}$ acre.

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

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

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

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

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

MACHINE OPERATION

Determining Pounds Per Acre (Brush-Type Seed Meter)

To determine pounds per acre:

| | | | | |
|-------------------------------|---|---|---|-----------------------|
| Seeds Per Acre On Chart | ÷ | Seeds Per Pound From Seed Tag On Bag | = | Pounds Per Acre |
|-------------------------------|---|---|---|-----------------------|

To determine bushels per acre:

| | | | | |
|--------------------|---|------------------------|---|---------------------|
| Pounds Per Acre | ÷ | Unit Weight Of Seed | = | Bushels Per Acre |
|--------------------|---|------------------------|---|---------------------|

The unit weight of:

- 1 Bushel Soybeans = 60 Pounds
- 1 Bushel Milo = 56 Pounds
- 1 Bushel Cotton = 32 Pounds

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

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

If seed check shows planting rate is significantly different than seed rate chart shows or if a particular meter is not planting accurately, see "Brush-Type Seed Meter Maintenance" and "Brush-Type Seed Meter Troubleshooting".

CHECKING GRANULAR CHEMICAL APPLICATION RATE

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

A field check is important to determine correct application rates.

72359-105



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

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

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

| LBS. PER ACRE FACTOR FOR GIVEN ROW WIDTH | |
|--|--------|
| Row Width | Factor |
| 30" | 0.83 |

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

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

Metering Gate

Use the metering gate setting for distributing insecticide or herbicide as a starting point. The charts are 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.

MACHINE OPERATION

GENERAL PLANTING RATE INFORMATION

These planting rate charts are applicable to KINZE® Model 2500 Twin-Line® Planters. See "Tire Pressure" for recommended tire pressures.

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

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

Finger Pickup Corn Meter (Corn, Oil Sunflower)

Larger grades will generally plant more accurately at the high end of the ground speed range than smaller grades. Higher than optimum speeds may result in population rate increase or higher incidence of doubles, particularly with small seed. Medium round corn seed is most desirable for planting accuracy at optimum speed. Only No. 3 and No. 4 oil sunflower seed are recommended for planting accuracy at optimum speed.

NOTE: Seed additives, added to the seed in the hopper, may adversely affect performance of the finger pickup seed meter and accelerate wear. See "Finger Pickup Seed Meter" in the Row Unit Operation section.

Brush-Type Seed Meter (Soybean, Milo/Sorghum, Acid-Delinted Cotton)

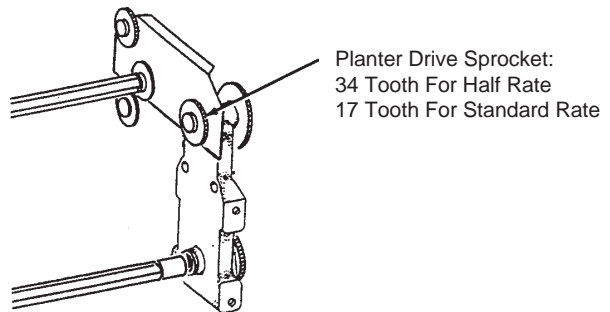
Rate charts are given in seeds per acre as well as seed spacing in inches rounded to the nearest tenth of an inch. Because of the large range in seed size, pounds per acre is not a suggested method of selecting transmission settings. When using smaller size seeds it may appear the pounds per acre is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

NOTE: Due to a multitude of variables, seed spacing can be adversely affected at speeds above 5.5 MPH.

Seed population per acre with 15" rows (See page 6-31) will be double the rate for 30" rows (See page 6-30) at the listed sprocket combination.

NOTE: Use of the Half Rate (2 To 1) Drive Reduction Package will reduce the planter transmission speed. The seeding rate will be approximately 50% of the chart reading when using the Half Rate (2 to 1) Drive Reduction Package. Planting speed can affect actual seeding rate. Make a field check and adjust setting in the transmission as needed to obtain the desired seed drop.

(PLTR81)



EXAMPLE: 30" row machine equipped with 15" Interplant® rows, brush-type seed meters with 60 cell seed discs, 17 tooth drive sprocket and 28 tooth driven sprocket.

$$80,928 \text{ Seeds/Acre (30" Rows)} \times 2 \text{ (15" Interplant® Rows)} = 161,856 \text{ (Seed Spacing 2.6")}$$
$$161,856 \div 2 \text{ (Half Rate Drive Reduction)} = 80,928 \text{ Seeds/Acre (Seed Spacing 5.2")}$$

MACHINE OPERATION

Z202

PLANTING RATES FOR FINGER PICKUP SEED METERS APPROXIMATE SEEDS/ACRE FOR 30" ROW WIDTH

| 30" Rows | Transmission Sprockets | | Recommended Speed Range (MPH) | Average Seed Spacing In Inches |
|----------|------------------------|--------|-------------------------------|--------------------------------|
| | Drive | Driven | | |
| 16,186 | 17 | 28 | 4 to 6 | 12.9 |
| 16,785 | 17 | 27 | 4 to 6 | 12.5 |
| 17,431 | 17 | 26 | 4 to 6 | 12.0 |
| 18,090 | 19 | 28 | 4 to 6 | 11.6 |
| 18,128 | 17 | 25 | 4 to 6 | 11.5 |
| 18,760 | 19 | 27 | 4 to 6 | 11.1 |
| 18,883 | 17 | 24 | 4 to 6 | 11.1 |
| 19,481 | 19 | 26 | 4 to 6 | 10.7 |
| 19,704 | 17 | 23 | 4 to 6 | 10.6 |
| 20,261 | 19 | 25 | 4 to 6 | 10.3 |
| 21,104 | 19 | 24 | 4 to 6 | 9.9 |
| 21,898 | 23 | 28 | 4 to 6 | 9.5 |
| 22,022 | 19 | 23 | 4 to 6 | 9.5 |
| 22,709 | 23 | 27 | 4 to 6 | 9.2 |
| 22,850 | 24 | 28 | 4 to 6 | 9.2 |
| 23,583 | 23 | 26 | 4 to 6 | 8.9 |
| 23,697 | 24 | 27 | 4 to 6 | 8.8 |
| 23,802 | 25 | 28 | 4 to 6 | 8.8 |
| 23,853 | 17 | 19 | 4 to 6 | 8.8 |
| 24,526 | 23 | 25 | 4 to 6 | 8.5 |
| 24,608 | 24 | 26 | 4 to 6 | 8.5 |
| 24,684 | 25 | 27 | 4 to 6 | 8.5 |
| 24,755 | 26 | 28 | 4 to 6 | 8.4 |
| 25,548 | 23 | 24 | 4 to 6 | 8.2 |
| 25,592 | 24 | 25 | 4 to 6 | 8.2 |
| 25,633 | 25 | 26 | 4 to 6 | 8.2 |
| 25,671 | 26 | 27 | 4 to 6 | 8.1 |
| 25,707 | 27 | 28 | 4 to 6 | 8.1 |
| 26,659 | 23 | 23 | 4 to 6 | 7.8 |
| 27,646 | 28 | 27 | 4 to 6 | 7.6 |
| 27,684 | 27 | 26 | 4 to 6 | 7.6 |
| 27,770 | 25 | 24 | 4 to 6 | 7.5 |
| 27,818 | 24 | 23 | 4 to 6 | 7.5 |
| 28,709 | 28 | 26 | 4 to 6 | 7.3 |
| 28,791 | 27 | 25 | 4 to 6 | 7.3 |
| 28,977 | 25 | 23 | 4 to 6 | 7.2 |
| 29,795 | 19 | 17 | 4 to 6 | 7.0 |
| 29,858 | 28 | 25 | 4 to 6 | 7.0 |
| 29,991 | 27 | 24 | 4 to 6 | 7.0 |
| 30,136 | 26 | 23 | 4 to 6 | 7.0 |
| 31,102 | 28 | 24 | 3 to 6 | 6.7 |
| 31,295 | 27 | 23 | 3 to 6 | 6.7 |
| 32,271 | 23 | 19 | 3 to 5.5 | 6.5 |
| 32,454 | 28 | 23 | 3 to 5.5 | 6.5 |
| 33,674 | 24 | 19 | 3 to 5.5 | 6.2 |
| 35,077 | 25 | 19 | 3 to 5 | 6.0 |
| 36,068 | 23 | 17 | 3 to 5 | 5.8 |
| 36,480 | 26 | 19 | 3 to 5 | 5.7 |
| 37,636 | 24 | 17 | 3 to 5 | 5.6 |
| 37,883 | 27 | 19 | 3 to 5 | 5.5 |
| 39,204 | 25 | 17 | 3 to 4.5 | 5.3 |
| 39,287 | 28 | 19 | 3 to 4.5 | 5.3 |
| 40,772 | 26 | 17 | 3 to 4.5 | 5.1 |
| 42,340 | 27 | 17 | 3 to 4.5 | 4.9 |
| 43,908 | 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.

MACHINE OPERATION

Z214/RH

PLANTING RATES FOR BRUSH-TYPE SEED METERS

APPROXIMATE SEEDS/ACRE FOR 30" ROW WIDTH

| Transmission Sprockets | | 60 Cell Soybean Or High Rate Milo/ Grain Sorghum | Average Seed Spacing In Inches | 48 Cell Specialty Soybean Or High Rate Acid-Delinted Cotton | Average Seed Spacing In Inches | Speed Range (MPH) |
|------------------------|--------|---|--------------------------------|---|--------------------------------|-------------------|
| Drive | Driven | 30" Rows | | 30" Rows | | |
| 17 | 28 | 80,928 | 2.6 | 64,742 | 3.2 | 2 to 8 |
| 17 | 27 | 83,926 | 2.5 | 67,141 | 3.1 | 2 to 8 |
| 17 | 26 | 87,154 | 2.4 | 69,723 | 3.0 | 2 to 8 |
| 19 | 28 | 90,449 | 2.3 | 72,359 | 2.9 | 2 to 8 |
| 19 | 27 | 93,799 | 2.2 | 75,039 | 2.8 | 2 to 8 |
| 17 | 24 | 94,416 | 2.2 | 75,533 | 2.8 | 2 to 8 |
| 17 | 23 | 98,521 | 2.1 | 78,817 | 2.7 | 2 to 8 |
| 19 | 25 | 101,303 | 2.1 | 81,042 | 2.6 | 2 to 8 |
| 19 | 24 | 105,524 | 2.0 | 84,419 | 2.5 | 2 to 8 |
| 23 | 28 | 109,491 | 1.9 | 87,593 | 2.4 | 2 to 8 |
| 19 | 23 | 110,112 | 1.9 | 88,090 | 2.4 | 2 to 8 |
| 24 | 28 | 114,252 | 1.8 | 91,402 | 2.3 | 2 to 8 |
| 24 | 27 | 118,483 | 1.8 | 94,786 | 2.2 | 2 to 8 |
| 17 | 19 | 119,263 | 1.8 | 95,410 | 2.2 | 2 to 8 |
| 24 | 26 | 123,040 | 1.7 | 98,432 | 2.1 | 2 to 8 |
| 26 | 28 | 123,773 | 1.7 | 99,018 | 2.1 | 2 to 8 |
| 24 | 25 | 127,962 | 1.6 | 102,370 | 2.0 | 2 to 8 |
| 26 | 27 | 128,357 | 1.6 | 102,686 | 2.0 | 2 to 8 |
| 23 | 23 | 133,294 | 1.6 | 106,635 | 2.0 | 2 to 8 |
| 27 | 26 | 138,420 | 1.5 | 110,736 | 1.9 | 2 to 8 |
| 24 | 23 | 139,089 | 1.5 | 111,271 | 1.9 | 2 to 8 |
| 25 | 23 | 144,884 | 1.4 | 115,907 | 1.8 | 2 to 8 |
| 19 | 17 | 148,975 | 1.4 | 119,180 | 1.8 | 2 to 8 |
| 27 | 24 | 149,955 | 1.4 | 119,964 | 1.7 | 2 to 8 |
| 28 | 24 | 155,509 | 1.3 | 124,407 | 1.7 | 2 to 8 |
| 23 | 19 | 161,355 | 1.3 | 129,084 | 1.6 | 2 to 8 |
| 28 | 23 | 162,270 | 1.3 | 129,816 | 1.6 | 2 to 8 |
| 24 | 19 | 168,371 | 1.2 | 134,696 | 1.6 | 2 to 8 |
| 25 | 19 | 175,386 | 1.2 | 140,309 | 1.5 | 2 to 8 |
| 23 | 17 | 180,338 | 1.2 | 144,270 | 1.5 | 2 to 8 |
| 26 | 19 | 182,402 | 1.1 | 145,922 | 1.4 | 2 to 7 |
| 27 | 19 | 189,417 | 1.1 | 151,534 | 1.4 | 2 to 7 |
| 28 | 19 | 196,433 | 1.1 | 157,146 | 1.3 | 2 to 7 |
| 26 | 17 | 203,861 | 1.0 | 163,089 | 1.3 | 2 to 7 |
| 27 | 17 | 211,702 | 0.9 | 169,362 | 1.2 | 2 to 7 |
| 28 | 17 | 219,542 | 0.9 | 175,634 | 1.2 | 2 to 7 |

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

NOTE: When using the Half Rate (2 To 1) Drive Reduction Package, rates will be approximately 50% of given numbers.

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

MACHINE OPERATION

Z214/RH

PLANTING RATES FOR BRUSH-TYPE SEED METERS (Continued)

APPROXIMATE SEEDS/ACRE FOR 15" ROW WIDTH

| Transmission Sprockets | | 60 Cell Soybean Or High Rate Milo/ Grain Sorghum | Average Seed Spacing In Inches | 48 Cell Specialty Soybean Or High Rate Acid-Delinted Cotton | Average Seed Spacing In Inches | Speed Range (MPH) |
|------------------------|--------|--|--------------------------------|---|--------------------------------|-------------------|
| Drive | Driven | 15" Rows | | 15" Rows | | |
| 17 | 28 | 161,856 | 2.6 | 129,484 | 3.2 | 2 to 8 |
| 17 | 27 | 167,852 | 2.5 | 134,282 | 3.1 | 2 to 8 |
| 17 | 26 | 174,308 | 2.4 | 139,446 | 3.0 | 2 to 8 |
| 19 | 28 | 180,898 | 2.3 | 144,718 | 2.9 | 2 to 8 |
| 19 | 27 | 187,598 | 2.2 | 150,078 | 2.8 | 2 to 8 |
| 17 | 24 | 188,832 | 2.2 | 151,066 | 2.8 | 2 to 8 |
| 17 | 23 | 197,042 | 2.1 | 157,634 | 2.7 | 2 to 8 |
| 19 | 25 | 202,606 | 2.1 | 162,084 | 2.6 | 2 to 8 |
| 19 | 24 | 211,048 | 2.0 | 168,838 | 2.5 | 2 to 8 |
| 23 | 28 | 218,982 | 1.9 | 175,186 | 2.4 | 2 to 8 |
| 19 | 23 | 220,224 | 1.9 | 176,180 | 2.4 | 2 to 8 |
| 24 | 28 | 228,504 | 1.8 | 182,804 | 2.3 | 2 to 8 |
| 24 | 27 | 236,966 | 1.8 | 189,572 | 2.2 | 2 to 8 |
| 17 | 19 | 238,526 | 1.8 | 190,820 | 2.2 | 2 to 8 |
| 24 | 26 | 246,080 | 1.7 | 196,864 | 2.1 | 2 to 8 |
| 26 | 28 | 247,546 | 1.7 | 198,036 | 2.1 | 2 to 8 |
| 24 | 25 | 255,924 | 1.6 | 204,740 | 2.0 | 2 to 8 |
| 26 | 27 | 256,714 | 1.6 | 205,372 | 2.0 | 2 to 8 |
| 23 | 23 | 266,588 | 1.6 | 213,270 | 2.0 | 2 to 8 |
| 27 | 26 | 276,840 | 1.5 | 221,472 | 1.9 | 2 to 8 |
| 24 | 23 | 278,178 | 1.5 | 222,542 | 1.9 | 2 to 8 |
| 25 | 23 | 289,768 | 1.4 | 231,814 | 1.8 | 2 to 8 |
| 19 | 17 | 297,950 | 1.4 | 238,360 | 1.8 | 2 to 8 |
| 27 | 24 | 299,910 | 1.4 | 239,928 | 1.7 | 2 to 8 |
| 28 | 24 | 311,018 | 1.3 | 248,814 | 1.7 | 2 to 8 |
| 23 | 19 | 322,710 | 1.3 | 258,168 | 1.6 | 2 to 8 |
| 28 | 23 | 324,540 | 1.3 | 259,632 | 1.6 | 2 to 8 |
| 24 | 19 | 336,742 | 1.2 | 269,392 | 1.6 | 2 to 8 |
| 25 | 19 | 350,772 | 1.2 | 280,618 | 1.5 | 2 to 8 |
| 23 | 17 | 360,676 | 1.2 | 288,540 | 1.5 | 2 to 8 |
| 26 | 19 | 364,804 | 1.1 | 291,844 | 1.4 | 2 to 7 |
| 27 | 19 | 378,834 | 1.1 | 303,068 | 1.4 | 2 to 7 |
| 28 | 19 | 392,866 | 1.1 | 314,292 | 1.3 | 2 to 7 |
| 26 | 17 | 407,722 | 1.0 | 326,178 | 1.3 | 2 to 7 |
| 27 | 17 | 423,404 | 0.9 | 338,724 | 1.2 | 2 to 7 |
| 28 | 17 | 439,084 | 0.9 | 351,268 | 1.2 | 2 to 7 |

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

NOTE: When using the Half Rate (2 To 1) Drive Reduction Package, rates will be approximately 50% of given numbers.

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

MACHINE OPERATION

Z214/RH

PLANTING RATES FOR BRUSH-TYPE SEED METERS (Continued)

APPROXIMATE SEEDS/ACRE FOR 30" ROW WIDTH

| Transmission Sprockets | | 36 Cell Acid-Delinted Large Cotton | Average Seed Spacing In Inches | 30 Cell Milo/Grain Sorghum Or Acid-Delinted Cotton | Average Seed Spacing In Inches | Speed Range (MPH) |
|------------------------|--------|---------------------------------------|--------------------------------|--|--------------------------------|-------------------|
| Drive | Driven | 30" Rows | | 30" Rows | | |
| 17 | 28 | 48,557 | 4.3 | 40,464 | 5.2 | 2 to 8 |
| 17 | 27 | 50,356 | 4.2 | 41,963 | 5.0 | 2 to 8 |
| 17 | 26 | 52,292 | 4.0 | 43,577 | 4.8 | 2 to 8 |
| 19 | 28 | 54,269 | 3.9 | 45,225 | 4.6 | 2 to 8 |
| 19 | 27 | 56,279 | 3.7 | 46,900 | 4.5 | 2 to 8 |
| 17 | 24 | 56,650 | 3.7 | 47,208 | 4.4 | 2 to 8 |
| 17 | 23 | 59,113 | 3.5 | 49,261 | 4.2 | 2 to 8 |
| 19 | 25 | 60,782 | 3.4 | 50,652 | 4.1 | 2 to 8 |
| 19 | 24 | 63,314 | 3.3 | 52,762 | 4.0 | 2 to 8 |
| 23 | 28 | 65,695 | 3.2 | 54,746 | 3.8 | 2 to 8 |
| 19 | 23 | 66,067 | 3.2 | 55,056 | 3.8 | 2 to 8 |
| 24 | 28 | 68,551 | 3.0 | 57,126 | 3.7 | 2 to 8 |
| 24 | 27 | 71,090 | 2.9 | 59,242 | 3.5 | 2 to 8 |
| 17 | 19 | 71,558 | 2.9 | 59,631 | 3.5 | 2 to 8 |
| 24 | 26 | 73,824 | 2.8 | 61,520 | 3.4 | 2 to 8 |
| 26 | 28 | 74,264 | 2.8 | 61,886 | 3.4 | 2 to 8 |
| 24 | 25 | 76,772 | 2.7 | 63,981 | 3.3 | 2 to 8 |
| 26 | 27 | 77,014 | 2.7 | 64,178 | 3.3 | 2 to 8 |
| 23 | 23 | 79,976 | 2.6 | 66,647 | 3.1 | 2 to 8 |
| 27 | 26 | 83,052 | 2.5 | 69,210 | 3.0 | 2 to 8 |
| 24 | 23 | 83,453 | 2.5 | 69,544 | 3.0 | 2 to 8 |
| 25 | 23 | 86,930 | 2.4 | 72,442 | 2.9 | 2 to 8 |
| 19 | 17 | 89,385 | 2.3 | 74,488 | 2.8 | 2 to 8 |
| 27 | 24 | 89,973 | 2.3 | 74,978 | 2.8 | 2 to 8 |
| 28 | 24 | 93,305 | 2.2 | 77,755 | 2.7 | 2 to 8 |
| 23 | 19 | 96,813 | 2.2 | 80,678 | 2.6 | 2 to 8 |
| 28 | 23 | 97,362 | 2.1 | 81,135 | 2.6 | 2 to 8 |
| 24 | 19 | 101,023 | 2.1 | 84,185 | 2.5 | 2 to 8 |
| 25 | 19 | 105,232 | 2.0 | 87,693 | 2.4 | 2 to 8 |
| 23 | 17 | 108,233 | 1.9 | 90,169 | 2.3 | 2 to 8 |
| 26 | 19 | 109,441 | 1.9 | 91,201 | 2.3 | 2 to 7 |
| 27 | 19 | 113,650 | 1.8 | 94,709 | 2.2 | 2 to 7 |
| 28 | 19 | 117,860 | 1.8 | 98,216 | 2.1 | 2 to 7 |
| 26 | 17 | 122,317 | 1.7 | 101,930 | 2.1 | 2 to 7 |
| 27 | 17 | 127,021 | 1.6 | 105,851 | 2.0 | 2 to 7 |
| 28 | 17 | 131,725 | 1.6 | 109,771 | 1.9 | 2 to 7 |

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

NOTE: When using the Half Rate (2 To 1) Drive Reduction Package, rates will be approximately 50% of given numbers.

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

MACHINE OPERATION

Z202

PLANTING RATES FOR BRUSH-TYPE SEED METERS (Continued) APPROXIMATE HILLS/ACRE FOR 30" ROW WIDTH

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

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

To determine population per acre, determine average seeds per hill and hills per acre by doing a field check. Measure $\frac{1}{1000}$ of an acre ($\frac{1}{1000}$ acre = Length of row 17' 5" for 30" row width). Multiply average seeds per hill by hills per acre.

EXAMPLE: 4 seeds per hill x (13 hills x 1000) = 52,000

| Transmission Sprockets | | NUMBER OF HILLS PER ACRE 12 Cell Hill-Drop Cotton, Acid-Delinted 30" Rows | Average Hill Spacing In Inches | Speed Range (MPH) |
|------------------------|-------|---|-----------------------------------|-------------------|
| Drive | Drive | | | |
| 17 | 28 | 16,186 | 12.9 | 2 to 8 |
| 17 | 27 | 16,785 | 12.5 | 2 to 8 |
| 17 | 26 | 17,431 | 12.0 | 2 to 8 |
| 19 | 28 | 18,090 | 11.6 | 2 to 8 |
| 19 | 27 | 18,760 | 11.1 | 2 to 8 |
| 17 | 24 | 18,883 | 11.1 | 2 to 8 |
| 17 | 23 | 19,704 | 10.6 | 2 to 8 |
| 19 | 25 | 20,261 | 10.3 | 2 to 8 |
| 19 | 24 | 21,105 | 9.9 | 2 to 8 |
| 23 | 28 | 21,898 | 9.5 | 2 to 8 |
| 19 | 23 | 22,022 | 9.5 | 2 to 8 |
| 24 | 28 | 22,850 | 9.2 | 2 to 8 |
| 24 | 27 | 23,697 | 8.8 | 2 to 8 |
| 17 | 19 | 23,853 | 8.8 | 2 to 8 |
| 24 | 26 | 24,608 | 8.5 | 2 to 8 |
| 26 | 28 | 24,755 | 8.4 | 2 to 8 |
| 24 | 25 | 25,592 | 8.2 | 2 to 8 |
| 26 | 27 | 25,671 | 8.1 | 2 to 8 |
| 23 | 23 | 26,659 | 7.8 | 2 to 8 |
| 27 | 26 | 27,684 | 7.6 | 2 to 8 |
| 24 | 23 | 27,818 | 7.5 | 2 to 8 |
| 25 | 23 | 28,977 | 7.2 | 2 to 8 |
| 19 | 17 | 29,795 | 7.0 | 2 to 8 |
| 27 | 24 | 29,991 | 7.0 | 2 to 8 |
| 28 | 24 | 31,102 | 6.7 | 2 to 8 |
| 23 | 19 | 32,271 | 6.5 | 2 to 8 |
| 28 | 23 | 32,454 | 6.5 | 2 to 8 |
| 24 | 19 | 33,674 | 6.2 | 2 to 8 |
| 25 | 19 | 35,077 | 6.0 | 2 to 8 |
| 23 | 17 | 36,068 | 5.8 | 2 to 8 |
| 26 | 19 | 36,480 | 5.7 | 2 to 7 |
| 27 | 19 | 37,883 | 5.5 | 2 to 7 |
| 28 | 19 | 39,287 | 5.3 | 2 to 7 |
| 26 | 17 | 40,772 | 5.1 | 2 to 7 |
| 27 | 17 | 42,340 | 4.9 | 2 to 7 |
| 28 | 17 | 43,908 | 4.8 | 2 to 7 |

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

NOTE: When using the Half Rate (2 To 1) Drive Reduction Package, rates will be approximately 50% of given numbers.

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

MACHINE OPERATION

DRY INSECTICIDE APPLICATION RATES APPROXIMATE POUNDS/ACRE AT 5 MPH FOR 30" ROW WIDTH

| Meter Setting | 30" Rows |
|----------------------|----------|
| CLAY GRANULES | |
| 10 | 4.9 |
| 11 | 5.4 |
| 12 | 6.1 |
| 13 | 6.9 |
| 14 | 7.7 |
| 15 | 8.5 |
| 16 | 9.6 |
| 17 | 10.7 |
| 18 | 11.4 |
| 19 | 13.1 |
| 20 | 14.2 |
| 21 | 15.5 |
| 22 | 16.4 |
| 23 | 17.2 |
| 24 | 18.8 |
| 25 | 20.9 |
| 26 | 23.0 |
| 27 | 24.1 |
| 28 | 25.4 |
| 29 | 27.8 |
| 30 | 29.6 |
| SAND GRANULES | |
| 5 | 2.9 |
| 6 | 4.9 |
| 7 | 5.3 |
| 8 | 6.3 |
| 9 | 7.8 |
| 10 | 8.9 |
| 11 | 10.2 |
| 12 | 11.2 |
| 13 | 12.6 |
| 14 | 14.1 |
| 15 | 15.5 |
| 16 | 17.5 |
| 17 | 19.4 |
| 18 | 21.8 |
| 19 | 24.3 |
| 20 | 25.7 |
| 21 | 27.6 |
| 22 | 29.6 |
| 23 | 32.0 |
| 24 | 34.4 |
| 25 | 36.9 |

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

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

MACHINE OPERATION

DRY HERBICIDE APPLICATION RATES

APPROXIMATE POUNDS/ACRE AT 5 MPH FOR 30" ROW WIDTH

CLAY GRANULES

| Meter Setting | 30" Rows |
|---------------|----------|
| 10 | 4.7 |
| 11 | 5.2 |
| 12 | 5.8 |
| 13 | 6.5 |
| 14 | 7.3 |
| 15 | 8.2 |
| 16 | 9.0 |
| 17 | 9.9 |
| 18 | 10.7 |
| 19 | 11.6 |
| 20 | 12.6 |
| 21 | 13.6 |
| 22 | 14.6 |
| 23 | 15.7 |
| 24 | 17.0 |
| 25 | 18.1 |
| 26 | 19.4 |
| 27 | 20.9 |
| 28 | 22.6 |
| 29 | 24.3 |
| 30 | 26.7 |

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 effect 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.

MACHINE OPERATION

DRY FERTILIZER APPLICATION RATES

APPROXIMATE RATE IN POUNDS PER ACRE

| Drive Sprocket | Driven Sprocket | Low Rate Setting | High Rate Setting |
|----------------|-----------------|------------------|-------------------|
| | | 30" Rows | 30" Rows |
| 15 | 35 | 32 | 94 |
| 15 | 33 | 36 | 109 |
| 15 | 30 | 39 | 120 |
| 19 | 33 | 45 | 135 |
| 19 | 30 | 50 | 153 |
| 15 | 19 | 58 | 174 |
| 30 | 35 | 61 | 188 |
| 30 | 33 | 67 | 200 |
| 33 | 35 | 69 | 206 |
| 35 | 33 | 76 | 214 |
| 33 | 30 | 81 | 241 |
| 19 | 15 | 93 | 278 |
| 30 | 19 | 116 | 347 |
| 33 | 19 | 127 | 382 |
| 35 | 19 | 133 | 402 |
| 30 | 15 | 146 | 440 |
| 33 | 15 | 161 | 482 |
| 35 | 15 | 168 | 510 |

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

**Direction
Of Rotation**



(PLTR6)



High Rate Position

(PLTR7)



Low Rate Position

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

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

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

To check the exact number of pounds your fertilizer attachment will actually deliver on a 30" 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'. Weigh the amount of fertilizer caught in the container and multiply that amount by 100. The result will be the pounds of fertilizer delivered per acre when planting in 30" rows.

MACHINE OPERATION

LIQUID FERTILIZER SQUEEZE PUMP APPLICATION RATES

GALLONS PER ACRE

| Drive | Driven | 30" Rows |
|-------|--------|----------|
| 15 | *62 | 6.9 |
| 19 | *62 | 8.8 |
| 15 | 46 | 9.3 |
| 19 | 46 | 11.8 |
| 15 | 34 | 12.6 |
| 15 | 32 | 13.4 |
| 32 | *62 | 14.7 |
| 19 | 34 | 16.0 |
| 19 | 32 | 17.0 |
| 32 | 46 | 19.9 |
| 34 | 46 | 21.1 |
| 46 | *62 | 21.2 |
| 15 | 19 | 22.5 |
| 32 | 34 | 26.9 |
| 34 | 32 | 30.3 |
| 19 | 15 | 36.2 |
| 46 | 34 | 38.6 |
| 46 | 32 | 41.0 |
| 32 | 19 | 48.1 |
| 34 | 19 | 51.1 |
| *62 | 34 | 52.1 |

*Optional sprocket.

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

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

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

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

Remove the hose from one of the fertilizer openers and insert it into a collection container which has been secured to the planter frame. Engage the fertilizer attachment and drive forward for 174'. Measure the fluid ounces caught in the container and multiply that amount by 100. Divide that amount by 128. The result will be the gallons of fertilizer delivered per acre when planting in 30" rows. Rinse the collection container and repeat test on other rows if necessary.

MACHINE OPERATION

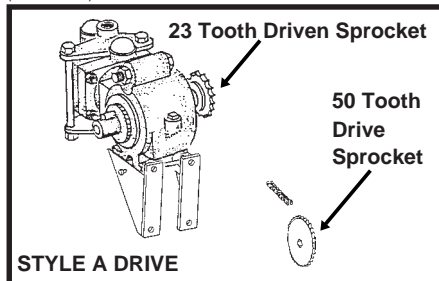
LIQUID FERTILIZER PISTON PUMP APPLICATION RATES GALLONS PER ACRE

| Chart 1 | | | | | | | | | | |
|---|-----|------|------|------|------|------|------|------|------|------|
| For Planters Equipped With L-4405 Pump With 50 Tooth Drive And 23 Tooth Driven Sprocket | | | | | | | | | | |
| Pump Setting | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 6 Row 30 | 6.9 | 13.9 | 20.8 | 27.7 | 34.7 | 41.6 | 48.5 | 55.5 | 62.4 | 69.3 |
| 8 Row 30 | 5.2 | 10.4 | 15.6 | 20.8 | 26.0 | 31.2 | 36.4 | 41.6 | 46.8 | 52.0 |

| Chart 2 | | | | | | | | | | |
|---|-----|------|------|------|------|------|------|------|------|------|
| For Planters Equipped With L-4405 Pump With 40 Tooth Drive And 23 Tooth Driven Sprocket | | | | | | | | | | |
| Pump Setting | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 6 Row 30" | 8.6 | 17.4 | 26.0 | 34.6 | 43.4 | 52.0 | 60.6 | 69.4 | 78.0 | 86.6 |
| 8 Row 30" | 6.5 | 13.0 | 19.5 | 26.0 | 32.5 | 39.0 | 45.5 | 52.0 | 58.5 | 65.0 |

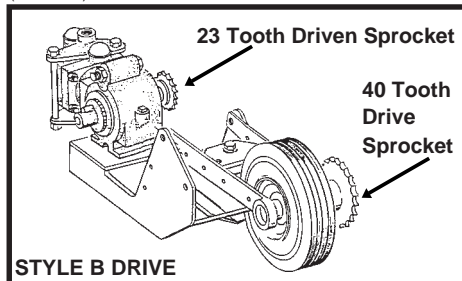
| Chart 3 | | | | | | | | | | |
|---|-----|------|------|------|------|------|------|------|------|------|
| For Planters Equipped With L-2455-R Pump With 40 Tooth Drive And 18 Tooth Driven Sprocket | | | | | | | | | | |
| Pump Setting | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 6 Row 30" | 6.8 | 13.8 | 20.6 | 27.5 | 34.4 | 41.3 | 48.1 | 55.1 | 61.9 | 68.7 |
| 8 Row 30" | 5.2 | 10.3 | 15.5 | 20.6 | 25.8 | 31.0 | 36.1 | 41.3 | 46.4 | 51.6 |

(FRTZ164b)



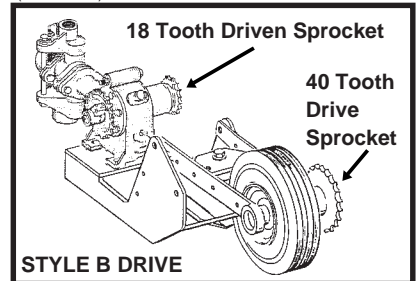
GA6145 (L-4405) - Use Chart 1

(FRTZ164)



GA6145 (L-4405) - Use Chart 2

(FRTZ164a)



GA8069 (LM-2455-R) - Use Chart 3

Above charts are for planters equipped with contact drive. See "Tire Pressure" for recommended tire pressures. Charts are based on average wheel slippage and liquid viscosities.

Measure and weigh one gallon of actual fertilizer solution to determine exact application rate. These charts were calculated based on a solution weighing ten pounds per gallon.

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

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

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

Remove the hose from one of the fertilizer openers and insert it into a collection container which has been secured to the planter frame. Engage the fertilizer attachment and drive forward for 174'. Measure the fluid ounces caught in the container and multiply that amount by 100. Divide that amount by 128. The result will be the gallons of fertilizer delivered per acre when planting in 30" rows. Rinse the collection container and repeat test on other rows if necessary.

ROW UNIT OPERATION

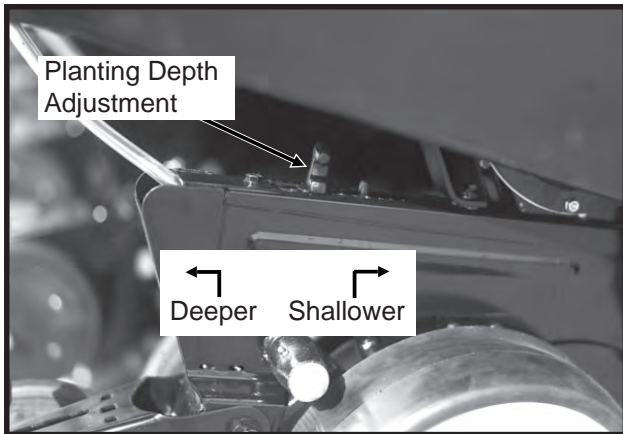
PLANTING DEPTH

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



WARNING: Never work under the planter while in raised position without using safety lockups.

72359-108



“V” CLOSING WHEEL ADJUSTMENT (Rubber And Cast Iron)

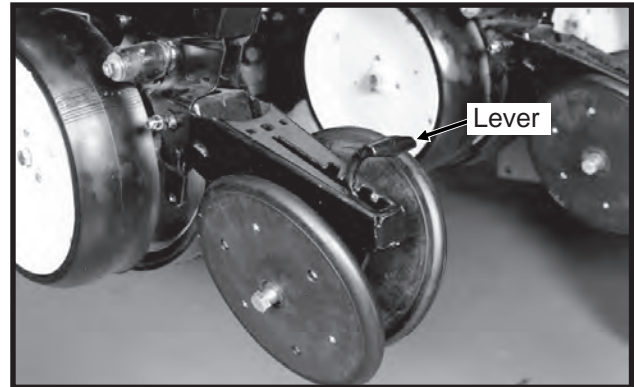


WARNING: Raise planter and install safety lockups before making closing wheel adjustments.

After adjusting planting depth, check the operation of the “V” closing wheels. The “V” closing wheels should have enough down pressure to close the seed trench and ensure good soil to seed contact. To increase spring pressure on the closing wheels, move the 5-position quick adjustable down force lever located on the top of the closing wheel arm to the rear. Moving the lever forward decreases spring tension.

Adjust all row units to a similar setting.

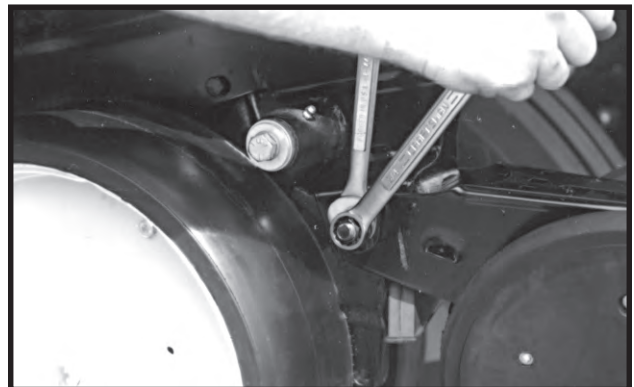
77121-10



Light soil usually requires less down force at average depth (approximately 2”) while heavy soil requires increased down force.

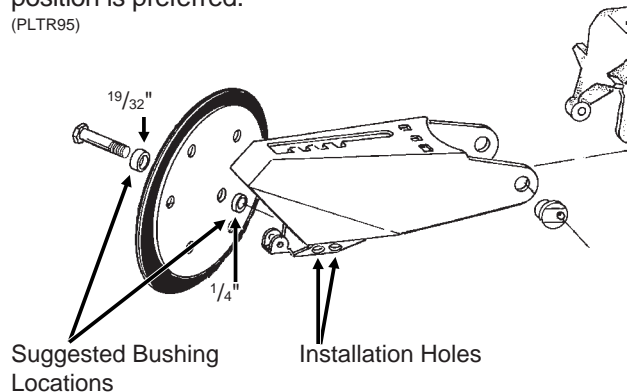
Eccentric bushings in the wheel arm stop allow for lateral adjustment of the “V” closing wheel assembly. Using a $\frac{3}{4}$ ” wrench, loosen the hardware which attaches the closing wheel arm to the wheel arm stop. Using another $\frac{3}{4}$ ” wrench turn the eccentric bushings until the **closing wheels are aligned with the seed trench**. Tighten hardware.

72359-129



Bushings used for installation of the closing wheels can be moved from side to side for closing wheel spacing adjustment and the closing wheels can be installed in two locations either “offset” (to improve residue flow) or “directly” opposite. Under normal conditions the narrow position is preferred.

(PLTR95)



ROW UNIT OPERATION

COVERING DISCS/SINGLE PRESS WHEEL ADJUSTMENT



WARNING: Raise planter and install safety lockups before making covering discs/single press wheel adjustments.

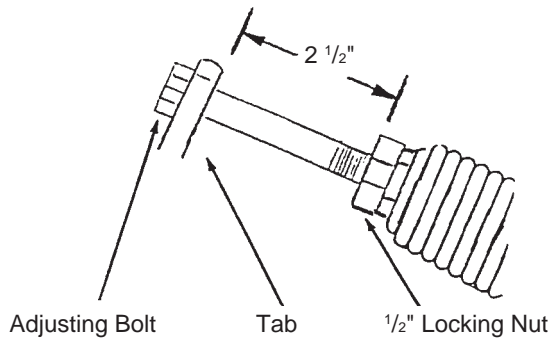
72359-31



After adjusting planting depth, check the operation of the covering discs/single press wheels.

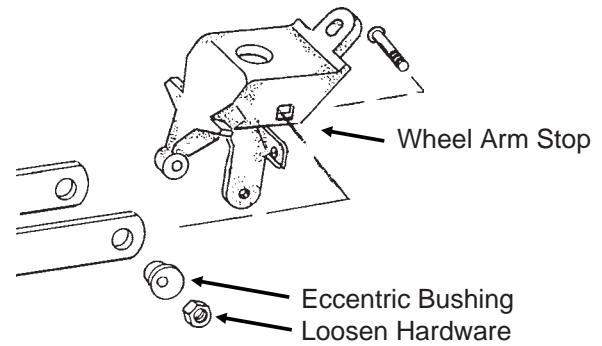
Initial press wheel down force setting should be with 2 1/2" between mounting arm tab and locking nut. To adjust down force spring, loosen 1/2" locking nut and turn adjusting bolt in to increase down force and out to decrease down force. Tighten locking nut against spring plug. Adjust all row units to a similar setting.

RH993(PLTR12)



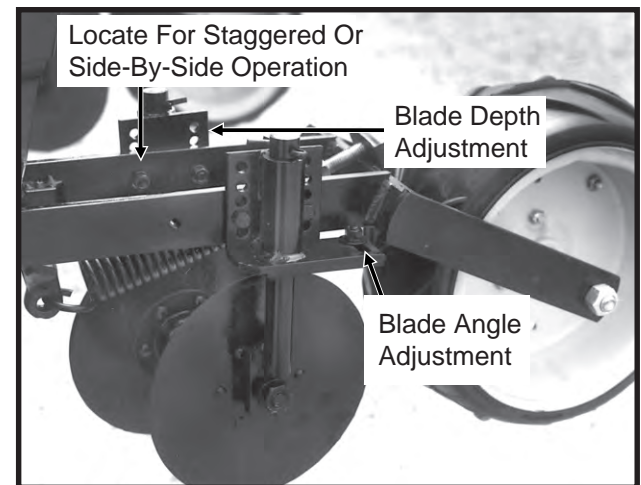
Eccentric bushings in the wheel arm stop allow for lateral adjustment of the covering discs/single press wheel assembly. Using a 3/4" wrench, loosen the hardware which attaches the assembly to the wheel arm stop. Using another 3/4" wrench, turn the eccentric bushings until the press wheel is aligned with the seed trench.

(PLTR96)



Two sets of holes in the mounting arm allow the covering discs to be located for staggered or side-by-side operation as desired.

72359-35



Five sets of holes in each disc bracket allow for 1/2" incremental blade depth adjustment.

Slotted holes in the disc mount and bracket allow for 0° - 15° blade angle adjustment.

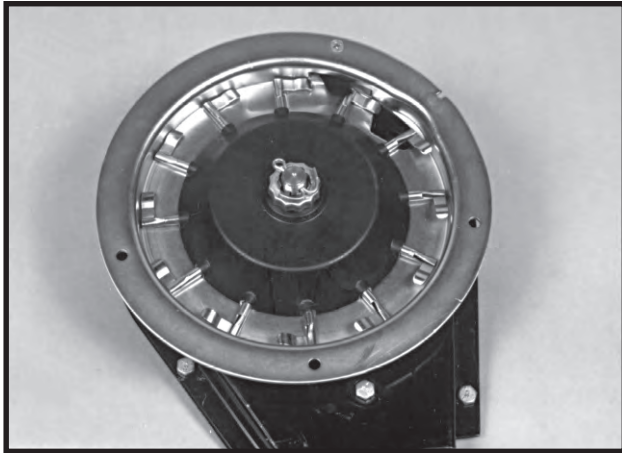
Adjust covering discs on all row units to similar settings.

ROW UNIT OPERATION

FINGER PICKUP SEED METER

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

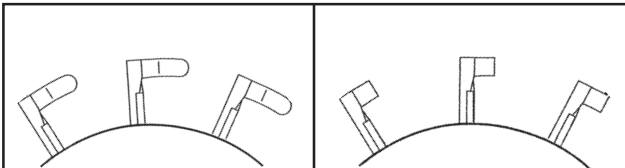
60620-16



Shown With Corn Fingers Installed

The following seed fingers are available for use with the finger pickup seed meter:

(PLTR91/PLTR92)



Corn Fingers

Oil Sunflower Fingers

No. 3 and/or No. 4 size oil sunflower seeds are recommended for use in the finger pickup seed meter equipped with oil sunflower fingers.

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

IMPORTANT: To ensure efficient operation of the finger pickup seed meter and extend the life of its components, mix one teaspoon of powdered graphite with the seed twice daily. Even distribution of the graphite with the seed is critical with newer seed coatings to provide lubrication for the seed pickup mechanism. Graphite application frequency may need to be increased if using additional seed additives.

82354-1

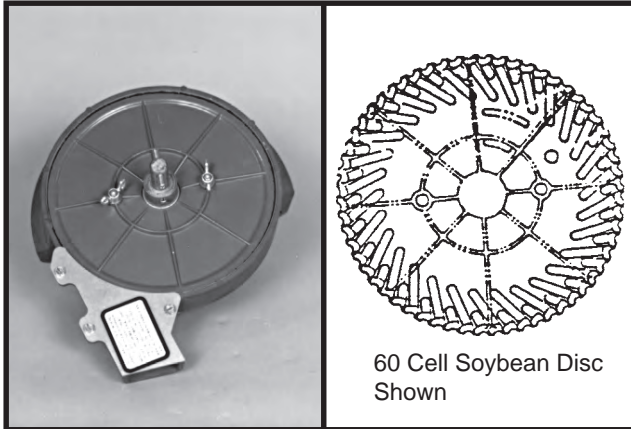


See "General Planting Rate Information", "Finger Pickup Seed Meter Troubleshooting" and "Finger Pickup Seed Meter Inspection/Adjustment" for additional information.

ROW UNIT OPERATION

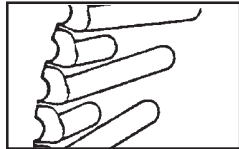
BRUSH-TYPE SEED METER

60607-40(PLTR13)

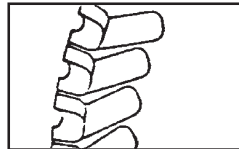


The following seed discs are available for use with the brush-type seed meter:

Soybean: 60 cells to meter seed sizes from 2200 to 4000 seeds per pound (Black color-coded). (PLTR14)



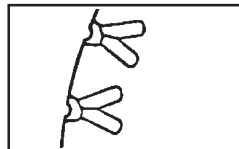
Specialty soybean: 48 cells to meter seed sizes from 1400 to 2200 seeds per pound (Dark blue color-coded). (PLTR15)



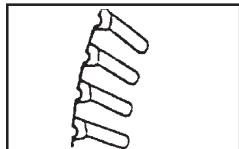
Small milo/grain sorghum: 30 cells to meter seed sizes from 14,000 to 20,000 seeds per pound (Red color-coded). (PLTR16)



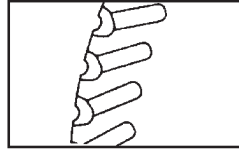
Large milo/grain sorghum: 30 cells to meter seed sizes from 10,000 to 16,000 seeds per pound (Light blue color-coded). (PLTR17)



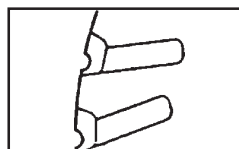
High rate small milo/grain sorghum: 60 cells to meter seed sizes from 12,000 to 18,000 seeds per pound (Red color-coded). (PLTR18)



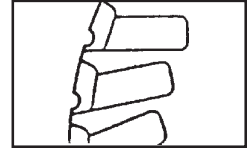
High rate large milo/grain sorghum: 60 cells to meter seed sizes from 10,000 to 14,000 seeds per pound (Yellow color-coded). (PLTR19)



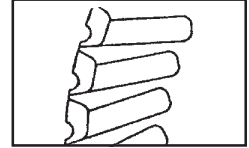
Cotton, acid-delinted: 30 cells to meter seed sizes from 4200 to 5200 seeds per pound (White color-coded). (PLTR20)



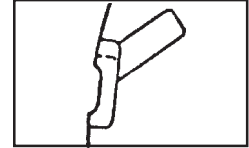
Large cotton, acid-delinted: 36 cells to meter seed sizes from 3800 to 4400 seeds per pound (Tan color-coded). (PLTR21)



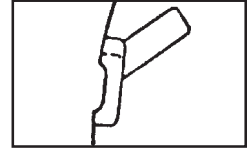
High rate cotton, acid-delinted: 48 cells to meter seed sizes from 4200 to 5200 seeds per pound (Light green color-coded). (PLTR22)



Hill-drop cotton, acid-delinted: 12 cells, 3 to 6 seeds/cell, to meter seed sizes from 4000 to 5200 seeds per pound (Brown color-coded). (PLTR23)



Small hill-drop cotton, acid-delinted: 12 cells, 3 to 6 seeds/cell, to meter seed sizes from 5000 to 6200 seeds per pound (Dark green color-coded). (PLTR23)



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

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

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

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

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

ROW UNIT OPERATION

82354-1



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

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

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

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

SEED HOPPER

60620-69



The seed hopper has a capacity of 1.6 bushels.

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

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

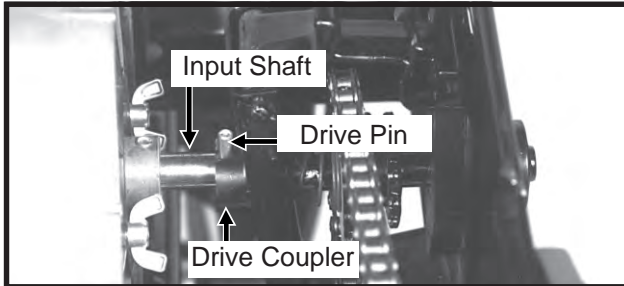
ROW UNIT OPERATION

SEED METER DRIVE ADJUSTMENT

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

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

61658-27



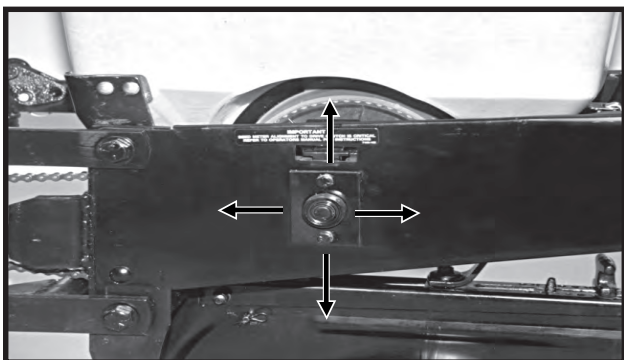
To check alignment:

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

To adjust drive clutch:

- Slightly loosen both $\frac{5}{16}$ " cap screws.
- Move clutch assembly to correct any misalignment.
- Tighten both $\frac{5}{16}$ " cap screws.

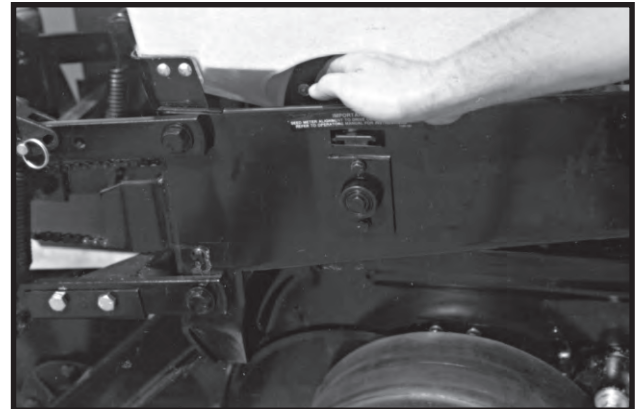
72794-24



SEED METER DRIVE RELEASE

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

72359-164

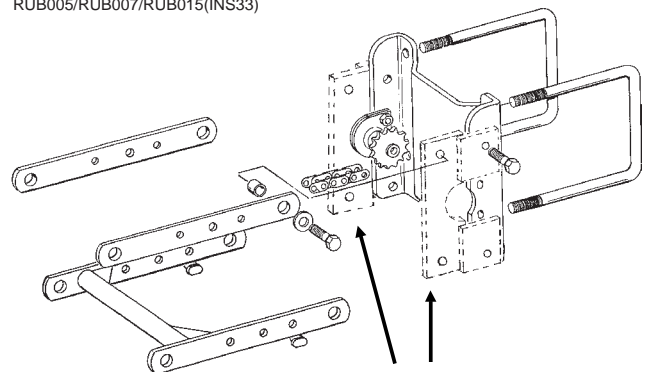


To disengage the drive, lift the release handle and pull outward until the handle locks in the slot in the side of the hopper side panel. To engage the row unit, lift and unlatch the handle. Spring tension will return the mechanism to the drive position.

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

ROW UNIT EXTENSION BRACKETS

RUB005/RUB007/RUB015(INS33)

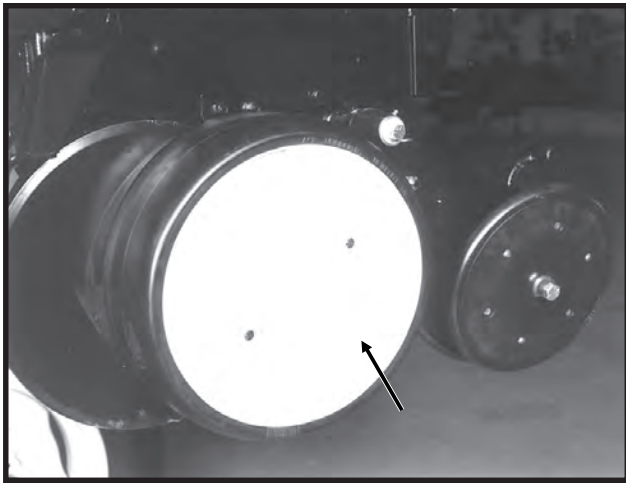


Row unit extension brackets are required on the four center pull row units if the Model 2500 planter is equipped with coulter mounted residue wheels. The brackets extend the row units rearward 4" to provide required clearance.

ROW UNIT OPERATION

ROW UNIT GAUGE WHEEL COVER

78896-6a



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

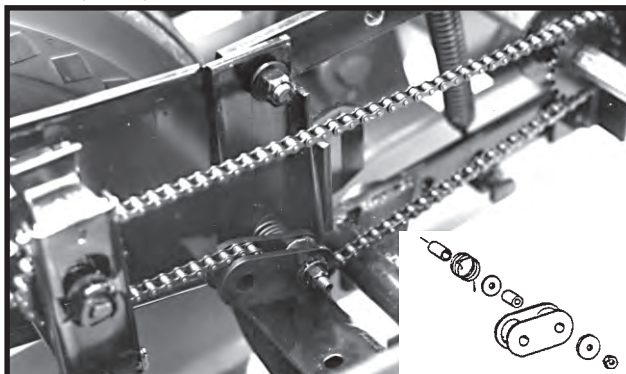
ROW UNIT CHAIN ROUTING

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

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

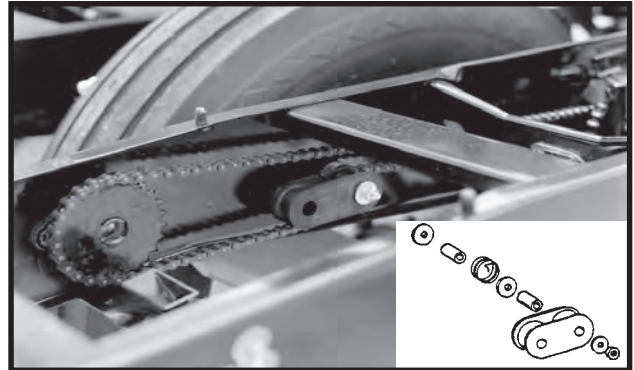
NOTE: When idler shows signs of wear, it can be reversed for prolonged use.

72359-124(PLTR25)



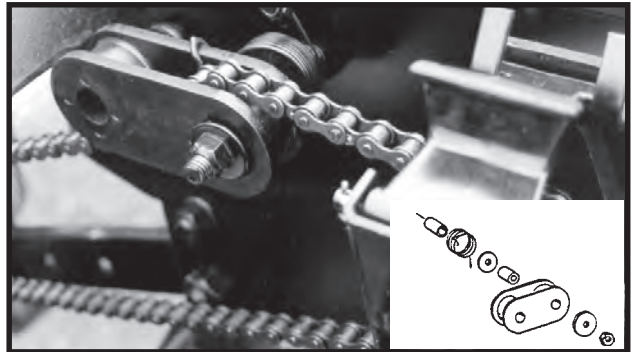
Pull Row Unit Meter Drive

72359-97(PLTR26)



Row Unit Granular Chemical Drive

08229714(PLTR26)



Push Row Unit Meter Drive

NOTE: Make sure connector link is installed with closed end located as shown below.

(PLTR24)



Direction Of Chain Travel →

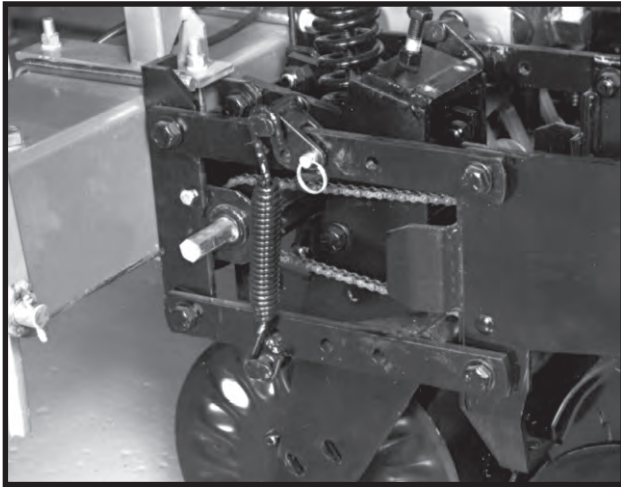
ROW UNIT OPERATION

QUICK ADJUSTABLE DOWN FORCE SPRINGS

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

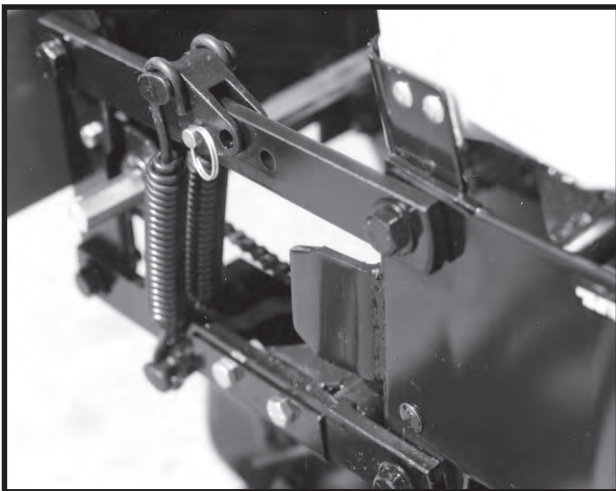
Two springs per row, one on the L.H. parallel arms and one on the R.H. parallel arms, are used unless equipped with row unit mounted no till coulters. Four springs per row are used with row unit mounted no till coulters.

61703-4



Two Springs Per Row (Dual)

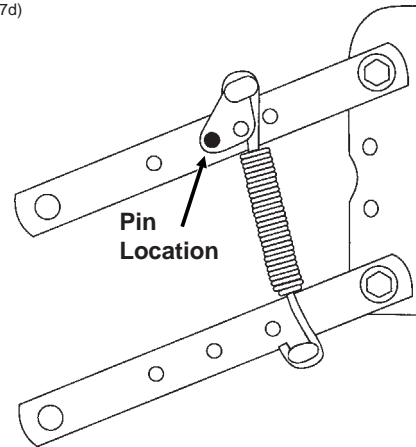
72359-4



**Four Springs Per Row (Quad)
(Used Only In Conjunction With Row Unit
Mounted No Till Coulters)**

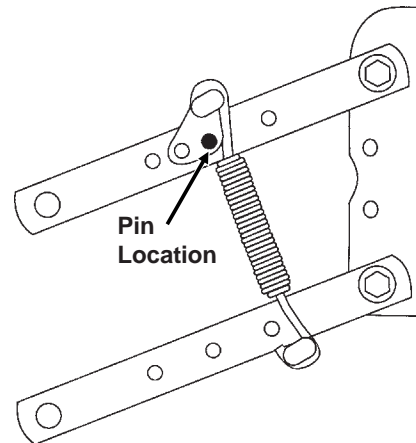
There are four positions for spring tension adjustment. Position 1 allows for minimum down pressure and position 4 for maximum down pressure.

L0096(PLTR27d)



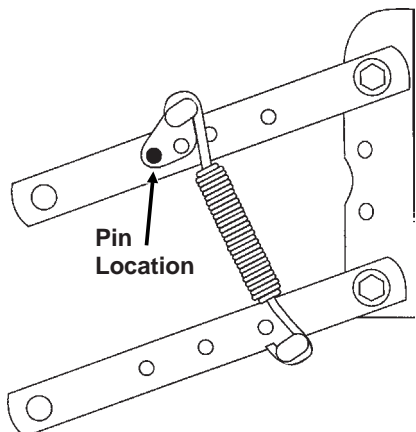
Position 1 (Minimum)

(PLTR28d)



Position 2

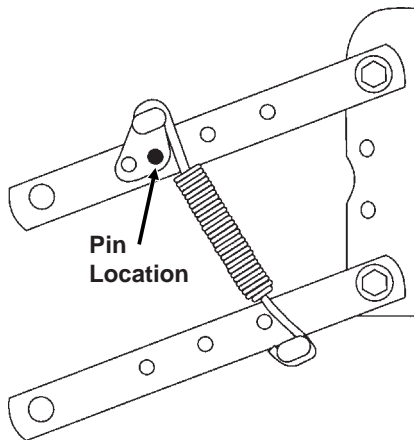
(PLTR29d)



Position 3

ROW UNIT OPERATION

(PLTR30d)



Position 4 (Maximum)

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

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



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

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

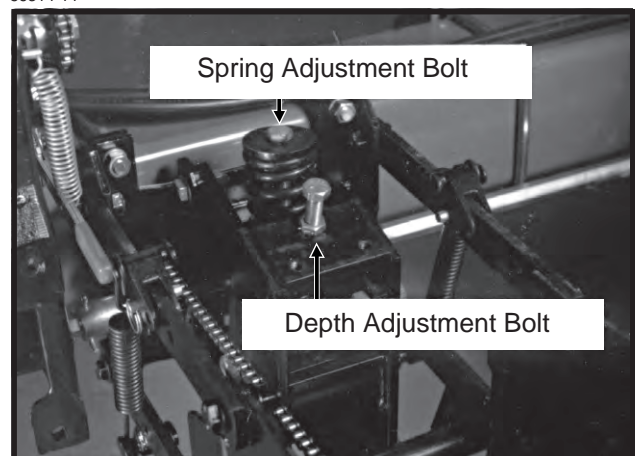
FRAME MOUNTED COULTER

Frame mounted coulters with 1" bubbled, 1" fluted (8 flutes) or $\frac{3}{4}$ " fluted (13 flutes) blades may be used on pull row units only. (Not compatible with push row units.)

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

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

56314-14

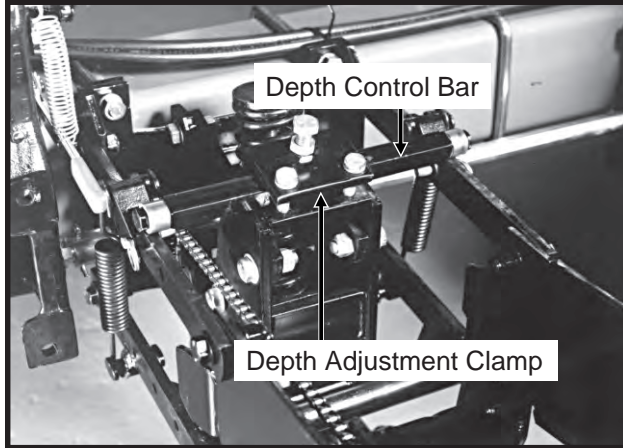


DEPTH ADJUSTMENT (Without Depth Control Bar Installed)

When the depth control bar is not used, operating depth of the coulter blade is determined by adjusting the depth adjustment bolt and positioning of the blade assembly in the fork mount. The depth adjustment bolt will stop downward travel of the coulter arm assembly. One turn of the adjusting bolt will change depth setting approximately $\frac{1}{4}$ ". Initial setting of the depth adjustment bolt should be with approximately $1\frac{3}{8}$ " of thread showing. With this setting and the bar height at 20", the coulter depth will be approximately 2" with coulter mounting spindle in top hole. Turn the adjustment bolt clockwise to decrease operating depth. Turn the depth adjustment bolt counterclockwise to increase operating depth.

ROW UNIT OPERATION

56314-16

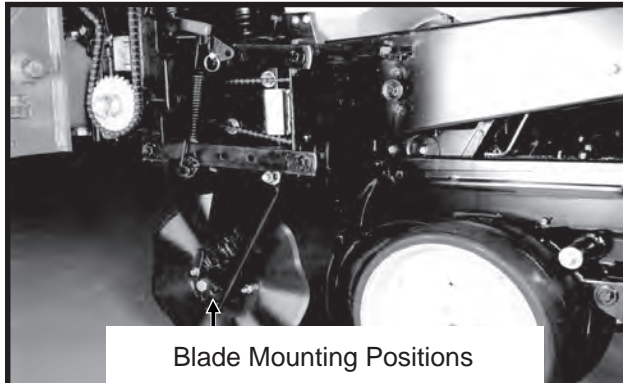


In certain applications it is desirable to use the depth control bar. In uneven terrain, use of the depth control bar allows greater depth control. The up and down movement of the row unit allows the coulter to move up and down at a rate of approximately $\frac{1}{2}$ that of the row unit, maintaining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

DEPTH ADJUSTMENT (With Depth Control Bar Installed)

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

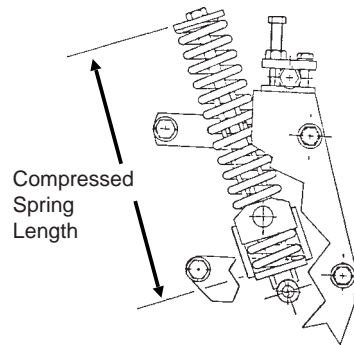
56314-1



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

| Compressed Spring Length (Including Washer) | Pounds Down Pressure With Blade $\frac{1}{2}$ " Above Maximum Down Position | Pounds Down Pressure With Blade 4" Above Maximum Down Position |
|--|---|--|
| 13 $\frac{5}{16}$ " | 90 | 230 |
| 12 $\frac{5}{16}$ " | 190 | 330 |
| Suggested initial setting. | | |
| 11 $\frac{5}{16}$ " | 300 | 430 |

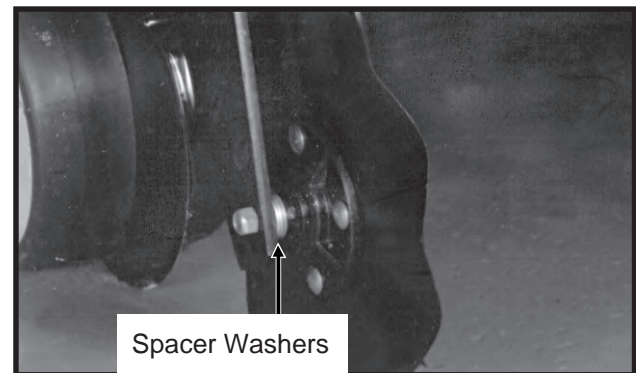
A5649rev.(PLTR44)



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

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

56314-12



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

NOTE: Torque $\frac{5}{8}$ " spindle bolts to 120 ft. lbs.

ROW UNIT OPERATION

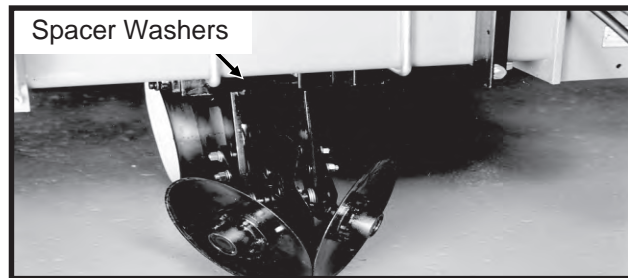
DISC FURROWERS

(For Use With Frame Mounted Coulter)

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

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

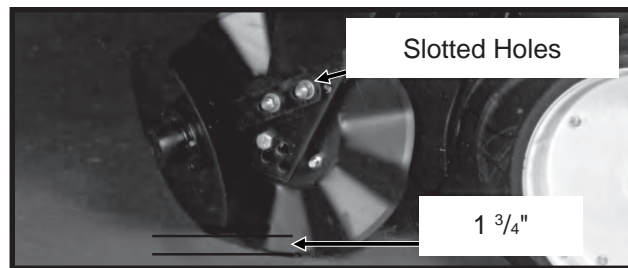
56314-19



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

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

56314-17



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

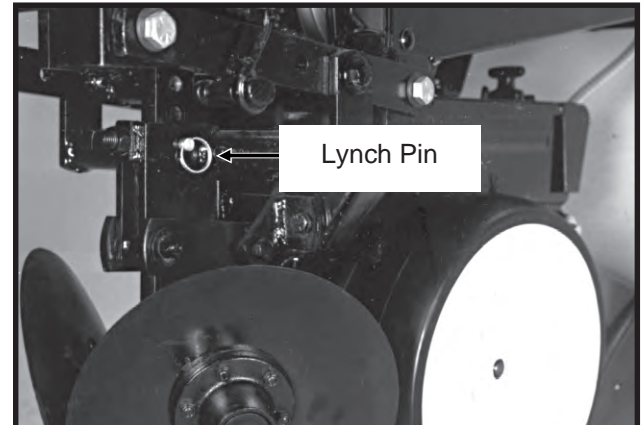
NOTE: The depth control bar should always be used when the frame mounted coulter is equipped with disc furrowers.

ROW UNIT MOUNTED DISC FURROWER

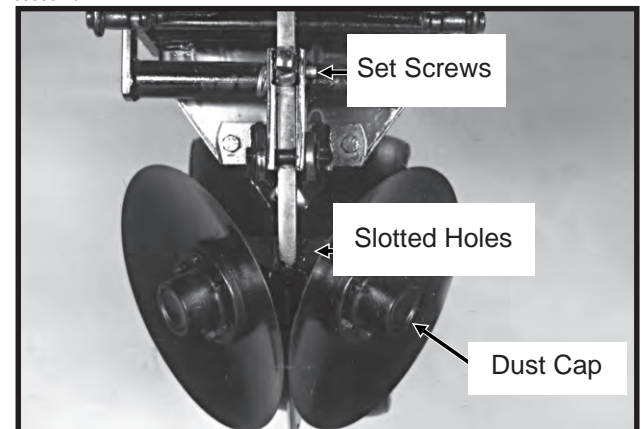
The row unit mounted disc furrower for use on pull row units only (Not compatible with Interplant® push row units.) may be equipped with either 12" solid blades or 12" notched blades.

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

59386-23



59386-20



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

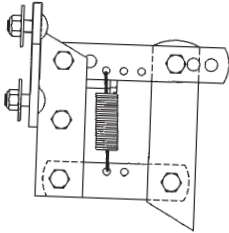
Slotted holes in the support arm where the blades are mounted allow fore and aft adjustment of the discs. Blades can be adjusted so the front edges meet or one blade can be moved to the rear and the other to the front of the slot so the cutting edge of one blade overlaps the edge of the other blade.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

ROW UNIT OPERATION

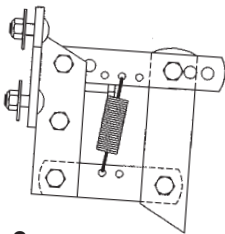
ROW UNIT MOUNTED RESIDUE WHEEL

The row unit mounted residue wheel may be used on pull row units and push row units.

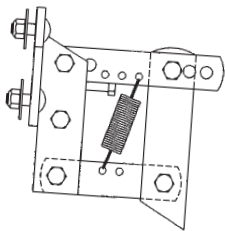
Two adjustable springs on the parallel links on each residue wheel allow for down force adjustment. Position 1 as shown below provides minimum down pressure and position 3 maximum down pressure.



Position 1 (Minimum) (PLTR31a)



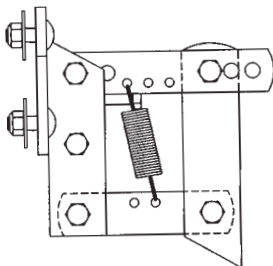
Position 2 (PLTR32a)



Position 3 (Maximum) (PLTR33a)

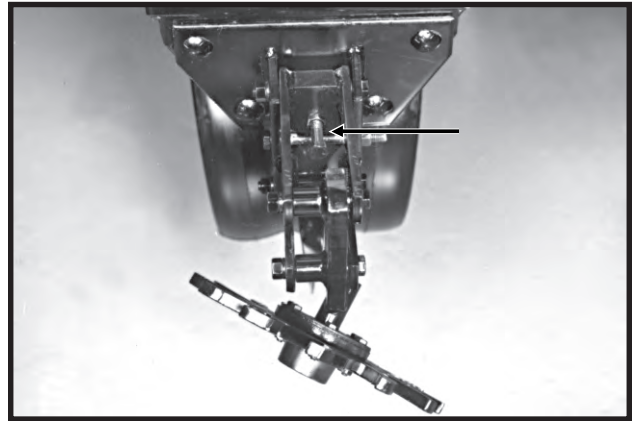
For additional uplift or float, position springs as shown below.

(PLTR34a)



To adjust down force springs, raise the row unit out of the ground and reposition springs as shown for the desired down pressure.

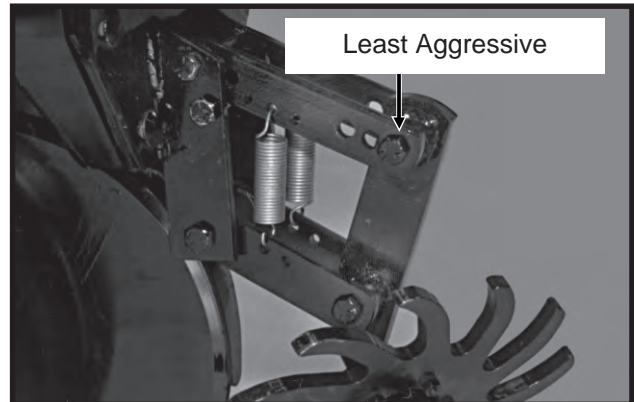
76782-31



A full threaded bolt and jam nut located on the upper link allows maximum depth to be set for loose soil conditions. Initial setting should be 1 3/4" above the depth of the row unit double disc opener.

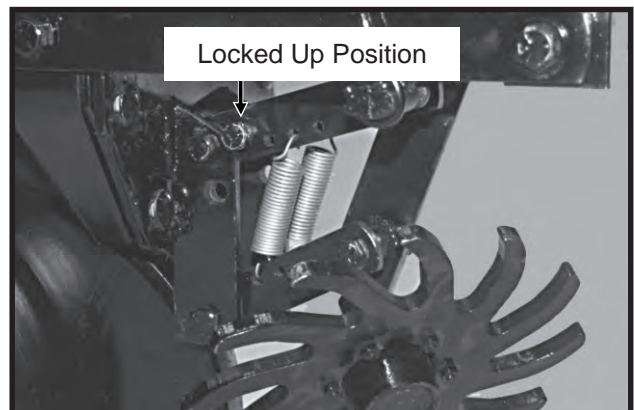
Three holes in the upper link allow for wheel angle adjustment. With the wheel mount in the most vertical position, using the rear hole in the upper link, the residue wheel is most aggressive. Moving the wheel mount to one of the forward holes reduces the aggressiveness of the wheel for use in mulch till applications where the soil is loose.

72794-29



To lock the residue wheel up out of the ground, remove the 1/2" x 5" lockup bolt, raise the residue wheel and install bolt.

72794-31



ROW UNIT OPERATION

ROW UNIT MOUNTED NO TILL COULTER

80367-10



Row unit mounted no till coulters with 1" bubbled, 1" fluted (8 flutes) or $\frac{3}{4}$ " fluted (13 flutes) blades may be used on pull row units and push row units. ($\frac{3}{4}$ " fluted shown)

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

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

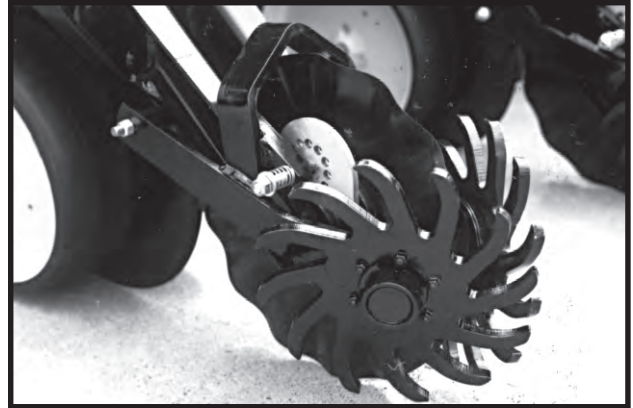
The coulters blade can be adjusted to one of four $\frac{1}{2}$ " incremental settings in the forked arm. Initial location of the coulters is in the top hole. As the coulters blade wears, the blade should be adjusted downward to one of the three lower settings to maintain the coulters blade at or slightly below the opener discs. In very hard soil conditions such as compacted wheel tracks, the opener penetration and cutting of surface residue may be improved by adjusting the coulters to operate below the depth of the double disc opener blades.

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

NOTE: Torque $\frac{5}{8}$ " spindle bolts to 120 ft. lbs.

COULTERS MOUNTED RESIDUE WHEELS

80376-15



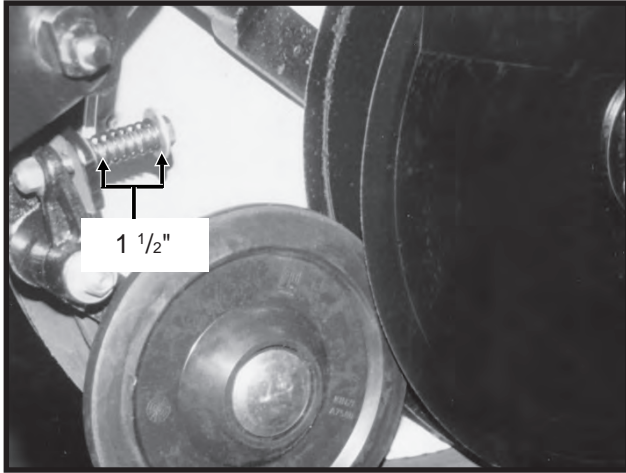
Coulters mounted residue wheels are designed for use on pull row unit and push row units. Row unit extension brackets are required on the four center pull row units if the planter is equipped with the coulters mounted residue wheels.

The coulters mounted residue wheels are attached to the row unit mounted no till coulters with one cap screw and sleeve allowing the unit to free-float. A 2-position spindle bolt mounting allows the tined wheels to be mounted interlocked or staggered. Depth adjustment is made using a spring-loaded cam and pin with 11 positions in $\frac{1}{4}$ " increments. A high point on the cam allows the wheels to be locked up so they do not contact the ground.

ROW UNIT OPERATION

SEED FIRING WHEEL

02209715



Shown with gauge wheel removed.

The seed firming wheel is designed for use on pull row units and push row units. Seed firming wheels are for use in dry loose soil conditions to gently and firmly press the seed into the seed bed before the closing wheels close the seed trench.

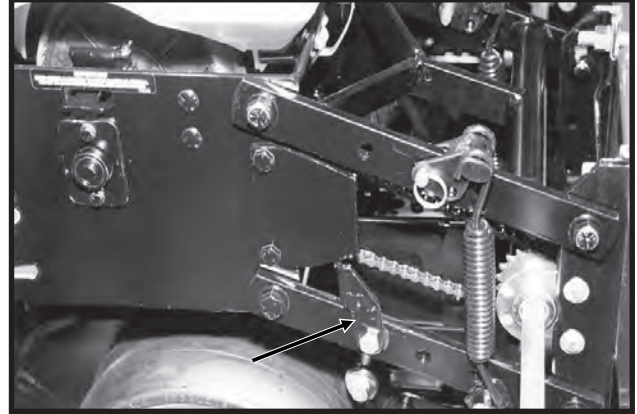
NOTE: Certain soil types and moisture conditions may lead to erratic performance resulting in irregular seed placement.

Initial spring tension is set leaving 1 1/2" between the washers.

PUSH ROW UNIT LOCKUPS

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

03279808

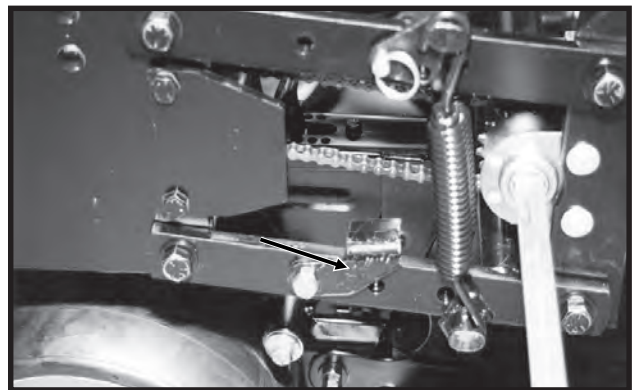


Raised Position

To lock in raised position:

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

03279809



Planting Position

To release lockups:

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

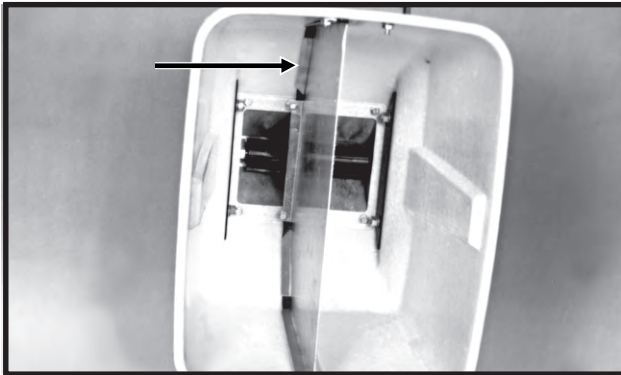


DANGER: Always install all safety lockups or lower planter to the ground before working under or around the machine.

ROW UNIT OPERATION

GRANULAR CHEMICAL HOPPER

61766-2



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

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

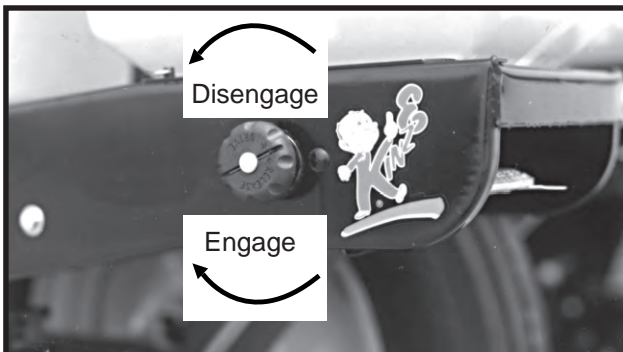
The metering gate located on the bottom of the hopper regulates the application rate. See “Dry Insecticide And Dry Herbicide Application Rate Charts” in this manual. Calibrate using the chemical manufacturers’ instructions.



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

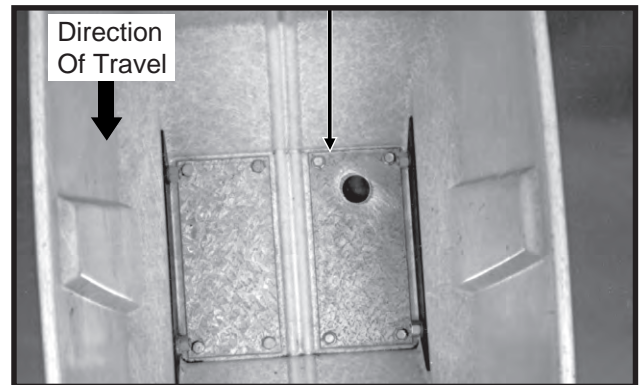
The granular chemical clutch drive coupler and meter shaft can be disengaged and engaged by turning the throwout knob located at the rear of the hopper support panel. To engage the drive, turn the knob $\frac{1}{4}$ turn clockwise. To disengage the drive, turn the knob $\frac{1}{4}$ turn counterclockwise.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

72359-183



GRANULAR CHEMICAL RESTRICTOR PLATE

65249-17



The granular chemical restrictor plate is designed for use in the granular chemical hopper when granular chemical application rates below 4 pounds per acre are desired. The plate restricts chemical flow to the meter outlet to prevent grinding of the material.

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



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

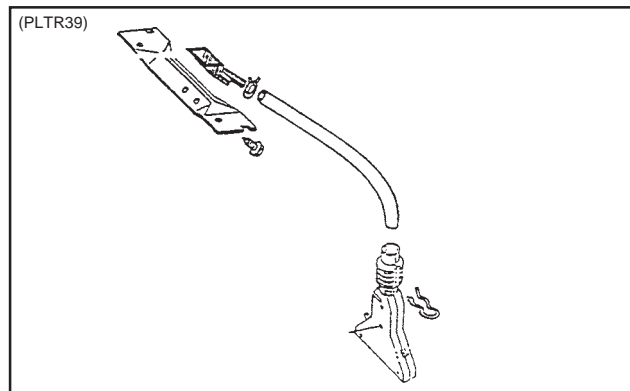
ROW UNIT OPERATION

GRANULAR CHEMICAL BANDING OPTIONS

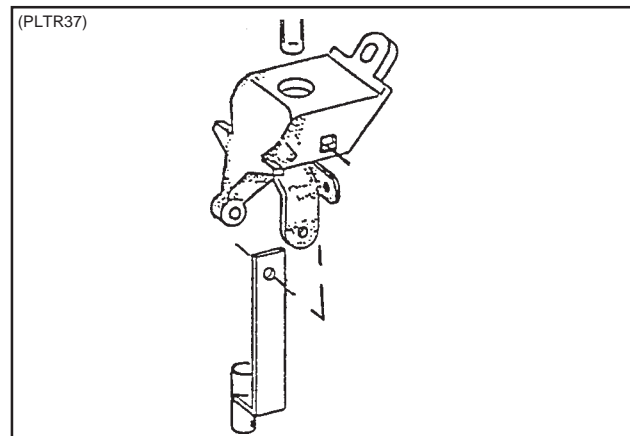
Granular chemical banding options allow front and/or rear banding.

With use of the granular chemical hopper divider and second meter, two banding applications may be utilized.

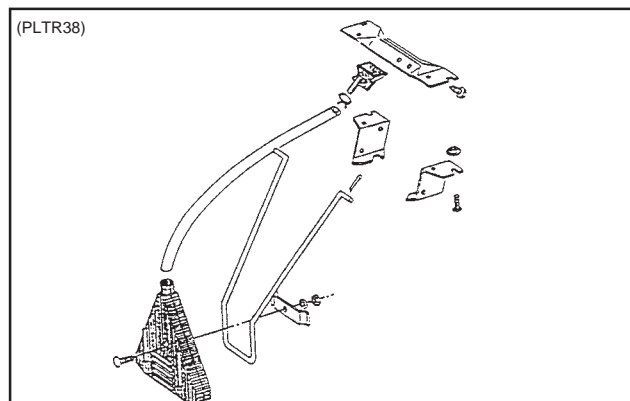
NOTE: The granular chemical rear bander is not compatible with the covering discs/single press wheel option.



4 1/2" Slope-Compensating Bander



Straight Drop In-Furrow Placement



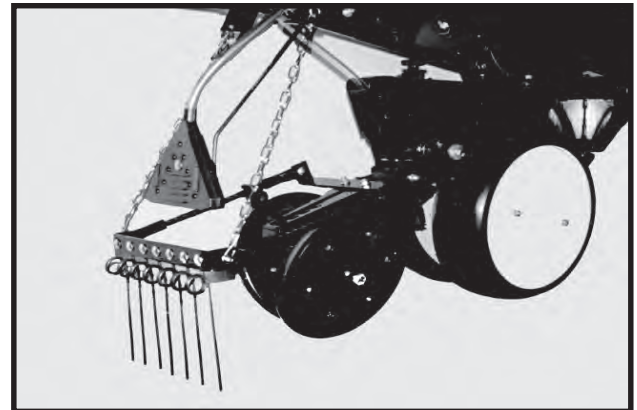
14" Rear Banding

SPRING TOOTH INCORPORATOR

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

NOTE: The spring tooth incorporator is not compatible with the covering discs/single press wheel option.

73090-4a

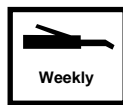


LUBRICATION

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

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

LUBRICATION SYMBOLS



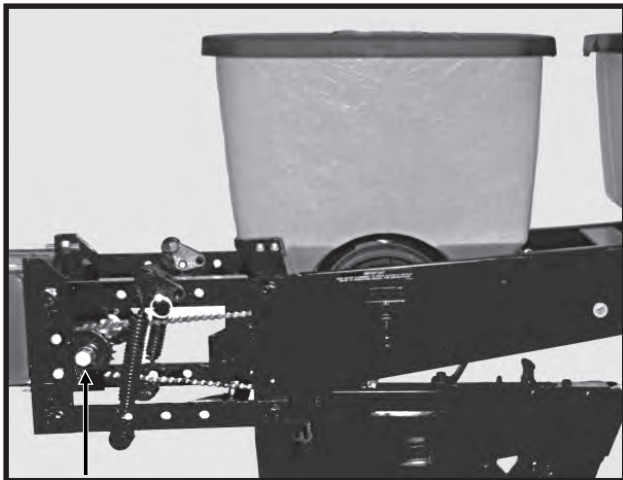
Lubricate at frequency indicated with an SAE multipurpose type grease.



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

SEALED BEARINGS

72794-21a



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.

CENTER POST

67976-13a



The center post is clad with stainless steel. To prolong service life keep stainless steel surface clean and free of any lubrication.

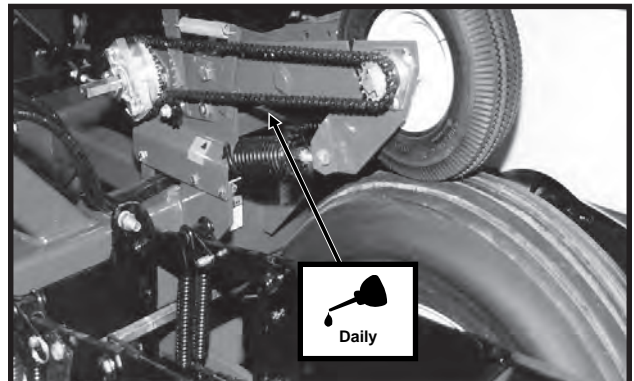
CENTER POST AND POLY WEAR PADS REQUIRE NO LUBRICATION. ANY OIL OR GREASE WILL ATTRACT DIRT AND ACCELERATE WEAR ON THE CENTER POST AND ON THE POLY WEAR PADS.

See “Wear Pad Replacement/Adjustment” for additional information.

DRIVE CHAINS

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

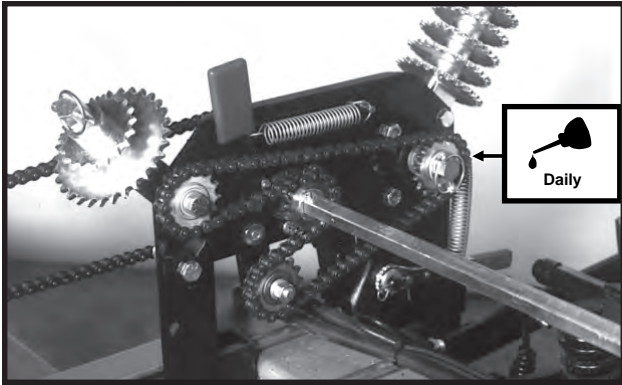
03279803



Contact Wheel Drive Chain

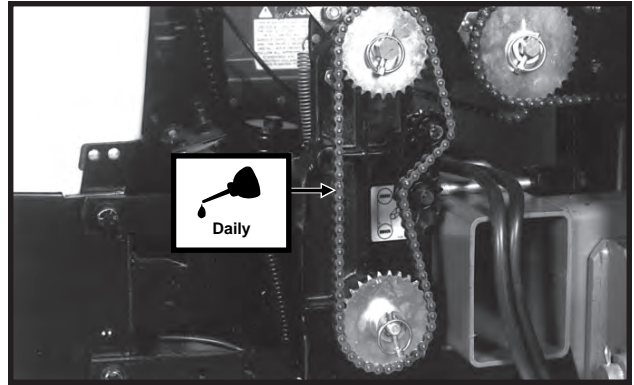
LUBRICATION

69797-26



Reverser Plate Drive Chain

69797-7



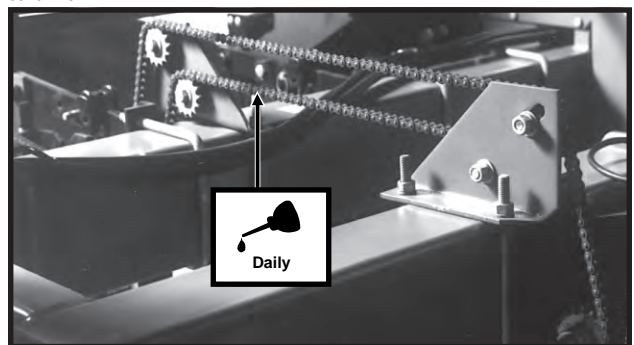
Planter Transmission Drive Chain

72359-123



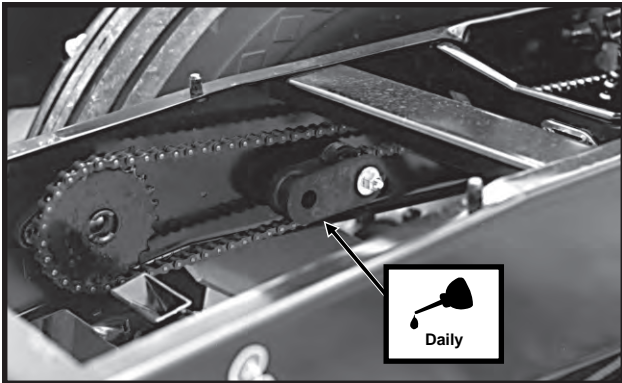
Pull Row Unit Meter Drive Chain(s)

69797-18



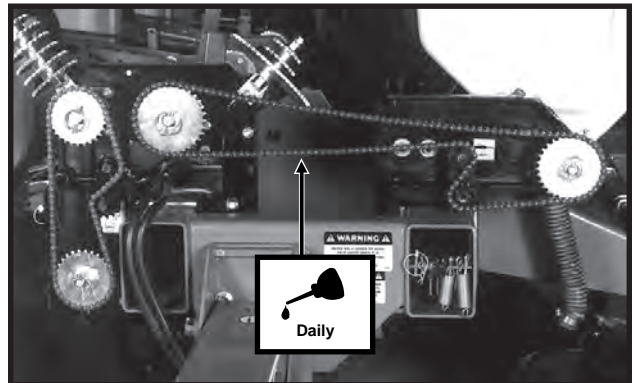
Interplant® Drive Chain

72359-126



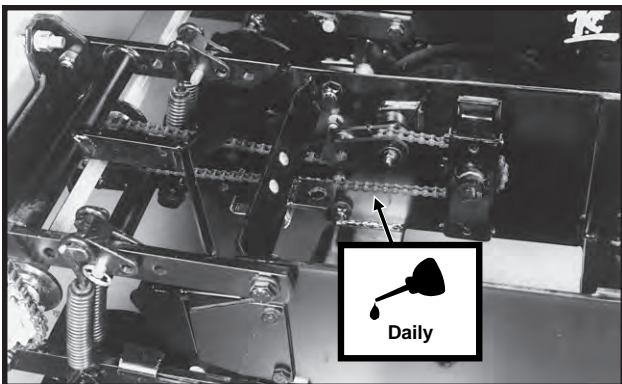
Row Unit Granular Chemical Drive Chain(s)

69797-21



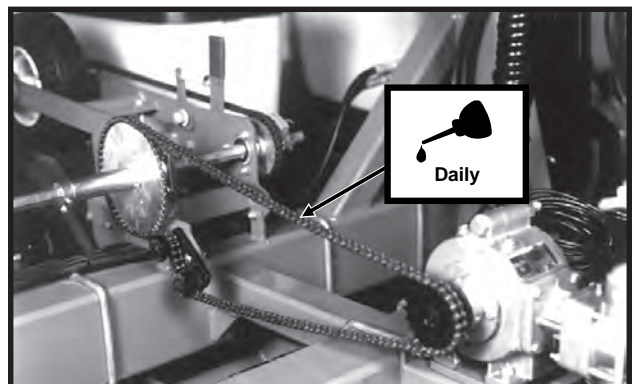
Dry Fertilizer Drive Chain

82354-6



Push Row Unit Meter Drive Chain(s)

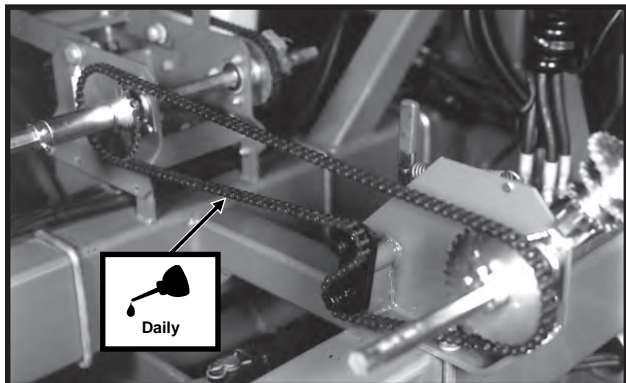
69922-32



**Liquid Fertilizer Drive Chain (Optional Piston Pump)
Style A Shown**

LUBRICATION

69922-21



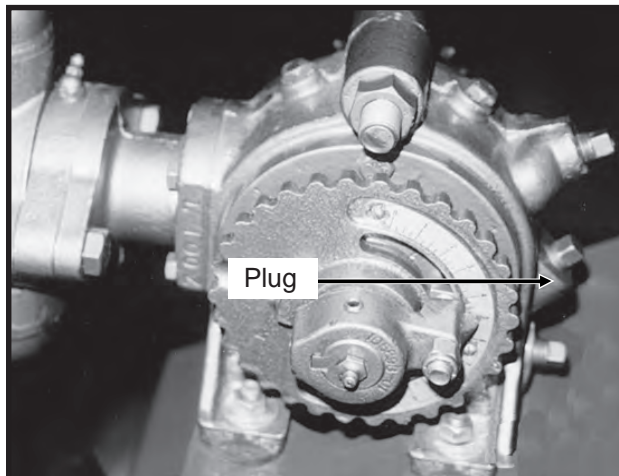
Liquid Fertilizer Drive Chain (Optional Squeeze Pump)

WHEEL BEARINGS

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

LIQUID FERTILIZER PISTON PUMP

12229799



Check crankcase oil daily and maintain at plug level. Fill as needed with EP 90 weight gear oil.

Refer to operator and instruction manual supplied with the pump and flow divider for additional information.

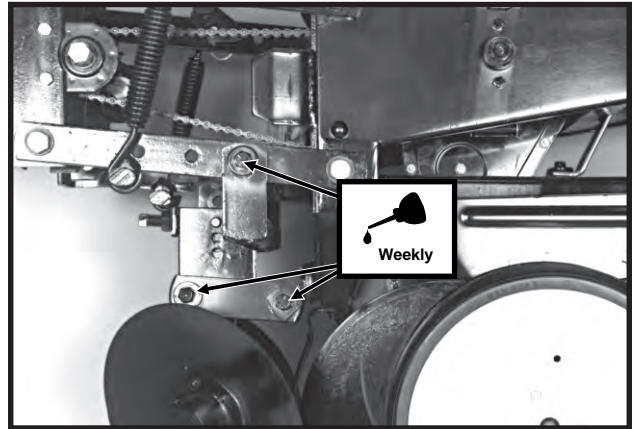
LUBRICATION

BUSHINGS

Lubricate bushings at the frequency indicated.

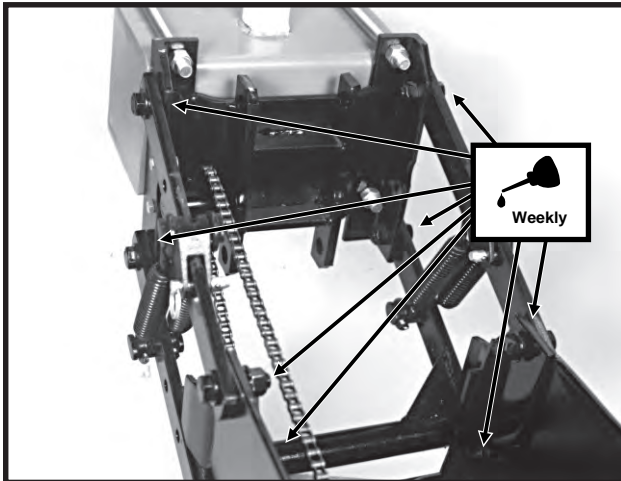
Using a torque wrench, check each bolt for proper torque. If bolt is loose, it should be removed and the bushing inspected for cracks and wear. Replace bushing if necessary. **Only hardened flat washers should be used. Replace damaged flat washers with proper part. Torque bolts to 130 ft. lbs.**

59386-18



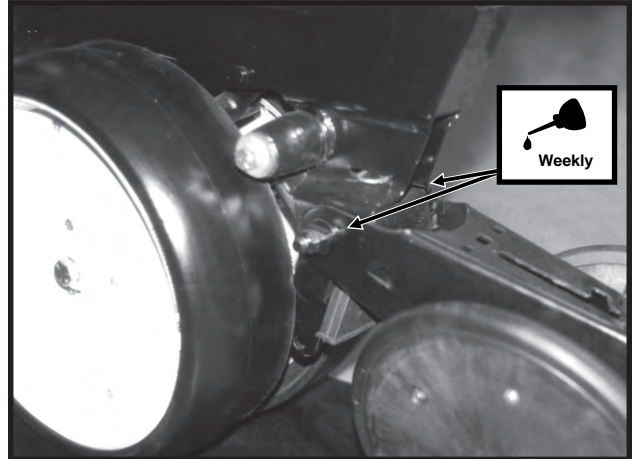
Row Unit Mounted Disc Furrower Parallel Linkage (6 per row)

59386-43



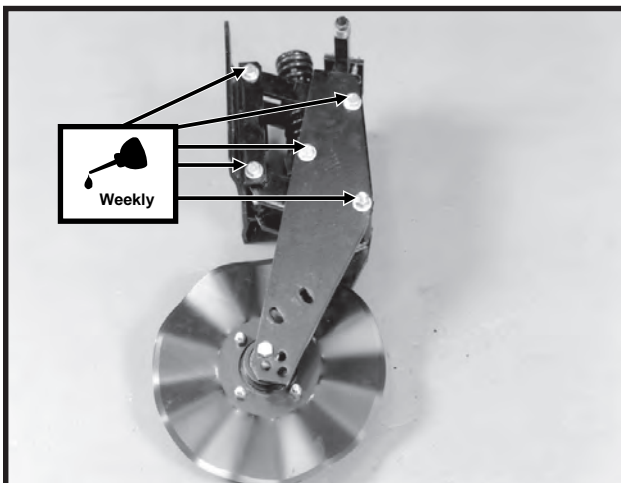
Pull Row Unit and/or Push Row Unit Parallel Linkage (8 per row)

8/30/93-4



Row Unit Closing Wheel and/or Covering Discs/Single Press Wheel Eccentric Bushings (2 per row)

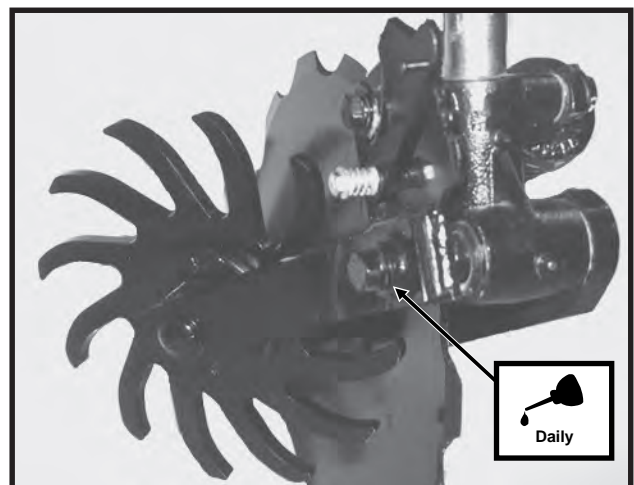
56314-8



Frame Mounted Coulters Parallel Linkage (10 per row)

Shown not installed on row unit for visual clarity.

12229721



Notched Single Disc Fertilizer Opener Residue Wheel (1 per row)

LUBRICATION

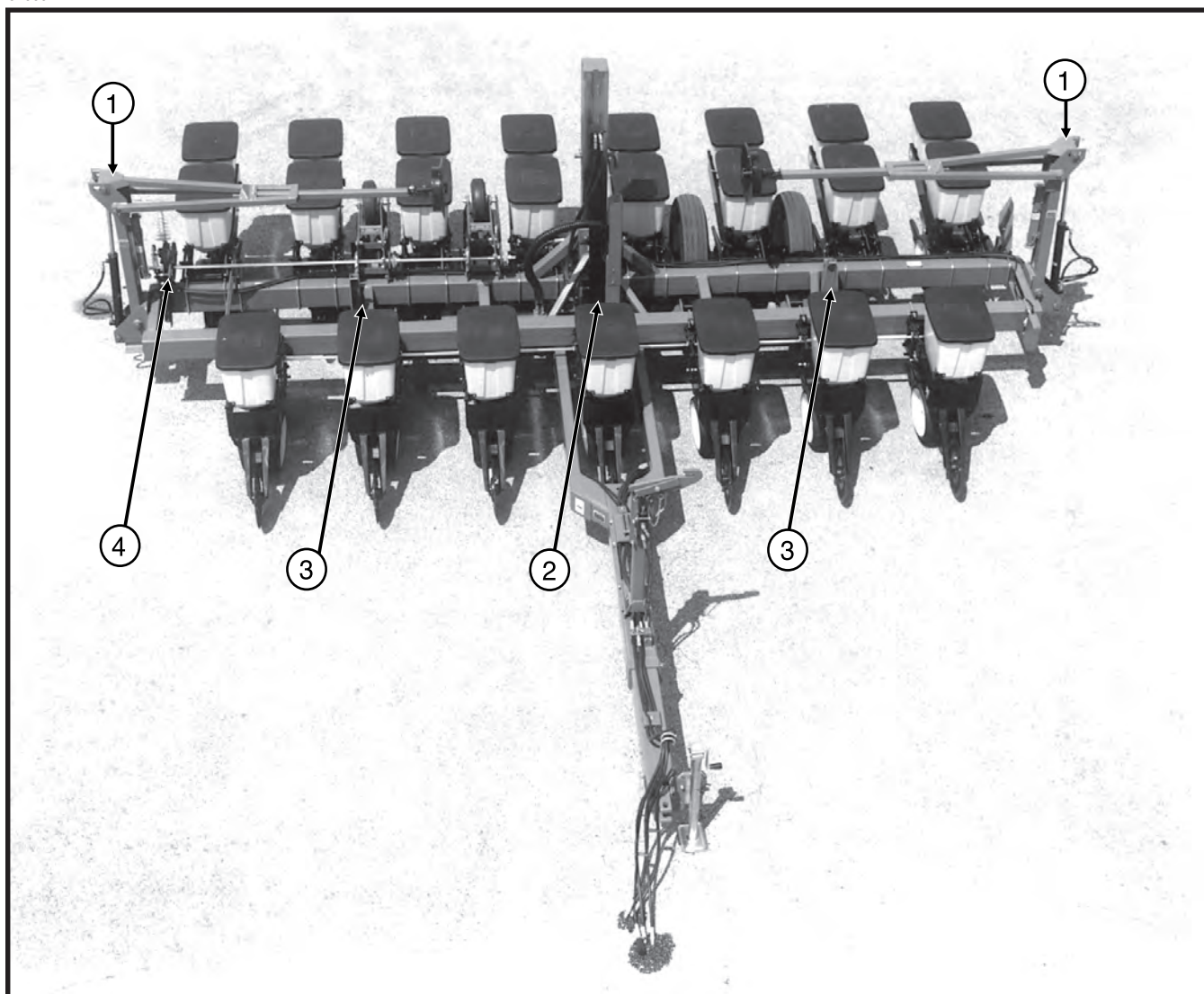
GREASE FITTINGS

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

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

NOTE: Numbers on below photo correspond to photos on following page showing lubrication frequencies.

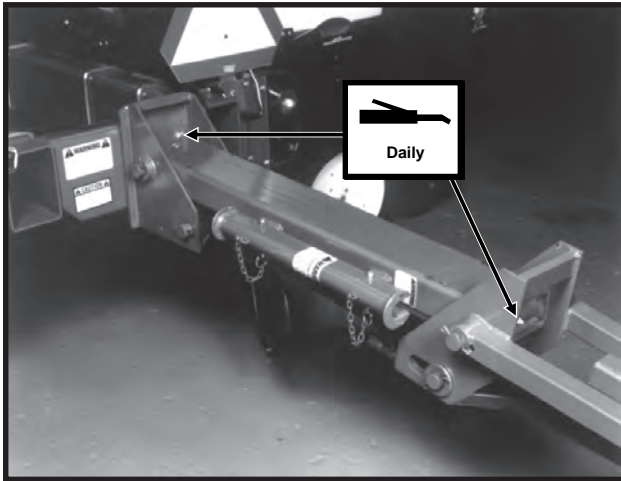
67999-41



LUBRICATION

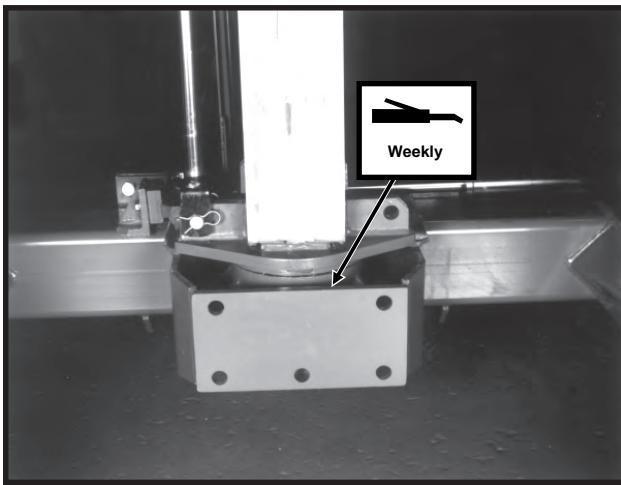
Base Machine

79421-38



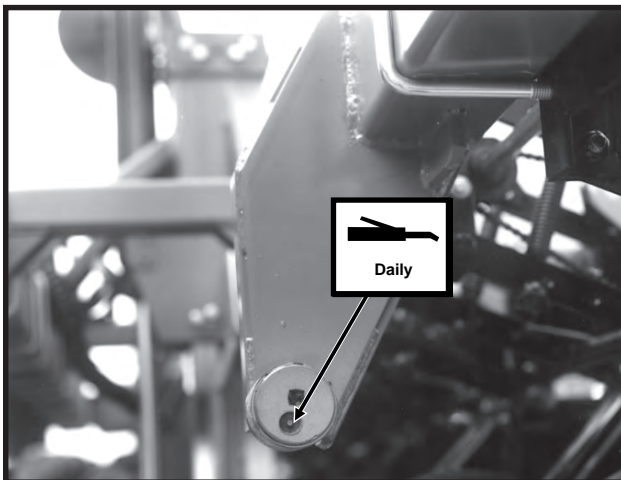
1. Marker Assembly - 2 Zerks Per Assembly

74176-7a



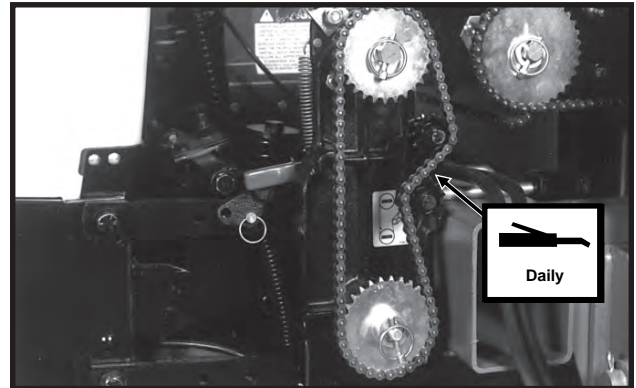
2. Center Pivot - 1 Zerk

67999-22



3. Cam Follower - 1 Zerk Per Cam Follower

69797-7

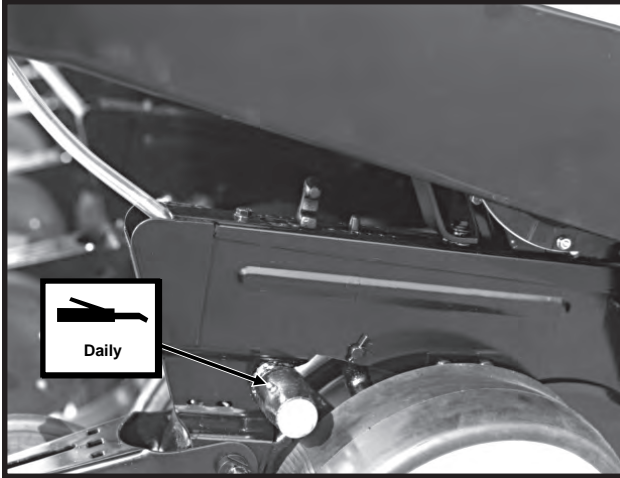


4. Transmission Assembly - 1 Zerk (Idler)

LUBRICATION

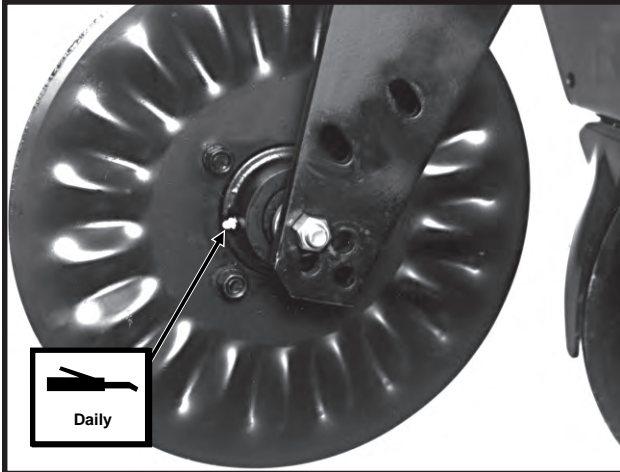
Row Unit

72359-106



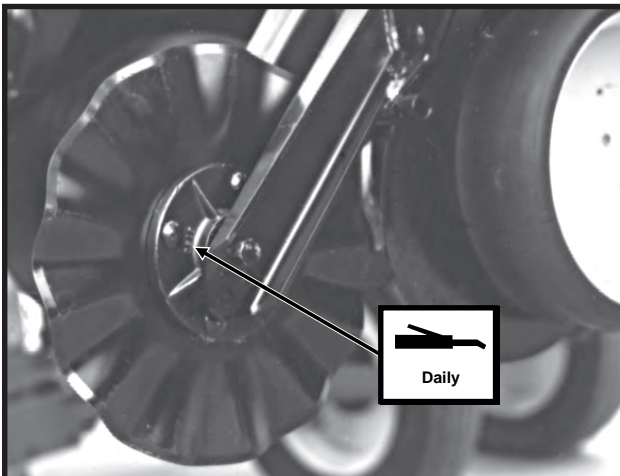
Gauge Wheel Arms - 1 Zerk Per Arm

56673-6



Frame Mounted Coultter Hubs - 1 Zerk Per Hub
(Pump grease into hub until grease comes out around the seals. Spin hub while filling with grease.)

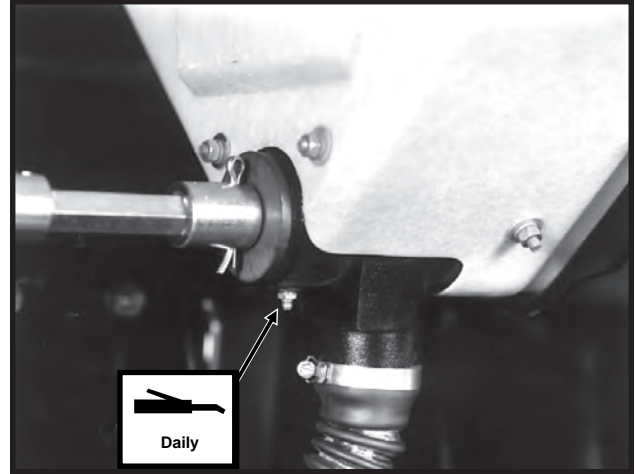
80367-10



Row Unit Mounted No Till Coultter Hubs - 1 Zerk Per Hub
(Pump grease into hub until grease comes out around the seals. Spin hub while filling with grease.)

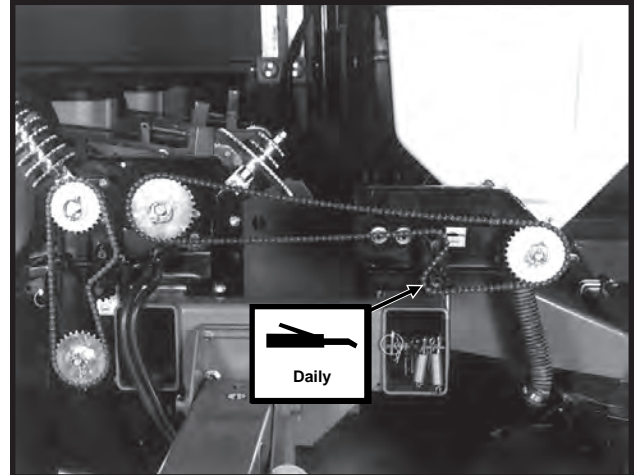
Dry Fertilizer Attachment

61111-28



Fertilizer Hopper - 2 Zerks Per Hopper

69797-21

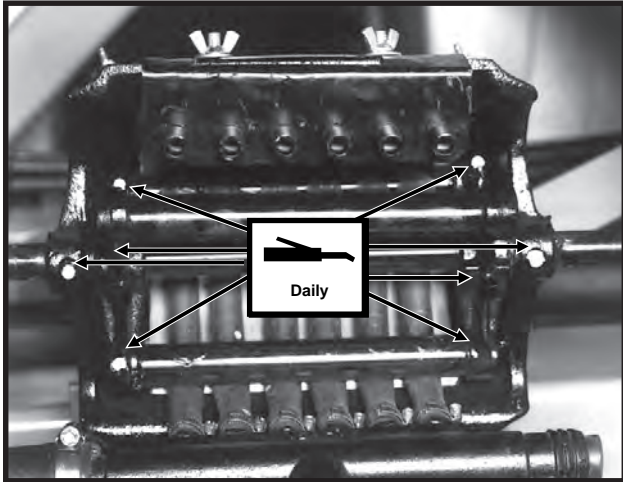


Fertilizer Transmission - 1 Zerk Per Transmission (Idler)

LUBRICATION

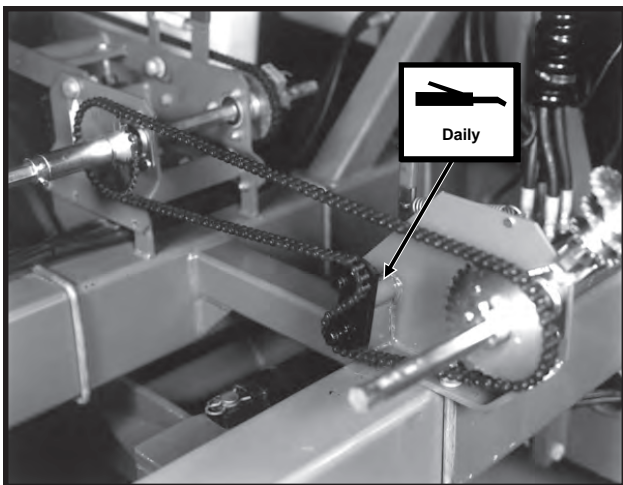
Liquid Fertilizer Attachment

61010-6



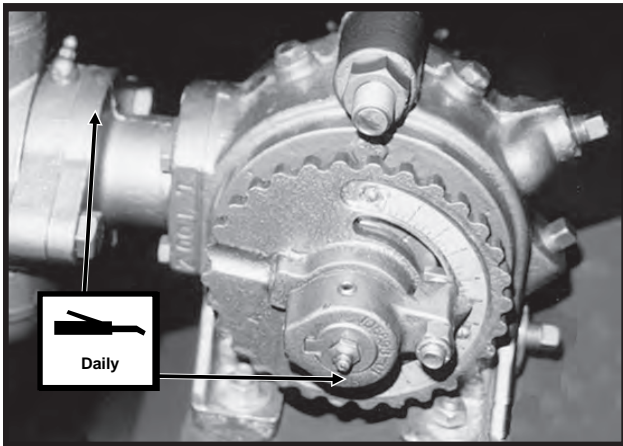
Squeeze Pump - 8 Zerks Per Pump

69922-20



Squeeze Pump Drive Plate - 1 Zerk (Idler)

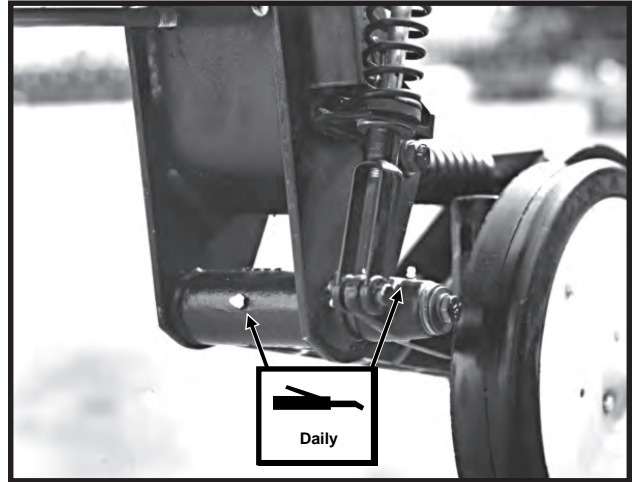
12229799



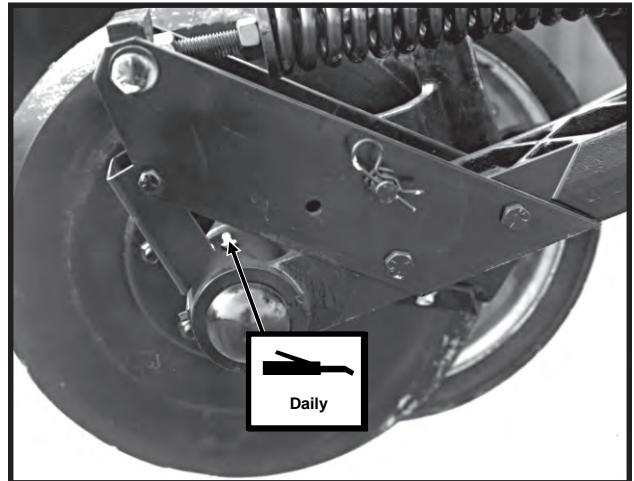
Piston Pump -2 Zerks (Fill zerk on outboard stuffing box until lubricant seeps out of drain hole in bottom.)

HD Single Disc Fertilizer Opener

60389-58



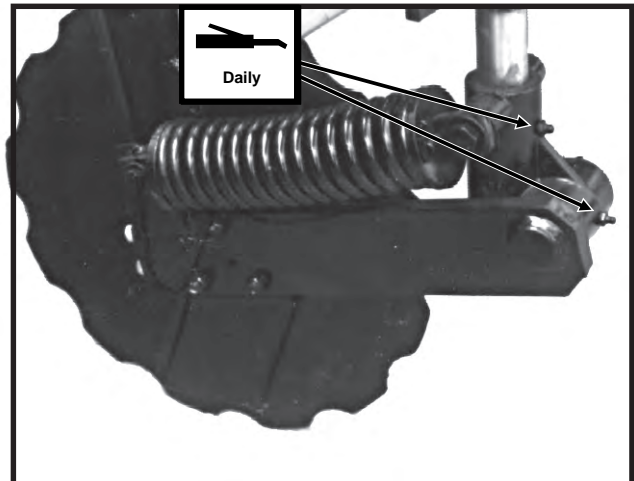
60389-60



HD Single Disc Fertilizer Opener - 3 Zerks Per Opener

Notched Single Disc Fertilizer Opener

8037637b



2 Zerks Per Notched Single Disc Fertilizer Opener

MAINTENANCE

MOUNTING BOLTS AND HARDWARE

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

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

Row unit parallel linkage bushing bolts - 130 Ft. Lbs. (See "Bushings" in the Lubrication Section of this manual.)

5/8" No Till Coulter Spindle Bolts - 120 ft. lbs.

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



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

TORQUE VALUES CHART - PLATED HARDWARE

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

NOTE: Unplated hardware and bolts with lock nuts should be torqued approximately 1/3 higher than the above values. Bolts lubricated prior to installation should be torqued to 70% of value shown in chart.



GRADE 2
No Marks



GRADE 5
3 Marks

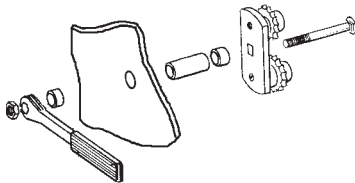


GRADE 8
6 Marks

CHAIN TENSION ADJUSTMENT

The drive chains have a spring loaded idler and therefore are 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 rotate freely.

(MT18a)



NOTE: The nut on the mounting bolt (on applicable idler assemblies) must be kept tight or chain tension will not be maintained and adjustment wrench will not function properly.

Additional chain links can be found in the storage area located inside the front planter frame.

79421-21

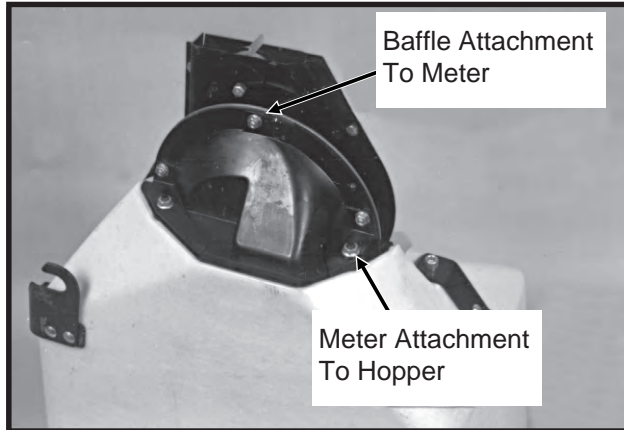


MAINTENANCE

FINGER PICKUP SEED METER INSPECTION/ADJUSTMENT

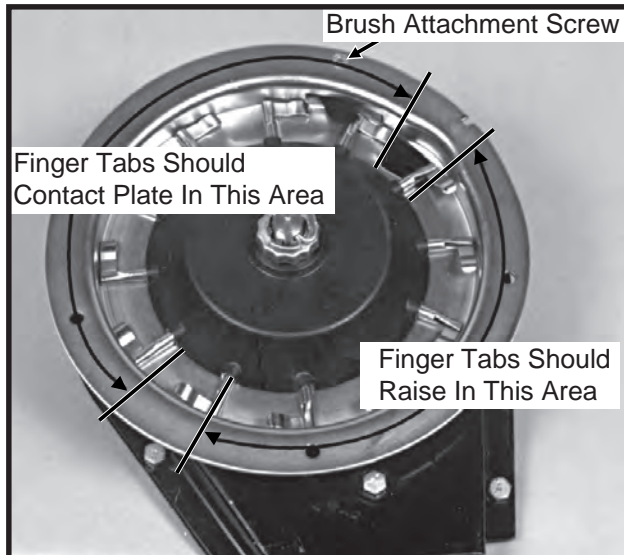
To inspect or service the finger pickup seed meter, remove the meter from the seed hopper by removing the two nuts which secure the mechanism to the hopper. Remove the baffle from the meter assembly by removing three cap screws. This will permit access to the finger pickup.

60620-8



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

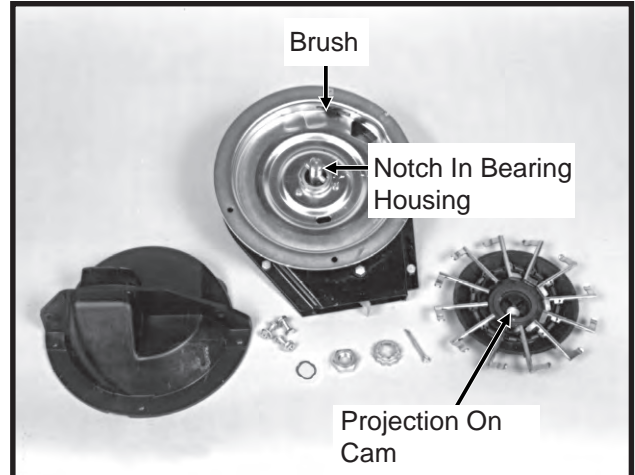
60620-16a



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

1. Remove cotter pin, cover nut, adjusting nut and wave washer (If Applicable) from drive shaft.
2. Carefully lift finger holder, along with fingers and cam, off of the shaft and clean.

60620-3a



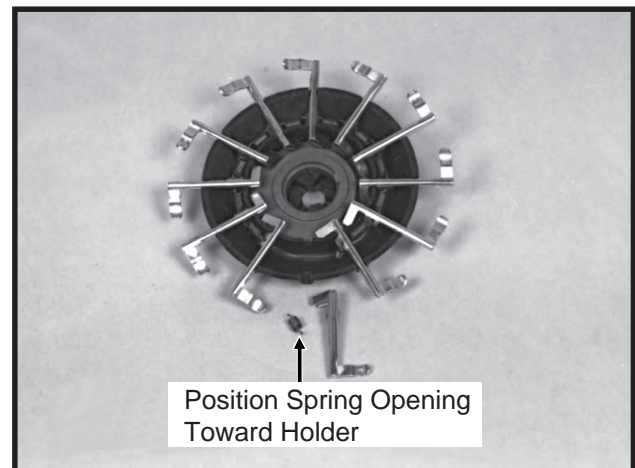
3. Check brush for wear and replace if necessary or following every 100 acres per row of operation.

EXAMPLE: Approximately 800 acres of corn on an 8 row machine or 1200 acres on a 12 row machine.

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

4. To replace fingers or springs, remove springs from fingers and remove finger from holder by lifting it out of the friction fit slot. Under average conditions, life expectancy of these parts should be 600-900 acres per row of operation.
5. After cleaning and/or replacing defective parts, reassemble the meter in the reverse order. When replacing fingers, make sure the open end of the spring loop is toward the inside of the finger holder.

60620-22



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

MAINTENANCE

50725-4

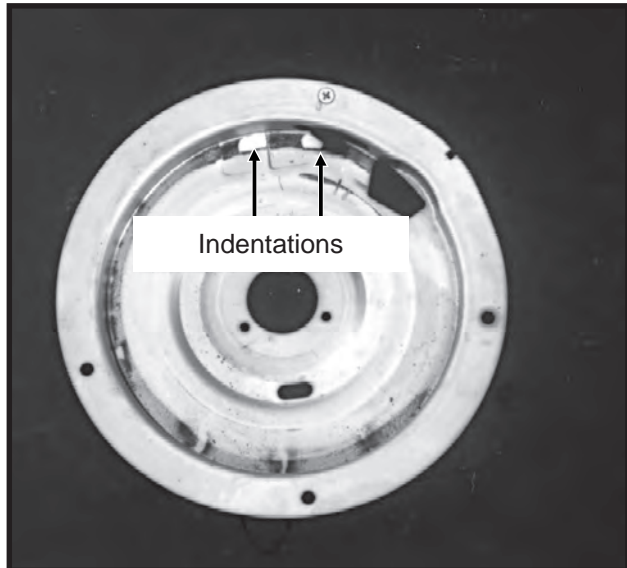


Photo shows worn plate

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

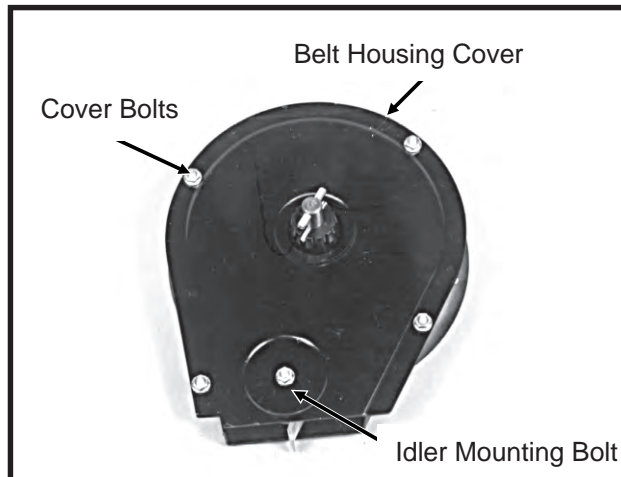
Inspect the carrier plate annually. Under average conditions, the life expectancy of the carrier plate should be 250-300 acres per row of operation.

8. With finger holder flush against the carrier, install wave washer and adjusting nut. Tighten adjusting nut to fully compress wave washer. Then back off nut $\frac{1}{2}$ to 2 flats ($\frac{1}{12}$ to $\frac{1}{3}$ turn) to obtain rolling torque of 14 to 22 inch pounds.
9. Turn finger holder by hand to make sure it is positioned firmly against the carrier, but is not over tightened and can be rotated with moderate force.
10. Install cage nut and cotter pin and reinstall housing.

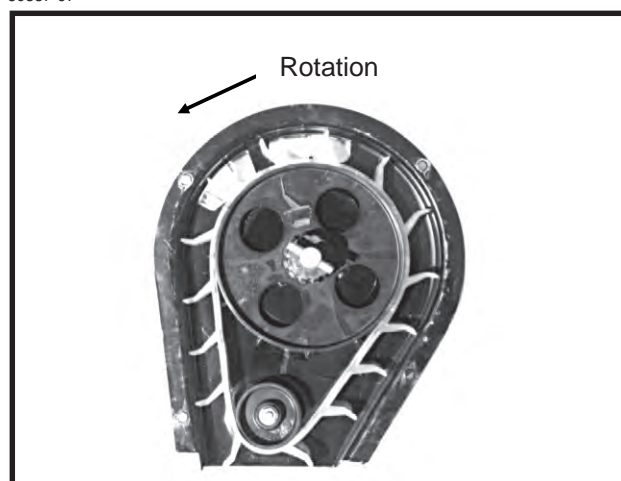
NOTE: Check tightness of adjusting nut on each unit after first day of use and periodically thereafter.

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

60620-13



60887-97



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

CAUTION: Do not over tighten hardware.

FINGER PICKUP SEED METER CLEANING

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

MAINTENANCE

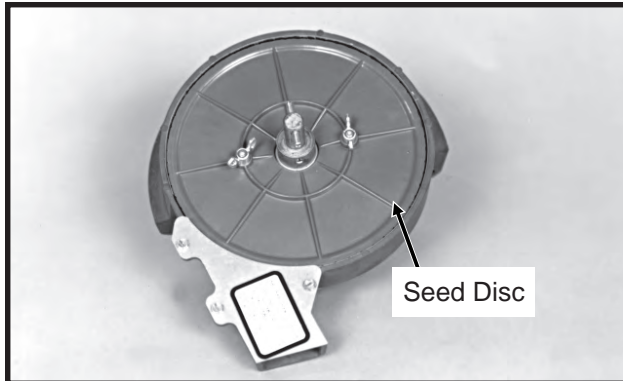
FINGER PICKUP SEED METER TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|--|---|--|
| One row not planting seed. | Drive release not engaged. | Engage drive release mechanism. |
| | Foreign material in hopper. | Clean hopper and finger carrier mechanism. |
| | Seed hopper empty. | Fill seed hopper. |
| | Pin sheared in drive release sprocket. | Replace pin. Inspect meter for obstructions or defective parts. |
| | Row unit drive chain off of sprocket or broken. | Check drive chain. |
| Drive release does not engage properly. | Drive release shaft is not aligned properly with meter drive shaft. | Align drive mechanism. See "Seed Meter Drive Adjustment". |
| Unit is skipping. | Foreign material or obstruction in meter. | Clean out and inspect. |
| | Finger holder improperly adjusted. | Adjust to proper setting. (14 to 22 in. lbs. rolling torque) |
| | Broken fingers. | Replace fingers and/or springs as required. |
| | Planting too slowly. | Increase planting speed to within recommended range. |
| Planting too many doubles. | Planting too fast. | Stay within recommended speed range. |
| | Loose finger holder. | Adjust to specs. (14 to 22 in. lbs. rolling torque) |
| | Worn brush in carrier plate. | Inspect and replace if necessary. |
| Over planting. | Worn carrier plate. | Inspect and replace if necessary. |
| | Seed hopper additive being used. | Reduce or eliminate additive or increase graphite. |
| Under planting. | Belt installed backwards. | Remove and install correctly. |
| | Weak or broken springs. | Replace. |
| | Spring not properly installed. | Remove finger holder and correct. |
| | Seed belt catching or dragging. | Replace belt. |
| | Brush dislodging seed. | Replace brush. |
| Irregular or incorrect seed spacing. | Driving too fast. | Check chart for correct speed. |
| | Wrong tire pressure. | Inflate tires to correct air pressure. |
| | Drive wheels slipping. | Reduce down pressure on row unit down force springs. |
| | Wrong sprockets. | Check seed rate charts for correct sprocket combinations. |
| Seed spacing not as indicated in charts. | Wrong tire pressure. | Inflate tires to correct air pressure. |
| | Inconsistent seed size. | Do field check and adjust sprockets accordingly. |
| | Wrong sprockets. | Check chart for correct sprocket combination. |
| | Charts are approximate. | Slight variations due to wear in meter components and tire slippage due to field conditions may produce seed spacing variations. |
| | Stiff or worn drive chains. | Replace chains. |
| Scattering of seeds. | Planting too fast. | Reduce planting speed. |
| | Seed tube improperly installed. | Check seed tube installation. |
| | Seed tube worn or damaged. | Replace seed tube. |
| Seed tubes and/or openers plugging. | Allowing planter to roll backward when lowering. | Lower planter only when tractor is moving forward. |
| Inconsistent seed depth. | Rough seed bed. | Adjust down pressure springs. Reduce planting speed. |
| | Partially plugged seed tube. | Inspect and clean. |
| | Seed tube improperly installed. | Install properly. |

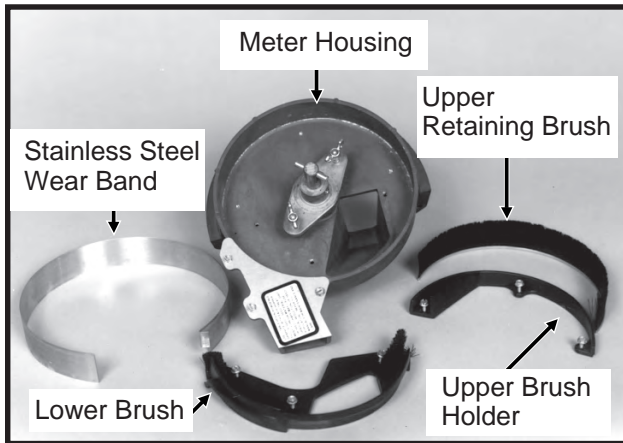
MAINTENANCE

BRUSH-TYPE SEED METER MAINTENANCE

60607-10

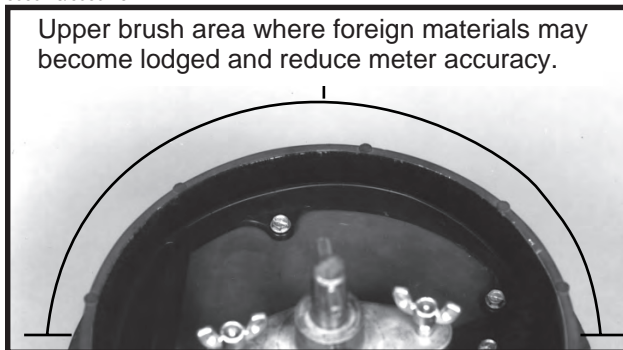


60607-3



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

60607-8/60607-8L



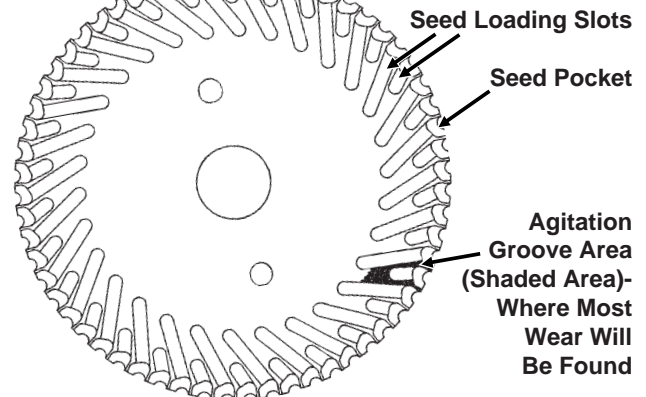
NOTE: Replace hopper lids after hoppers are filled to prevent accumulation of dust or dirt in the seed meter which will cause premature wear.

Cleaning brush-type seed meter for storage:

1. Remove meter from seed hopper by removing the two nuts which secure the meter to the hopper.
2. Remove seed disc and wash with soap and water and dry thoroughly.
3. Remove upper retaining brush by removing the three hex head screws from the brush holder and removing brush holder and retaining brush.
4. Remove the three hex head screws from the lower brush and remove lower brush and stainless steel wear band.
5. Wash all parts and meter housing with soap and water and dry thoroughly.
6. Inspect all parts for wear and replace worn parts.
7. Reassemble meter except for seed disc. **Meter should be stored in a rodent-free space with seed disc removed.**

Seed Disc Wear

(PLTR40a)



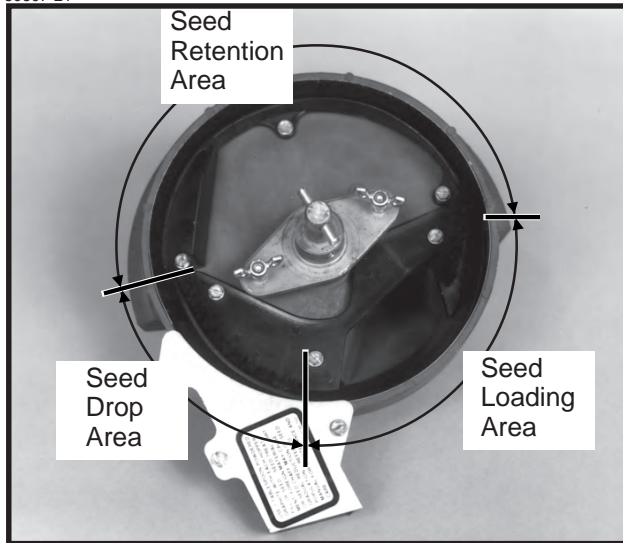
Most wear on the seed disc will be found in the agitation groove area (area between the seed loading slots). Wear will affect planting accuracy at high RPM. To measure for wear, lay a straight edge across the surface of the disc and measure the gap between the disc (at the agitation groove area) and the straight edge. If the agitation groove areas are worn in excess of .030" and accuracy starts to drop off at higher meter RPM, the seed disc should be replaced.

Estimated life expectancy of the seed disc under normal operating conditions should be approximately 200 acres per row. Severe operating conditions such as dust, lack of lubrication or abrasive seed coating could greatly reduce life expectancy of the seed disc.

MAINTENANCE

Upper Retaining Brush

60607-21



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

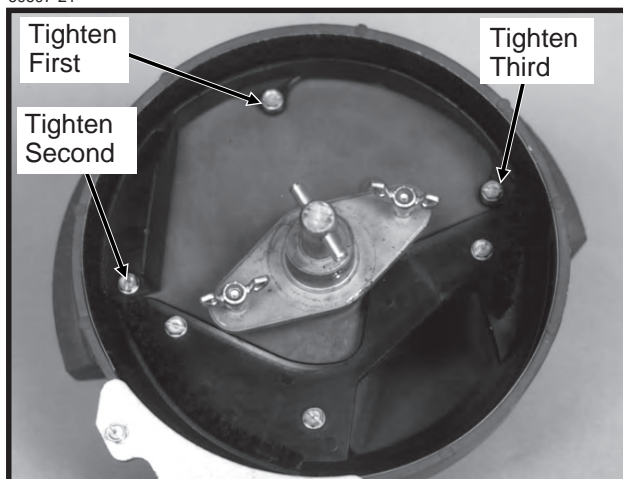
The retaining brush must apply enough pressure against the seed in the seed disc pocket as the disc rotates through the seed retention area to prevent the seed from dropping out of the disc pocket. A damaged spot, excessive wear on the brush or foreign material lodged in the brush may greatly reduce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

The upper retaining brush should be replaced at approximately 120-400 acres per row of use or sooner if damage or excessive wear is found.

Installation Of Upper Retaining Brush

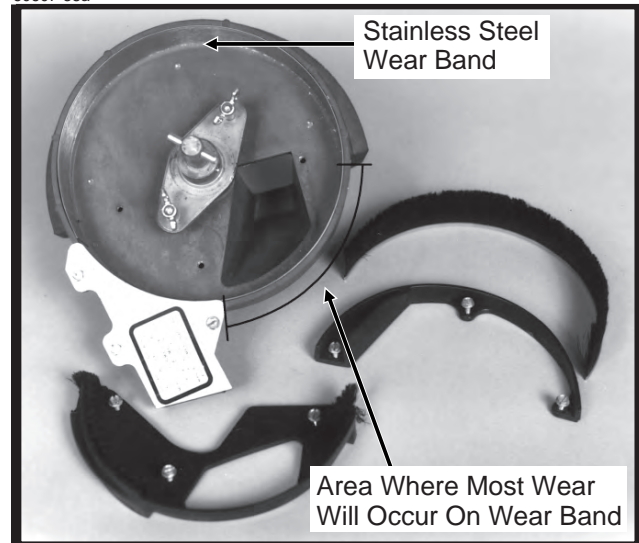
Position retaining brush into inner perimeter of seed retention area. Make sure the base of the brush is tight against the bottom of the meter housing. Install brush holder and three hex head screws. Tighten center screw first, left screw second and right screw last.

60607-21



Stainless Steel Wear Band

60607-38a

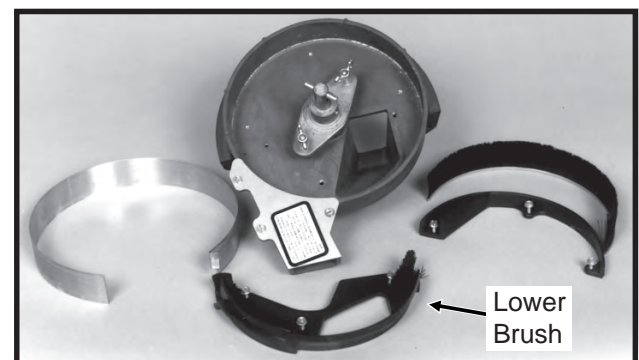


The purpose of the stainless steel wear band is to protect the meter housing from wear. The band is .030" thick and should be replaced when approximately .020" of wear is found in the primary area of wear. If the wear band is allowed to wear through or if the meter is used without the wear band in place,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

Estimated life expectancy of the stainless steel wear band is 240-800 acres per row.

Lower Brush

60607-3



The lower brush has several functions. One function is to move seed down the seed loading slots to the seed pockets. The second function is to isolate seed in the reservoir from entering the seed tube and a third is to clean the seed loading slots.

Estimated life expectancy of the lower brush is 240-800 acres per row. The lower brush should be replaced if the bristles are deformed or missing or if there are cracks in the brush holder.

MAINTENANCE

BRUSH-TYPE SEED METER TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|--|--|--|
| Low count. | Meter RPM too high. | Reduce planting speed. |
| | Misalignment between drive clutch and meter. | See "Seed Meter Drive Adjustment". |
| | Seed sensor not picking up all seeds dropped. | Clean seed tube. Switch meter to different row. If problem stays with same row, replace sensor. |
| | Lack of lubrication causing seeds not to release from disc properly. | Use graphite or talc as recommended. |
| | Seed size too large for seed disc being used. | Switch to smaller seed or appropriate seed disc. See "Brush-Type Seed Meter" for proper seed disc for size of seed being used. |
| | Seed treatment buildup in meter. | Reduce amount of treatment used and/or thoroughly mix treatment with seed. |
| Low count at low RPM and higher count at higher RPM. | Foreign material lodged in upper retaining brush. | Remove seed disc and remove foreign material from between brush holder and bristles. Clean with compressed air. |
| | Worn upper retaining brush. | Replace. See "Maintenance". |
| Low count at higher RPM and normal count at low RPM. | Seed disc worn in the agitation groove area. | Replace disc. See "Maintenance". |
| High count. | Seed size too small for seed disc. | Switch to larger seed or appropriate seed disc. |
| | Incorrect seed rate transmission setting. | Reset transmission. Refer to proper rate chart in "Machine Operation" section of manual. |
| | Upper brush too wide (fanned out) for small seed size. | Replace upper brush. |
| Upper retaining brush laid back. | Seed treatment buildup on brush. | Remove brush. Wash with soap and water. Dry thoroughly before reinstalling. See "Maintenance". |
| | Buildup of foreign material at base of brush. | Remove brush holder and brush. Clean with compressed air. Reinstall. |

CLOSING WHEEL TROUBLESHOOTING

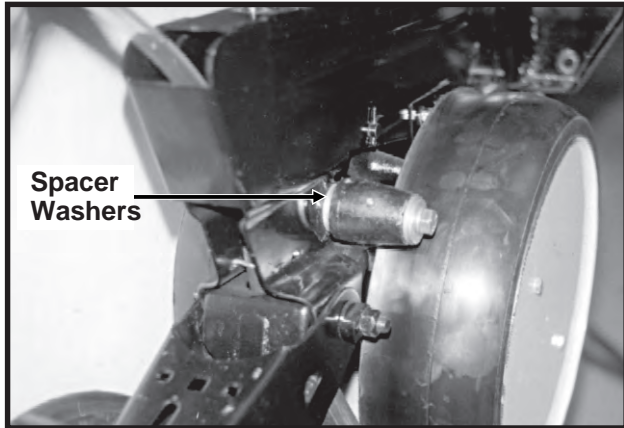
| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|--|---|---|
| Closing wheel(s) leave severe imprint in soil. | Too much closing wheel down pressure. | Adjust closing wheel pressure. |
| Closing wheel(s) not firming soil around seed. | Insufficient closing wheel down pressure. | Adjust closing wheel pressure. Severe no till conditions may require use of cast iron closing wheels. |
| "V" closing wheel running on top of seed furrow. | Improper centering. | Align. See "V" Closing Wheel Adjustment. |
| Single closing wheel not directly over seed. | Improper centering. | Align. See "Covering Discs/Single Press Wheel Adjustment". |

MAINTENANCE

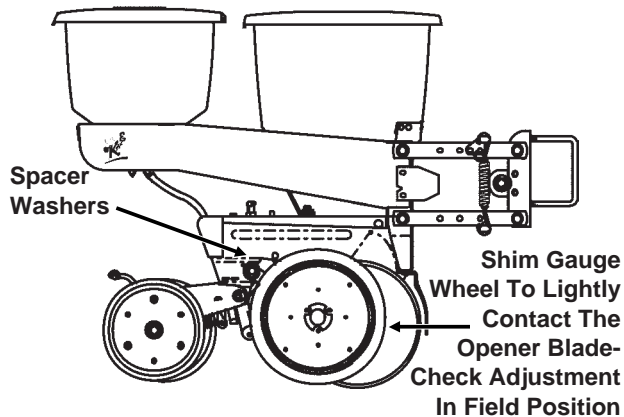
GAUGE WHEEL ADJUSTMENT

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

73090-24



(RU61a)



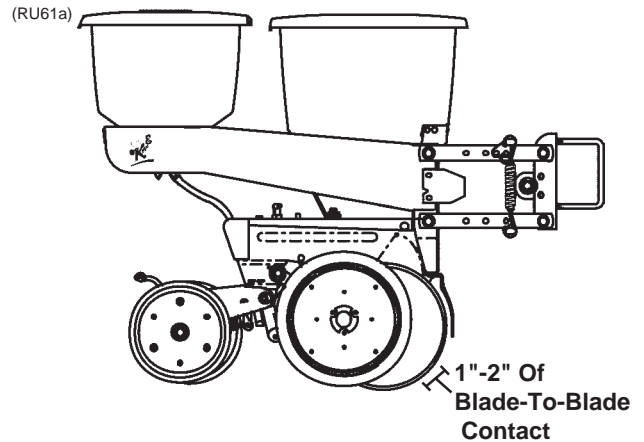
To adjust clearance between gauge wheels and opener blades, add or remove spacer washers between the shank and gauge wheel arm. Store remaining spacer washers between gauge wheel arm and flat washer on outer side of gauge wheel arm.

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

15" SEED OPENER DISC/BEARING ASSEMBLY

1"-2" of blade-to-blade contact should be maintained to properly open and form the seed trench. As the blade diameter decreases due to wear, it will be necessary to remove spacer washers to maintain 1"-2" of contact.

If 1"-2" of blade-to-blade contact cannot be maintained after removing spacer washers or if blade diameter falls below 14 1/2", the blade should be replaced.



To replace disc/bearing assembly:

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

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

5. Remove disc/bearing assembly. The spacer bushings between the shank and disc are used to maintain the 1"-2" blade-to-blade contact.
6. After installing new disc/bearing assembly, install washer and jam nut to secure disc/bearing assembly. Torque 5/8"-11 Grade 2 nut to value shown in "Torque Values Chart".
7. Replace bearing dust cap.
8. Install scraper.
9. Install gauge wheel.

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

To replace bearing:

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

MAINTENANCE

SEED TUBE GUARD/INNER SCRAPER

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

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

50881-9



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

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

ROW UNIT MOUNTED NO TILL COULTER

80367-10



Lubricate at frequency indicated in the Lubrication Section of this manual. Check periodically to be sure nuts and hardware are tightened to proper torque specification.

NOTE: Torque $\frac{5}{8}$ " spindle bolts to 120 ft. lbs.

Be sure the coulter is positioned square with the row unit and aligned in front of row unit disc opener.

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

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

Timely lubrication at the frequency indicated in the Lubrication Section of this manual is necessary to purge moisture and dirt from bearing and seal. This will also lubricate the seal.

NOTE: Add grease until it comes out around the seal. Spin hub while filling with grease.

MAINTENANCE

ELECTRONIC SEED MONITOR SYSTEM TROUBLESHOOTING

LFD2-96/LFD1-96



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

1. Sensors

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

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

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

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

2. Planter Harness And Console Cable

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

3. Console

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

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

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

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

MAINTENANCE

KM1000 TROUBLESHOOTING CHART

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|--|--|
| 1. Low Voltage Indicator is ON. | Connected to 6 volt battery. | Connect to 12 volt battery. |
| | System voltage insufficient. | Insure greater than 11.0 volts. |
| | Battery connection corroded. | Inspect battery connections. If console power cable terminals or battery terminals are dirty or corroded, clean terminals as required. |
| | Console defective. | Repair or replace console. Contact your KINZE® Dealer. |
| 2. One row indicator lamp fails to flash when planting. Alarm does not sound. | Burned out row indicator lamp. | Replace row indicator lamp with a No. 1892 lamp only. (Part No. GR0595). |
| 3. One row indicator lamp fails to flash when planting. Alarm sounds continuously. Seeds are being planted by the row unit. | Sensing elements inside seed sensor are dirty. | Clean sensing elements using a dry bottle brush. NOTE: Some seed treatment chemicals are detrimental to the operation of seed sensors and refuse to be removed by dry brushing. To remove such treatment from the inside of a sensor, proceed as follows: Wet a bottle brush with water, then apply a moderate amount of kitchen cleanser (such as Ajax® or Comet®) to the brush. Scrub inside of sensor until treatment is removed, then rinse sensor in clear cold water. Dry thoroughly. |
| | Defective sensor. | Plug suspect sensor cable into an adjacent row that is operating correctly. If sensor does not operate, sensor is defective. If you wish to continue planting and a replacement sensor is not available, disconnect the defective sensor cable from the planter harness, turn the monitor OFF and then back ON. The monitor will ignore the disconnected row sensor and you can continue to monitor all other rows. |

MAINTENANCE

KM1000 TROUBLESHOOTING CHART (Continued)

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|--|---|---|
| 4. One row indicator lamp fails to come on when the console is powered up. | Burned out row indicator lamp. | Replace row indicator lamp with a No. 1892 lamp only. (Part No. GR0595) |
| | Defective seed sensor or planter harness. | Disconnect the suspected sensor from the planter harness row lead. Disconnect the sensor from the planter harness of an adjacent row. Reverse the harness row leads to the sensors (connect the suspected sensor to the adjacent row planter harness lead and the adjacent sensor to the suspected row harness lead). Turn console power OFF then back ON. If the symptom moves to the adjacent row, the seed sensor is defective and needs replaced. If the symptom does not move, the planter harness or console is defective and needs repaired. Visually inspect the planter harness for cuts, pinching, etc., if damage is found, repair by cutting away the cable covering and splicing the wires (being sure to match wire colors). Solder the splices and tape each wire individually. Tape over repaired cable. |
| | Console defective. | Repair or replace console. Contact your KINZE® Dealer. |
| 5. Monitor completely "dead". | Blown fuse. | Check fuse, located on rear panel of console. If fuse is blown, replace with a 5 amp, type AGC. If fuse blows again, check power connection to battery. If connections are reversed fuse will blow. If battery connections are correct, console needs repair or replacement. Contact your KINZE® Dealer. |
| | Poor battery connections. | Check battery connections. Connections must be clean and tight. |

MAINTENANCE

KM1000 TROUBLESHOOTING CHART (Continued)

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

MAINTENANCE

KM3000 TROUBLESHOOTING CHART

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|--|--|--|
| 1. Display readout incomplete (fragmented) alarm sounds continuously. | Low battery voltage. | Recharge or replace battery. |
| | Battery connections corroded. | Inspect battery connection. If console power cable terminals or battery terminals are dirty or corroded, clean terminals as required. |
| | Console defective. | Repair or replace console. Contact your KINZE® Dealer. |
| 2. One row indicator segment (lower display) fails to flash when planting. Population readout for the planter row is .0. Alarm sounds continuously. Seeds are being planted by the row unit. | Sensing elements inside seed sensor are dirty. | Clean sensing elements using a dry bottle brush. NOTE: Some seed treatment chemicals are detrimental to the operation of seed sensors and refuse to be removed by dry brushing. To remove such treatment from the inside of a sensor proceed as follows: Wet a bottle brush with water, then apply a moderate amount of kitchen cleanser (such as Ajax® or Comet®) to the brush. Scrub inside of sensor until treatment is removed, then rinse sensor in clear cold water. Dry thoroughly. |
| | Defective sensor. | Plug suspect sensor cable into an adjacent row that is operating correctly. If sensor does not operate, sensor is defective. If you wish to continue planting and a replacement sensor is not available, disconnect the defective sensor cable from the planter harness, turn the monitor OFF and then back ON. The monitor will ignore the disconnected row sensor and you can continue to monitor all other rows. |
| 3. Display will not accumulate area planted. | Both radar ground and magnetic distance sensors are connected to the monitor at the same time. | Disconnect either the radar ground sensor or the magnetic distance sensor. |

MAINTENANCE

KM3000 TROUBLESHOOTING CHART (Continued)

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

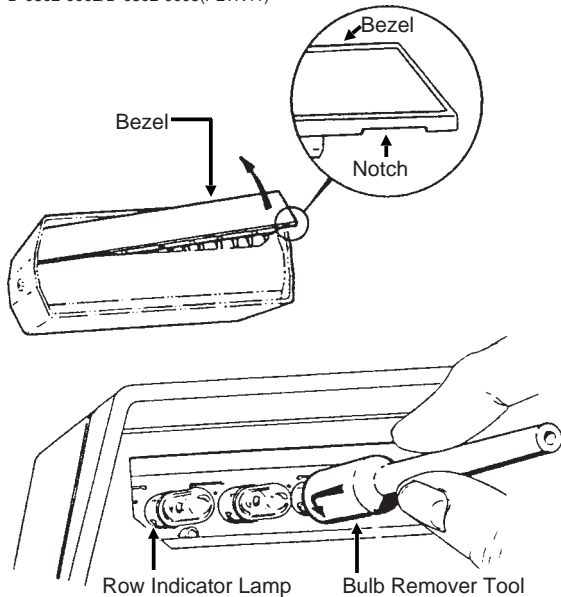
MAINTENANCE

KM3000 TROUBLESHOOTING CHART (Continued)

| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|---|--------------------------|--|
| 5. (Cont'd.) When monitor is turned ON, row display (lower display) remains blank. Upper display shows SPEED, NUMBER OF ROWS, and ROW SPACING constants. Monitor will not enter OPERATE mode. | Planter harness shorted. | Visually inspect the planter harness (including all row unit cables) for cuts, pinching and other types of damage. If damage is found, cut away cable covering and repair the individual wires. Tape over repaired wire and cable. |
| | Console cable shorted. | Visually inspect the console cable for cuts, pinching and other types of damage. If damage is found, cut away cable covering and repair the individual wires. Tape over repaired wire and cable. |
| | Console defective. | If the console cable, planter harness and seed sensors are normal, the console is at fault and needs to be repaired or replaced. Contact your KINZE® Dealer. |

SEED MONITOR ROW INDICATOR BULB REPLACEMENT (KM1000 Only)

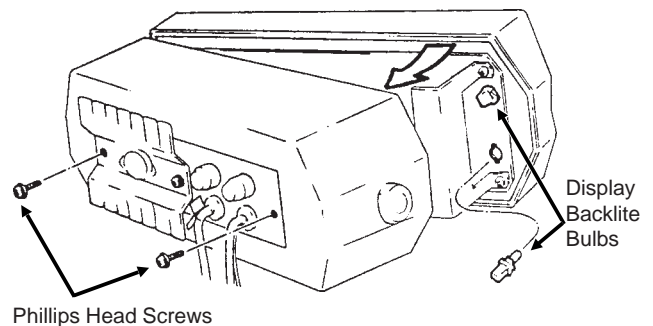
D-0802-0002/D-0802-0003(PLTR41)



Carefully remove the row indicator bezel as shown. Use your fingernail to pry up along the lower outside edge of the bezel. Remove bezel. Remove burned out bulb using a bulb remover tool. Press in on bulb, turn $\frac{1}{4}$ turn counterclockwise and remove bulb. Replace bulb with a No. 1892 (Part No. GR0595) only. Install bezel.

SEED MONITOR DISPLAY BACKLITE BULB REPLACEMENT (KM3000 Only)

D-0841-0006(PLTR42)



Remove the two outside Phillips head screws. **NOTE: DO NOT REMOVE THE CENTER PHILLIPS HEAD SCREW.** Carefully separate the console case from the front panel. Remove the defective bulb by turning the lamp assembly $\frac{1}{4}$ turn counterclockwise and pulling straight out. Replace bulb with a GE No. 73 bulb (Part No. GR1084). Carefully assemble the console front panel, case and rear panel and install the two Phillips head screws. **CAUTION: Make sure that all wires are located where they will not be pinched or cut.**

MAINTENANCE

MARKER SEQUENCING/FLOW CONTROL VALVE INSPECTION

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

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

1. Remove valve block assembly from planter.
2. Remove detent assembly and port adapter assemblies from rear of valve block.

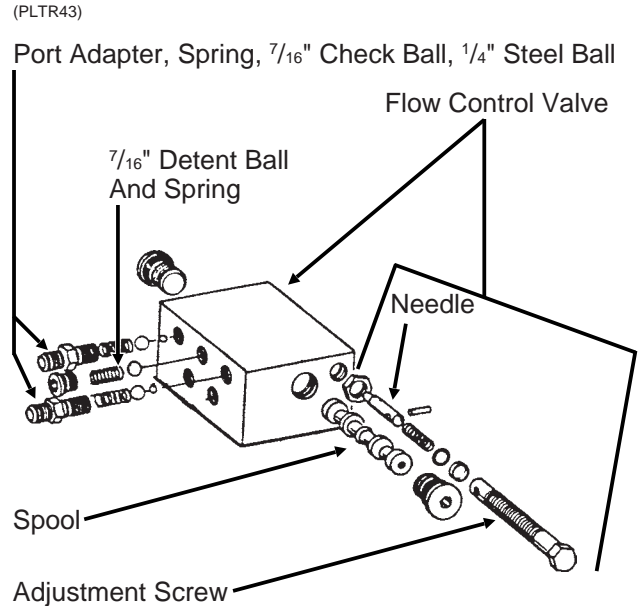
IMPORTANT: Damage to the spool may occur if the detent assembly and port adapter assemblies are not removed prior to removal of the spool.

3. Remove plug from both sides of valve block and remove spool.
4. Inspect all parts for pitting, contamination or foreign material. Also check seating surfaces inside the valve. Replace any parts found to be defective.
5. Lubricate spool with a light oil and reinstall. Check to be sure spool moves freely in valve body.

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

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

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



MAINTENANCE

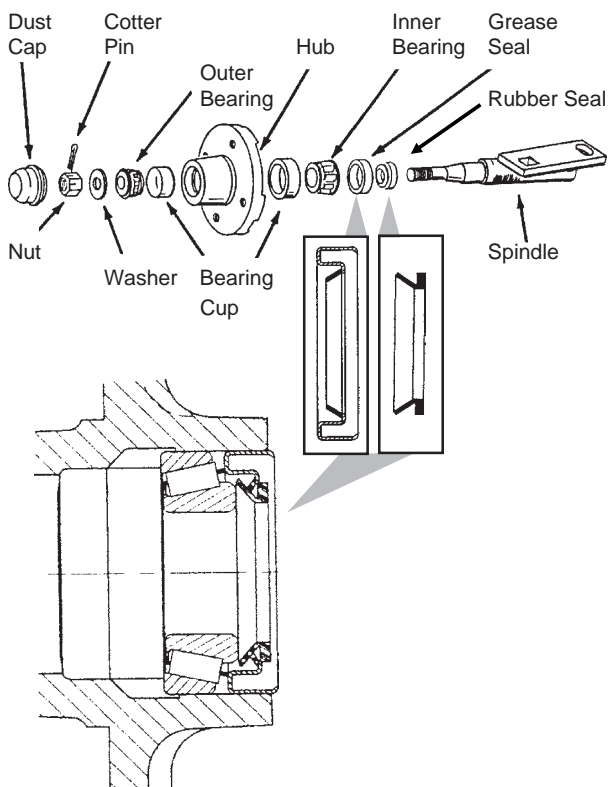
| MARKER OPERATION TROUBLESHOOTING | | |
|---|---|--|
| PROBLEM | POSSIBLE CAUSE | SOLUTION |
| Both markers lowering and only one raising at a time. | Hoses from cylinders to valve connected backwards. | Check hosing diagram in manual and correct. |
| Same marker always operating. | Spool in sequencing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

MAINTENANCE

MARKER BEARING LUBRICATION OR REPLACEMENT

1. Remove marker blade.
2. Remove dust 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. Install rubber seal into grease seal. Place inner bearing in place and press in new rubber seal/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 dust caps approximately $\frac{3}{4}$ full of wheel bearing grease and install on hub.
12. Install blade and dust cap retainer on hub and tighten evenly and securely.

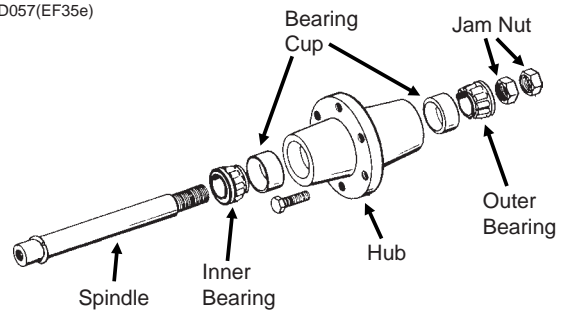
(PLTR45/PLTR99/PLTR98/PLTR102)



WHEEL BEARING LUBRICATION OR REPLACEMENT

1. Raise tire clear of ground and remove wheel.
2. Remove double jam nuts and slide hub from spindle.
3. Remove bearings and cups and discard if bearings are being replaced. Clean hub and dry. Remove bearings only and not cups if repacking.
4. Press in new bearing cups with thickest edge facing in. (Bearing replacement procedure only.)
5. Pack bearings with heavy duty wheel bearing grease thoroughly forcing grease between roller cone and bearing cage. Fill the space between the bearing cups in the hub with grease.
6. Place inner bearing in place.
7. Clean spindle and install hub.
8. Install outer bearing and jam nut. Tighten jam nut while rotating hub until there is some drag. This assures that all bearing surfaces are in contact. Back off jam nut $\frac{1}{4}$ 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.

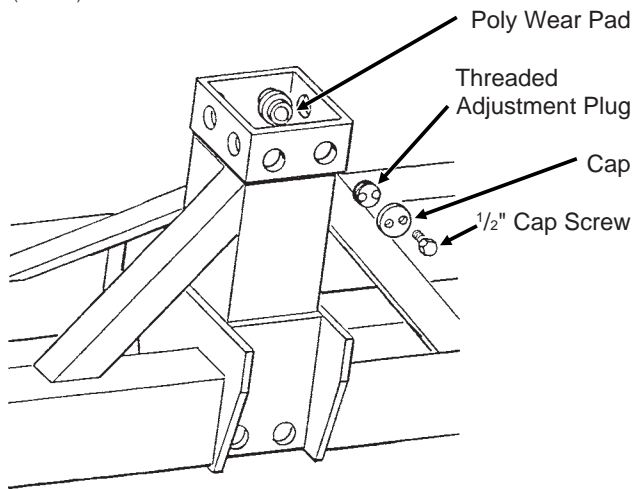
PTD057(EF35e)



MAINTENANCE

WEAR PAD REPLACEMENT/ ADJUSTMENT

(PLTR80)



The center section of the planter consists of a steel tubular frame equipped with 16 adjustable wear pad assemblies which travel up and down against a stainless steel clad center post. Each adjustable wear pad assembly consists of a poly wear pad, a threaded adjustment plug and a cap. The assembly is held in place by the threaded adjustment plug and locked in place by the cap and two 1/2" hex head cap screws.

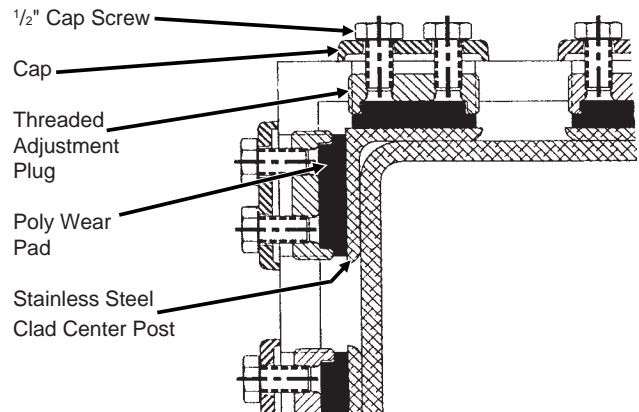
Check pad adjustment and wear annually.

To check adjustment and wear, park the planter on a level surface. Raise the planter to the raised field position. Visually check all 16 adjustable wear pad assemblies. Each wear pad assembly should lightly contact the stainless steel clad center post. The maximum allowable gap, when checked using a thickness gauge, should be no more than .060".



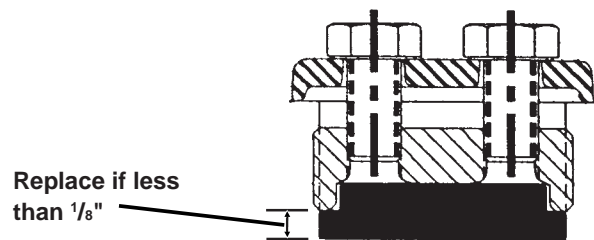
DANGER: Always install all safety lockups and safety lock pins before working under the unit.

(TWL68a)



If adjustment is necessary proceed as follows: (a) Support the frame with safety stands at a comfortable working height with all row units off the ground. (b) Level the planter frame side to side and fore and aft with the planter axle. (c) To remove each wear pad assembly for inspection, remove the two 1/2" cap screws and cap. Reinstall the cap screws into the adjustment pad and remove the threaded adjustment plug and poly wear pad using the cap screws as a handle. (d) If a poly wear pad is worn to less than 1/8" as shown below, replace the wear pad.

(TWL69a)



(e) Reinstall the wear pad assembly. (f) Hand tighten poly wear pad and adjustment plug until the poly wear pad lightly contacts the stainless steel clad center post. (g) Install cap using two 1/2" cap screws. Torque cap screws to 25-30 ft. lbs.

CAUTION: DO NOT OVER TIGHTEN WEAR PADS. OVER TIGHTENING WILL CAUSE PREMATURE WEAR.

MAINTENANCE

PISTON PUMP STORAGE

KEEP AIR OUT OF PUMP! This is the only way to prevent corrosion. Even for short periods of storage, the entrance of air into the pump, will cause RAPID AND SEVERE CORROSION.

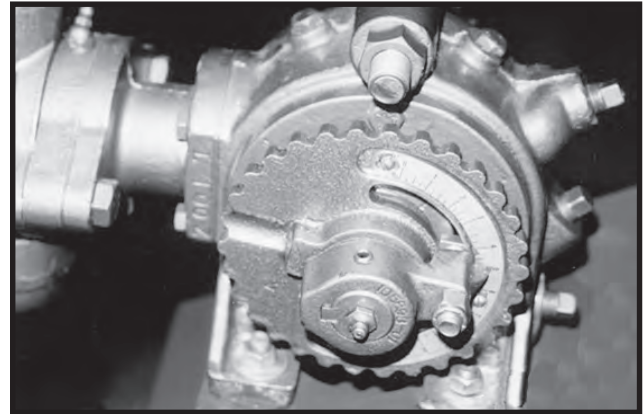
Overnight Storage

SUSPENSION FERTILIZER must be flushed from the pump for ANY storage period.

Winter Storage

1. Flush pump thoroughly with 5 to 10 gallons of fresh water and circulate until all corrosive salts are dissolved in the pump.
2. With the pump set on 10, draw in a mixture of half diesel fuel and half 10 weight oil until the discharge is clean. Then plug inlet and outlet.

12229799



| PISTON PUMP TROUBLESHOOTING | | |
|---|--|-----------------------------------|
| PROBLEM | POSSIBLE CAUSE | SOLUTION |
| Pump hard or impossible to prime. | Valves fouled or in wrong place. | Inspect and clean valves. |
| | Air leak in suction line. | Repair leak. |
| | Pump set too low. | Adjust pump setting. |
| | Packing washers worn out. | Replace. |
| Low metering. | Valves fouled or in wrong place. | Inspect and clean valves. |
| | Air leak in suction line. | Repair leak. |
| | Pump set too low. | Adjust pump setting. |
| | Broken valve spring. | Replace spring. |
| Over meters. | Broken discharge valve spring. | Replace spring. |
| | Trash under valves. | Inspect and clean valves. |
| | Improper rate setting. | Adjust pump setting. |
| Leaks through when stopped. | Broken discharge valve spring. | Replace spring. |
| | Trash under valves. | Inspect and clean valves. |
| Fertilizer solution leaking under stuffing box. | Packing washers worn out. | Replace. |
| Pump using excessive oil. | Oil seals or o-ring worn and leaking. | Replace. |
| Pump operates noisily. | Crankcase components worn excessively. | Inspect and replace if necessary. |

MAINTENANCE

PREPARATION FOR STORAGE

- Store the planter in a dry sheltered area if possible.
- Remove all trash that may be wrapped on sprockets or shafts and remove dirt that can draw and hold moisture.
- Clean all drive chains and coat with a rust preventative spray, or remove chains and submerge in oil.
- Lubricate planter and row units at all lubrication points.
- If possible, remove weight from all tires particularly if the unit is stored outdoors, in which case it is best to remove wheels and tires for storage in a cool dry area.
- Inspect the planter for parts that are in need of replacement and order during the "off" season.
- Make sure all seed, herbicide and insecticide hoppers are empty and clean.
- Clean seed meters and store in a rodent-free dry area.
- Remove seed discs from brush-type seed meter, clean and store meters with discs removed.

Grease exposed areas of cylinder rods before storing planter.

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

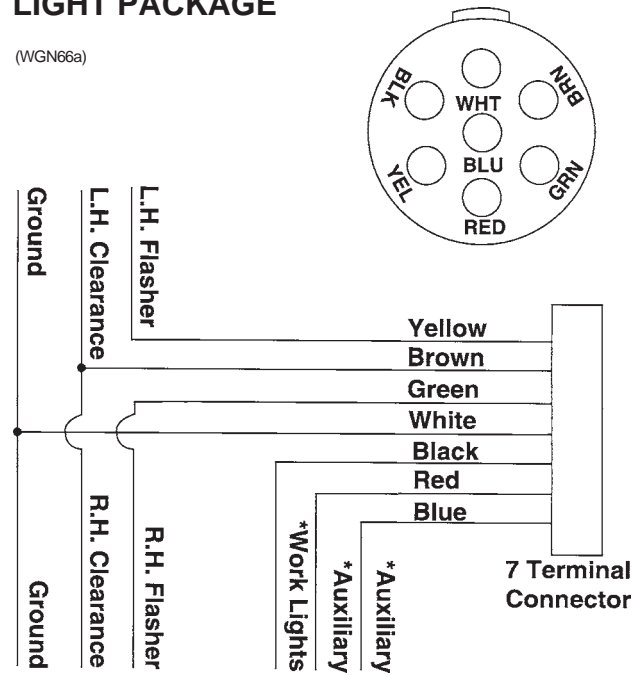
Flush liquid fertilizer tanks, hoses and metering pump with clean water. See "Piston Pump Storage" if applicable.

Empty dry fertilizer hoppers, clean hoppers, disassemble and clean metering augers, reassemble coating all metal parts with rust preventative.

The center post is clad with stainless steel. To prolong service life keep stainless steel surface clean and free of any lubrication. CENTER POST AND POLY WEAR PADS REQUIRE NO LUBRICATION. ANY OIL OR GREASE WILL ATTRACT DIRT AND ACCELERATE WEAR ON THE CENTER POST AND ON THE POLY WEAR PADS.

ELECTRICAL WIRING DIAGRAM FOR LIGHT PACKAGE

(WGN66a)

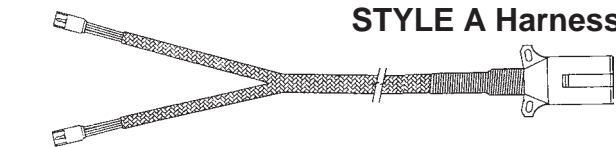


*Optional lights and wires (to be supplied by customer) may be wired into existing plug terminals.

Light package supplied on the Model 2500 planter meets ASAE Standards. For the correct wiring harness to be wired into the lights on your tractor, check with the tractor manufacturer.

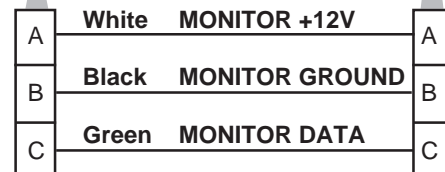
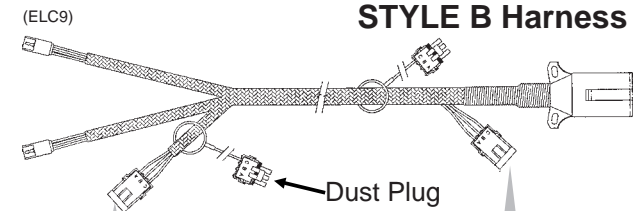
(PT50)

STYLE A Harness



(ELC9)

STYLE B Harness



3 Pin Connector

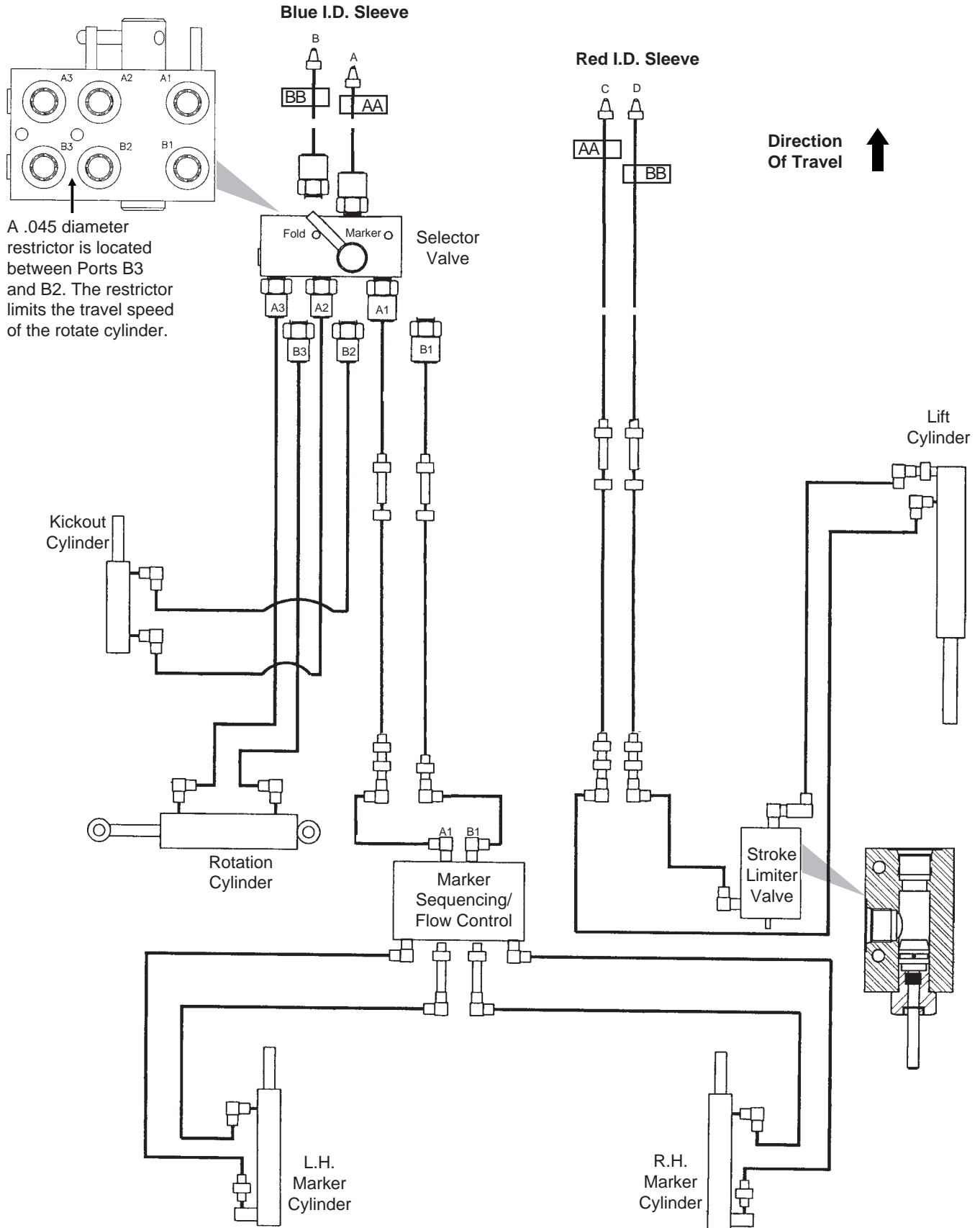
3 Pin Connector

NOTE: These connectors not applicable to KM1000 or KM3000 monitor applications.

MAINTENANCE

HYDRAULIC DIAGRAM, STYLE A Model 2500 Twin-Line® Planter

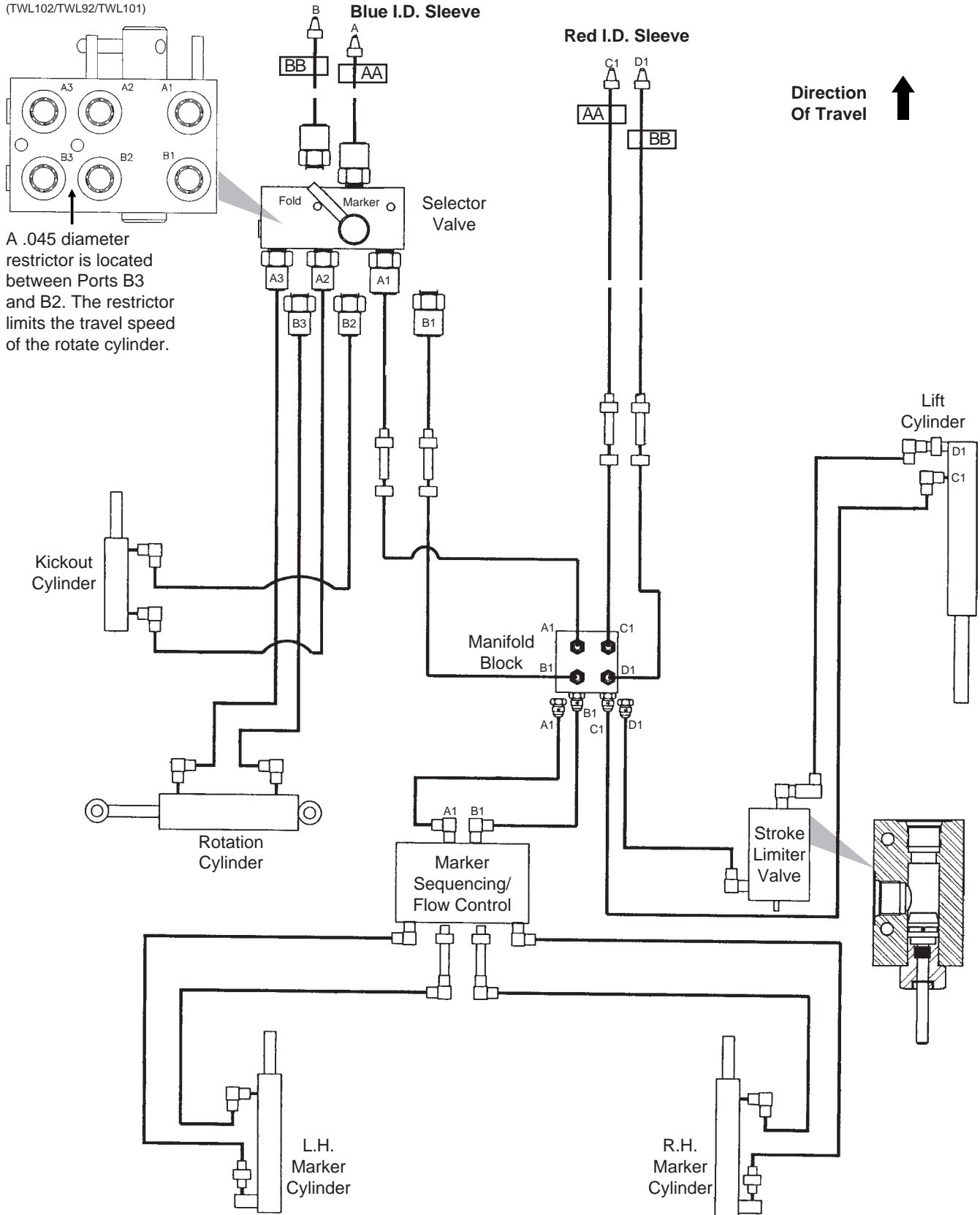
(TWL102/TWL92a/TWL101)



MAINTENANCE

HYDRAULIC DIAGRAM, STYLE B (Manifold Block R.H. Side Of Center Post) Model 2500 Twin-Line® Planter

(TWL102/TWL92/TWL101)



PARTS LIST INDEX

ROW UNIT

| | |
|--|-----|
| Brush-Type Seed Meter | P13 |
| Covering Discs/Single Press Wheel | P6 |
| Disc Furrower, Row Unit Mounted | P20 |
| Finger Pickup Seed Meter | P12 |
| Frame Mounted Coulter W/Disc Furrower | P24 |
| Gauge Wheel | P5 |
| Granular Chemical Banders | P14 |
| Granular Chemical Hopper With Meter(s) And Throwout | P16 |
| Granular Chemical Sub-Assemblies And Kits | P15 |
| Hopper Support And Meter Drive | P10 |
| No Till Coulter, Row Unit Mounted | P19 |
| Parallel Arms, Mounting Support Plate And Quick Adjustable Down Force Springs | P4 |
| Residue Wheel, Row Unit Mounted | P22 |
| Residue Wheels, Coulter Mounted | P23 |
| Seed Firming Wheel | P9 |
| Seed Hopper | P11 |
| Shank Assembly | P2 |
| Spring Tooth Incorporator | P18 |
| “V” Closing Wheels | P8 |

BASE MACHINE

| | |
|---|------|
| Axle/Pivot And Wheel Assembly | P34 |
| Cylinders | P49 |
| Contact Drive Wheel And Arm Assembly | P36 |
| Driveline | P40 |
| Electrical Components | P106 |
| Frame Assembly | P32 |
| Hydraulic Systems | P54 |
| Inner Hitch | P28 |
| Marker Assemblies | P44 |
| Marker Spindle/Hub/Blade | P48 |
| Outer Hitch | P30 |
| Safety Chain | P28 |
| Transmission Assembly | P42 |
| Valves (Stroke Limiter, Selector, Marker Sequencing/Flow Control) | P51 |

ELECTRONIC SEED MONITOR

| | |
|---|--------------------------------|
| Electronic Seed Monitor (KM1000/KM3000) | P58 |
| Electronic Seed Monitor (KPM I/KPM II) | See Assembly Instruction IS364 |

INTERPLANT®

| | |
|---------------------------------|-----|
| Interplant® Push Row Unit | P26 |
| Interplant® Driveline | P60 |

FERTILIZER

| | |
|--|------|
| Dry Fertilizer | P74 |
| Fertilizer Opener Mounting Bar/Bracket (Double Disc And Notched Single Disc Fertilizer Openers) | P62 |
| Fertilizer Openers | P64 |
| Liquid Fertilizer | P78 |
| Rear Trailer Hitch | P102 |

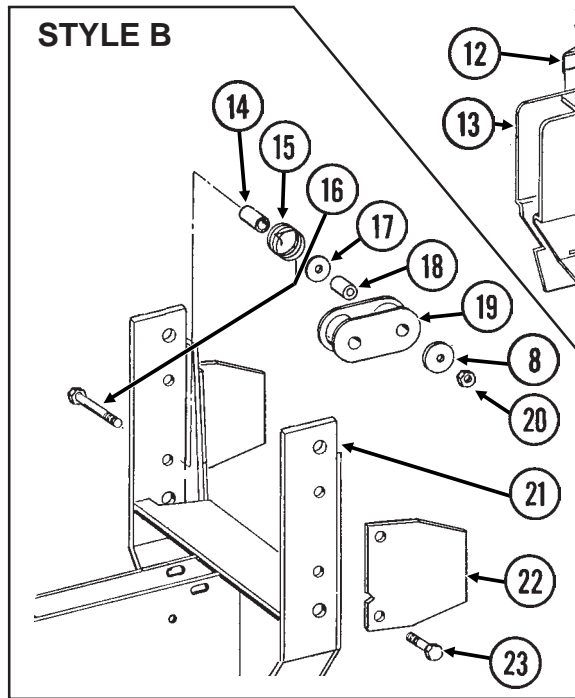
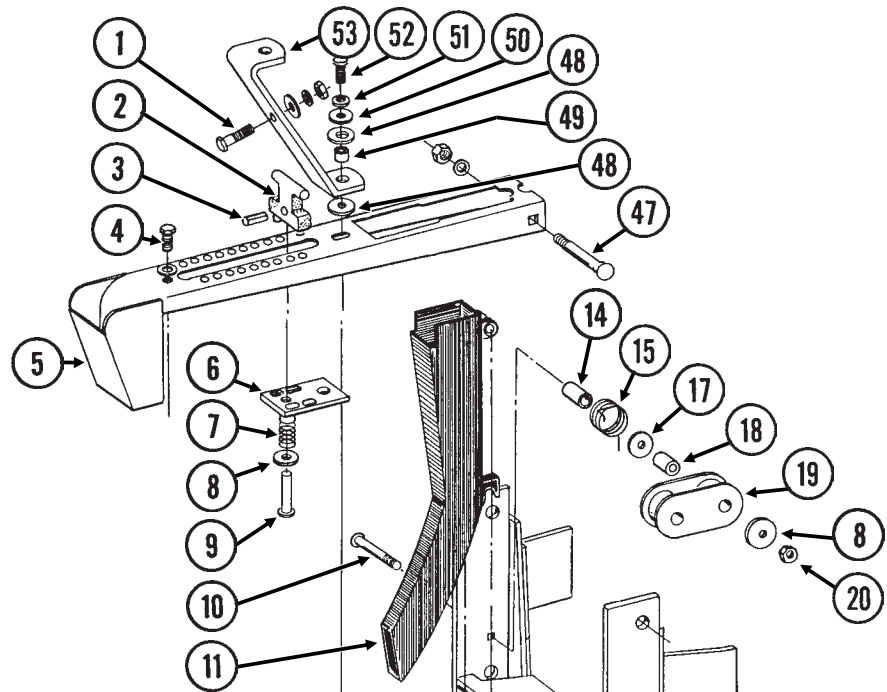
| | |
|---|------|
| SMV Sign, Decals, Reflectors And Tie Straps | P104 |
|---|------|

| | |
|-----------------------|---|
| Numerical Index | a |
|-----------------------|---|

SHANK ASSEMBLY

RUB006/RUA044(RU1c/RU1d)

STYLE A



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|-----------|-------------|
| | | (Per Row) | |

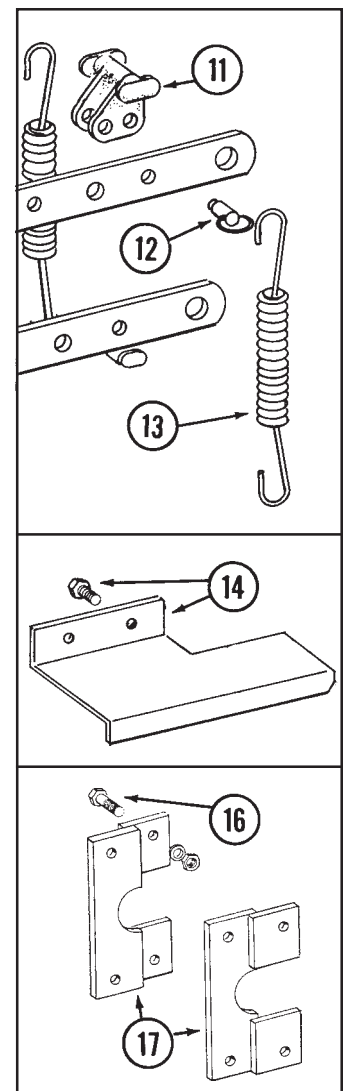
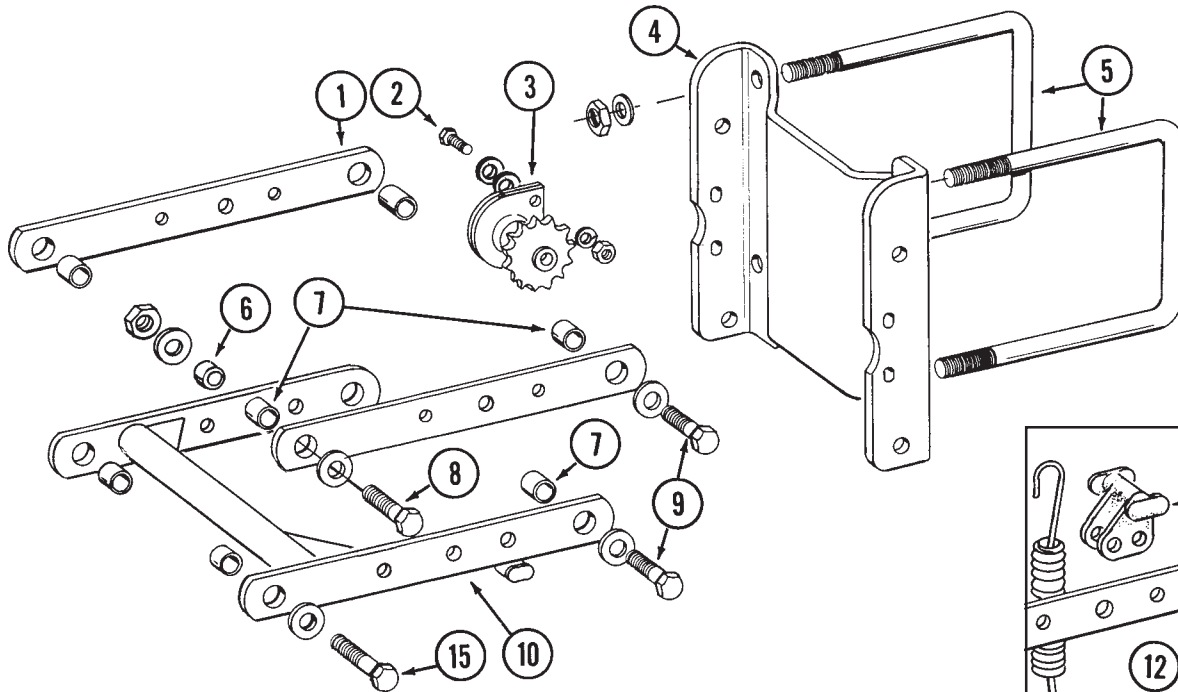
| | | | |
|----|--------|---|--------------------------------------|
| 1. | G10305 | 2 | Carriage Bolt, 3/8"-16 x 1", Grade 2 |
| | G10210 | 2 | Washer, 3/8" USS |
| | G10229 | 2 | Lock Washer, 3/8" |
| | G10101 | 2 | Hex Nut, 3/8"-16 |
| 2. | GB0102 | 1 | Depth Adjusting Handle |
| 3. | G10605 | 1 | Spring Pin, 5/32" x 3/4" |
| 4. | G10001 | 1 | Hex Head Cap Screw, 3/8"-16 x 1" |
| | G10229 | 1 | Lock Washer, 3/8" |
| 5. | GA0811 | 1 | Shank Cover |
| 6. | GB0105 | 1 | Depth Adjusting Slide |

SHANK ASSEMBLY

| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|----------|-------------------|---|
| 7. | GD1066 | 1 | Compression Spring |
| 8. | G10210 | 1 | Washer, 3/8" USS |
| 9. | G10552 | 1 | Clevis Pin, 3/8" x 2" |
| 10. | G10307 | 1 | Carriage Bolt, 3/8"-16 x 3 1/2", Grade 2 |
| 11. | GD1130 | - | Seed Tube, Regular |
| | GA5880 | - | Seed Tube W/High Rate Sensor |
| | GR1062 | - | Seed Tube (With Holes For High Rate Sensor Installation) |
| | GR1087 | - | Sensor Only (For GA5880) |
| 12. | GA2012L | 1 | Disc Scraper, L.H. |
| 13. | GA0860 | 1 | Shank (Sub G1K272) |
| 14. | GD7318 | 1 | Bushing, 1" |
| 15. | GD1065 | 1 | Idler Spring |
| 16. | G10326 | 1 | Hex Head Cap Screw, 3/8"-16 x 3 3/4" |
| 17. | G10201 | 1 | Special Washer |
| 18. | GD1026 | 1 | Spacer, 1 3/16" |
| 19. | GD9240 | 1 | Idler |
| 20. | G10108 | 1 | Lock Nut, 3/8"-16 |
| 21. | GA1306 | 1 | Shank |
| 22. | GD10867 | 2 | Stop |
| 23. | G10004 | 3 | Hex Head Cap Screw, 3/8"-16 x 1 1/4" |
| | G10229 | 3 | Lock Washer, 3/8" |
| | G10101 | 3 | Hex Nut, 3/8"-16 |
| 24. | G10526 | - | Spacer Washer, .048" Gauge (As Required) |
| 25. | G10206 | 2 | Washer, 1/2" SAE |
| 26. | GB0104 | 1 | Depth Adjusting Stop |
| 27. | G10814 | 2 | Spring Pin, 1/4" x 7/8" |
| 28. | GB0103 | 1 | Seed Tube Guard/Inner Scraper |
| 29. | GD1030 | 2 | Disc, 15" |
| 30. | GA2014 | 2 | Bearing |
| 31. | GD10473 | 2 | Housing |
| 32. | G10427 | 12 | Rivet, 1/4" x 1/2" |
| 33. | | - | See "Gauge Wheel", Page P5 |
| 34. | G10216 | 2 | Washer, 1/2" USS |
| 35. | G10228 | 2 | Lock Washer, 1/2" |
| 36. | G10014 | 2 | Hex Head Cap Screw, 1/2"-13 x 1" |
| 37. | GD6533 | 2 | Dust Cap |
| 38. | G10503 | 1 | Jam Nut, 5/8"-11, R.H. |
| | G10504 | 1 | Jam Nut, 5/8"-11, L.H. |
| 39. | G10204 | 2 | Machine Bushing, 21/32" |
| 40. | GA2012R | 1 | Disc Scraper, R.H. |
| 41. | G10213 | - | Machine Bushing, .030" Gauge (As Required) |
| 42. | GD1033 | 1 | Shield |
| 43. | G10328 | 4 | Hex Head Cap Screw, 3/8"-16 x 5/8" |
| | G10622 | 4 | Flange Nut, 3/8"-16 |
| 44. | G10555 | 1 | Clevis Pin, 1/2" x 2 1/2" |
| | G10451 | 1 | Cotter Pin, 1/8" x 1" |
| 45. | G10551 | 1 | Clevis Pin, 1/4" x 2 1/2" |
| | G10669 | 1 | Hair Pin Clip, No. 22 |
| 46. | G10312 | 2 | Carriage Bolt, 5/16"-18 x 3/4", Grade 2 |
| | G10620 | 2 | Flange Nut, 5/16"-18 |
| 47. | G10304 | 1 | Carriage Bolt, 3/8"-16 x 3", Grade 2 |
| | G10108 | 1 | Lock Nut, 3/8"-16 |
| 48. | GD1120 | 2 | Rubber Washer |
| 49. | GD1110 | 1 | Bushing, 1/2" |
| 50. | G10208 | 1 | Special Washer, 13/32" |
| 51. | G10229 | 1 | Lock Washer, 3/8" |
| 52. | G10003 | 1 | Hex Head Cap Screw, 3/8"-16 x 1 1/2" |
| 53. | GD1027 | 1 | Stabilizer Bracket |
| A. | GA2013 | - | Disc And Bearing Assembly, Less Bearing Cap (Items 29-32) |
| B. | G1K212 | - | Meter Drive Idler Kit (Items 8 And 14-20) |
| C. | G1K272 | - | Row Unit Shank Replacement Kit (Items 16 And 20-23) |

PARALLEL ARMS, MOUNTING SUPPORT PLATE AND QUICK ADJUSTABLE DOWN FORCE SPRINGS

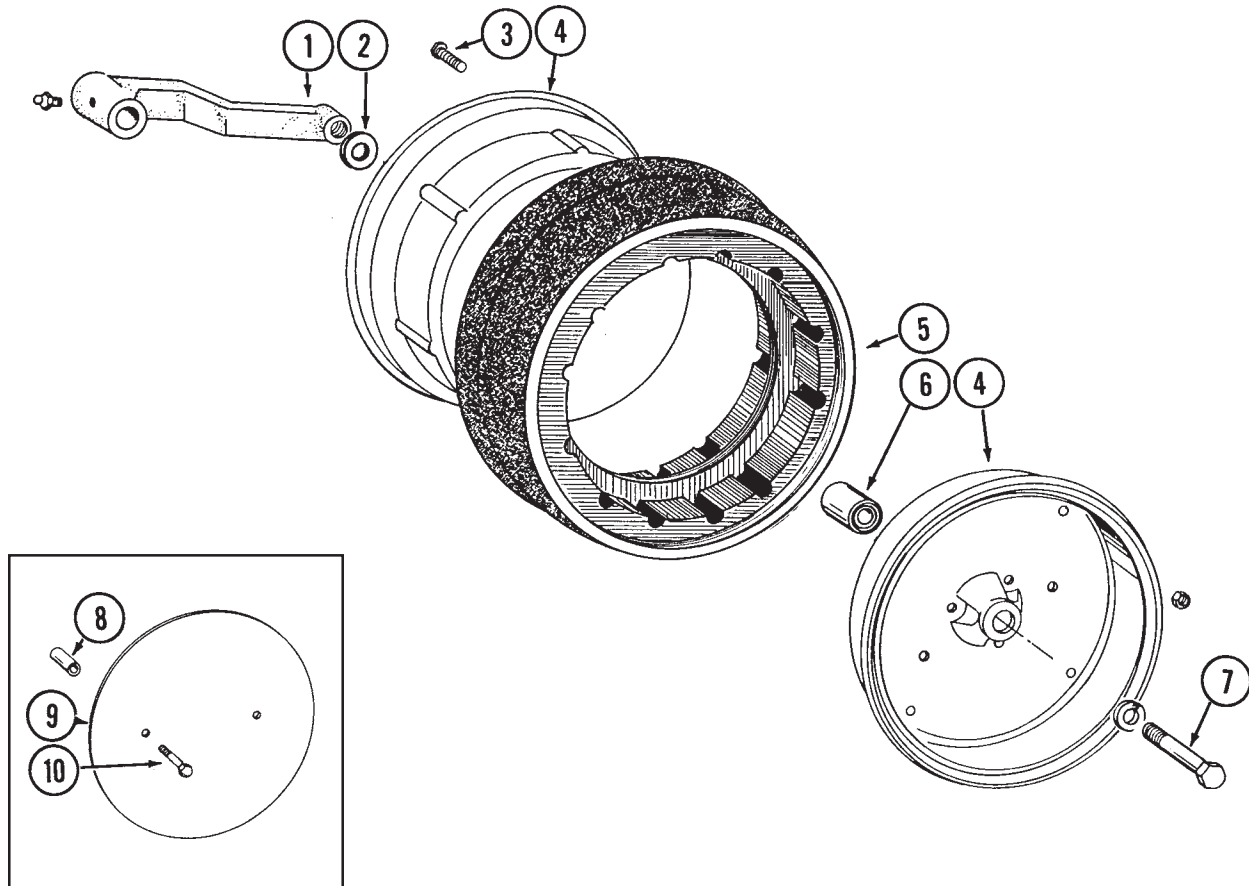
RUB007/RUB015/RUB016/RUB013/RUB019/RUB020(RU2a/RU3/RU4/RU30)



| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|----------|-------------------|--------------------------------------|
| 1. | GD7619 | 2 | Upper Parallel Arm |
| 2. | G10004 | 2 | Hex Head Cap Screw, 3/8"-16 x 1 1/4" |
| | G10210 | - | Washer, 3/8" USS (As Required) |
| | G10229 | 2 | Lock Washer, 3/8" |
| | G10101 | 2 | Hex Nut, 3/8"-16 |
| 3. | GA1720 | 1 | Bearing/Sprocket, 7/8" Bore |
| 4. | GD10036 | 1 | Mounting Support Plate |
| 5. | GD1113 | 2 | U-Bolt, 5" x 7" x 5/8"-11 |
| | G10230 | 4 | Lock Washer, 5/8" |
| | G10104 | 4 | Hex Nut, 5/8"-11 |
| 6. | GD1109 | 2 | Pivot Bushing, 1/4" |
| 7. | GB0218 | 8 | Bushing, 19/32" |
| 8. | G10752 | 2 | Hex Head Cap Screw, 5/8"-18 x 2 1/4" |
| | GD7805 | 4 | Special Washer |
| | G10412 | 2 | Lock Nut, 5/8"-18 |
| 9. | G10732 | 4 | Hex Head Cap Screw, 5/8"-18 x 2" |
| | GD7805 | 4 | Special Washer |
| | G10412 | 4 | Lock Nut, 5/8"-18 |
| 10. | GA5651 | 1 | Lower Parallel Arm |
| 11. | GB0186 | 2 | Spring Anchor |
| 12. | G10545 | 2 | Detent Pin, 1" Grip |
| 13. | GD8249 | - | Spring |
| 14. | G7192X | - | Chain Shield Package With Hardware |
| | G10037 | - | Hex Head Cap Screw, 1/2"-13 x 1 1/4" |
| | G10228 | - | Lock Washer, 1/2" |
| | G10102 | - | Hex Nut, 1/2"-13 |
| 15. | G10751 | 2 | Hex Head Cap Screw, 5/8"-18 x 1 3/4" |
| | GD7805 | 2 | Special Washer |
| | G10412 | 2 | Lock Nut, 5/8"-18 |
| 16. | G10007 | 4 | Hex Head Cap Screw, 5/8"-11 x 1 1/2" |
| | G10230 | 4 | Lock Washer, 5/8" |
| | G10104 | 4 | Hex Nut, 5/8"-11 |
| 17. | GA7410 | 2 | Extension Bracket |

GAUGE WHEEL

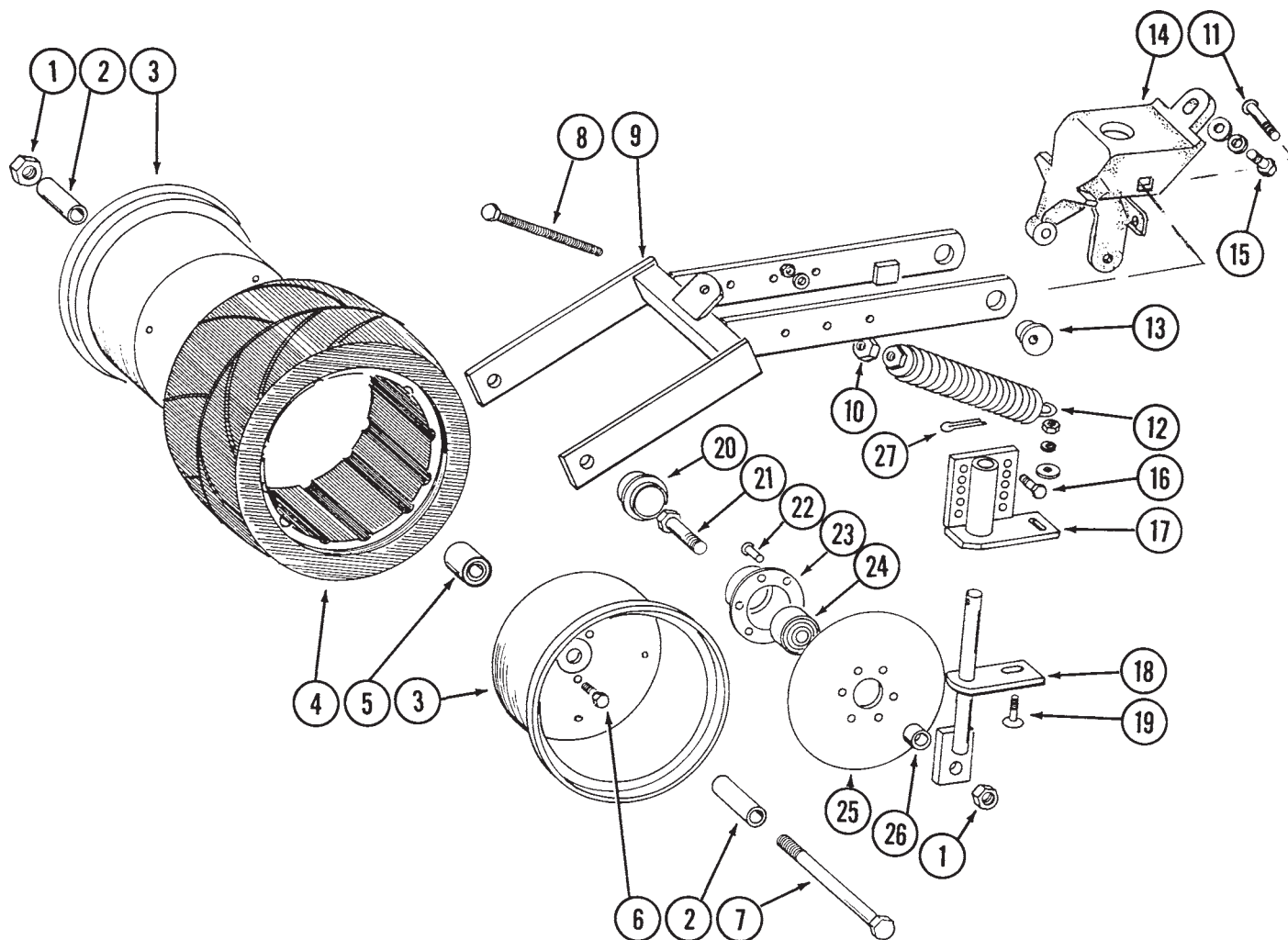
RUB001/RUB018/RUA039/RUB018/RUA044(RU5a/RU6)



| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|----------|-------------------|---------------------------------------|
| 1. | GA6614 | 2 | Wheel Arm With Grease Fitting |
| | G10640 | 2 | Grease Fitting, 1/4"-28 |
| 2. | G10204 | 1 | Machine Bushing, 21/32" |
| 3. | G10018 | 14 | Hex Head Cap Screw, 5/16"-18 x 5/8" |
| | G10109 | 14 | Lock Nut, 5/16"-18 |
| 4. | GD1048 | 4 | Half Wheel |
| 5. | GD1086 | 2 | Tire |
| 6. | GA6171 | 2 | Bearing |
| 7. | G10010 | 2 | Hex Head Cap Screw, 5/8"-11 x 3" |
| | G10230 | 2 | Lock Washer, 5/8" |
| 8. | GD0973 | 4 | Wheel Cover Sleeve, 1 1/2" (Optional) |
| 9. | GD1353 | 2 | Wheel Cover (Optional) |
| 10. | G10069 | 4 | Hex Head Cap Screw, 5/16"-18 x 2 1/4" |
| | G10232 | 4 | Lock Washer, 5/16" |
| | G10106 | 4 | Hex Nut, 5/16"-18 |
| A. | GA6615 | - | Gauge Wheel Complete (Items 3-6) |

COVERING DISCS/SINGLE PRESS WHEEL

RUA042/RUA044(RU8)

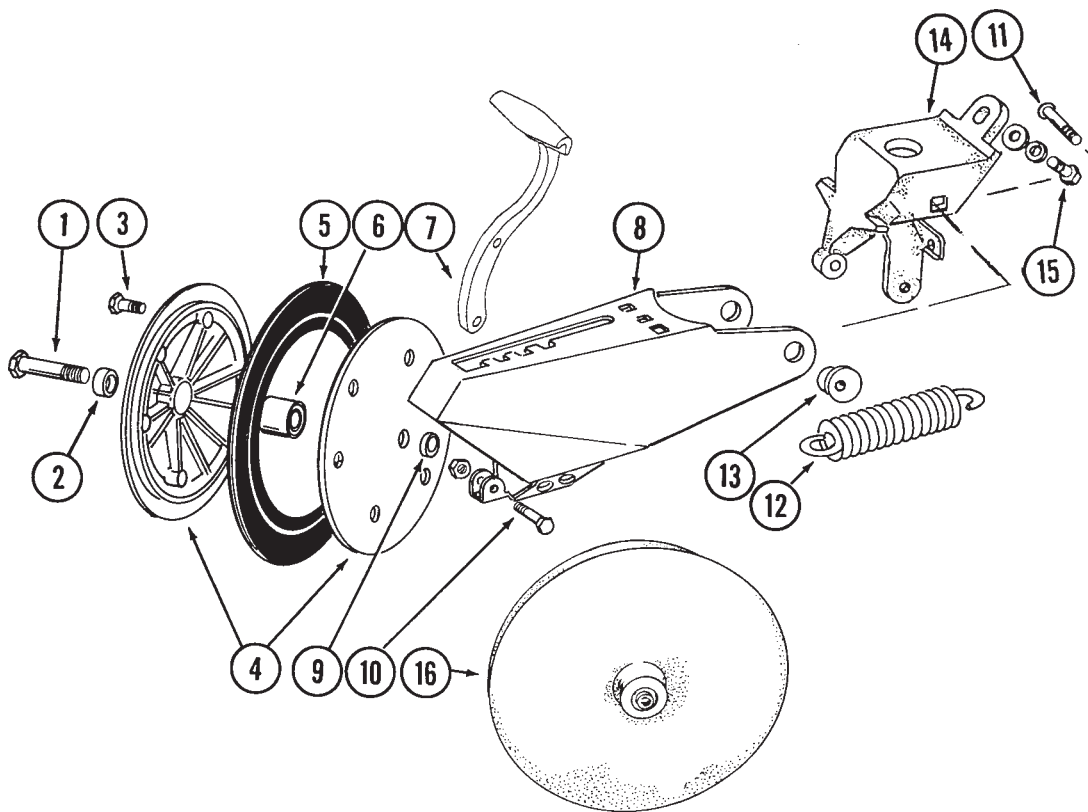


COVERING DISCS/SINGLE PRESS WHEEL

| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|-----------|-------------------|--|
| 1. | G10107 | 3 | Lock Nut, 5/8"-11 |
| 2. | GD3181-12 | 2 | Spacer, 2 7/8" |
| 3. | GD9562 | 2 | Half Wheel |
| 4. | GD9305 | 1 | Tire |
| 5. | GA6171 | 1 | Bearing |
| 6. | G10018 | 7 | Hex Head Cap Screw, 5/16"-18 x 5/8" |
| | G10109 | 7 | Lock Nut, 5/16"-18 |
| 7. | G10152 | 1 | Hex Head Cap Screw, 5/8"-11 x 9" |
| 8. | G10015 | 1 | Adjusting Bolt, 1/2"-13 x 5" |
| 9. | GA6619 | 1 | Mounting Arm |
| 10. | G10102 | 1 | Hex Nut, 1/2"-13 |
| 11. | G10801 | 2 | Carriage Bolt, 1/2"-13 x 2 1/4" |
| | G10216 | 2 | Washer, 1/2" USS |
| | G10111 | 2 | Lock Nut, 1/2"-13 |
| 12. | GA2054 | 1 | Spring |
| 13. | GB0239 | 2 | Eccentric Bushing |
| 14. | GB0233 | 1 | Wheel Arm Stop |
| 15. | G10003 | 1 | Hex Head Cap Screw, 3/8"-16 x 1 1/2" |
| | G10229 | 1 | Lock Washer, 3/8" |
| | G10210 | 2 | Washer, 3/8" USS |
| 16. | G10171 | 4 | Hex Head Cap Screw, 5/16"-18 x 1 1/4" |
| | G10232 | 4 | Lock Washer, 5/16" |
| | G10106 | 4 | Hex Nut, 5/16"-18 |
| 17. | GA6620 | 2 | Bracket |
| 18. | GA6618 | 2 | Mount |
| 19. | G10303 | 2 | Carriage Bolt, 5/16"-18 x 1" |
| | G10219 | 2 | Washer, 5/16" USS |
| | G10232 | 2 | Lock Washer, 5/16" |
| | G10106 | 2 | Hex Nut, 5/16"-18 |
| 20. | GD6533 | 2 | Cap |
| 21. | G10006 | 2 | Hex Head Cap Screw, 5/8"-11 x 2 1/4" |
| 22. | G10427 | 12 | Rivet, 1/4" x 1/2" |
| 23. | GD10473 | 2 | Bearing Housing |
| 24. | GA2014 | 2 | Bearing |
| 25. | GD9290 | 2 | Blade, 8" Diameter |
| 26. | GD1109 | 2 | Spacer, 1/4" |
| 27. | G10463 | 2 | Cotter Pin, 1/4" x 1 1/2" |
| A. | GA6733 | - | Single Press Wheel Complete With Bearing (Items 3-6) |
| B. | GA6801 | - | Covering Disc Complete With Bearing (Items 22-25) |

"V" CLOSING WHEELS

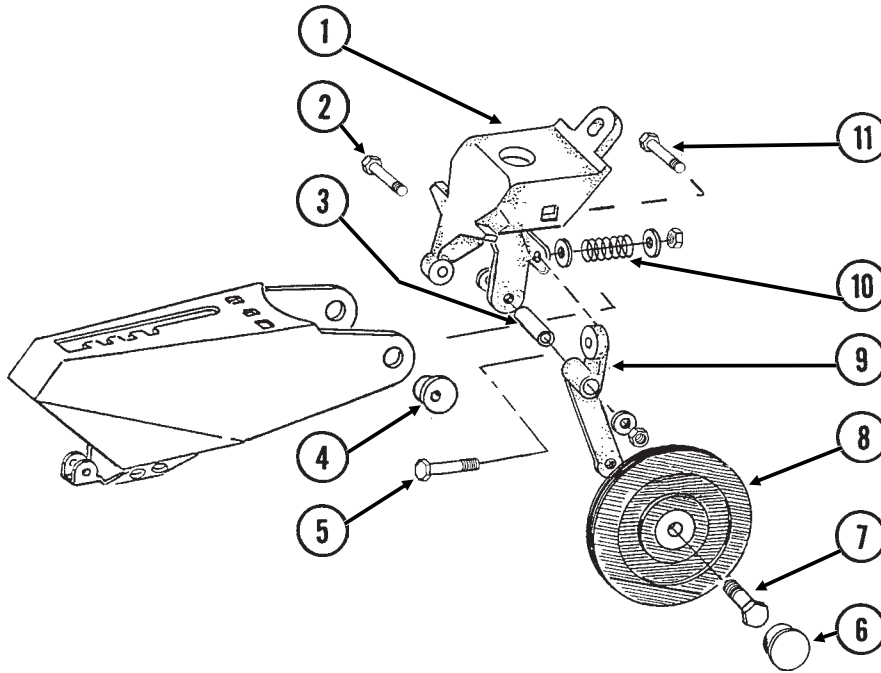
RUB004/RUA044/RUA046(RU9)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|-----------|--|
| | | (Per Row) | |
| 1. | G10013 | 2 | Hex Head Cap Screw, 5/8"-11 x 3 1/2" |
| | G10107 | 2 | Lock Nut, 5/8"-11 |
| 2. | GB0218 | 2 | Bushing, 19/32" |
| 3. | G10064 | 6 | Hex Head Cap Screw, 1/4"-20 x 1" |
| | G10103 | 6 | Hex Nut, 1/4"-20 |
| 4. | GD9120 | 4 | Nylon Half Wheel |
| 5. | GD1085 | 2 | Rubber Tire, 1" x 12" |
| 6. | GA6171 | 2 | Bearing |
| 7. | GB0254 | 1 | Lever |
| 8. | GA6613 | 1 | Arm |
| 9. | GD1109 | 2 | Bushing, 1/4" |
| 10. | G10133 | 1 | Hex Head Cap Screw, 5/16"-18 x 1 1/2" |
| | G10109 | 1 | Lock Nut, 5/16"-18 |
| 11. | G10747 | 2 | Carriage Bolt, 1/2"-13 x 2" |
| | G10111 | 2 | Lock Nut, 1/2"-13 |
| 12. | GD8460 | 1 | Spring |
| 13. | GB0219 | 2 | Eccentric Bushing |
| 14. | GB0233 | 1 | Wheel Arm Stop |
| 15. | G10003 | 1 | Hex Head Cap Screw, 3/8"-16 x 1 1/2" |
| | G10229 | 1 | Lock Washer, 3/8" |
| | G10210 | 2 | Washer, 3/8" USS |
| 16. | GA6597 | - | Cast Iron Closing Wheel W/Bearing |
| | GA6171 | - | Bearing |
| A. | GA6434 | - | Rubber Closing Wheel Complete With Bearing (Items 3-6) |

SEED FIRING WHEEL

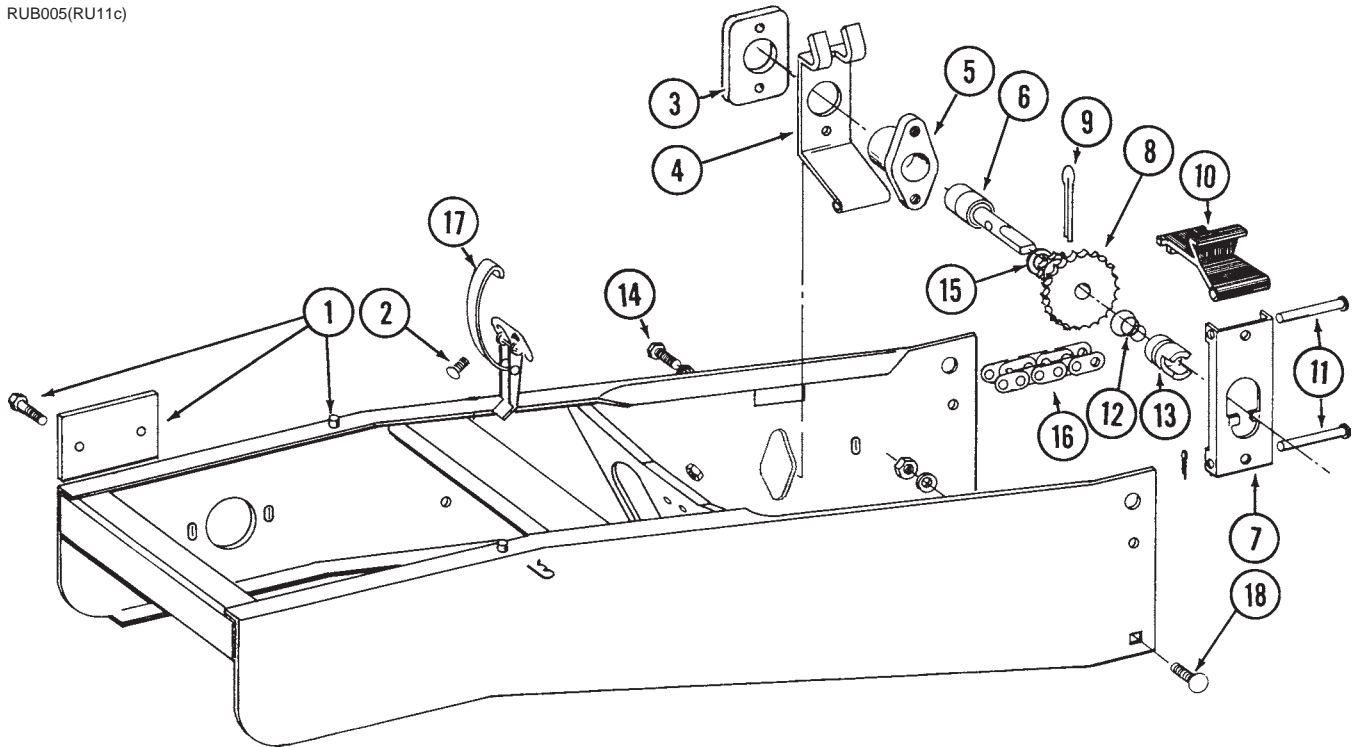
RUB006/RUA044(RU10b)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|-----------|--|
| | | (Per Row) | |
| 1. | GB0233 | 1 | Wheel Arm Stop |
| 2. | G10049 | 1 | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 2 $\frac{1}{2}$ " |
| | G10210 | 2 | Washer, $\frac{3}{8}$ " USS |
| | G10108 | 1 | Lock Nut, $\frac{3}{8}$ "-16 |
| 3. | GD9786 | 1 | Bushing |
| 4. | GB0219 | 2 | Eccentric Bushing |
| 5. | G10062 | 1 | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 3" |
| | G10210 | 2 | Washer, $\frac{3}{8}$ " USS |
| | G10108 | 1 | Lock Nut, $\frac{3}{8}$ "-16 |
| 6. | GD1079 | 1 | Dust Cap |
| 7. | G10055 | 1 | Hex Head Cap Screw, $\frac{5}{8}$ "-11 x 1 $\frac{1}{4}$ " |
| 8. | GA7580 | 1 | Seed Firming Wheel W/Bearing And Snap Ring |
| | GA2014 | - | Bearing |
| | G10770 | - | Snap Ring |
| 9. | GB0245 | 1 | Arm |
| 10. | GD9787 | 1 | Spring |
| 11. | G10747 | 2 | Carriage Bolt, $\frac{1}{2}$ "-13 x 2" |
| | G10111 | 2 | Lock Nut, $\frac{1}{2}$ "-13 |
| A. | GA6937 | - | Seed Firming Wheel Retrofit Package (Items 1-11) |

HOPPER SUPPORT AND METER DRIVE

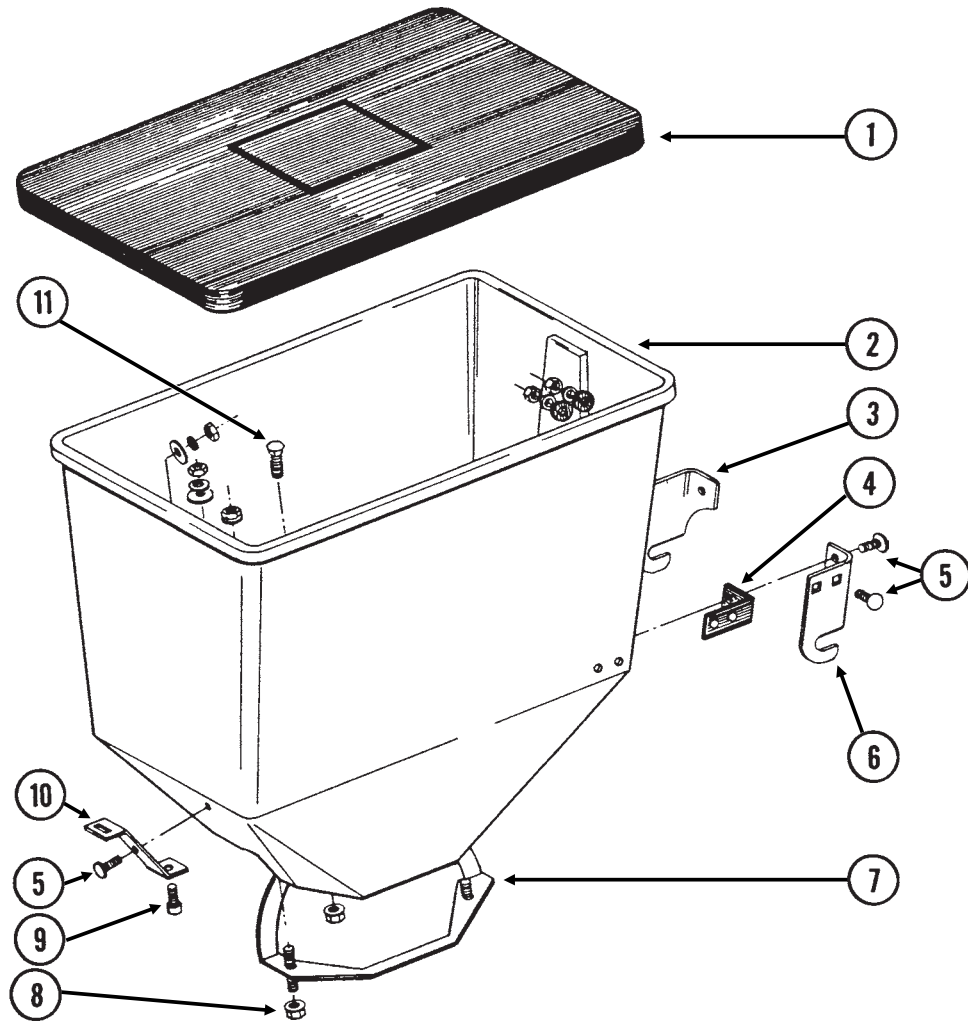
RUB005(RU11c)



| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|----------|-------------------|---|
| 1. | GR1066 | 1 | Hopper Support W/Cover And Hardware |
| | GD7618 | 1 | Cover |
| | G10312 | 2 | Carriage Bolt, $\frac{5}{16}$ "-18 x $\frac{3}{4}$ " |
| | G10620 | 2 | Flange Nut, $\frac{5}{16}$ "-18 |
| 2. | G10309 | 2 | Carriage Bolt, $\frac{1}{4}$ "-20 x $\frac{5}{8}$ ", Grade 2 |
| | G10621 | 2 | Flange Nut, $\frac{1}{4}$ "-20 |
| 3. | GD2128 | 1 | Plate |
| 4. | GD1037 | 1 | Bearing Support |
| 5. | GB0108 | 1 | Bearing Housing |
| 6. | GA2016 | 1 | Bearing |
| 7. | GD1036 | 1 | Drive Release Lever |
| 8. | GB0107 | 1 | Sprocket, 11/19 Tooth |
| 9. | G10457 | 1 | Cotter Pin, $\frac{5}{32}$ " x 1 $\frac{1}{2}$ " |
| 10. | GD1035 | 1 | Release Handle |
| 11. | G10553 | 2 | Clevis Pin, $\frac{1}{4}$ " x 2 $\frac{5}{8}$ " |
| | G10455 | 2 | Cotter Pin, $\frac{1}{16}$ " x $\frac{1}{2}$ " |
| 12. | GD10464 | 1 | Compression Spring |
| 13. | GB0243 | 1 | Drive Coupler |
| 14. | G10019 | 2 | Hex Head Cap Screw, $\frac{5}{16}$ "-18 x 1" |
| | G10232 | 2 | Lock Washer, $\frac{5}{16}$ " |
| 15. | G10204 | - | Machinery Bushing, $\frac{21}{32}$ " (As Required) |
| 16. | G3303-98 | 1 | Roller Chain, No. 41, 98 Links Including Connector Link |
| | G3303-16 | - | Roller Chain, No. 41, 16 Links Including Connector Link (Used W/Row Unit Extension Brackets) |
| | GR0196 | 1 | Connector Link, No. 41 |
| 17. | GA2007 | 1 | Hopper Hold Down Latch |
| 18. | G10305 | 1 | Carriage Bolt, $\frac{3}{8}$ "-16 x 1", Grade 2 |
| | G10004 | - | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{1}{4}$ " |
| | G10229 | 1 | Lock Washer, $\frac{3}{8}$ " |
| | G10101 | 1 | Hex Nut, $\frac{3}{8}$ "-16 |
| A. | GA4822 | - | Meter Drive Assembly Complete (Items 3-14) |

SEED HOPPER

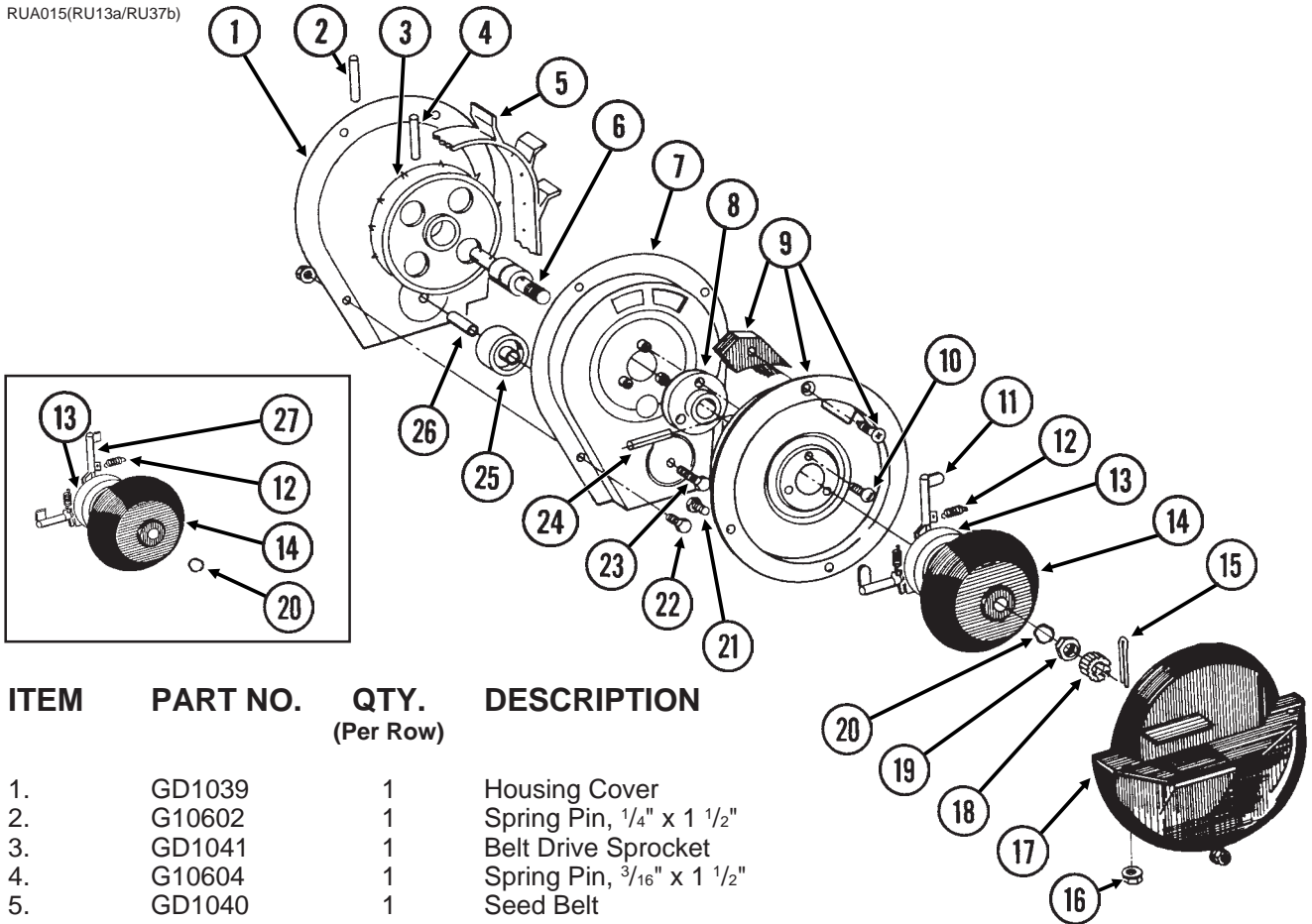
RUA015(RU12b)



| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|----------|-------------------|--|
| 1. | GA2327 | 1 | Lid With Clip |
| 2. | GD1053 | 1 | Seed Hopper |
| 3. | GD1051L | 1 | Bracket, Left Hand |
| 4. | GD1054 | 2 | Mounting Pad |
| 5. | G10310 | 7 | Carriage Bolt, 1/4"-20 x 3/4", Grade 2 |
| | GD1121 | 7 | Rubber Washer |
| | G10209 | 7 | Washer, 1/4" USS |
| | G10110 | 7 | Self Locking Nut, 1/4"-20 |
| 6. | GD1051R | 1 | Bracket, Right Hand |
| 7. | GA2027 | 1 | Retainer |
| 8. | G10620 | 4 | Flange Nut, 5/16"-18 |
| 9. | G10520 | 1 | Hex Socket Head Cap Screw, 3/8"-16 x 3/4", Grade 8 |
| | G10210 | 1 | Washer, 3/8" USS |
| | G10229 | 1 | Lock Washer, 3/8" |
| | G10101 | 1 | Hex Nut, 3/8"-16 |
| 10. | GD1055 | 1 | Clip |
| 11. | G10310 | 1 | Carriage Bolt, 1/4"-20 x 3/4", Grade 2 |
| | G10621 | 1 | Flange Nut, 1/4"-20 |
| A. | GA2058 | - | Seed Hopper With Hardware, Less Lid (Items 2-11) |

FINGER PICKUP SEED METER

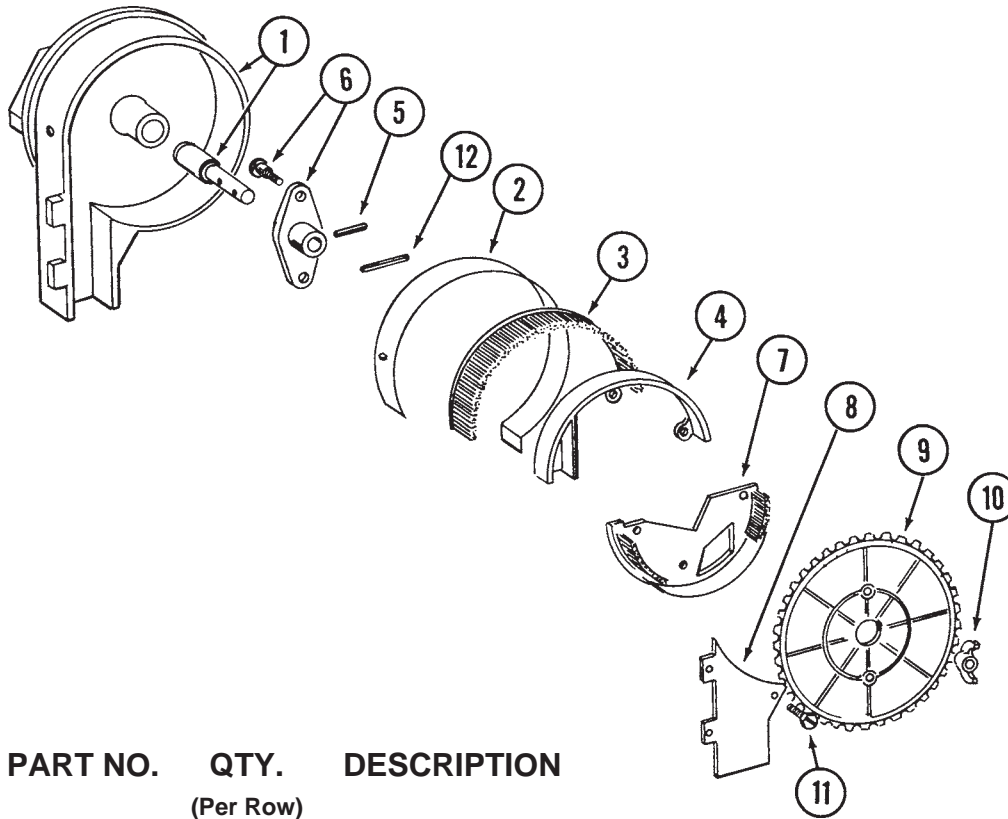
RUA015(RU13a/RU37b)



| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|----------|-------------------|---|
| 1. | GD1039 | 1 | Housing Cover |
| 2. | G10602 | 1 | Spring Pin, 1/4" x 1 1/2" |
| 3. | GD1041 | 1 | Belt Drive Sprocket |
| 4. | G10604 | 1 | Spring Pin, 3/16" x 1 1/2" |
| 5. | GD1040 | 1 | Seed Belt |
| 6. | GA2019 | 1 | Bearing |
| 7. | GA2018 | 1 | Conveyor Housing |
| 8. | GB0110 | 1 | Bearing Housing |
| 9. | GR0664 | 1 | Carrier With Brush And Screw |
| | GA2020 | - | Brush |
| | G10690 | - | Rolling Thread Screw, No. 10 x 3/4" |
| 10. | G10401 | 3 | Slotted Hex Washer Head Screw, No. 10-32 x 5/8" |
| 11. | GD10733 | 12 | Finger, Corn |
| 12. | GD6501 | 12 | Spring |
| 13. | GB0111 | 1 | Cam |
| 14. | GD1045 | 1 | Finger Holder |
| 15. | G10470 | 1 | Cotter Pin, 5/32" x 1" |
| 16. | G10620 | 2 | Flange Nut, 5/16"-18 |
| 17. | GD1046 | 1 | Seed Baffle |
| 18. | GD1083 | 1 | Cover Nut, 5/8"-18 |
| 19. | G10500 | 1 | Jam Nut, 5/8"-18 UNF |
| 20. | GA8343 | 1 | Wave Washer, 5/8" (Triple Wave) |
| 21. | G10020 | 3 | Hex Head Cap Screw, 1/4"-20 x 5/8" |
| | G10323 | 3 | Hex Flange Nut, 1/4"-20 |
| 22. | G10022 | 4 | Hex Head Cap Screw, 1/4"-20 x 1/2" |
| | G10621 | 4 | Flange Nut, 1/4"-20 |
| 23. | G10021 | 1 | Hex Head Cap Screw, 1/4"-20 x 1 1/2" |
| | G10621 | 1 | Flange Nut, 1/4"-20 |
| 24. | G10603 | 1 | Spring Pin, 1/4" x 1 1/4" |
| 25. | GD1042 | 1 | Idler |
| 26. | GB0120 | 1 | Bushing |
| 27. | GD10226 | 12 | Finger, Oil Sunflower |
| A. | GR0933 | - | Finger Assembly, Corn (Items 11-14 And 20) |
| B. | GR1327 | - | Finger Assembly, Oil Sunflower (Items 12-14, 20 And 27) |

BRUSH-TYPE SEED METER

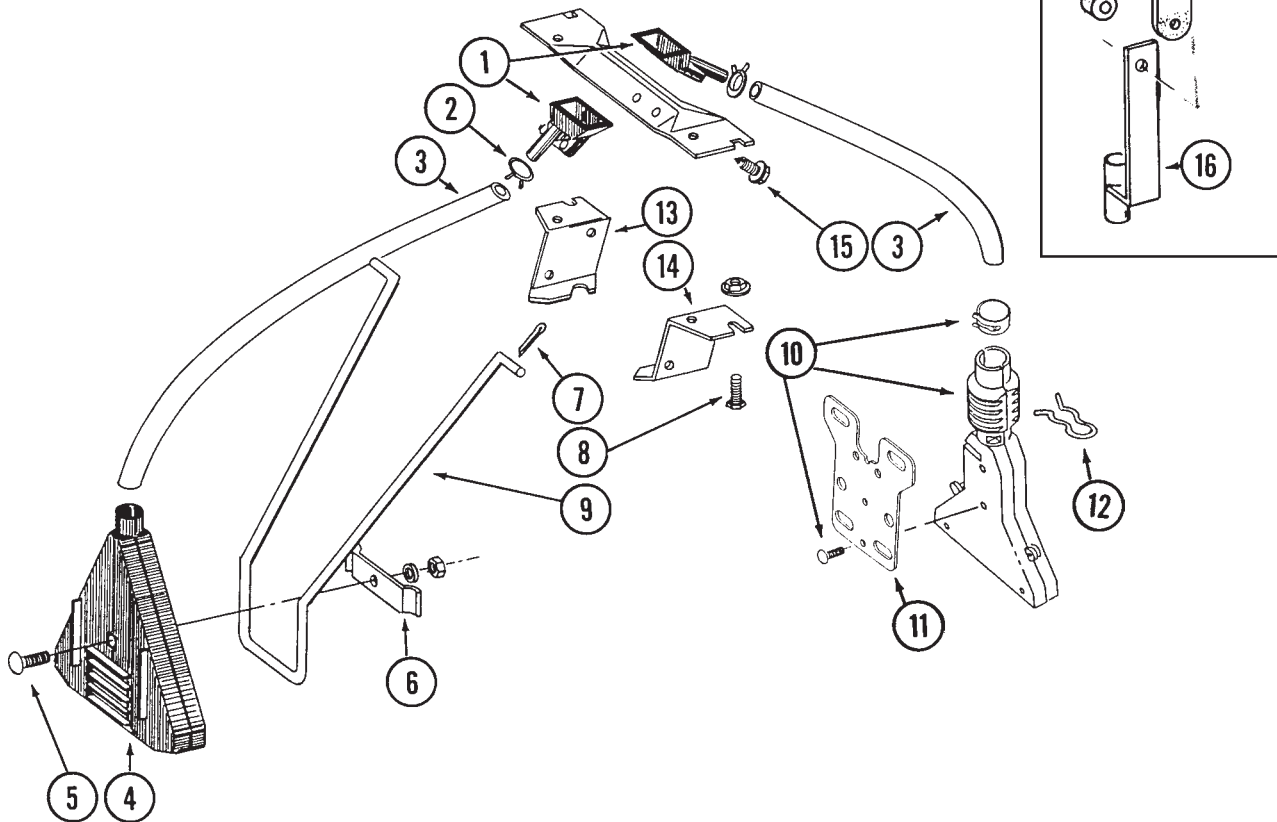
RUA037(RU14)



| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|----------|-------------------|---|
| 1. | GA6027 | 1 | Housing W/Bearing |
| | GA5698 | - | Bearing |
| 2. | GD8778 | 1 | Wear Strip |
| 3. | GA5699 | 1 | Upper Retaining Brush |
| 4. | GD8237 | 1 | Retaining Brush Holder |
| 5. | G10603 | 1 | Spring Pin, 1/4" x 1 1/4" |
| 6. | GA6038 | 1 | Hub W/Shoulder Bolts |
| | GD1755 | - | Shoulder Bolt, 1/4"-20 (2 Used) |
| 7. | GA5834 | 1 | Lower Brush |
| 8. | GD7878 | 1 | Cover |
| 9. | GA5794 | - | Seed Disc, Soybean, 60 Cell, Black Color-Coded |
| | GA6184 | - | Seed Disc, Specialty Soybean, 48 Cell, Dark Blue Color-Coded |
| | GA5982 | - | Seed Disc, Small Milo/Grain Sorghum, 30 Cell, Red Color-Coded |
| | GA6187 | - | Seed Disc, Large Milo/Grain Sorghum, 30 Cell, Light Blue Color-Coded |
| | GA5795 | - | Seed Disc, High Rate Small Milo/Grain Sorghum, 60 Cell, Red Color-Coded |
| | GA6633 | - | Seed Disc, High Rate Large Milo/Grain Sorghum, 60 Cell, Yellow Color-Coded |
| | GA5796 | - | Seed Disc, Cotton, Acid-Delinted, 30 Cell, White Color-Coded |
| | GA6168 | - | Seed Disc, Large Cotton, Acid-Delinted, 36 Cell, Tan Color-Coded |
| | GA6478 | - | Seed Disc, High Rate Cotton, Acid-Delinted, 48 Cell, Light Green Color-Coded |
| | GA6182 | - | Seed Disc, Hill-Drop Cotton, Acid-Delinted, 12 Cell, Brown Color-Coded |
| | GA7255 | - | Seed Disc, Small Hill-Drop Cotton, Acid-Delinted, 12 Cell, Dark Green Color-Coded |
| 10. | G10531 | 2 | Nylon Insert Wing Nut, 1/4"-20 |
| 11. | G10584 | 9 | Slotted Tap Screw, No. 10-24 x 1/2" |
| 12. | G10602 | 1 | Spring Pin, 1/4" x 1 1/2" |

GRANULAR CHEMICAL BANDERS

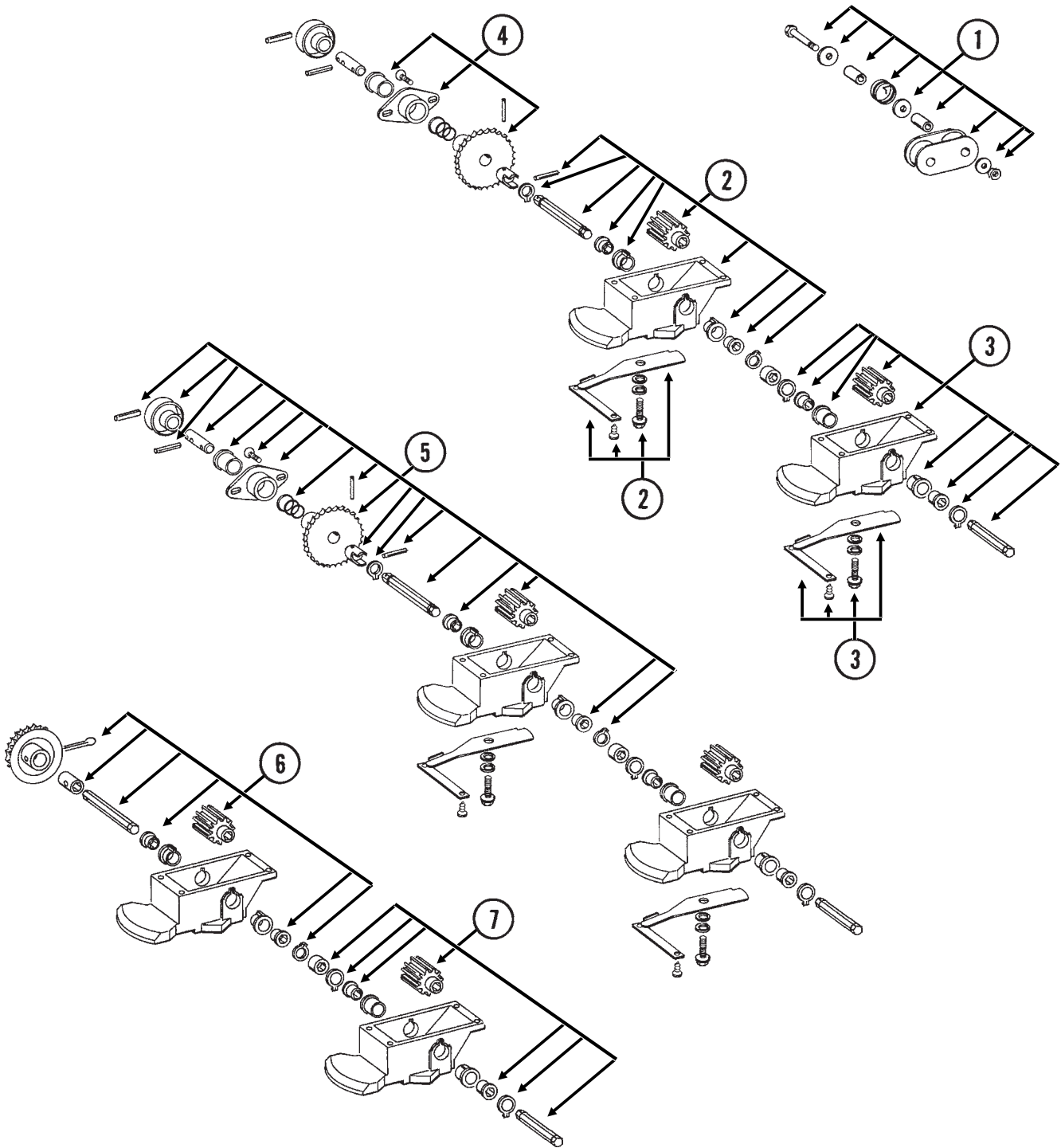
RUA013/RUA016/RUA044(RU16a/RU15)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--|
| 1. | GD2423 | - | Funnel |
| 2. | G10680 | - | Hose Clamp, 7/16" |
| 3. | GD2947 | - | Hose, 7/16" x 28" |
| 4. | GA2075 | - | Diffuser, 14" Band |
| 5. | G10306 | - | Carriage Bolt, 3/8"-16 x 2", Grade 2 |
| | G10229 | - | Lock Washer, 3/8" |
| | G10101 | - | Hex Nut, 3/8"-16 |
| 6. | GD1118 | - | Clamp |
| 7. | G10452 | - | Cotter Pin, 1/8" x 1/2" |
| 8. | G10310 | - | Carriage Bolt, 1/4"-20 x 3/4", Grade 2 |
| | G10227 | - | Lock Washer, 1/4" |
| | G10103 | - | Hex Nut, 1/4"-20 |
| 9. | GD1116 | - | Hanger |
| 10. | GA6907 | - | Slope-Compensating Bander W/Hardware (4 1/2" Band Width) |
| | G10864 | - | Uni-Clamp |
| | G10757 | 2 | Screw, No. 10-32 x 1 1/4" |
| | G10758 | 2 | Hex Nut, No. 10-32 |
| 11. | GD9816 | - | Bander Mounting Bracket (For Some Non-KINZE® Applications) |
| 12. | GD1090 | - | Spring Clip |
| 13. | GD1115L | - | Hanger Bracket, L.H. |
| 14. | GD1115R | - | Hanger Bracket, R.H. |
| 15. | G10523 | - | Self Tapping Screw, No. 10 x 1/2" |
| 16. | GA6741 | - | Bracket (Straight Drop In-Furrow) |

GRANULAR CHEMICAL SUB-ASSEMBLIES AND KITS

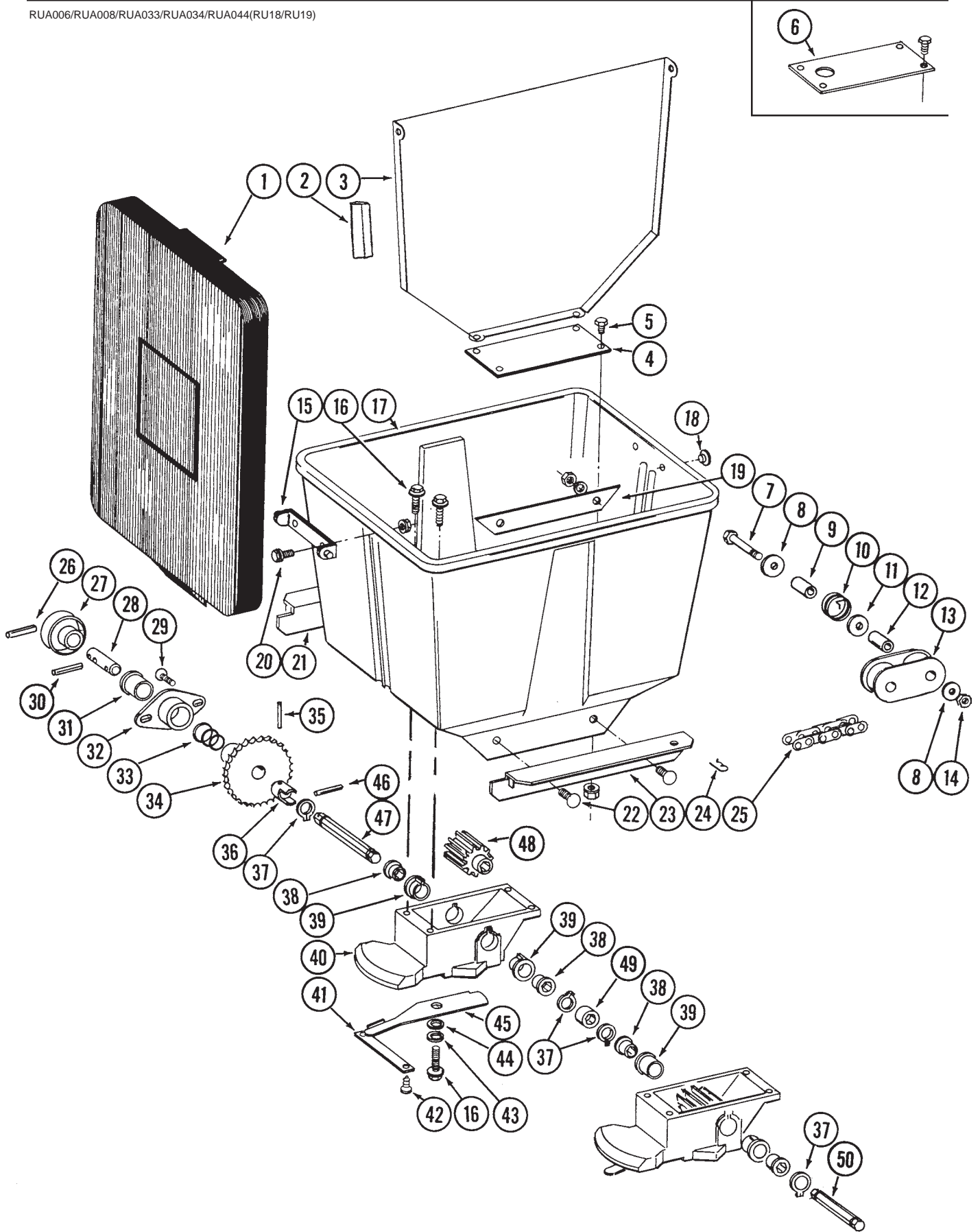
(RU65/RU66/RU67)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | G1K213 | 1 | Granular Chemical Idler Kit W/Instruction |
| 2. | GA5553 | 1 | Insecticide Housing Sub-Assembly |
| 3. | GA5554 | 1 | Herbicide Housing Sub-Assembly |
| 4. | GA5746 | 1 | Sprocket Sub-Assembly |
| 5. | GA5623 | 1 | Throwout Update Kit W/Instructions And Template |
| 6. | GA5560 | 1 | Primary Meter Roller Replacement Kit W/Instruction (Update For Non-Current Design) |
| 7. | GA5561 | 1 | Secondary Meter Roller Replacement Kit W/Instruction (Update For Non-Current Design) |

GRANULAR CHEMICAL HOPPER WITH METER(S) & THROWOUT

RUA006/RUA008/RUA033/RUA034/RUA044(RU18/RU19)

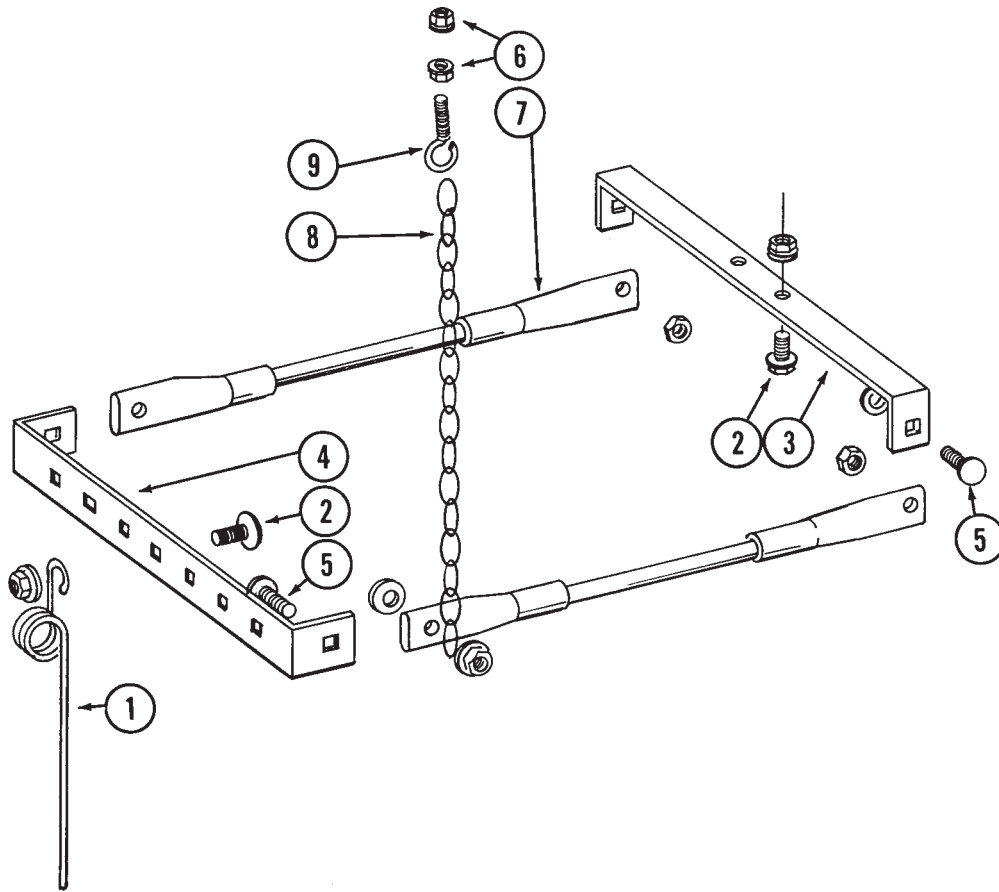


GRANULAR CHEMICAL HOPPER WITH METER(S) & THROWOUT

| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|-----------|-------------------|--|
| 1. | GA4444 | 1 | Lid |
| 2. | G3314-40 | - | Foam Strip, 40" |
| 3. | GA2076 | 1 | Divider (Used With Two Meters) |
| 4. | GD1056 | - | Cover Plate (1 Used With One Meter) |
| 5. | G10022 | 4 | Hex Head Cap Screw, 1/4"-20 x 1/2" |
| | G10621 | 4 | Flange Nut, 1/4"-20 |
| 6. | GD8750 | - | Restrictor Plate (Optional) |
| 7. | G10049 | 1 | Hex Head Cap Screw, 3/8"-16 x 2 1/2" |
| 8. | G10210 | 2 | Washer, 3/8" USS |
| 9. | GD2971-10 | 1 | Bushing, 9/16" |
| 10. | GD11219 | 1 | Spring |
| 11. | G10201 | 1 | Special Washer |
| 12. | GD1026 | 1 | Spacer, 1 3/16" |
| 13. | GD9240 | 1 | Idler |
| 14. | G10108 | 1 | Lock Nut, 3/8"-16 |
| 15. | GD1060 | 1 | Hinge |
| 16. | G10570 | - | Self Tapping Screw, 1/4" x 3/4" (4 Used Per Meter) |
| 17. | GD1058 | 1 | Hopper |
| 18. | GD1089 | 2 | Plug |
| 19. | GD1072 | 2 | Strap |
| 20. | G10023 | 2 | Hex Head Cap Screw, 1/4"-20 x 3/4" |
| | G10621 | 2 | Flange Nut, 1/4"-20 |
| 21. | GD1059L | 1 | Support, L.H. |
| 22. | G10311 | 4 | Carriage Bolt, 3/8"-16 x 3/4" Short Necked, Grade 2 |
| | G10229 | 4 | Lock Washer, 3/8" |
| | G10101 | 4 | Hex Nut, 3/8"-16 |
| 23. | GD1059R | 1 | Support, R.H. |
| 24. | G10670 | 2 | Spring Locking Pin, No. 3 |
| 25. | G3303-114 | 1 | Roller Chain, No. 41, 114 Pitch Including Connector Link |
| | GR0196 | 1 | Connector Link, No. 41 |
| 26. | G10637 | 1 | Spring Pin, 1/8" x 1 1/2" |
| 27. | GD11239 | 1 | Knob |
| 28. | GD7589 | 1 | Throwout Pin |
| 29. | G10312 | 2 | Carriage Bolt, 5/16"-18 x 3/4" |
| | G10620 | 2 | Flange Nut, 5/16"-18 |
| 30. | G10602 | 1 | Spring Pin, 1/4" x 1 1/2" |
| 31. | GB0121 | 1 | Bearing |
| 32. | GB0183 | 1 | Bearing Mount |
| 33. | GD10464 | 1 | Spring |
| 34. | GA5533 | 1 | Sprocket, 24 Tooth |
| 35. | G10609 | 1 | Spring Pin, 5/32" x 1" |
| 36. | GB0184 | 1 | Coupling |
| 37. | G10567 | 1 | Retaining Ring |
| 38. | GD7258 | - | Hex Bushing (2 Used Per Meter) |
| 39. | GB0115 | - | Bearing (2 Used Per Meter) |
| 40. | GB0116 | - | Granular Housing (1 Used Per Meter) |
| 41. | GD1061 | - | Support Strap (1 Used Per Meter) |
| 42. | G10521 | 1 | Self Tapping Screw, No. 10 x 3/8" (2 Used Per Meter) |
| 43. | G10209 | - | Washer, 1/4" USS (1 Used Per Meter) |
| 44. | G10660 | - | Wave Washer (1 Used Per Meter) |
| 45. | GD1063 | - | Metering Gate (1 Used Per Meter) |
| 46. | G10546 | 1 | Spring Pin, 3/16" x 1 1/4" |
| 47. | GD7588 | 1 | Shaft |
| 48. | GD7148 | - | Feed Roller, Hex Bore (1 Used Per Meter) |
| 49. | GD7592 | 1 | Coupler, Hex Bore (With 2nd Meter) |
| 50. | GD7591 | - | Shaft (1 Used In 2nd Meter) |

SPRING TOOTH INCORPORATOR

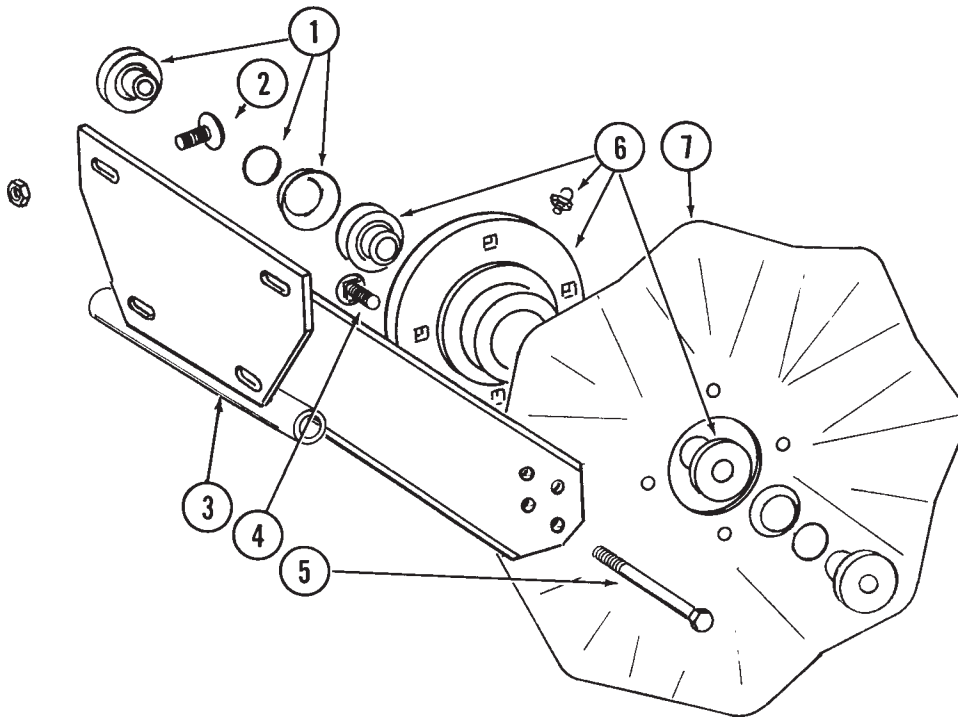
RUA011(RU20)



| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|----------|-------------------|--|
| 1. | GD1145 | 7 | Spring Tooth |
| 2. | G10308 | 9 | Carriage Bolt, $\frac{3}{8}$ "-16 x $\frac{3}{4}$ ", Grade 2 |
| | G10622 | 9 | Flange Nut, $\frac{3}{8}$ "-16 |
| 3. | GD1143 | 1 | Front Bracket |
| 4. | GD1144 | 1 | Rear Bracket |
| 5. | G10305 | 4 | Carriage Bolt, $\frac{3}{8}$ "-16 x 1", Grade 2 |
| | G10529 | 4 | External Tooth Lock Washer, $\frac{3}{8}$ " |
| | G10622 | 4 | Flange Nut, $\frac{3}{8}$ "-16 |
| 6. | G10621 | 4 | Flange Nut, $\frac{1}{4}$ "-20 |
| 7. | GA2094 | 2 | Cable Assembly |
| 8. | G3305-01 | 4 | Chain |
| 9. | GD2460 | 2 | Eyebolt, $\frac{1}{4}$ "-20 |

NO TILL COULTER, ROW UNIT MOUNTED

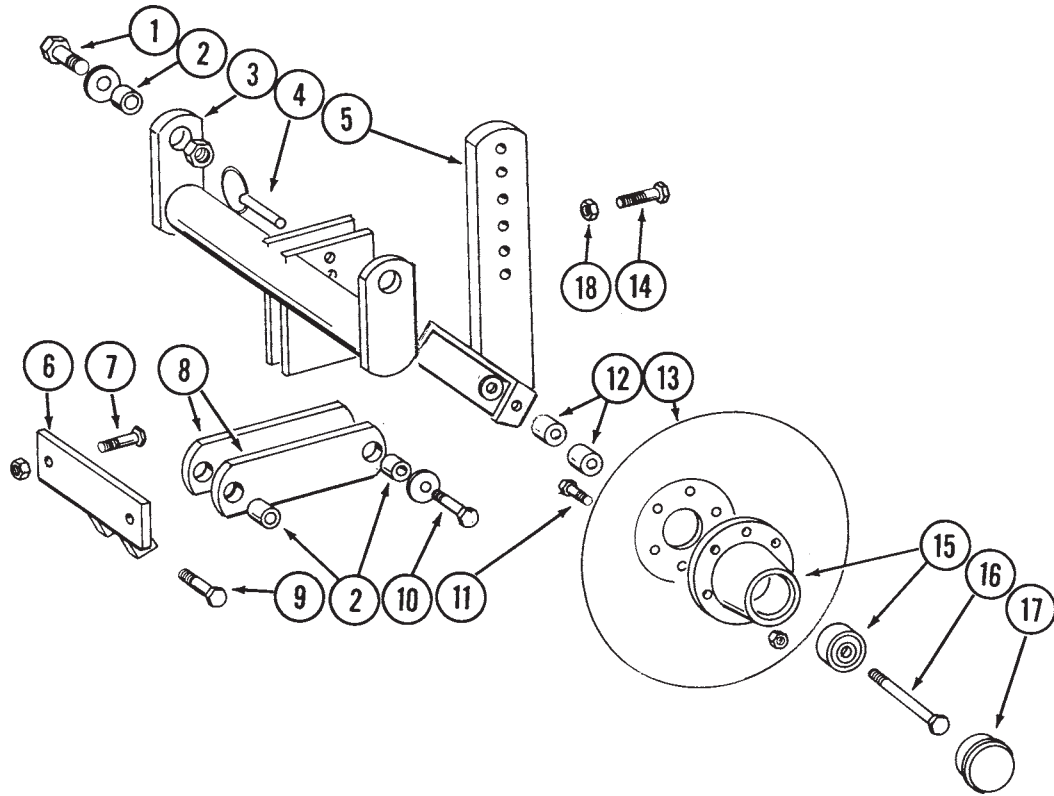
RUA036(RU21a)



| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|----------|-------------------|------------------------------------|
| 1. | GB0227 | 2 | Adapter W/O-Ring And Spring Washer |
| | GD8844 | 2 | O-Ring |
| | GD8843 | 2 | Spring Washer |
| 2. | G10574 | 4 | Carriage Bolt, 1/2"-13 x 1 1/4" |
| | G10111 | 4 | Lock Nut, 1/2"-13 |
| 3. | GA5625 | 1 | Arm |
| 4. | G10574 | 4 | Carriage Bolt, 1/2"-13 x 1 1/4" |
| | G10111 | 4 | Lock Nut, 1/2"-13 |
| 5. | G10036 | 1 | Hex Head Cap Screw, 5/8"-11 x 4" |
| | G10107 | 1 | Lock Nut, 5/8"-11 |
| 6. | GA5640 | 1 | Hub W/Bearings And Grease Fitting |
| | GA5622 | - | Bearing (2 Used) |
| | G10640 | - | Grease Fitting, 1/4"-28 |
| 7. | GD7803 | - | Fluted Blade, 1", 8 Flutes (Shown) |
| | GD7804 | - | Bubbled Blade, 1" |
| | GD9254 | - | Fluted Blade, 3/4", 13 Flutes |

DISC FURROWER, ROW UNIT MOUNTED

RUA038/RUA040(RU23)

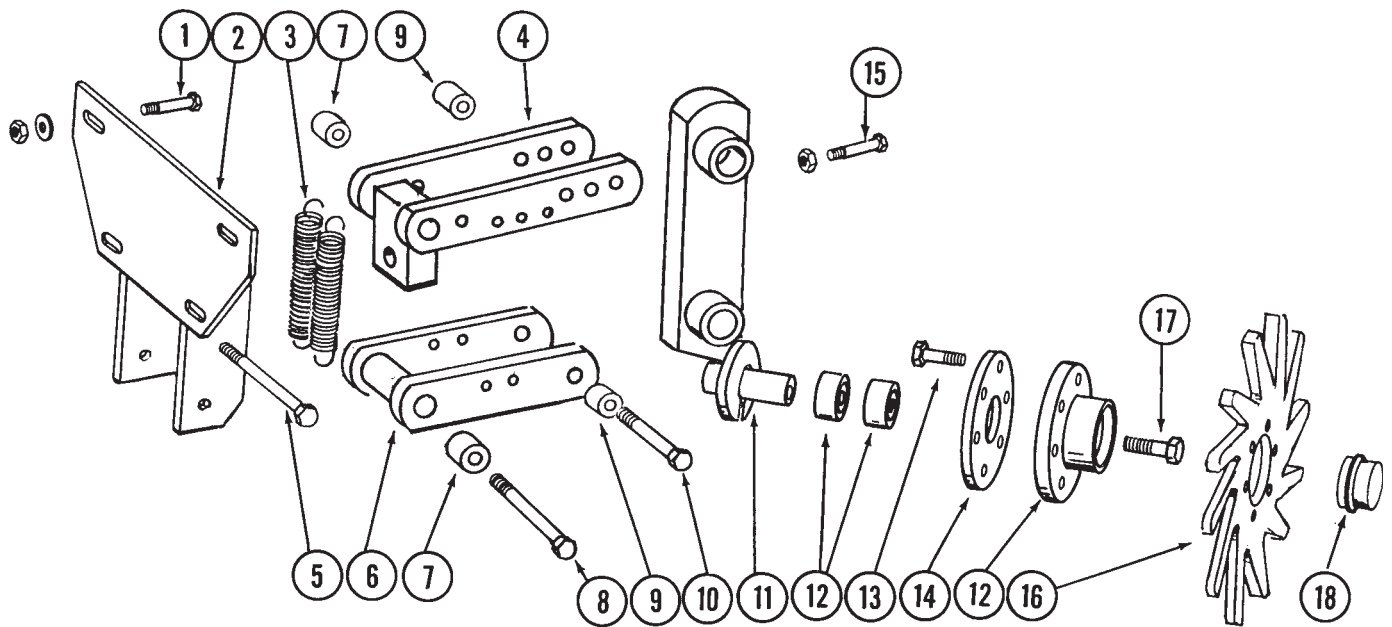


DISC FURROWER, ROW UNIT MOUNTED

| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|-----------|-------------------|---|
| 1. | G10039 | 2 | Hex Head Cap Screw, 1/2"-13 x 1 3/4" |
| | G10216 | 2 | Washer, 1/2" USS |
| | G10111 | 2 | Lock Nut, 1/2"-13 |
| 2. | GD7889 | 6 | Bushing |
| 3. | GA5719 | 1 | Mounting Bracket |
| 4. | G10536 | 1 | Pin |
| 5. | GA5718 | 1 | Support Arm |
| 6. | GA5715 | 1 | Anchor |
| 7. | G10017 | 2 | Hex Head Cap Screw, 1/2"-13 x 1 1/2" |
| | G10111 | 2 | Lock Nut, 1/2"-13 |
| 8. | GD7890 | 2 | Link |
| 9. | G10017 | 2 | Hex Head Cap Screw, 1/2"-13 x 1 1/2" |
| | G10216 | 2 | Washer, 1/2" USS |
| | G10111 | 2 | Lock Nut, 1/2"-13 |
| 10. | G10585 | 1 | Hex Head Cap Screw, 1/2"-13 x 3 1/4" |
| | G10216 | 2 | Washer, 1/2" USS |
| | G10111 | 1 | Lock Nut, 1/2"-13 |
| 11. | G10572 | 6 | Truss Head Slotted Machine Screw, 5/16"-18 x 7/8" |
| | G10106 | 6 | Hex Nut, 5/16"-18 |
| 12. | GD7817-01 | 2 | Spacer, 3/4" |
| | GD7817-04 | 2 | Spacer, 1/2" |
| 13. | GD7823 | - | Solid Blade, 12" (Shown) |
| | GD8307 | - | Notched Blade, 12" |
| 14. | G10597 | 1 | Set Screw, 5/8"-11 x 2 1/4" |
| 15. | GA5654 | 2 | Hub W/Bearings |
| | GA2014 | - | Bearing |
| 16. | G10318 | 2 | Hex Head Cap Screw, 5/8"-11 x 4 1/2" |
| | GD7805 | 2 | Special Washer |
| | G10107 | 2 | Lock Nut, 5/8"-11 |
| 17. | GD1132 | 2 | Dust Cap |
| 18. | G10503 | 1 | Jam Nut, 5/8"-11 |

RESIDUE WHEEL, ROW UNIT MOUNTED

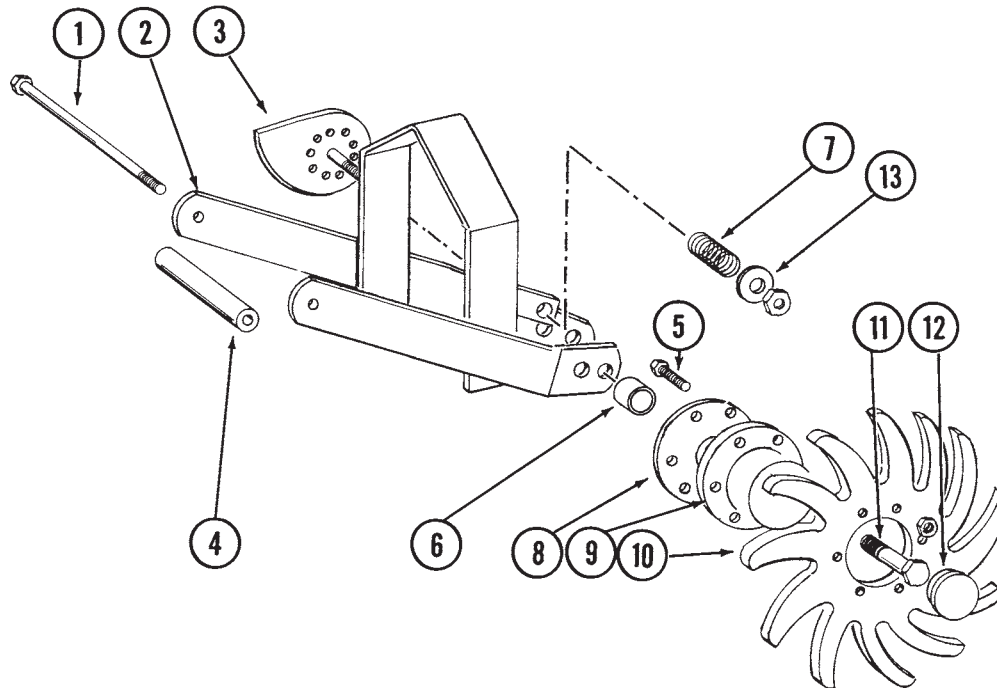
RUA041/RUA045(RU24a)



| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|----------|-------------------|--|
| 1. | G10574 | 4 | Carriage Bolt, 1/2"-13 x 1 1/4" |
| | G10216 | 4 | Washer, 1/2" USS |
| | G10111 | 4 | Lock Nut, 1/2"-13 |
| 2. | GA6832 | 1 | Mount |
| 3. | GD5857 | 2 | Spring |
| 4. | GA6833 | 1 | Upper Link |
| 5. | G10348 | 1 | Hex Head Cap Screw, 1/2"-13 x 5" (Lockup Bolt) |
| | G10111 | 1 | Lock Nut, 1/2"-13 |
| 6. | GA6834 | 1 | Lower Link |
| 7. | GD9715 | 2 | Spacer, 3" |
| 8. | G10045 | 2 | Hex Head Cap Screw, 1/2"-13 x 4 1/2" |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 9. | GD9720 | 2 | Spacer, 2 3/16" |
| 10. | G10033 | 2 | Hex Head Cap Screw, 1/2"-13 x 3 1/2" |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 11. | GA6838 | 1 | Wheel Mount |
| 12. | GA5654 | 2 | Hub W/Bearings |
| | GA2014 | - | Bearing |
| 13. | G10133 | 6 | Hex Head Cap Screw, 5/16"-18 x 1 1/2" |
| | G10109 | 6 | Lock Nut, 5/16"-18 |
| 14. | GD9724 | 1 | Backing Plate |
| 15. | G10371 | 1 | Hex Head Cap Screw, 1/2"-13 x 3", Full Thread |
| | G10501 | 1 | Jam Nut, 1/2"-13 |
| 16. | GD10552 | 1 | Wheel, 3/8" x 12" |
| 17. | G10006 | 1 | Hex Head Cap Screw, 5/8"-11 x 2 1/4" |
| 18. | GD1132 | 1 | Dust Cap |
| A. | GA7446 | - | Wheel Assembly (Items 12-14 And 16) |

RESIDUE WHEELS, COULTER MOUNTED

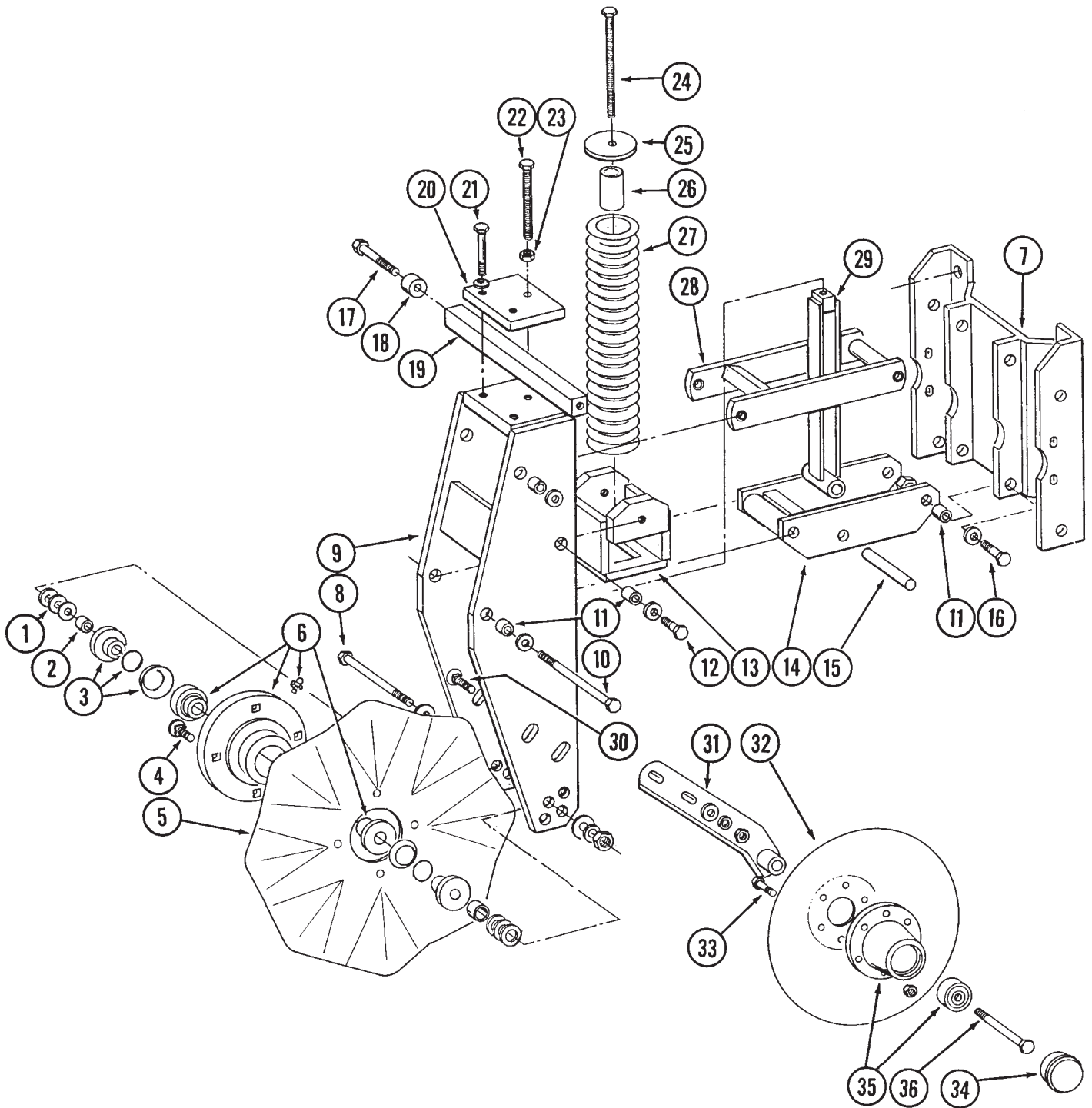
RUA047(RU31a)



| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|-----------|-------------------|--|
| 1. | G10148 | 1 | Hex Head Cap Screw, 1/2"-13 x 9 1/2" |
| | G10111 | 1 | Lock Nut, 1/2"-13 |
| 2. | GA7271 | 1 | Mount |
| 3. | GA7412 | 1 | Cam |
| 4. | GD10526 | 1 | Sleeve, 7 1/2" |
| 5. | G10133 | 12 | Hex Head Cap Screw, 5/16"-18 x 1 1/2" |
| | G10109 | 12 | Lock Nut, 5/16"-18 |
| 6. | GD7817-04 | 2 | Spacer, 1 1/4" O.D. x 1/2" Long |
| 7. | GD10519 | 1 | Spring |
| 8. | GD9724 | 2 | Backing Plate |
| 9. | GA5654 | 2 | Hub W/Bearings |
| | GA2014 | - | Bearing |
| 10. | GD10552 | 2 | Wheel, 3/8" x 12" |
| 11. | G10009 | 2 | Hex Head Cap Screw, 5/8"-11 x 2 1/2" |
| 12. | GD1132 | 2 | Dust Cap |
| 13. | G10206 | 1 | Washer, 1/2" SAE |
| | G10111 | 1 | Lock Nut, 1/2"-13 |
| A. | GA7446 | - | R.H. Wheel Assembly (Items 5 And 8-10) (Shown) |
| | GA7445 | - | L.H. Wheel Assembly (Items 5 and 8-10) |

FRAME MOUNTED COULTER W/DISC FURROWER

RUA035/RUB016(RU25)



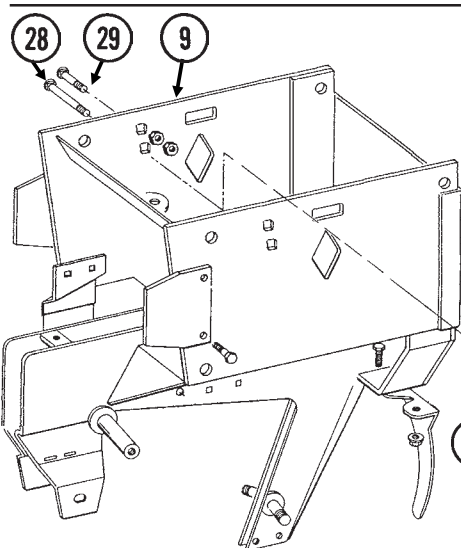
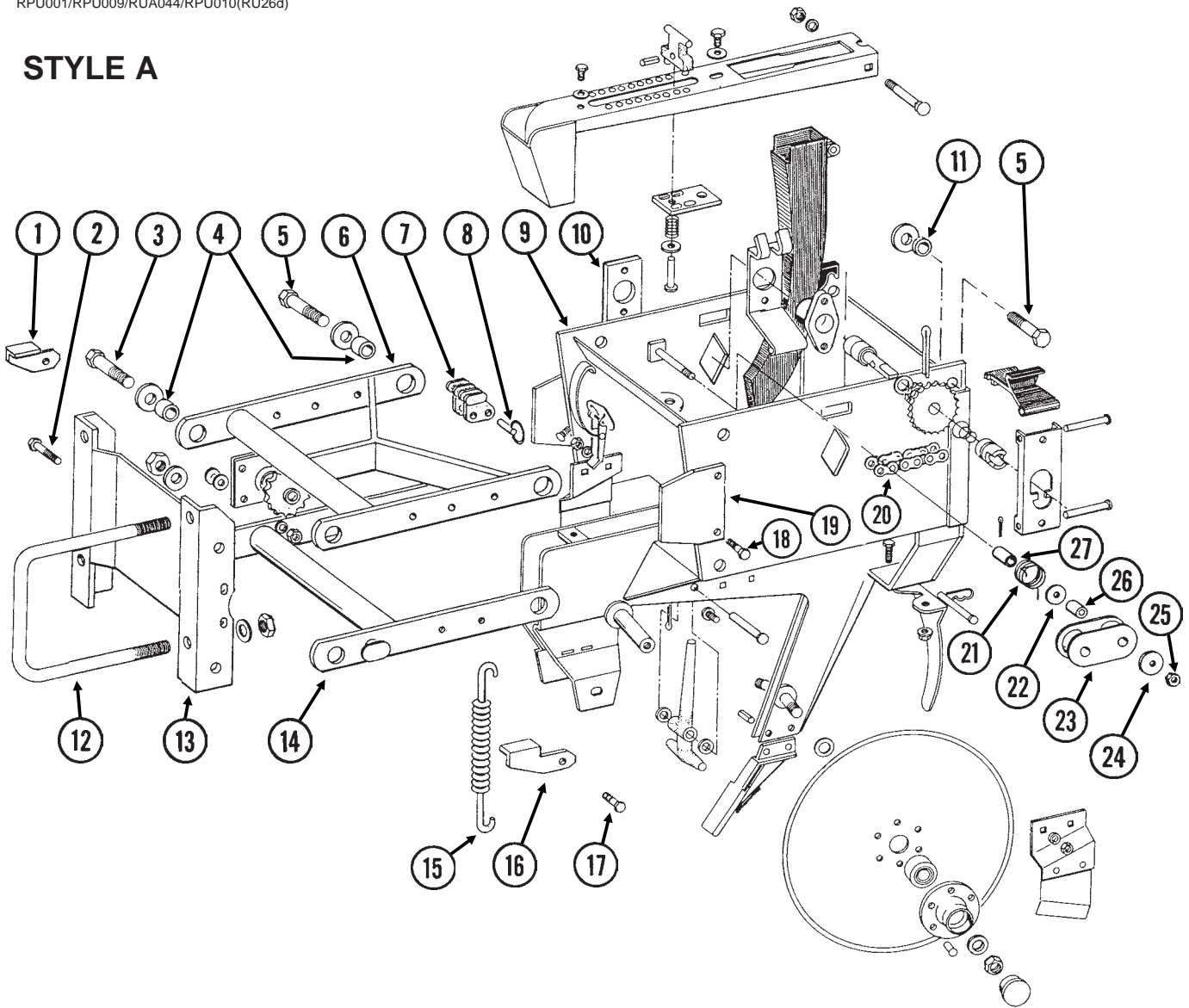
FRAME MOUNTED COULTER W/DISC FURROWER

| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|-----------|-------------------|---|
| 1. | G10217 | - | Washer, 5/8" USS (As Required) |
| 2. | GD7817-04 | 2 | Spacer, 1/2" |
| 3. | GB0227 | 2 | Adapter W/O-Ring And Spring Washer |
| | GD8844 | - | O-Ring |
| | GD8843 | - | Spring Washer |
| 4. | G10574 | 4 | Carriage Bolt, 1/2"-13 x 1 1/4" |
| | G10111 | 4 | Lock Nut, 1/2"-13 |
| 5. | GD7803 | - | Fluted Blade, 1", 8 Flutes (Shown) |
| | GD7804 | - | Bubbled Blade, 1" |
| | GD9254 | - | Fluted Blade, 3/4", 13 Flutes |
| 6. | GA5640 | 1 | Hub W/Bearings And Grease Fitting |
| | GA5622 | - | Bearing (2 Used Per Hub) |
| | G10640 | - | Grease Fitting, 1/4"-28 |
| 7. | GA5798 | 1 | Support Plate |
| 8. | G10068 | 1 | Hex Head Cap Screw, 5/8"-11 x 6" |
| | G10107 | 1 | Lock Nut, 5/8"-11 |
| 9. | GA5643 | 1 | Fork Mount |
| 10. | G10012 | 1 | Hex Head Cap Screw, 5/8"-11 x 6 1/2" |
| | GD7805 | 2 | Washer |
| | G10107 | 1 | Lock Nut, 5/8"-11 |
| 11. | GB0218 | 10 | Bushing, 19/32" |
| 12. | G10055 | 2 | Hex Head Cap Screw, 5/8"-11 x 1 1/4" |
| | GD7805 | 2 | Washer |
| 13. | GA5637 | 1 | Spring Socket |
| 14. | GA5631 | 1 | Lower Parallel Link |
| 15. | GD7815 | 1 | Pin, 5/8" x 4 1/4" |
| 16. | G10008 | 6 | Hex Head Cap Screw, 5/8"-11 x 2" |
| | GD7805 | 6 | Washer |
| | G10107 | 4 | Lock Nut, 5/8"-11 (As Required) |
| 17. | GD7818 | 2 | Special Bolt |
| 18. | GD7817-01 | 2 | Roller, 3/4" |
| 19. | GD7816 | 1 | Depth Control Bar |
| 20. | GD7811 | 1 | Depth Adjustment Clamp |
| 21. | G10581 | 2 | Hex Head Cap Screw, 1/2"-13 x 2 1/4" |
| | G10228 | 2 | Lock Washer, 1/2" |
| 22. | G10582 | 1 | Hex Head Cap Screw, 5/8"-11 x 4", Full Thread |
| 23. | G10104 | 1 | Hex Nut, 5/8"-11 |
| 24. | G10573 | 1 | Hex Head Cap Screw, 5/8"-11 x 5 1/2", Full Thread |
| 25. | GB0196 | 1 | Washer |
| 26. | GD7817-09 | 1 | Stop, 1 3/4" |
| 27. | GD7831 | 1 | Compression Spring |
| 28. | GA5630 | 1 | Upper Parallel Link |
| 29. | GA5635 | 1 | Spring Guide |
| 30. | G10747 | 4 | Carriage Bolt, 1/2"-13 x 2" |
| | G10206 | - | Washer, 1/2" SAE (As Required) |
| | G10228 | 4 | Lock Washer, 1/2" |
| | G10102 | 4 | Hex Nut, 1/2"-13 |
| 31. | GA5636 | 2 | Arm |
| 32. | GD7823 | - | Solid Blade, 12" (Shown) |
| | GD8307 | - | Notched Blade, 12" |
| 33. | G10572 | 12 | Truss Head Slotted Machine Screw, 5/16"-18 x 7/8" |
| | G10106 | 12 | Hex Nut, 5/16"-18 |
| 34. | GD1132 | 2 | Dust Cap |
| 35. | GA5654 | 2 | Hub W/Bearings |
| | GA2014 | 4 | Bearing |
| 36. | G10036 | 2 | Hex Head Cap Screw, 5/8"-11 x 4" |
| | G10107 | 2 | Lock Nut, 5/8"-11 |

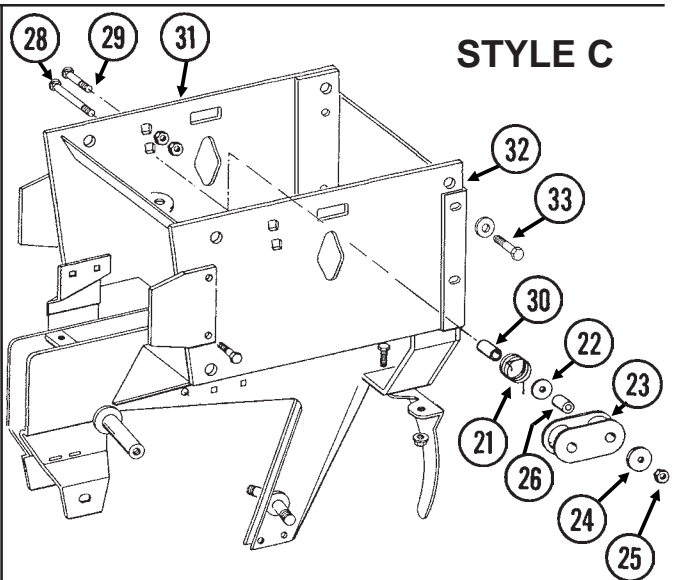
INTERPLANT® PUSH ROW UNIT

RPU001/RPU009/RUA044/RPU010(RU26d)

STYLE A



STYLE B



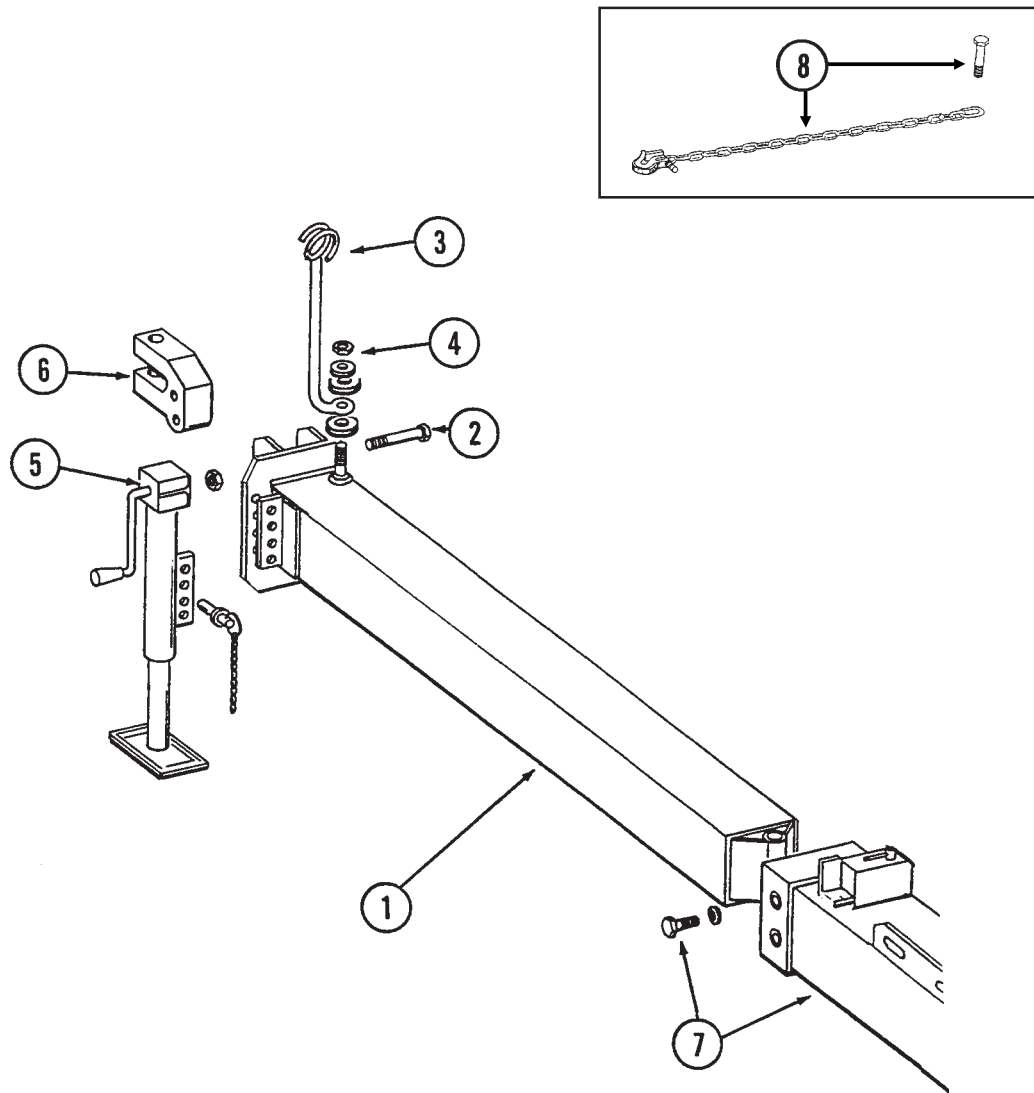
STYLE C

INTERPLANT® PUSH ROW UNIT

| ITEM | PART NO. | QTY. (Per Row) | DESCRIPTION |
|------|-----------|-------------------|--|
| 1. | D7627 | 1 | Lockup, L.H. (Non-Stock Item Sub GA5564) |
| 2. | G10004 | 2 | Hex Head Cap Screw, 3/8"-16 x 1 1/4" |
| | G10210 | - | Washer, 3/8" USS (As Required) |
| | G10229 | 2 | Lock Washer, 3/8" |
| | G10101 | 2 | Hex Nut, 3/8"-16 |
| 3. | G10732 | 4 | Hex Head Cap Screw, 5/8"-18 x 2" |
| | GD7805 | 4 | Special Washer |
| | G10412 | 4 | Lock Nut, 5/8"-18 |
| 4. | GB0218 | 8 | Bushing, 19/32" |
| 5. | G10751 | 6 | Hex Head Cap Screw, 5/8"-18 x 1 3/4" |
| | GD7805 | 6 | Special Washer |
| | G10412 | 6 | Lock Nut, 5/8"-18 |
| 6. | GA5788 | 1 | Upper Arm |
| 7. | GB0186 | 2 | Spring Anchor |
| 8. | G10545 | 2 | Detent Pin, 1" Grip |
| 9. | GA5846 | 1 | Push Unit Shank (Sub G1K273) |
| 10. | GD2128 | 1 | Plate |
| 11. | GD1109 | 2 | Pivot Bushing, 1/4" |
| 12. | GD1113 | 2 | U-Bolt, 5" x 7" x 5/8"-11 |
| | G10230 | 4 | Lock Washer, 5/8" |
| | G10104 | 4 | Hex Nut, 5/8"-11 |
| 13. | GA5786 | 1 | Mounting Plate |
| 14. | GA5787 | 1 | Lower Arm |
| 15. | GD8249 | - | Spring |
| 16. | GD7626 | 1 | Lockup, R.H. (Non-Stock Item Sub GA5564) |
| 17. | G10017 | 2 | Hex Head Cap Screw, 1/2"-13 x 1 1/2" |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10111 | 2 | Lock Nut, 1/2"-13 |
| 18. | G10037 | 4 | Hex Head Cap Screw, 1/2"-13 x 1 1/4" |
| | G10228 | 4 | Lock Washer, 1/2" |
| | G10102 | 4 | Hex Nut, 1/2"-13 |
| 19. | GD10710 | 2 | Stop Bar |
| 20. | G3303-96 | 1 | Roller Chain, No. 41, 96 Links Including Connector Link |
| | GR0196 | 1 | Connector Link, No. 41 |
| 21. | GD11218 | 1 | Spring |
| 22. | G10201 | 1 | Special Washer |
| 23. | GD9240 | 1 | Idler |
| 24. | G10210 | 1 | Washer, 3/8" USS |
| 25. | G10108 | 1 | Lock Nut, 3/8"-16 |
| 26. | GD1026 | 1 | Spacer, 1 3/16" |
| 27. | GD7318 | 1 | Bushing, 1" |
| 28. | G10307 | 1 | Carriage Bolt, 3/8"-16 x 3 1/2" |
| 29. | G10599 | 1 | Carriage Bolt, 3/8"-16 x 1 1/4" |
| | G10101 | 1 | Hex Nut, 3/8"-16 |
| | G10108 | 1 | Lock Nut, 3/8"-16 |
| 30. | GD8893-01 | 1 | Bushing, 1 3/8" |
| 31. | GA8167 | - | Push Unit Shank |
| 32. | GD11233 | - | Cover |
| 33. | G10003 | 4 | Hex Head Cap Screw, 3/8"-16 x 1 1/2" |
| | G10210 | 4 | Washer, 3/8" USS |
| | G10622 | 4 | Flange Nut, 3/8"-16 |
| A. | GA5564 | - | Lockup Package, Includes: (1) GD7627, (1) GD7626, (2) G10228, (2) G10017, (2) G10111 |
| B. | G1K273 | - | Push Row Unit Shank Replacement Kit (Items 18, 19, 24, 25 And 28-33) |

INNER HITCH/SAFETY CHAIN

PHA021/PHA025(WGN47a/TWL48)



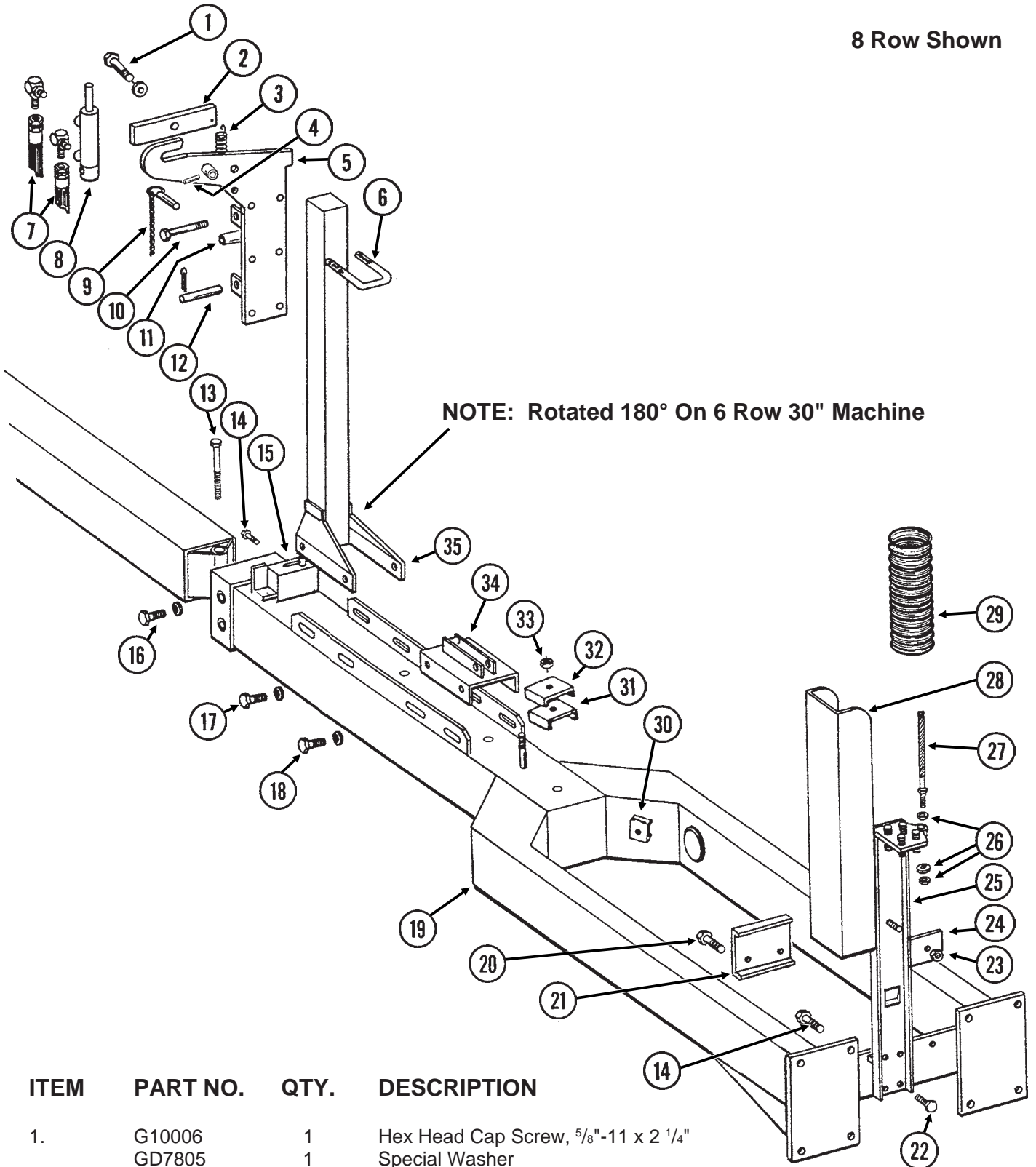
INNER HITCH/SAFETY CHAIN

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--------------------------------------|
| 1. | GA6372 | 1 | Inner Hitch, 65 1/4" |
| 2. | G10417 | 2 | Hex Head Cap Screw, 7/8"-9 x 4 1/2" |
| | G10418 | 2 | Lock Nut, 7/8"-9 |
| 3. | GD7140 | 1 | Hose Holder |
| 4. | G10217 | 2 | Special Washer |
| | G10230 | 1 | Lock Washer, 5/8" |
| | G10104 | 1 | Hex Nut, 5/8"-11 |
| 5. | GA4994 | 1 | Jack Assembly Complete |
| | GA4995 | - | Detent Pin Assembly |
| | GR0517 | - | Pin |
| | GR0516 | - | Crank Assembly |
| | GR0515 | - | Bevel Gear |
| 6. | GB0181 | 1 | Clevis |
| 7. | | - | See "Outer Hitch", Pages P30 And P31 |
| 8. | G1K234 | 1 | Safety Chain Kit, 3/8" (Optional) |
| | G10417 | 1 | Hex Head Cap Screw, 7/8"-9 x 4 1/2" |
| | G10418 | 1 | Lock Nut, 7/8"-9 |

OUTER HITCH

PHA028(TWL49c)

8 Row Shown



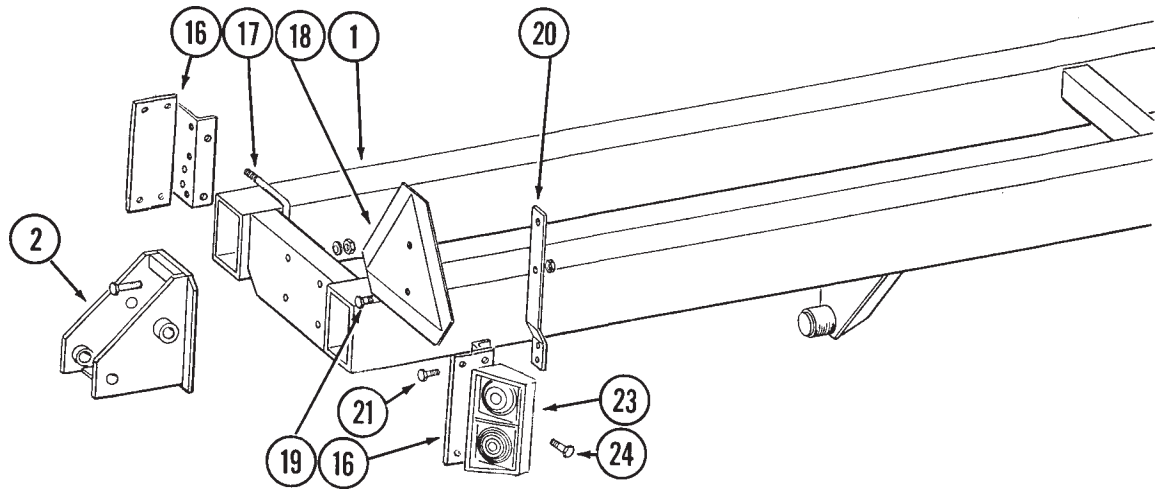
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--|
| 1. | G10006 | 1 | Hex Head Cap Screw, $\frac{5}{8}$ "-11 x 2 $\frac{1}{4}$ " |
| | GD7805 | 1 | Special Washer |
| | GB0218 | 1 | Bushing, $\frac{19}{32}$ " |
| | G10107 | 1 | Lock Nut, $\frac{5}{8}$ "-11 |
| 2. | GA6422 | 1 | Catch Bar |
| 3. | GD5857 | 1 | Spring |
| 4. | G10765 | 1 | Spring Pin, $\frac{1}{4}$ " x 1" |
| 5. | GA6420 | 1 | Transport Catch |

OUTER HITCH

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|------|--|
| 6. | GD4743 | 3 | U-Bolt, 3" x 3" x 1/2"-13 |
| | G10228 | 6 | Lock Washer, 1/2" |
| | G10102 | 6 | Hex Nut, 1/2"-13 |
| 7. | | - | See "Hydraulic System", Pages P54-P57 |
| 8. | | - | See "Kickout Cylinder", Page P50 |
| 9. | GA7022 | 1 | Detent Pin |
| 10. | G10061 | 1 | Hex Head Cap Screw, 3/8"-16 x 3 1/2" |
| | G10229 | 1 | Lock Washer, 3/8" |
| | G10101 | 1 | Hex Nut, 3/8"-16 |
| 11. | GD2971-09 | 1 | Sleeve, 5/8" O.D. x 2" |
| | GD3180-03 | - | Sleeve, 7/8" O.D. x 15/16" (As Required) |
| 12. | GD7137 | 1 | Pin, 3/4" x 3 3/8" |
| | G10457 | 2 | Cotter Pin, 5/32" x 1 1/2" |
| 13. | G10717 | 1 | Hex Head Cap Screw, 1 1/4"-7 x 9" |
| | G10236 | 1 | Lock Washer, 1 1/4" |
| | G10239 | 1 | Hex Nut, 1 1/4"-7 |
| 14. | G10027 | 8 | Hex Head Cap Screw, 3/4"-10 x 2 1/2", |
| | GD2169 | 8 | Hardened Washer |
| | G10105 | 8 | Hex Nut, 3/4"-10 |
| 15. | | - | See "Selector Valve", Page P52 |
| 16. | G10716 | 2 | Hex Head Cap Screw, 3/4"-10 x 1" |
| | G10231 | 2 | Lock Washer, 3/4" |
| 17. | G10005 | 4 | Hex Head Cap Screw, 5/8"-11 x 1 3/4" |
| | GD7805 | 4 | Special Washer |
| | G10230 | 4 | Lock Washer, 5/8" |
| | G10104 | 4 | Hex Nut, 5/8"-11 |
| 18. | G10005 | 4 | Hex Head Cap Screw, 5/8"-11 x 1 3/4" |
| | G10205 | 4 | Washer, 5/8" SAE |
| | G10230 | 4 | Lock Washer, 5/8" |
| | G10104 | 4 | Hex Nut, 5/8"-11 |
| 19. | GA6371 | 1 | Outer Hitch, 125 1/2" |
| 20. | G10004 | 2 | Hex Head Cap Screw, 3/8"-16 x 1 1/4" |
| | G10108 | 2 | Lock Nut, 3/8"-16 |
| 21. | GD10731 | 1 | Wire Clamp |
| 22. | G10004 | 4 | Hex Head Cap Screw, 3/8"-16 x 1 1/4" |
| | G10229 | 4 | Lock Washer, 3/8" |
| | G10101 | 4 | Hex Nut, 3/8"-16 |
| 23. | G10048 | 1 | Hex Head Cap Screw, 3/8"-16 x 2" |
| | G10229 | 1 | Lock Washer, 3/8" |
| | G10101 | 1 | Hex Nut, 3/8"-16 |
| 24. | GD9046 | 1 | Hose Clamp |
| 25. | GA6402 | 1 | Hose Support |
| 26. | G10228 | 4 | Lock Washer, 1/2" |
| | G10102 | 4 | Hex Nut, 1/2"-13 |
| 27. | GA6608 | 1 | Cable Assembly |
| 28. | GD9227 | 1 | Channel |
| 29. | GD9129-01 | 1 | Hose Protector, 48" |
| 30. | GD5875 | 3 | Hose Clamp, 9/16" x 2 1/2" x 2" |
| 31. | GD0740 | 2 | Hose Clamp, 3/4" x 4" x 3 1/2" |
| 32. | GD5892 | 2 | Hose Clamp, 5/8" x 1 1/2" x 1 1/2" |
| 33. | G10108 | 1 | Lock Nut, 3/8"-16 |
| 34. | GA6404 | 1 | Jack Storage Mount |
| 35. | GA6623 | - | Transport Post, 6 Row 30" |
| | GA6418 | - | Transport Post, 8 Row 30" (Shown) |

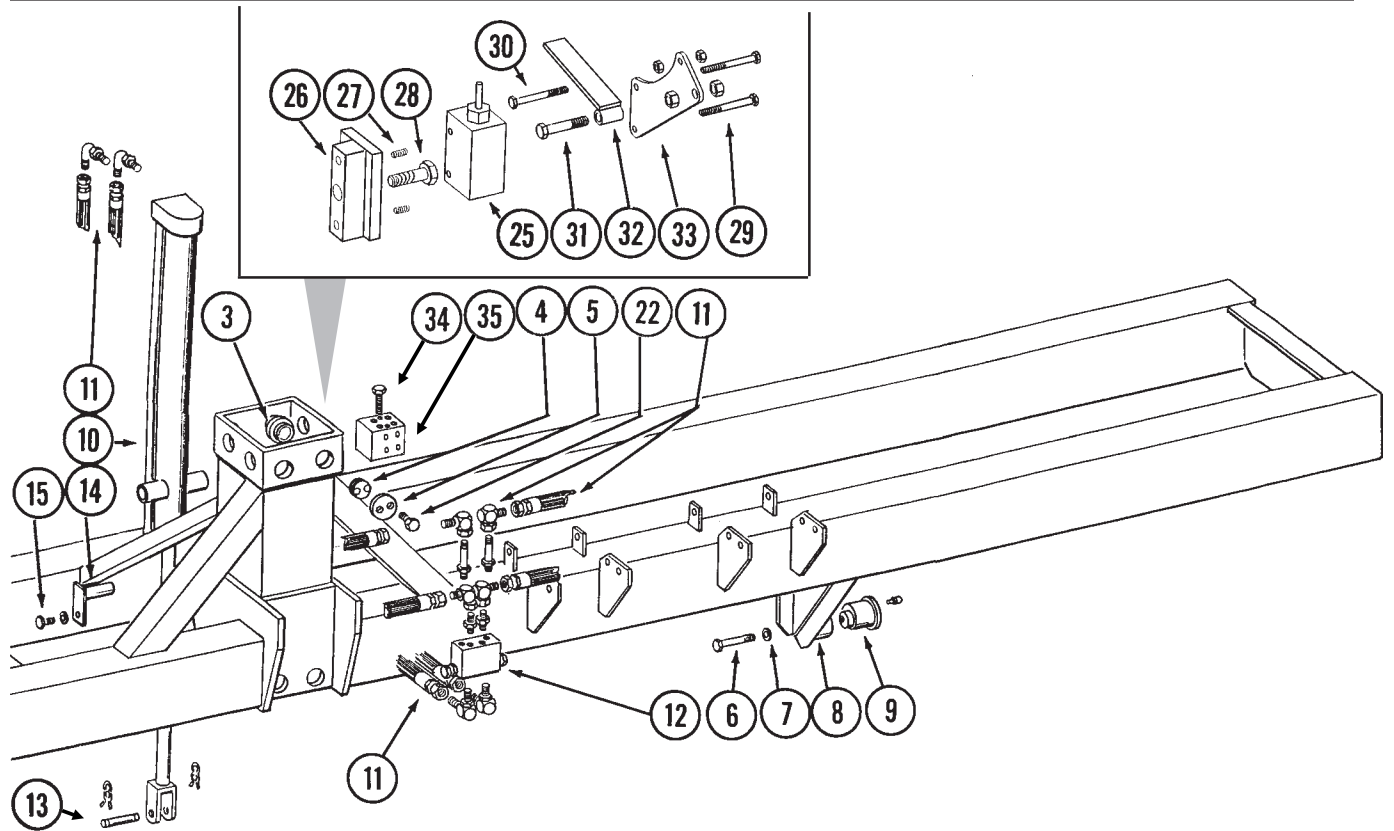
FRAME ASSEMBLY

PFA054/PFA055(TWL50/TWL51a)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--|
| 1. | A6401 | - | Frame, 180", 6 Row 30" (Non-Stock Item) |
| | A6364 | - | Frame, 240", 8 Row 30" (Non-Stock Item) |
| 2. | | - | See "Marker Assembly", Pages P44-P47 |
| 3. | GD9093 | 16 | Poly Wear Pad |
| 4. | GB0234 | 16 | Adjustment Plug |
| 5. | GB0230 | 16 | Cap |
| 6. | G10025 | 2 | Hex Head Cap Screw, 3/4"-10 x 1 1/2" |
| | G10231 | 2 | Lock Washer, 3/4" |
| 7. | GD9052 | 2 | Washer |
| 8. | GD10532 | 2 | Sleeve |
| 9. | GA6497 | 2 | Cam Follower W/Grease Fitting |
| | G10640 | - | Grease Fitting, 1/4"-28 |
| 10. | | - | See "Lift Cylinder", Page P49 |
| 11. | | - | See "Hydraulic System", Pages P54-P57 |
| 12. | | - | See "Marker Sequencing/Flow Control Valve", Page P53 |
| 13. | GR0375 | 1 | Cylinder Pin |
| | GR0193 | 2 | Hair Pin Clip |
| 14. | GA5121 | 2 | Pin |
| 15. | G10037 | 2 | Hex Head Cap Screw, 1/2"-13 x 1 1/4" |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 16. | GA6792 | 2 | Light Bracket |

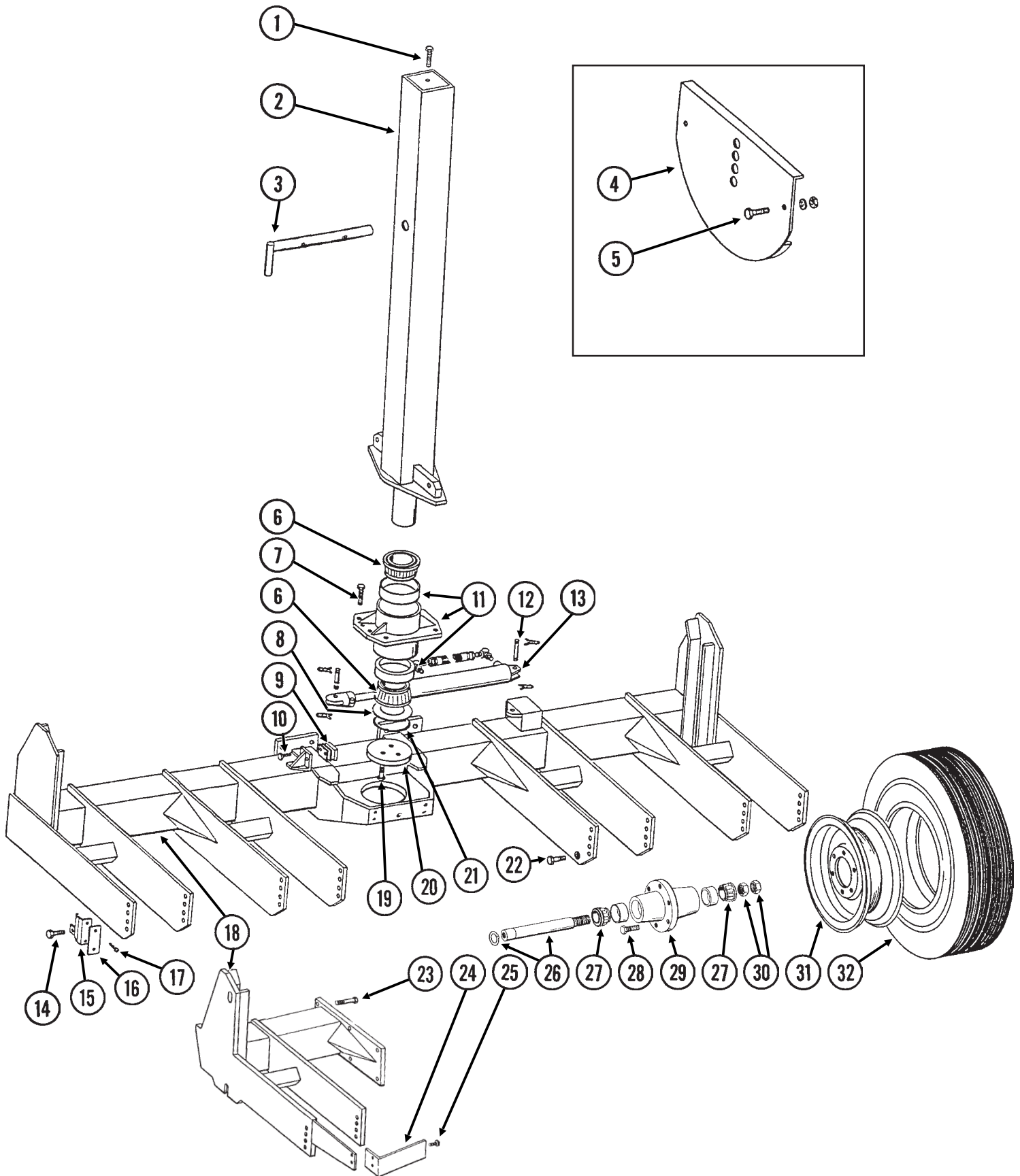
FRAME ASSEMBLY



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--|
| 17. | GD1113 | 2 | U-Bolt, 5" x 7" x 5/8"-11 |
| | G10230 | 4 | Lock Washer, 5/8" |
| | G10104 | 4 | Hex Nut, 5/8"-11 |
| 18. | | - | See "SMV Sign, Decals, Reflectors And Tie Straps", Pages P104 And P105 |
| 19. | G10022 | 2 | Hex Head Cap Screw, 1/4"-20 x 1/2" |
| | G10227 | 2 | Lock Washer, 1/4" |
| | G10103 | 2 | Hex Nut, 1/4"-20 |
| 20. | GD6783 | 1 | Bracket |
| 21. | G10031 | 2 | Hex Head Cap Screw, 5/16"-18 x 1 3/4" |
| | G10232 | 2 | Lock Washer, 5/16" |
| | G10106 | 2 | Hex Nut, 5/16"-18 |
| 22. | G10438 | 32 | Hex Head Cap Screw, 1/2"-13 x 3/4" |
| 23. | | - | See "Electrical Components", Page P106 |
| 24. | G10064 | 8 | Hex Head Cap Screw, 1/4"-20 x 1" |
| | G10227 | 8 | Lock Washer, 1/4" |
| | G10103 | 8 | Hex Nut, 1/4"-20 |
| 25. | | - | See "Stroke Limiter Valve", Page P51 |
| 26. | GA6850 | 1 | Valve Mount |
| 27. | G10120 | 2 | Set Screw, 3/8" x 1/2" |
| 28. | G10005 | 1 | Hex Head Cap Screw, 5/8"-11 x 1 3/4" |
| 29. | G10403 | 2 | Hex Head Cap Screw, 1/4"-20 x 2 1/2" |
| | G10227 | 2 | Lock Washer, 1/4" |
| 30. | G10638 | 1 | Hex Head Cap Screw, 1/4"-20 x 2" |
| | G10103 | 2 | Hex Nut, 1/4"-20 |
| 31. | G10048 | 1 | Hex Head Cap Screw, 3/8"-16 x 2" |
| | G10101 | 2 | Hex Nut, 3/8"-16 |
| 32. | GA7153 | 1 | Stroke Limiter Arm |
| 33. | GD10129 | 1 | Mounting Bracket |
| 34. | G10172 | 2 | Hex Head Cap Screw, 3/8"-16 x 5" |
| | G10108 | 2 | Lock Nut, 3/8"-16 |
| 35. | GD9971 | 1 | Manifold Block, Style B Hydraulic System |

AXLE/PIVOT AND WHEEL ASSEMBLY

PFA040/PLA015/HTA014(TWL52c/TWL52b)



AXLE/PIVOT AND WHEEL ASSEMBLY

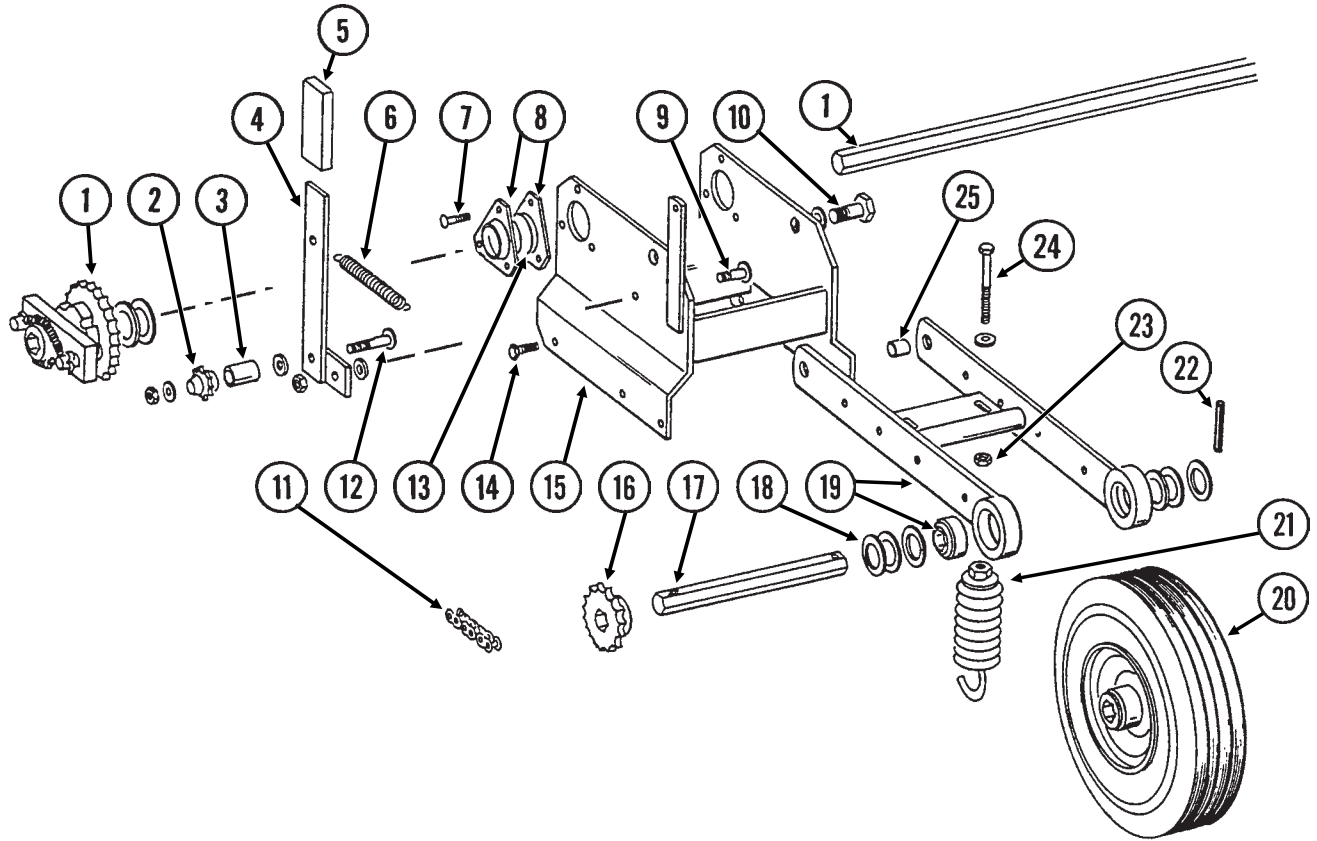
| ITEM | PART NO. | QTY. (Per Planter) | DESCRIPTION |
|------|----------|-----------------------|--|
| 1. | | - | See "Rear Trailer Hitch", Pages P102 And P103 |
| 2. | GA7543 | 1 | Center Post |
| 3. | GA6849 | 1 | Safety Lockup Pin, 17 1/4" |
| | G10671 | 1 | Slotted Spring Pin, 3/16" x 3 1/4" |
| | G10606 | 1 | Spring Pin, 1/4" x 2" |
| 4. | GA6529 | - | Rock Guard (Optional) |
| 5. | G10037 | - | Hex Head Cap Screw, 1/2"-13 x 1 1/4" |
| | G10228 | - | Lock Washer, 1/2" |
| | G10102 | - | Hex Nut, 1/2"-13 |
| 6. | GA6435 | 2 | Cone |
| 7. | G10028 | 8 | Hex Head Cap Screw, 3/4"-10 x 3" |
| | GD2169 | 8 | Hardened Washer |
| | G10105 | 8 | Hex Nut, 3/4"-10 |
| 8. | GD9122 | - | Shim, .005" Thick (As Required) |
| | GD9123 | - | Shim, .007" Thick (As Required) |
| | GD9124 | - | Shim, .020" Thick (As Required) |
| 9. | GD3389 | 1 | Tap Block |
| | GD3398 | - | Shim, 16 Gauge (As Required) |
| | GD7888 | - | Shim, 22 Gauge (As Required) |
| 10. | G10016 | 2 | Hex Head Cap Screw, 1/2"-13 x 2" |
| | G10228 | 2 | Lock Washer, 1/2" |
| 11. | GA6496 | 1 | Bearing Housing W/Cups And Grease Fitting |
| | GD9121 | - | Cup |
| | G10779 | - | Grease Fitting, 90°, 1/4"-28 |
| 12. | GR0375 | 2 | Cylinder Pin |
| | GR0193 | 4 | Hair Pin Clip |
| 13. | | - | See "Rotation Cylinder", Page P49 |
| 14. | G10039 | 2 | Hex Head Cap Screw, 1/2"-13 x 1 3/4" |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 15. | GD6957 | 1 | Mount, L.H. (Shown) |
| | GD6958 | 1 | Mount, R.H. |
| 16. | | - | See "SMV Sign, Decals, Reflectors And Tie Straps", Pages P104 And P105 |
| 17. | G10482 | 4 | Slotted Screw, No. 8 x 3/4" |
| 18. | A6363 | 1 | Axle, 6 Row 30" And 8 Row 30" (Non-Stock Item) |
| | A7380 | 1 | Axle W/Stub And Scraper Mounts, 6 Row 30" And 8 Row 30" (Non-Stock Item) |
| 19. | G10008 | 3 | Hex Head Cap Screw, 5/8"-11 x 2" |
| | G10230 | 3 | Lock Washer, 5/8" |
| 20. | GD9051 | 1 | Bearing Cap |
| 21. | GD9130 | 1 | O-Ring |
| 22. | G10026 | 2 | Hex Head Cap Screw, 3/4"-10 x 2" |
| | G10231 | 2 | Lock Washer, 3/4" |
| 23. | G10027 | 6 | Hex Head Cap Screw, 3/4"-10 x 2 1/2" |
| | G10231 | 6 | Lock Washer, 3/4" |
| | G10105 | 6 | Hex Nut, 3/4"-10 |
| 24. | GD10010 | 4 | Scraper |
| 25. | G10636 | 8 | Carriage Bolt, 1/2"-13 x 1 1/2" |
| | G10228 | 8 | Lock Washer, 1/2" |
| | G10102 | 8 | Hex Nut, 1/2"-13 |
| 26. | GA4693 | 1 | Spindle W/Round External Retaining Ring, 10 1/2" (Per Wheel) |
| | GD11490 | - | Round External Retaining Ring |
| 27. | GA0895 | 2 | Cone |
| 28. | GR0270 | 6 | Lug Bolt, 9/16"-18 |
| 29. | GA2148 | 1 | Hub W/Cups, 6 Bolt |
| | GR0434 | - | Cup |
| 30. | G10087 | 2 | Jam Nut, 1 1/2"-10 |
| 31. | GA2142 | 1 | Rim, 5.50" x 20" |
| 32. | D9645 | 1 | Tire, 7.50" x 20", 6 Ply (Specify Brand*) (Non-Stock Item Sub GD10795) |
| | GD10795 | - | Tire, 7.50" x 20", 6 Ply Without Center Rim (Specify Brand*) |
| | GA7434 | 1 | Tubeless Valve Stem |
| A. | GA6428 | - | Hub And Spindle Assembly (Items 22 And 26-30) |

* Specific brand requests will be supplied only as available from current KINZE® stock. If a specific brand as requested is not on hand, the brand available will be supplied.

CONTACT DRIVE WHEEL AND ARM ASSEMBLY

PLA026(TWL53d)

Prior To Serial No. 900719



CONTACT DRIVE WHEEL AND ARM ASSEMBLY

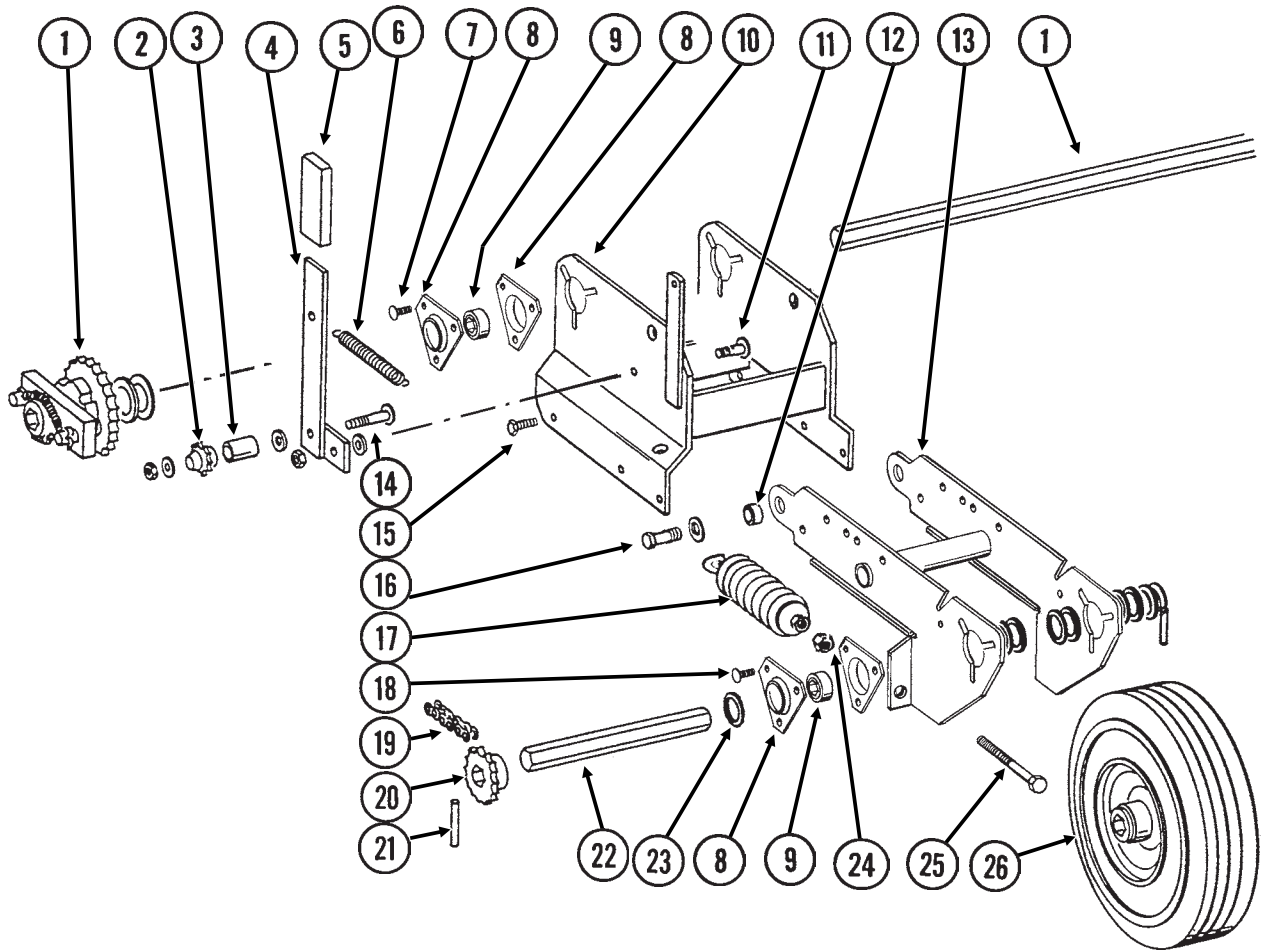
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|-------------|---|
| | | (Per Wheel) | |
| 1. | | - | See "Driveline", Pages P40 And P41 |
| 2. | GD7426 | 1 | Idler Sprocket, 12 Tooth |
| 3. | GD1026 | 1 | Sleeve, 1 ³ / ₁₆ " |
| 4. | GA5157 | 1 | Idler Arm |
| 5. | GD5827 | 1 | Cover |
| 6. | GD5857 | 1 | Spring |
| 7. | G10312 | 3 | Carriage Bolt, ⁵ / ₁₆ "-18 x ³ / ₄ " |
| | G10232 | 3 | Lock Washer, ⁵ / ₁₆ " |
| | G10106 | 3 | Hex Nut, ⁵ / ₁₆ "-18 |
| 8. | G3400-01 | 2 | Flangette |
| 9. | G10001 | 3 | Hex Head Cap Screw, ³ / ₈ "-16 x 1" |
| | G10229 | 3 | Lock Washer, ³ / ₈ " |
| | GD5756 | 3 | Special Nut |
| 10. | G10005 | 2 | Hex Head Cap Screw, ⁵ / ₈ "-11 x 1 ³ / ₄ " |
| | G10235 | 4 | Machine Bushing |
| | G10205 | 2 | Washer, ⁵ / ₈ " SAE |
| | GD7805 | 2 | Special Washer |
| | G10107 | 2 | Lock Nut, ⁵ / ₈ "-11 |
| 11. | G3310-117 | 1 | Chain, No. 40, 117 Pitch Including Connector Link And Offset Link |
| | GR0912 | - | Connector Link, No. 40 |
| | GR0911 | - | Offset Link, No. 40 |
| 12. | G10306 | 1 | Carriage Bolt, ³ / ₈ "-16 x 2" |
| | G10210 | - | Washer, ³ / ₈ " USS (As Required) |
| | G10108 | 1 | Lock Nut, ³ / ₈ "-16 |
| 13. | G2100-03 | 1 | Bearing, ⁷ / ₈ " Hex Bore, Spherical |
| 14. | G10001 | 6 | Hex Head Cap Screw, ³ / ₈ "-16 x 1" |
| | G10229 | 6 | Lock Washer, ³ / ₈ " |
| | G10101 | 6 | Hex Nut, ³ / ₈ "-16 |
| 15. | GA6417 | 1 | Mount |
| 16. | GA5105 | 1 | Sprocket, 15 Tooth |
| 17. | GD5797 | 1 | Shaft, ⁷ / ₈ " x 10" |
| 18. | G10233 | 6 | Machine Bushing, 1" |
| 19. | GA6415 | 2 | Wheel Arm W/Bearings (Sub G1K253 - See Pages P38 And P39) |
| | GA5116 | - | Bearing, ⁷ / ₈ " Hex Bore Cylindrical |
| 20. | GA5090 | - | Tire And Rim Assembly (Specify Brand*) |
| | GD5753 | 1 | Tire, 4.10" x 6" (Specify Brand*) |
| | GD5752 | 1 | Tube |
| 21. | GA2068 | 2 | Spring |
| 22. | G10602 | 2 | Spring Pin, ¹ / ₄ " x 1 ¹ / ₂ " |
| 23. | G10501 | 2 | Jam Nut, ¹ / ₂ "-13 |
| 24. | G10053 | 2 | Hex Adjusting Bolt, ¹ / ₂ "-13 x 2 ¹ / ₂ ", Grade 5 |
| | G10206 | 2 | Washer, ¹ / ₂ " SAE |
| 25. | GB0218 | 2 | Bushing, ¹⁹ / ₃₂ " |

* Specific brand requests will be supplied only as available from current KINZE® stock. If a specific brand as requested is not on hand, the brand available will be supplied. Different brand tires may have different diameters. Change in tire brand could result in rate changes. To maintain consistent planting rates throughout all rows, it is recommended that all contact tires be of the same brand and be equally inflated.

CONTACT DRIVE WHEEL AND ARM ASSEMBLY

PLA026(TWL53f)

Serial No. 900719 And On



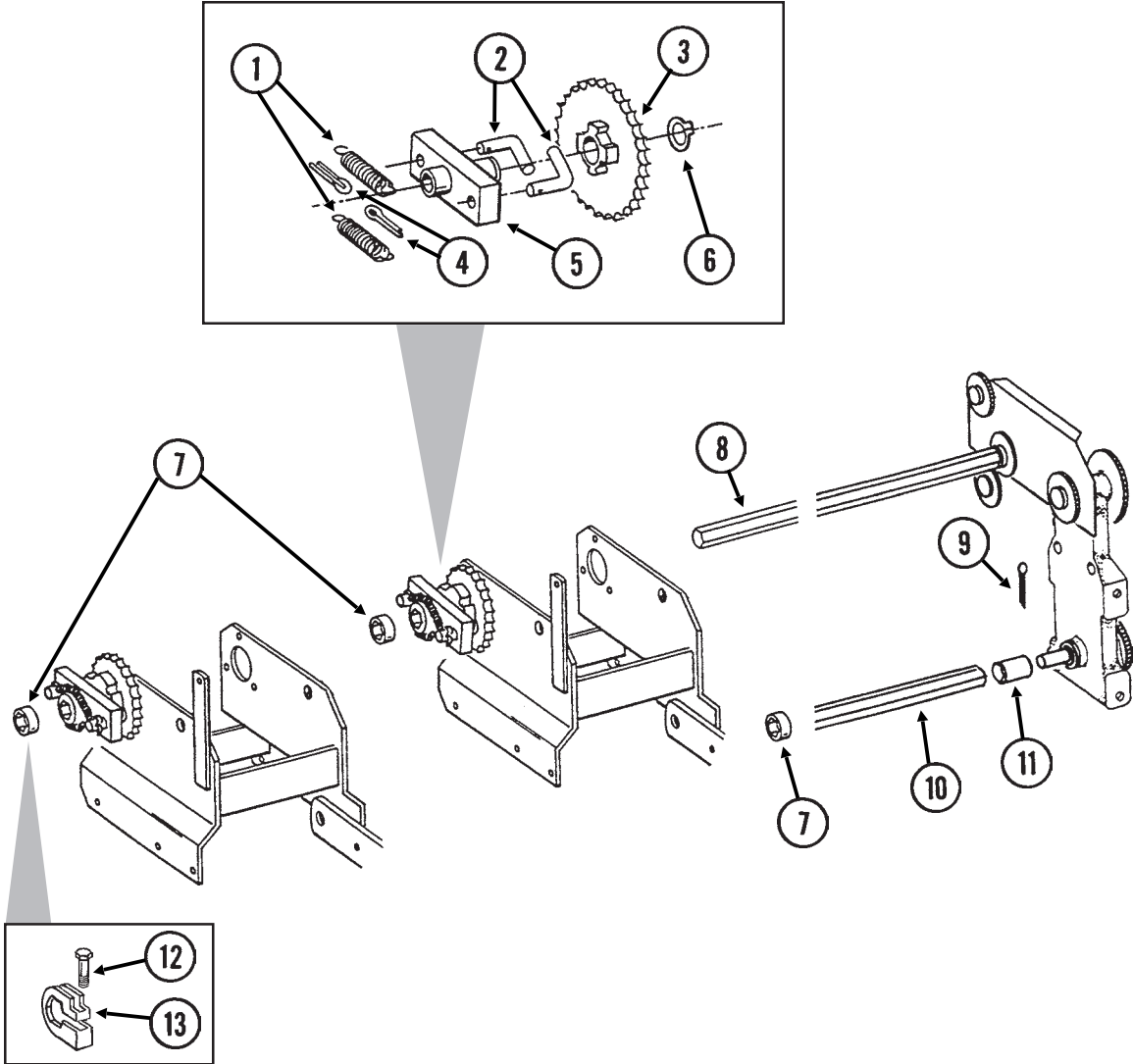
CONTACT DRIVE WHEEL AND ARM ASSEMBLY

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|---------------|-------------|--|
| | | (Per Wheel) | |
| 1. | | - | See "Driveline", Pages P40 And P41 |
| 2. | GD7426 | 1 | Idler Sprocket, 12 Tooth |
| 3. | GD1026 | 1 | Sleeve, 1 ³ / ₁₆ " |
| 4. | GA5157 | 1 | Idler Arm |
| 5. | GD5827 | 1 | Cover |
| 6. | GD5857 | 1 | Spring |
| 7. | G10312 | 3 | Carriage Bolt, ⁵ / ₁₆ "-18 x ³ / ₄ " |
| | G10232 | 3 | Lock Washer, ⁵ / ₁₆ " |
| | G10106 | 3 | Hex Nut, ⁵ / ₁₆ "-18 |
| 8. | G3400-01 | 4 | Flangette |
| 9. | G2100-03 | 2 | Bearing, ⁷ / ₈ " Hex Bore, Spherical |
| 10. | GA7826 | 1 | Mount |
| 11. | G10001 | 3 | Hex Head Cap Screw, ³ / ₈ "-16 x 1" |
| | G10229 | 3 | Lock Washer, ³ / ₈ " |
| | GD5756 | 3 | Special Nut |
| 12. | GB0218 | 2 | Bushing, ¹⁹ / ₃₂ " |
| 13. | GA7369 | 1 | Wheel Arm (Sub G1K253) |
| 14. | G10306 | 1 | Carriage Bolt, ³ / ₈ "-16 x 2" |
| | G10210 | - | Washer, ³ / ₈ " USS (As Required) |
| | G10108 | 1 | Lock Nut, ³ / ₈ "-16 |
| 15. | G10001 | 6 | Hex Head Cap Screw, ³ / ₈ "-16 x 1" |
| | G10229 | 6 | Lock Washer, ³ / ₈ " |
| | G10101 | 6 | Hex Nut, ³ / ₈ "-16 |
| 16. | G10751 | 2 | Hex Head Cap Screw, ⁵ / ₈ "-18 x 1 ³ / ₄ " |
| | G10235 | 6 | Machine Bushing |
| | GD7805 | 2 | Special Washer |
| | G10412 | 2 | Lock Nut, ⁵ / ₈ "-18 |
| 17. | GA2068 | 2 | Spring |
| 18. | G10303 | 6 | Carriage Bolt, ⁵ / ₁₆ "-18 x 1" |
| | G10219 | 6 | Washer, ⁵ / ₁₆ " USS |
| | G10232 | 6 | Lock Washer, ⁵ / ₁₆ " |
| | G10106 | 6 | Hex Nut, ⁵ / ₁₆ "-18 |
| 19. | G3310-116 | 1 | Chain, No. 40, 116 Pitch Including Connector Link And Offset Link |
| | GR0912 | - | Connector Link, No. 40 |
| | GR0911 | - | Offset Link, No. 40 |
| 20. | GA5105 | 1 | Sprocket, 15 Tooth |
| 21. | G10602 | 2 | Spring Pin, ¹ / ₄ " x 1 ¹ / ₂ " |
| 22. | GD6825-10.375 | 1 | Shaft, ⁷ / ₈ " x 10 ³ / ₈ " |
| 23. | G10233 | 6 | Machine Bushing, 1" |
| 24. | G10501 | 2 | Jam Nut, ¹ / ₂ "-13 |
| 25. | G10890 | 2 | Hex Head Adjusting Bolt, ¹ / ₂ "-13 x 4" |
| 26. | GA5090 | - | Tire And Rim Assembly (Specify Brand*) |
| | GD5753 | 1 | Tire, 4.10" x 6" (Specify Brand*) |
| | GD5752 | 1 | Tube |
| A. | G1K253 | - | Contact Wheel Arm Replacement Kit (Items 9, 13, 18, 21 And 22) |

* Specific brand requests will be supplied only as available from current KINZE® stock. If a specific brand as requested is not on hand, the brand available will be supplied. Different brand tires may have different diameters. Change in tire brand could result in rate changes. To maintain consistent planting rates throughout all rows, it is recommended that all contact tires be of the same brand and be equally inflated.

DRIVELINE

PTD033/PLA026/PTD016/PTD066(TWL54b)

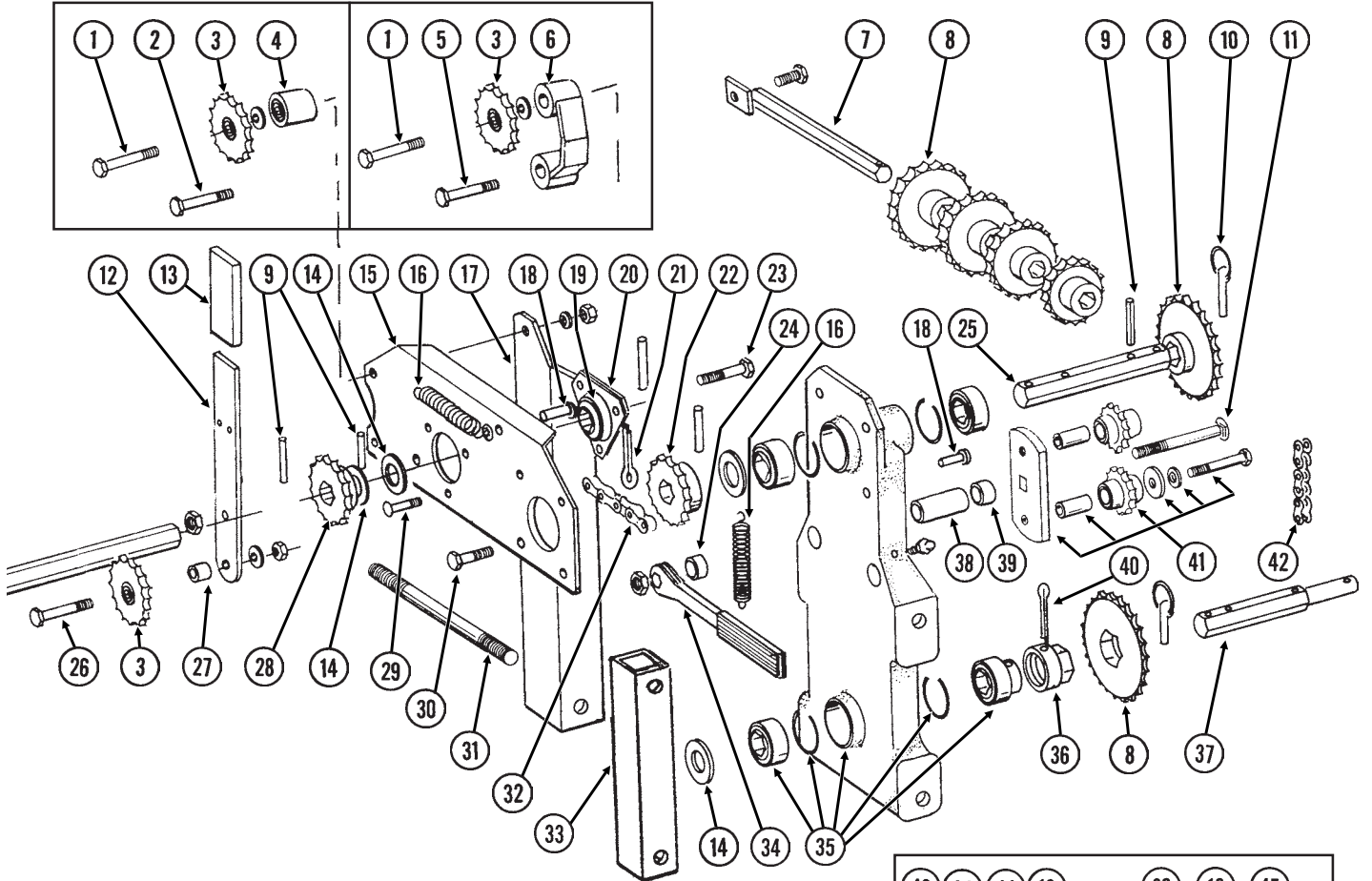


DRIVELINE

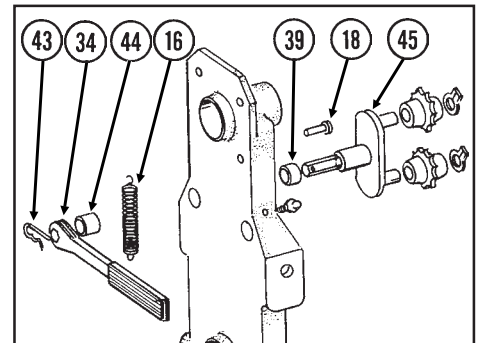
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|------------|---------------|---|
| | | (Per Planter) | |
| 1. | GD1256 | 4 | Spring |
| 2. | GD1255 | 4 | "L" Pin |
| 3. | GA5165 | 2 | Hub/Sprocket Assembly, 30 Tooth |
| 4. | G10464 | 4 | Cotter Pin, $\frac{3}{16}$ " x 1" |
| 5. | GA0378 | 2 | Block And Hub Assembly |
| 6. | G10430 | 2 | Ring |
| 7. | GD0917 | - | Lock Collar, $\frac{7}{8}$ " Hex, Less Set Screws (Sub G1K269) |
| | G10145 | 2 | Set Screw, $\frac{5}{16}$ "-18 x $\frac{1}{2}$ " |
| 8. | GD9078 | - | Drive Shaft, 58" (4 Holes), 6 Row 30" |
| | GD9077 | - | Drive Shaft, 98" (4 Holes), 8 Row 30" |
| 9. | G10460 | 1 | Cotter Pin, $\frac{1}{4}$ " x 2" |
| 10. | GD0914-165 | - | Drill Shaft, 6 Row 30" |
| | GD0914-225 | - | Drill Shaft, 8 Row 30" |
| 11. | GD5886 | 1 | Coupler |
| 12. | G10031 | - | Hex Head Cap Screw, $\frac{5}{16}$ "-18 x 1 $\frac{3}{4}$ " |
| | G10620 | - | Flange Nut, $\frac{5}{16}$ "-18 |
| 13. | GD11045 | - | Lock Clamp |
| A. | GA5164 | - | Ratchet/Sprocket Assembly, Includes: (2)GD1256, (2)G10464, (1)GA0378, (2)GD1255, (1)GA5165, (1)G10430 (Items 1-6) |
| B. | G1K269 | - | Lock Clamp Kit (Items 12 And 13) |

TRANSMISSION ASSEMBLY

PTD040/PTD066/PTD041(PT8d/PT8b)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | G10033 | 1 | Hex Head Cap Screw, 1/2"-13 x 3 1/2" |
| | G10128 | - | Machine Bushing (As Required) |
| | G10228 | 1 | Lock Washer, 1/2" |
| | G10102 | 1 | Hex Nut, 1/2"-13 |
| 2. | G10017 | 1 | Hex Head Cap Screw, 1/2"-13 x 1 1/2" |
| | G10228 | 1 | Lock Washer, 1/2" |
| | G10102 | 1 | Hex Nut, 1/2"-13 |
| 3. | GA7154 | 1 | Idler Sprocket W/Bearing, 18 Tooth |
| 4. | GB0259 | 1 | Spacer, 1" |
| 5. | G10053 | 1 | Hex Head Cap Screw, 1/2"-13 x 2 1/2" |
| | G10228 | 1 | Lock Washer, 1/2" |
| | G10102 | 1 | Hex Nut, 1/2"-13 |
| 6. | GA7156 | 1 | Idler Mount, R.H. (Sub GB0259 And G10017) |
| 7. | GA5146 | 1 | Sprocket Storage Rod |
| 8. | GA5106 | 1 | Sprocket, 17 Tooth |
| | GA5107 | 1 | Sprocket, 19 Tooth |
| | GA5108 | 2 | Sprocket, 23 Tooth |
| | GA5109 | 1 | Sprocket, 24 Tooth |
| | GA5110 | 1 | Sprocket, 25 Tooth |
| | GA5111 | 1 | Sprocket, 26 Tooth |
| | GA5112 | 1 | Sprocket, 27 Tooth |
| | GA5113 | 1 | Sprocket, 28 Tooth |
| 9. | G10602 | 5 | Spring Pin, 1/4" x 1 1/2" |
| 10. | GD2558 | 3 | Lynch Pin, 1/4" |
| 11. | G10867 | 1 | Carriage Bolt, 1/2"-13 x 5" |
| | G10111 | 1 | Lock Nut, 1/2"-13 |
| 12. | GD5829 | 1 | Arm |
| 13. | GD5827 | 1 | Cover |
| 14. | G10233 | - | Machine Bushing |
| 15. | GD5824 | 1 | Plate, R.H. |

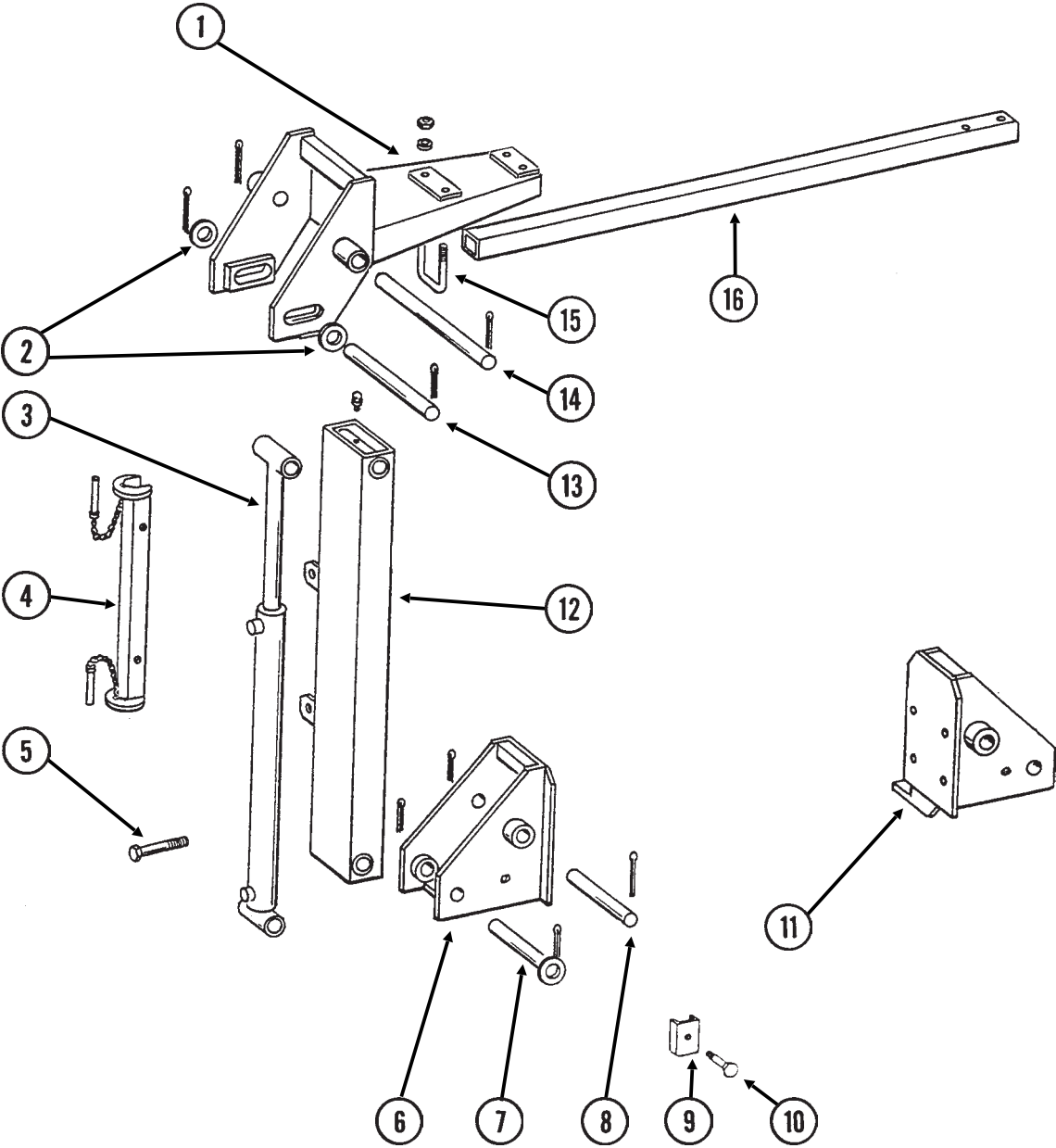


TRANSMISSION ASSEMBLY

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|------|---|
| 16. | GD5857 | 2 | Spring |
| 17. | GD5830 | 1 | Angle Support, R.H. |
| 18. | G10478 | 1 | Clevis Pin, $\frac{5}{16}$ " x 1" |
| | G10409 | 1 | Retaining Ring, $\frac{5}{16}$ " |
| 19. | G2100-03 | 1 | Bearing, $\frac{7}{8}$ " Hex Bore, Spherical |
| 20. | G3400-01 | 2 | Flangette |
| 21. | G10460 | 1 | Cotter Pin, $\frac{1}{4}$ " x 2" |
| 22. | GA5106 | 1 | Sprocket, 17 Tooth |
| | GA5202 | - | Sprocket, 34 Tooth Half Rate (2 To 1) Drive Reduction |
| 23. | G10001 | 1 | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1" |
| | G10229 | 1 | Lock Washer, $\frac{3}{8}$ " |
| | G10203 | - | Washer, $\frac{3}{8}$ " SAE (As Required) |
| | G10210 | - | Washer, $\frac{3}{8}$ " USS (As Required) |
| | GD5756 | 1 | Special Nut, $\frac{3}{8}$ "-16 |
| 24. | GD10161 | 1 | Spacer, $\frac{3}{8}$ " |
| 25. | GD5835 | 1 | Shaft, $\frac{7}{8}$ " x 7" |
| 26. | G10053 | 1 | Hex Head Cap Screw, $\frac{1}{2}$ "-13 x 2 $\frac{1}{2}$ " |
| | G10128 | - | Machine Bushing (As Required) |
| | G10228 | 1 | Lock Washer, $\frac{1}{2}$ " |
| | G10102 | 1 | Hex Nut, $\frac{1}{2}$ "-13 |
| 27. | GD4887-01 | 1 | Sleeve, $\frac{5}{8}$ " |
| 28. | GA5105 | 1 | Sprocket, 15 Tooth |
| 29. | G10303 | 3 | Carriage Bolt, $\frac{5}{16}$ "-18 x 1" |
| | G10232 | 3 | Lock Washer, $\frac{5}{16}$ " |
| | G10106 | 3 | Hex Nut, $\frac{5}{16}$ "-18 |
| 30. | G10037 | 3 | Hex Head Cap Screw, $\frac{1}{2}$ "-13 x 1 $\frac{1}{4}$ " |
| | G10228 | 3 | Lock Washer, $\frac{1}{2}$ " |
| | G10102 | 3 | Hex Nut, $\frac{1}{2}$ "-13 |
| 31. | GD6793 | 2 | Stud, $\frac{5}{8}$ "-11 x 9 $\frac{1}{2}$ " (Threaded Both Ends) |
| | G10230 | 4 | Lock Washer, $\frac{5}{8}$ " |
| | G10107 | 4 | Hex Nut, $\frac{5}{8}$ "-11 |
| 32. | G3310-92 | 1 | Chain, No. 40, 92 Pitch Including Connector |
| | G3310-08 | - | Chain, No. 40, 8 Pitch Including Connector Link, Used With Half Rate (2 To 1) Drive |
| | GR0912 | - | Connector Link, No. 40 |
| 33. | GD9047 | 1 | Spacer |
| 34. | GA4235 | 1 | Ratchet Wrench W/Protective Closure |
| | G10445 | - | Protective Closure |
| 35. | GA5629 | 1 | Transmission Plate W/ Bearings, Grease Fittings And Retaining Rings |
| | GA5116 | 3 | Bearing, $\frac{7}{8}$ " Hex Bore, Cylindrical |
| | GA5624 | 1 | Special Bearing, $\frac{7}{8}$ " Hex Bore x 1.6" |
| | GD6551 | 4 | Ring |
| | G10641 | - | Grease Fitting, $\frac{1}{8}$ " NPT |
| 36. | GD7127 | 1 | Shear Coupler |
| 37. | GD7822 | 1 | Shaft, $\frac{7}{8}$ " x 7" |
| 38. | GD3180-16 | 1 | Sleeve, 2 $\frac{13}{16}$ " |
| 39. | GD2734-01 | 1 | Sleeve, $\frac{1}{2}$ " |
| 40. | G10462 | 1 | Cotter Pin, $\frac{3}{16}$ " x 2" |
| 41. | GA7336 | 1 | Idler W/Bolt-On Sprockets |
| | GD7426 | - | Sprocket |
| | GD1026 | - | Spacer, 1 $\frac{3}{16}$ " |
| | G10210 | - | Washer, $\frac{3}{8}$ " USS |
| | G10229 | - | Lock Washer, $\frac{3}{8}$ " |
| | G10047 | - | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{3}{4}$ " |
| 42. | G3310-80 | 1 | Chain, No. 40, 80 Pitch Including Connector Link |
| | GR0912 | - | Connector Link, No. 40 |
| 43. | G10670 | 1 | Hair Pin Clip, No. 3 |
| 44. | GD6819 | 1 | Idler Sleeve, $\frac{7}{16}$ " |
| 45. | GA5628 | 1 | Idler W/Sprockets And Rings |
| | GD7426 | - | Sprocket |
| | G10435 | - | Ring |

MARKER ASSEMBLY, 6 ROW 30"

MKR025/PFA054(MKR9a)

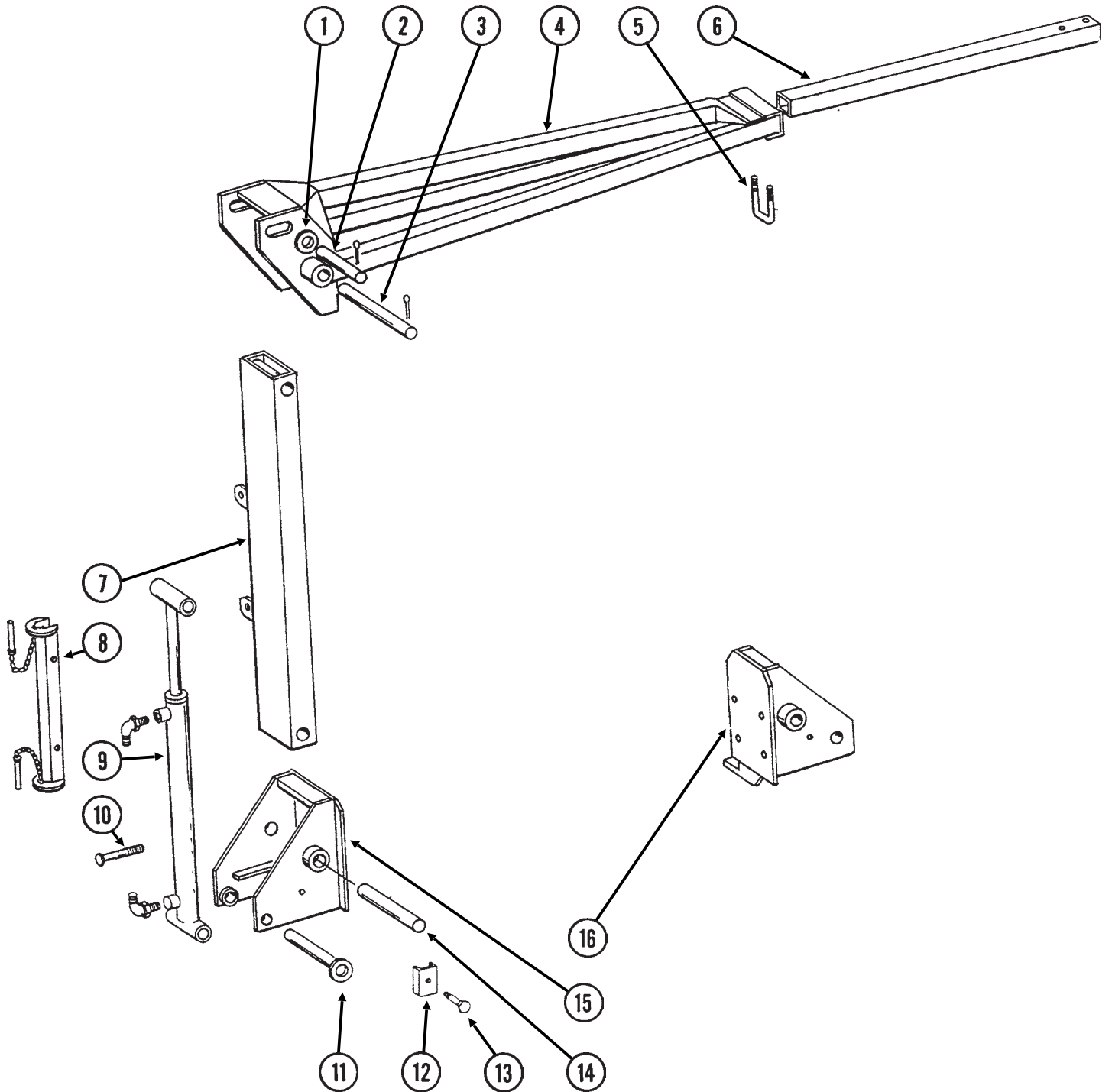


MARKER ASSEMBLY, 6 ROW 30"

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|--------------|--|
| | | (Per Marker) | |
| 1. | GA6442 | 1 | Second Stage Arm, 20" |
| 2. | G10226 | 2 | Washer, 1 1/4" SAE |
| 3. | | - | See "Marker Cylinder", Page P50 |
| 4. | GA5526 | 1 | Safety Lockup W/Detent Pins |
| | G10536 | - | Detent Pin, 1/2" x 2 1/2" |
| 5. | G10008 | 4 | Hex Head Cap Screw, 5/8"-11 x 2" |
| | G10230 | 4 | Lock Washer, 5/8" |
| 6. | GA6859 | 1 | Mount, L.H. |
| 7. | GA6532 | 1 | Pin |
| | G10460 | 1 | Cotter Pin, 1/4" x 2" |
| 8. | GD0652 | 1 | Pin, 1 1/4" x 9 1/2" |
| | G10460 | 2 | Cotter Pin, 1/4" x 2" |
| 9. | GD5875 | 1 | Hose Clamp, 9/16" x 2 1/2" x 2" |
| 10. | G10133 | 1 | Hex Head Cap Screw, 5/16"-18 x 1 1/2" |
| | G10232 | 1 | Lock Washer, 5/16" |
| | G10106 | 1 | Hex Nut, 5/16"-18 |
| 11. | GA6858 | - | Mount, R.H. |
| 12. | GA6585 | 1 | First Stage Arm W/Grease Fittings, L.H. (Shown) |
| | GA6586 | - | First Stage Arm W/Grease Fittings, R.H. |
| | G10641 | - | Grease Fitting, 1/8" NPT |
| 13. | GD2161 | 1 | Pin, 1 1/4" x 8 1/4" |
| | G10460 | 2 | Cotter Pin, 1/4" x 2" |
| 14. | GD3214 | 1 | Pin, 1 1/4" x 12 1/4" |
| | G10460 | 2 | Cotter Pin, 1/4" x 2" |
| 15. | GD2721 | 2 | U-Bolt, 2" x 2" x 1/2"-13 |
| | G10228 | 4 | Lock Washer, 1/2" |
| | G10102 | 4 | Hex Nut, 1/2"-13 |
| 16. | GD0453-02 | 1 | Extension Tube, 40" |
| | GD0453-06 | - | Extension Tube, 30" (Used With Interplant® Option) |

MARKER ASSEMBLY, 8 ROW 30"

MKR026/PFA054/MKR019(MKR10b)

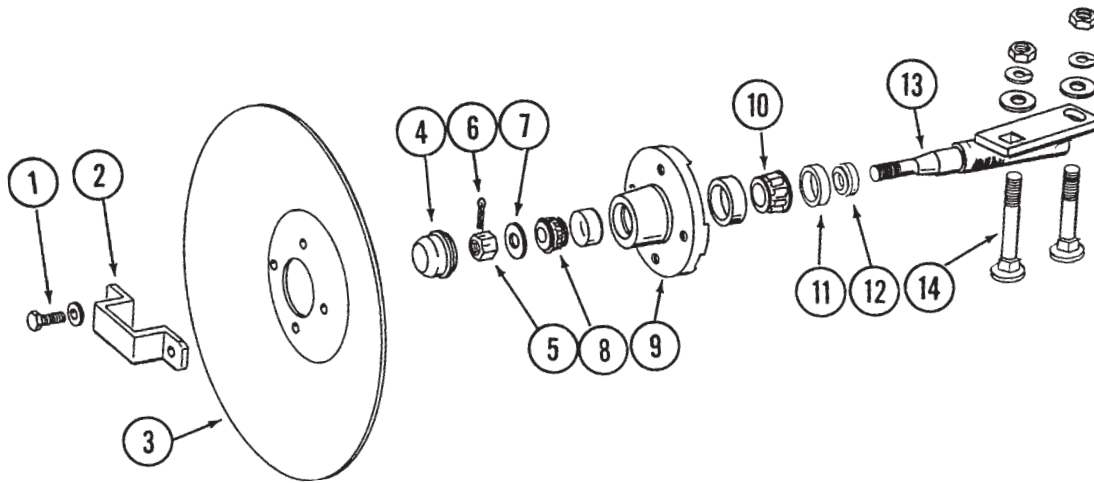


MARKER ASSEMBLY, 8 ROW 30"

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|--------------|---|
| | | (Per Marker) | |
| 1. | G10226 | 2 | Washer, 1 1/4" SAE |
| 2. | GD2161 | 1 | Pin, 1 1/4" x 8 1/4" |
| | G10460 | 2 | Cotter Pin, 1/4" x 2" |
| 3. | GD3214 | 1 | Pin, 1 1/4" x 12 1/4" |
| | G10460 | 2 | Cotter Pin, 1/4" x 2" |
| 4. | GA5188 | 1 | Second Stage Arm, 46" |
| 5. | GD2721 | 1 | U-Bolt, 2" x 2" x 1/2"-13 |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 6. | GD0453-03 | 1 | Extension Tube, 50" |
| 7. | GA6585 | 1 | First Stage Arm W/Grease Fittings, L.H. (Shown) |
| | GA6586 | - | First Stage Arm W/Grease Fittings, R.H. |
| | G10641 | - | Grease Fitting, 1/8" NPT |
| 8. | GA5526 | 1 | Safety Lockup W/Detent Pin |
| | G10536 | - | Detent Pin, 1/2" x 2 1/2" |
| 9. | | - | See "Marker Cylinder", Page P50 |
| 10. | G10008 | 4 | Hex Head Cap Screw, 5/8"-11 x 2" |
| | G10230 | 4 | Lock Washer, 5/8" |
| 11. | GA6532 | 1 | Pin |
| | G10460 | 1 | Cotter Pin, 1/4" x 2" |
| 12. | GD5875 | 1 | Hose Clamp, 9/16" x 2 1/2" x 2" |
| 13. | G10133 | 1 | Hex Head Cap Screw, 5/16"-18 x 1 1/2" |
| | G10232 | 1 | Lock Washer, 5/16" |
| | G10106 | 1 | Hex Nut, 5/16"-18 |
| 14. | GD0652 | 1 | Pin, 1 1/4" x 9 1/2" |
| | G10460 | 2 | Cotter Pin, 1/4" x 2" |
| 15. | GA6859 | 1 | Mount, L.H. |
| 16. | GA6858 | - | Mount, R.H. |

MARKER SPINDLE/HUB/BLADE

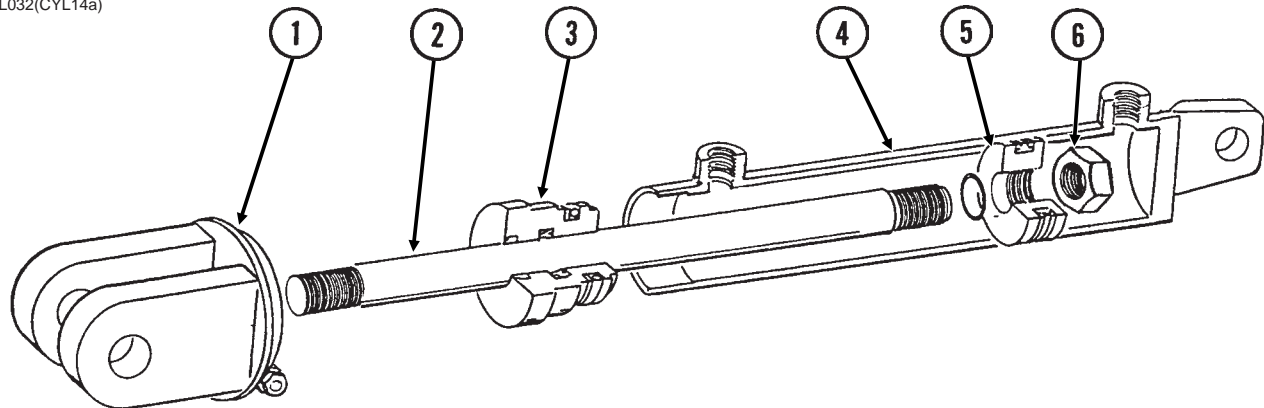
MKR020(MKR3)



| ITEM | PART NO. | QTY. (Per Assy.) | DESCRIPTION |
|------|----------|---------------------|--|
| 1. | G10722 | 4 | Hex Head Cap Screw, 1/2"-20 x 1" |
| | G10228 | 4 | Lock Washer, 1/2" |
| 2. | GD2597 | 1 | Retainer |
| 3. | GD0746 | 1 | Solid Blade, 16" (Shown) |
| | GD10283 | - | Notched Blade, 16" (Optional) |
| 4. | GD0840 | 1 | Dust Cap |
| 5. | G10725 | 1 | Hex Slotted Nut, 5/8"-18 |
| 6. | G10544 | 1 | Cotter Pin, 5/32" x 1" |
| 7. | G10724 | 1 | Washer, 5/8" |
| 8. | GA0257 | 1 | Outer Bearing |
| 9. | GA0167 | 1 | Hub With Cups |
| | GR0151 | - | Outer Cup |
| | GR0150 | - | Inner Cup |
| 10. | GA0245 | 1 | Inner Bearing |
| 11. | GA0243 | 1 | Grease Seal |
| 12. | GA0899 | 1 | Rubber Seal |
| 13. | GA1677 | 1 | Spindle, L.H. (Shown) |
| | GA1676 | - | Spindle, R.H. |
| 14. | G10844 | 2 | Carriage Bolt, 1/2"-13 x 3 1/2" |
| | G10168 | 2 | Machine Bushing, 1/2", 7 Gauge |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| A. | GA1679 | - | Hub And Spindle Assembly, L.H. (Items 1, 2 And 4-13) |
| | GA1678 | - | Hub And Spindle Assembly, R.H. (Items 1, 2 And 4-13) |

ROTATION CYLINDER

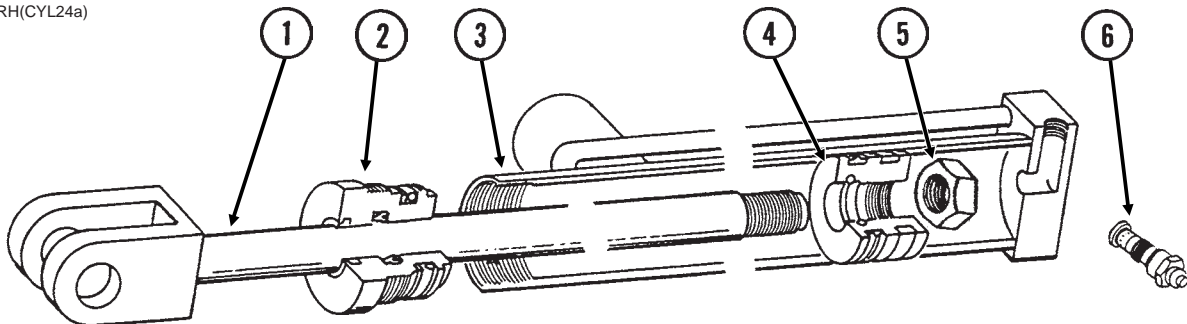
CYL032(CYL14a)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|----------------|----------|------|--|
| (Per Cylinder) | | | |
| 1. | GA6525 | 1 | Clevis W/ $\frac{3}{8}$ "-16 x $1 \frac{3}{4}$ " Socket Head Cap Screw And Lock Nut |
| 2. | GD9241 | 1 | Rod |
| 3. | GD5951 | 1 | Gland |
| 4. | GA6524 | 1 | Barrel |
| 5. | GD9239 | 1 | Piston |
| 6. | GR0983 | 1 | Lock Nut, $1 \frac{1}{4}$ "-12 |
| A. | GA6349 | - | Cylinder Complete, 3" x 16" |
| B. | GR1185 | - | Seal Kit, Includes: (1)Wear Ring, (1)Uniring, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper |

LIFT CYLINDER

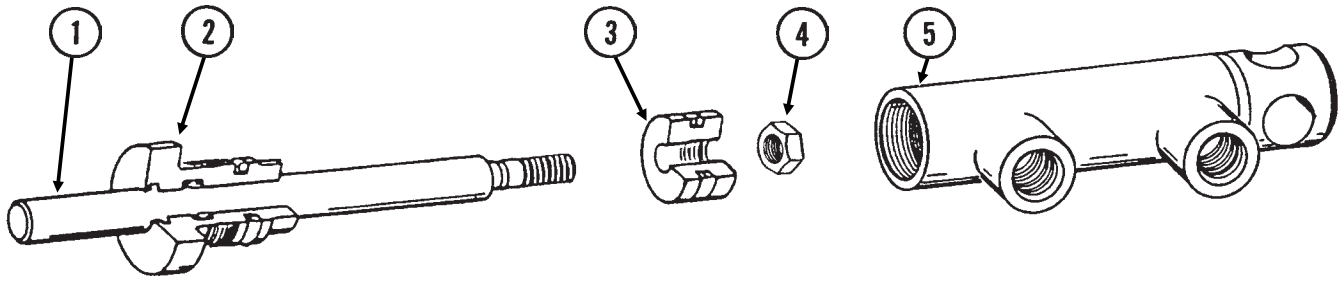
CYL054/RH(CYL24a)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|----------------|----------|------|---|
| (Per Cylinder) | | | |
| 1. | GA6523 | 1 | Rod |
| 2. | GD6574 | 1 | Gland |
| 3. | GA6522 | 1 | Barrel |
| 4. | GD9238 | 1 | Piston |
| 5. | GR0983 | 1 | Lock Nut, $1 \frac{1}{4}$ "-12 |
| 6. | GR1183 | 1 | Counter Balance Valve |
| A. | GA6350 | - | Cylinder Complete, 3" x 48" |
| B. | GR1184 | - | Seal Kit, Includes: (1)Wear Ring, (1)Uniring, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper For Cylinder And (3) O-Rings, (3) BU Rings For Counter Balance Valve |

KICKOUT CYLINDER

CYL035/CYL050(CYL9b)



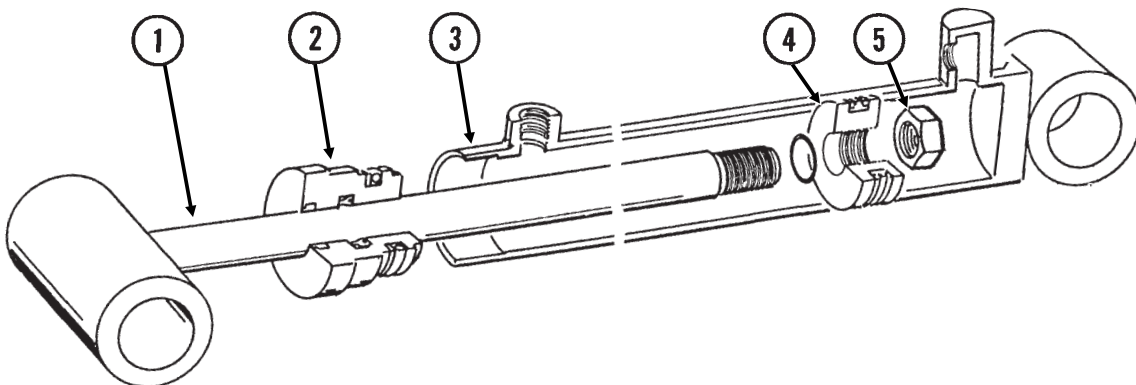
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|-------------|
|------|----------|------|-------------|

(Per Cylinder)

| | | | |
|----|--------|---|---|
| 1. | GD7124 | 1 | Rod |
| 2. | GD7122 | 1 | Gland |
| 3. | GD7120 | 1 | Piston |
| 4. | GR0999 | 1 | Lock Nut, 1/2"-20 |
| 5. | GA6020 | 1 | Barrel |
| A. | GA4309 | - | Cylinder Complete, 1 1/2" x 2 1/2" |
| B. | GR1001 | - | Seal Kit, Includes: (2)O-Rings, (1)U-Cup, (1)Rod Wiper, (1)Seal |

MARKER CYLINDER

CYL039(CYL3b)



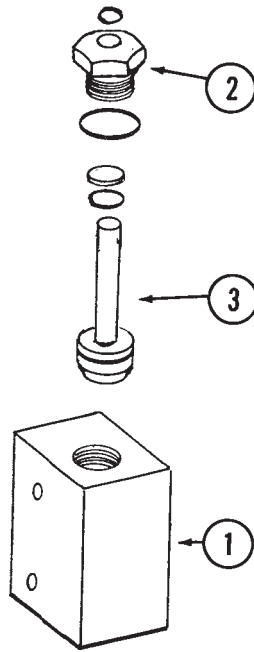
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|-------------|
|------|----------|------|-------------|

(Per Cylinder)

| | | | |
|----|--------|---|---|
| 1. | GA5459 | 1 | Rod |
| 2. | GD5949 | 1 | Gland |
| 3. | A5460 | 1 | Barrel (Non-Stock Item) |
| 4. | GD4632 | 1 | Piston |
| 5. | GR0959 | 1 | Lock Nut, 3/4"-16 |
| A. | GA5097 | - | Cylinder Complete, 2" x 20 1/16" |
| B. | GR0927 | - | Seal Kit, Includes: (1)T Seal, (2)O-Rings, (1)BU Ring, (1)U-Cup, (1)Wiper |

STROKE LIMITER VALVE

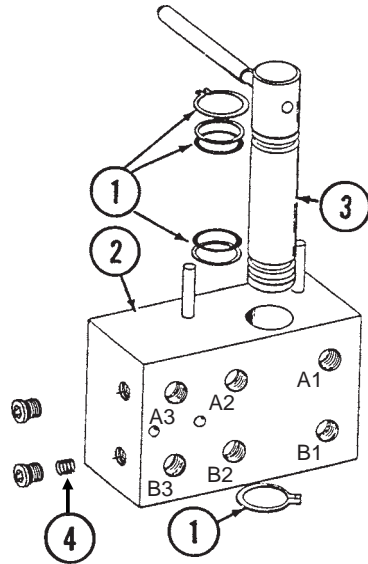
VVB027rev(TWL55)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--|
| 1. | | 1 | Block (Non-Stock Item) |
| 2. | GR1281 | 1 | Adapter Plug |
| 3. | GR1282 | 1 | Piston Rod & Poppet Assembly |
| A. | GA6884 | - | Stroke Limiter Valve Complete |
| B. | GR1289 | - | Seal Kit Includes: (2) O-Rings, (1) BU Ring, (1) Rod Seal |

SELECTOR VALVE

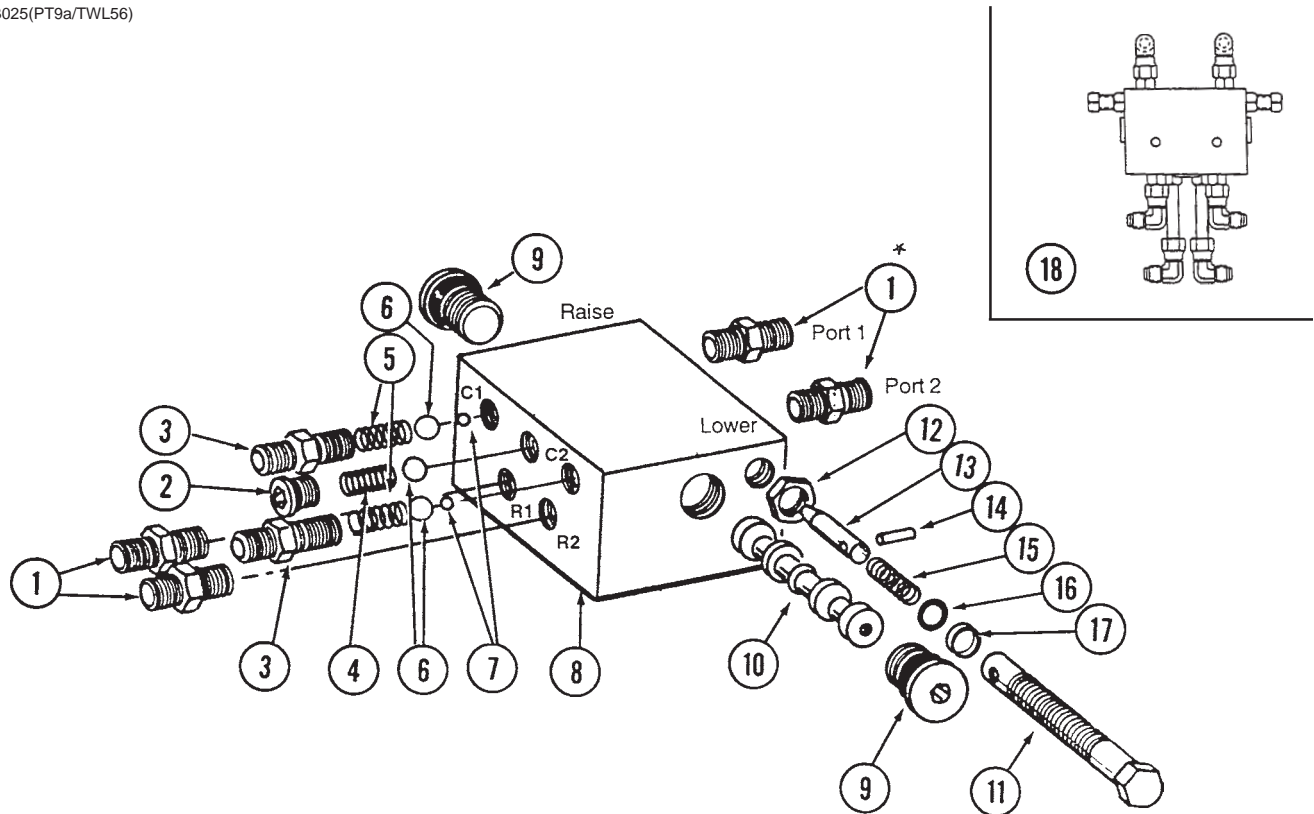
VVB028(EF8a)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|-------------------------------|
| 1. | GR1096 | 1 | Seal Kit |
| 2. | | 1 | Block (Non-Stock Item) |
| 3. | GR1177 | 1 | Spool W/Handle |
| 4. | GR1178 | 1 | Restrictor |
| A. | GA6438 | - | Valve Assembly Complete |

MARKER SEQUENCING/FLOW CONTROL VALVE

VVB025(PT9a/TWL56)



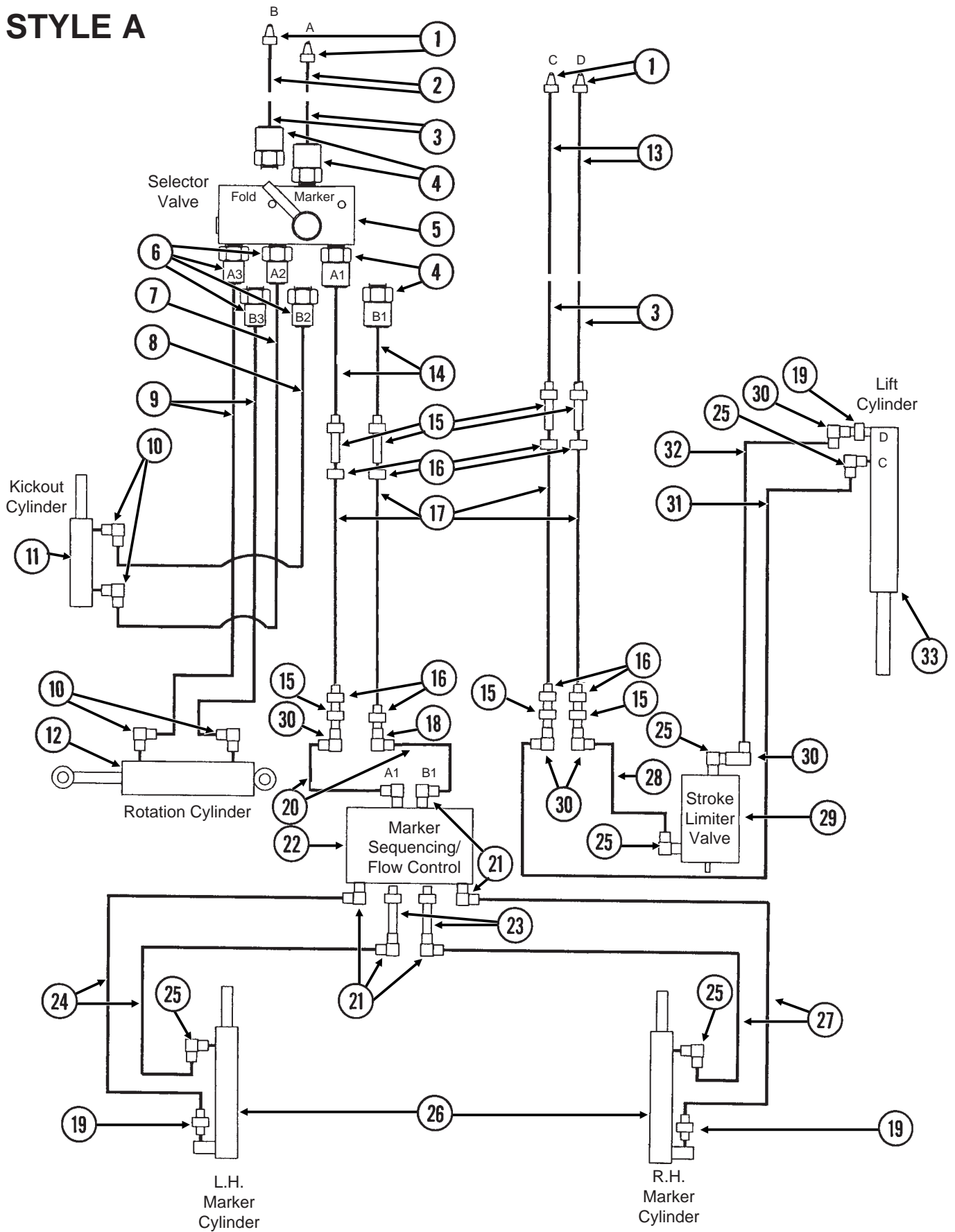
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|------|---|
| 1. | *G6400-06 | 4 | Connector, 9/16"-18 Male 37° JIC to 9/16"-18 O-Ring |
| | GR1045 | - | O-Ring |
| 2. | GR1034 | 2 | Hex Socket O-Ring Plug |
| | GR1035 | - | O-Ring |
| 3. | GR1032 | 2 | Port Adapter |
| | GR1045 | - | O-Ring |
| 4. | GR1033 | 1 | Detent Spring |
| 5. | GR1036 | 2 | Spring |
| 6. | GR1044 | 3 | 7/16" Check Ball |
| 7. | GR1043 | 2 | 1/4" Steel Ball |
| 8. | | 1 | Valve Body (Non-Stock Item) |
| 9. | GR1047 | 2 | Hex Socket Plug |
| | GR1037 | - | O-Ring |
| 10. | | - | Spool (Non-Stock Item) |
| 11. | GR1042 | 2 | Adjustment Screw |
| 12. | GR1048 | 2 | Hex Jam Nut, 1/2"-20 |
| 13. | GR1038 | 2 | Needle |
| 14. | GR1039 | 2 | Spring Pin |
| 15. | GR1046 | 2 | Compression Spring |
| 16. | GR1040 | 2 | O-Ring |
| 17. | GR1041 | 2 | Teflon BU Ring |
| 18. | | - | See "Hydraulic System", Pages P54-P57 |
| A. | GA5552 | - | Valve Assembly Complete (Items 1-17) |
| B. | GA5572 | - | Flow Control Portion Only (Items 11-17) |

*Not used.

HYDRAULIC SYSTEM

L0133-35(TWL92a)

STYLE A



HYDRAULIC SYSTEM

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-------------|------|--|
| 1. | GD4086 | 4 | ISO Coupler |
| 2. | *A1023 | 2 | Hose Assembly, $\frac{3}{8}$ " x 76" |
| 3. | *A1048 | 4 | Hose Assembly, $\frac{3}{8}$ " x 12", 8 Row 30" Only |
| 4. | G6400-08-06 | 4 | Connector, $\frac{3}{4}$ "-16 Male JIC To $\frac{9}{16}$ "-18 O-Ring |
| 5. | | - | See "Selector Valve", Page P52 |
| 6. | G6400-06 | 4 | Connector, $\frac{9}{16}$ "-18 Male JIC To $\frac{9}{16}$ "-18 O-Ring |
| 7. | *A1153 | 1 | Hose Assembly, $\frac{1}{4}$ " x 56", 6 Row 30" |
| | *A1194 | - | Hose Assembly, $\frac{1}{4}$ " x 30", 8 Row 30" |
| 8. | *A1141 | 1 | Hose Assembly, $\frac{1}{4}$ " x 62", 6 Row 30" |
| | *A1195 | - | Hose Assembly, $\frac{1}{4}$ " x 34", 8 Row 30" |
| 9. | *A1107 | 2 | Hose Assembly, $\frac{1}{4}$ " x 140" |
| 10. | G6801-06-08 | 4 | Elbow, $\frac{9}{16}$ "-18 Male JIC To $\frac{3}{4}$ "-16 O-Ring |
| 11. | | - | See "Kickout Cylinder", Page P50 |
| 12. | | - | See "Rotation Cylinder", Page P49 |
| 13. | *A3151 | 2 | Hose Assembly, $\frac{3}{8}$ " x 234" |
| 14. | *A1026 | 2 | Hose Assembly, $\frac{3}{8}$ " x 152" |
| 15. | G2700-08 | 8 | Bulkhead, $\frac{3}{4}$ "-16 Male JIC |
| 16. | G306-08 | 8 | Lock Nut, $\frac{3}{4}$ "-16 |
| 17. | *A1021 | 4 | Hose Assembly, $\frac{3}{8}$ " x 56" |
| 18. | G2701-08 | 1 | Tube Elbow, $\frac{3}{4}$ "-16 Male JIC |
| 19. | G6400-08 | 3 | Connector, $\frac{3}{4}$ "-16 JIC To $\frac{3}{4}$ "-16 O-Ring |
| 20. | *A1073 | 2 | Hose Assembly, $\frac{3}{8}$ " x 18" |
| 21. | G6500-08-06 | 6 | Elbow, $\frac{3}{4}$ "-16 JIC Male To $\frac{9}{16}$ "-18 JIC Female |
| 22. | | - | See "Marker Sequencing/Flow Control Valve", Page P53 |
| 23. | G6400-L-06 | 2 | Long Connector, $\frac{9}{16}$ "-18 JIC To O-Ring |
| 24. | *A3137 | 2 | Hose Assembly, $\frac{3}{8}$ " x 140", 6 Row 30" |
| | *A3105 | - | Hose Assembly, $\frac{3}{8}$ " x 170", 8 Row 30" |
| 25. | G6801-08 | 4 | Elbow, $\frac{3}{4}$ "-16 JIC Male To $\frac{3}{4}$ "-16 O-Ring |
| 26. | | - | See "Marker Cylinder", Page P50 |
| 27. | *A1041 | 2 | Hose Assembly, $\frac{3}{8}$ " x 130", 6 Row 30" |
| | *A1090 | - | Hose Assembly, $\frac{3}{8}$ " x 162", 8 Row 30" |
| 28. | *A1018 | 1 | Hose Assembly, $\frac{3}{8}$ " x 40" |
| 29. | | - | See "Stroke Limiter Valve", Page P51 And "Frame Assembly", Pages P32 And P33 |
| 30. | G6500-08 | 4 | Elbow, $\frac{3}{4}$ "-16 JIC Male To Female |
| 31. | *A1055 | 3 | Hose Assembly, $\frac{3}{8}$ " x 66" |
| 32. | *A1076 | 1 | Hose Assembly, $\frac{3}{8}$ " x 30" |
| 33. | | - | See "Lift Cylinder", Page P49 |

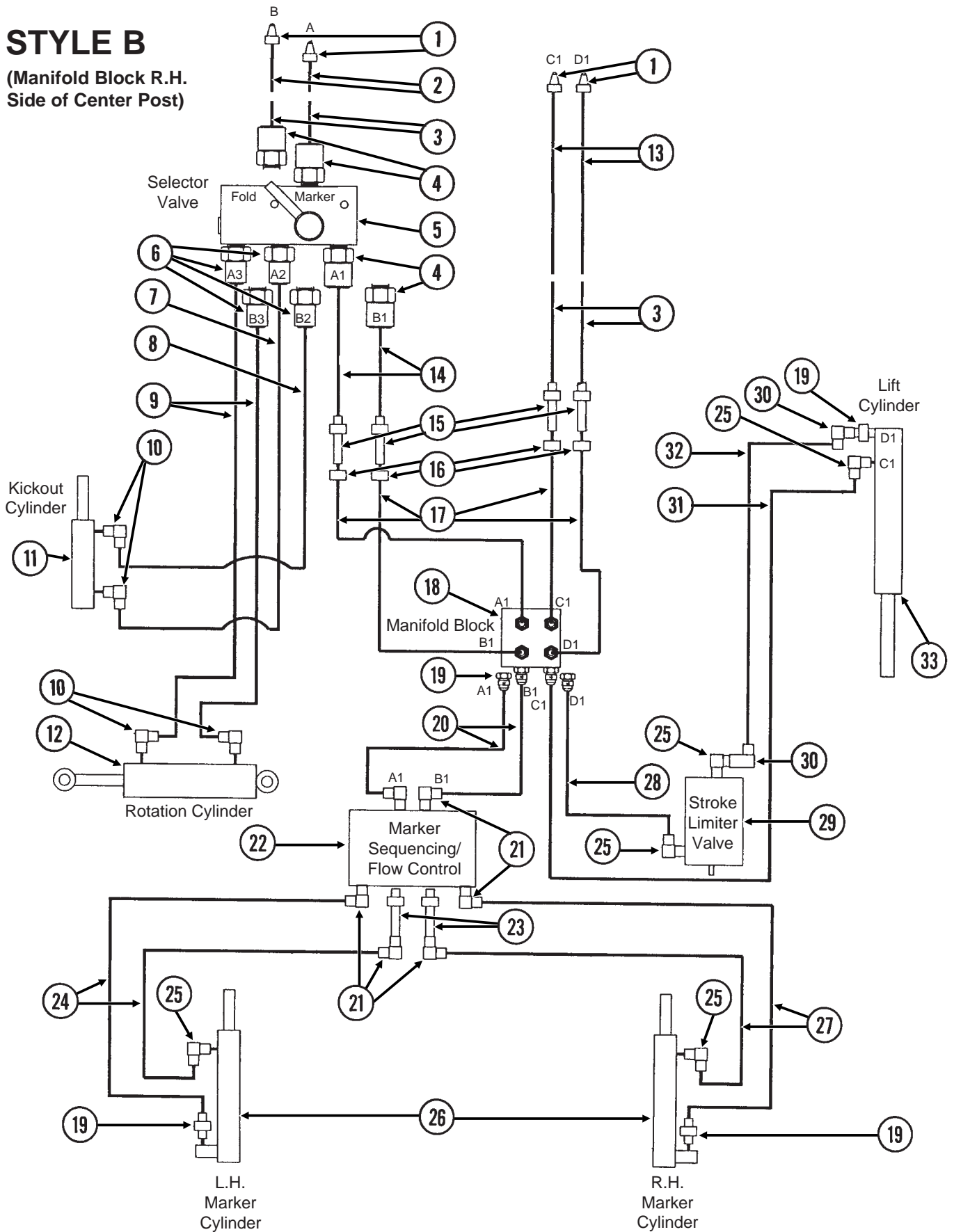
* Hydraulic hose is not stocked by KINZE® Repair Parts, but can be made available on a special order basis. Call for quote.

HYDRAULIC SYSTEM

A6499-2(TWL92)

STYLE B

(Manifold Block R.H. Side of Center Post)



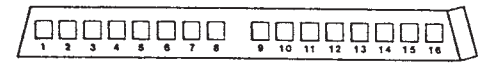
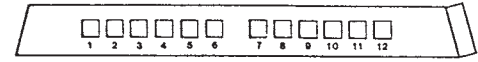
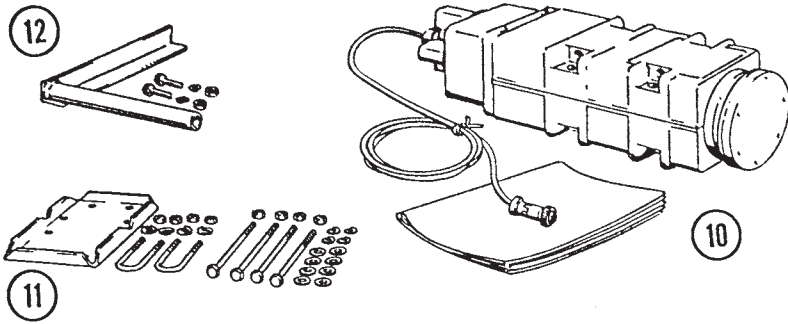
HYDRAULIC SYSTEM

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-------------|------|--|
| 1. | GD4086 | 4 | ISO Coupler |
| 2. | *A1023 | 2 | Hose Assembly, $\frac{3}{8}$ " x 76" |
| 3. | *A1048 | 2 | Hose Assembly, $\frac{3}{8}$ " x 12", 8 Row 30" Only |
| 4. | G6400-08-06 | 4 | Connector, $\frac{3}{4}$ "-16 Male JIC To $\frac{9}{16}$ "-18 O-Ring |
| 5. | | - | See "Selector Valve", Page P52 |
| 6. | G6400-06 | 4 | Connector, $\frac{9}{16}$ "-18 Male JIC To $\frac{9}{16}$ "-18 O-Ring |
| 7. | *A1153 | 1 | Hose Assembly, $\frac{1}{4}$ " x 56", 6 Row 30" |
| | *A1194 | - | Hose Assembly, $\frac{1}{4}$ " x 30", 8 Row 30" |
| 8. | *A1141 | 1 | Hose Assembly, $\frac{1}{4}$ " x 62", 6 Row 30" |
| | *A1195 | - | Hose Assembly, $\frac{1}{4}$ " x 34", 8 Row 30" |
| 9. | *A1107 | 2 | Hose Assembly, $\frac{1}{4}$ " x 140" |
| 10. | G6801-06-08 | 4 | Elbow, $\frac{9}{16}$ "-18 Male JIC To $\frac{3}{4}$ "-16 O-Ring |
| 11. | | - | See "Kickout Cylinder", Page P50 |
| 12. | | - | See "Rotation Cylinder", Page P49 |
| 13. | *A3183 | 2 | Hose Assembly, $\frac{3}{8}$ " x 246" |
| 14. | *A1026 | 2 | Hose Assembly, $\frac{3}{8}$ " x 152" |
| 15. | G2700-08 | 4 | Bulkhead, $\frac{3}{4}$ "-16 Male JIC |
| 16. | G306-08 | 4 | Lock Nut, $\frac{3}{4}$ "-16 |
| 17. | *A1021 | 4 | Hose Assembly, $\frac{3}{8}$ " x 56" |
| 18. | | - | See "Frame Assembly", Page P33, Item 35 |
| 19. | G6400-08 | 11 | Connector, $\frac{3}{4}$ "-16 JIC To $\frac{3}{4}$ "-16 O-Ring |
| 20. | *A1002 | 2 | Hose Assembly, $\frac{3}{8}$ " x 20" |
| 21. | G6500-08-06 | 6 | Elbow, $\frac{3}{4}$ "-16 JIC Male To $\frac{9}{16}$ "-18 JIC Female |
| 22. | | - | See "Marker Sequencing/Flow Control Valve", Page P53 |
| 23. | G6400-L-06 | 2 | Long Connector, $\frac{9}{16}$ "-18 JIC To O-Ring |
| 24. | *A3137 | 2 | Hose Assembly, $\frac{3}{8}$ " x 140", 6 Row 30" |
| | *A3105 | - | Hose Assembly, $\frac{3}{8}$ " x 170", 8 Row 30" |
| 25. | G6801-08 | 5 | Elbow, $\frac{3}{4}$ "-16 JIC Male To $\frac{3}{4}$ "-16 O-Ring |
| 26. | | - | See "Marker Cylinder", Page P50 |
| 27. | *A1041 | 2 | Hose Assembly, $\frac{3}{8}$ " x 130", 6 Row 30" |
| | *A1090 | - | Hose Assembly, $\frac{3}{8}$ " x 162", 8 Row 30" |
| 28. | *A1076 | 1 | Hose Assembly, $\frac{3}{8}$ " x 30" |
| 29. | | - | See "Stroke Limiter Valve", Page P51 And "Frame Assembly", Pages P32 And P33 |
| 30. | G6500-08 | 2 | Elbow, $\frac{3}{4}$ "-16 JIC Male To Female |
| 31. | *A1055 | 3 | Hose Assembly, $\frac{3}{8}$ " x 66" |
| 32. | *A1018 | 1 | Hose Assembly, $\frac{3}{8}$ " x 40" |
| 33. | | - | See "Lift Cylinder", Page P49 |

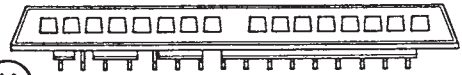
* Hydraulic hose is not stocked by KINZE® Repair Parts, but can be made available on a special order basis. Call for quote.

ELECTRONIC SEED MONITOR

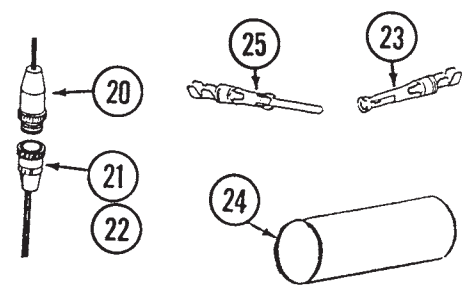
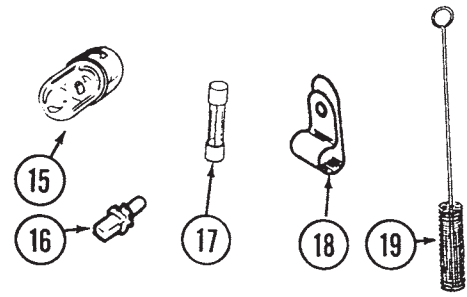
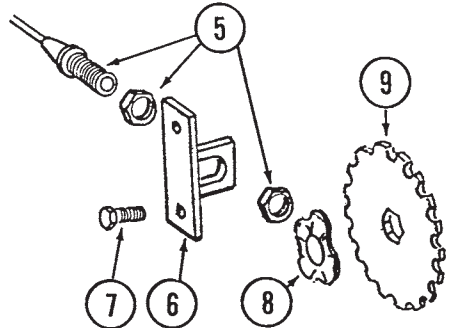
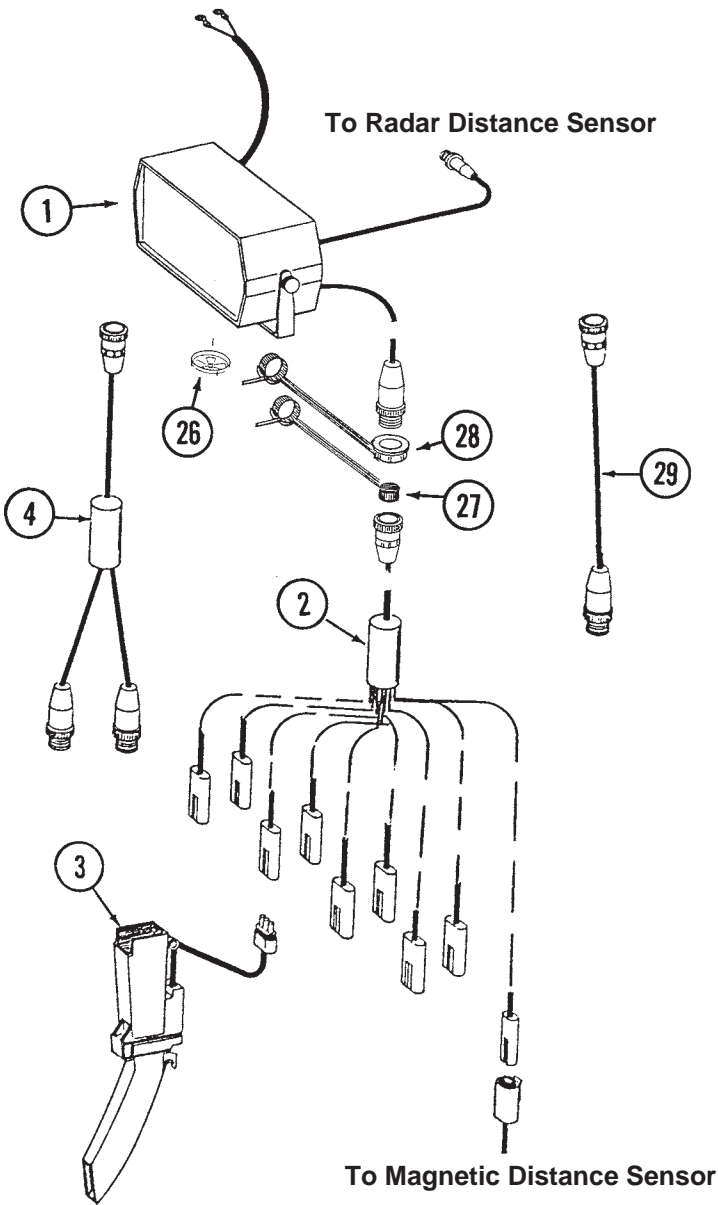
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13



14

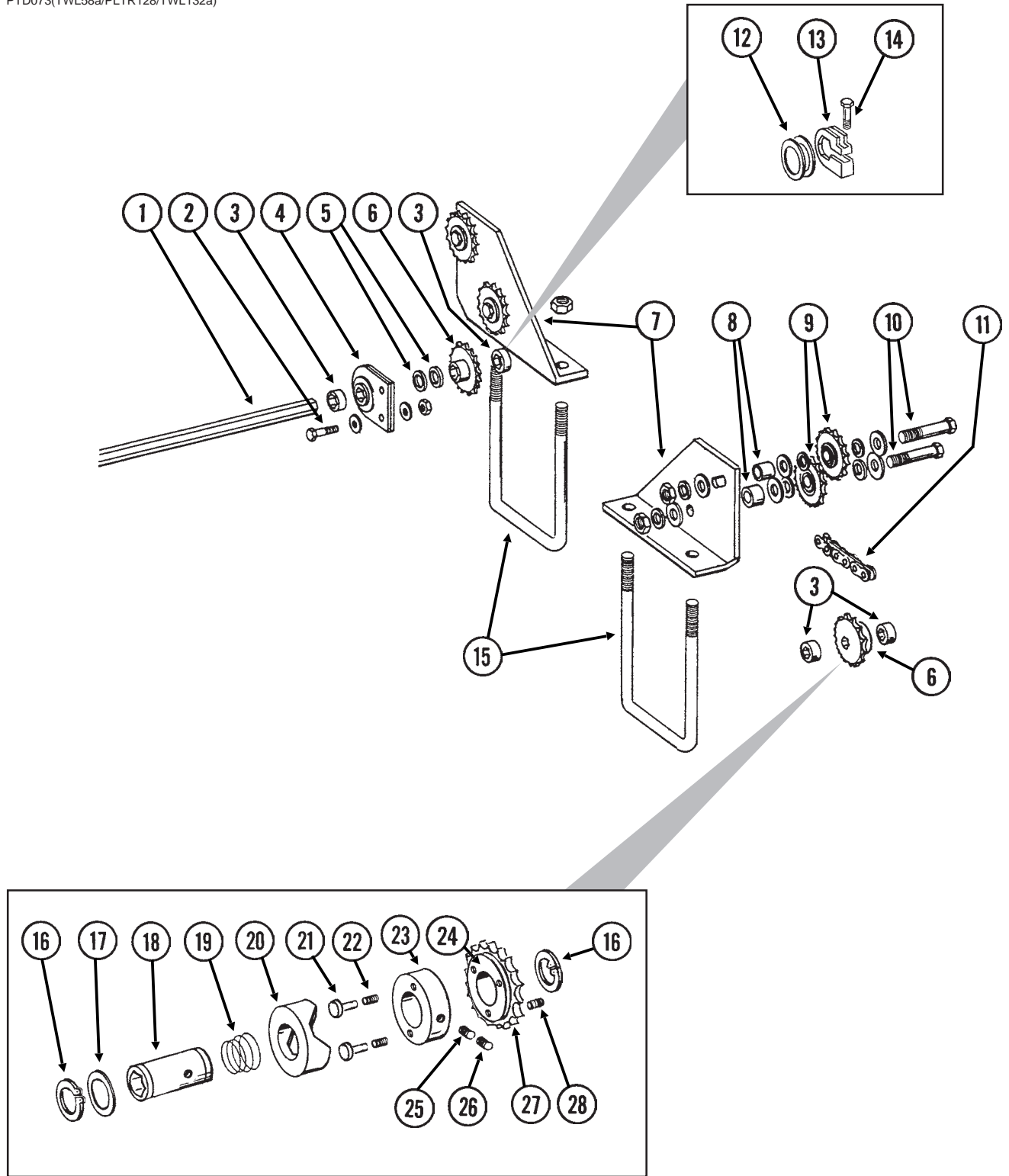


ELECTRONIC SEED MONITOR

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | GA5873 | 1 | Console W/Mounting Bracket, KM1000 |
| | GA5874 | - | Console W/Mounting Bracket, KM3000 |
| | GR1077 | - | Mounting Bracket, KM1000 |
| | GR1078 | - | Mounting Bracket, KM3000 |
| | GR1079 | - | Console Mounting Bracket Hardware Package (Includes 2 Wellnuts, 2 Knobs And 1/4" Hardware) |
| 2. | GA5876 | - | Planter Harness, 6 Row |
| | GA5877 | - | Planter Harness, 8 Row |
| 3. | GA5880 | - | Seed Tube W/High Rate Sensor |
| | GR1062 | - | Seed Tube (With Holes For High Rate Sensor Installation) |
| | GR1087 | - | Sensor Only (For GA5880) |
| | GR0676 | - | Sunshade |
| | GD2117 | - | Tie Strap, 14 1/2" |
| 4. | GA5884 | 1 | Y-Connector, 16 Row (Interplant®) (Used On 8 Row) |
| | GA5883 | - | Y-Connector, 12 Row (Interplant®) (Used On 6 Row) |
| 5. | GA5600 | 1 | Magnetic Distance Sensor (Use W/KM3000 Console Only) |
| 6. | GD8770 | 1 | Bracket |
| 7. | G10004 | 2 | Hex Head Cap Screw, 3/8"-16 x 1 1/4" |
| | G10229 | 2 | Lock Washer, 3/8" |
| | G10101 | 2 | Hex Nut, 3/8"-16 |
| 8. | GD8771 | 1 | Spring Wave Washer |
| 9. | GD8751 | - | Magnetic Distance Sensor Pulse Wheel (Use W/KM3000 Console Only) |
| 10. | GA4223 | - | Radar Distance Sensor (Use W/KM3000 Console Only) |
| 11. | GA4229 | - | Radar Sensor Mounting Bracket Package |
| 12. | GA4230 | - | Radar Sensor Pipe Mounting Package |
| 13. | GR1081 | - | KM1000 Bezel Decal, 6 Row |
| | GR1083 | - | KM1000 Bezel Decal, 16 Row (Used On 8 Row And 6 Row With Interplant®) |
| 14. | GR1080 | 1 | KM1000 Bezel |
| 15. | GR0595 | 1 | Bulb, KM1000 Row Lamp |
| 16. | GR1084 | 1 | Bulb, KM3000 Backlite |
| 17. | GR0866 | 1 | Fuse, 5 Amp, Type AGC |
| | GR1085 | 1 | Fuse, 2 Amp, Type AGC |
| 18. | GD6291 | - | Insulated Clamp |
| 19. | GR0594 | - | Brush |
| 20. | GR0583 | - | Console Connector Kit W/Pins And Shrink Tube |
| 21. | GR0582 | - | Harness Connector Kit W/Female Socket Contacts, Coupling Ring And Shrink Tube |
| 22. | GR0807 | - | Coupling Ring |
| 23. | GR1171 | - | Female Socket Contact |
| 24. | GR1069 | - | Shrink Tube, 2 1/2" |
| 25. | GR1067 | - | Pin |
| 26. | GR1348 | - | Sound Baffle W/Pin |
| 27. | GD4564 | - | Dust Cover |
| 28. | GD4563 | - | Dust Cap |
| 29. | GA5882 | - | Extension Cable, 30', 1-32 Rows |
| | GA5881 | - | Extension Cable, 15', 1-32 Rows |
| A. | GA6147 | - | Magnetic Distance Sensor And Mounting Package (Items 5-9 And 18) |

INTERPLANT® DRIVELINE

PTD073(TWL58a/PLTR128/TWL132a)



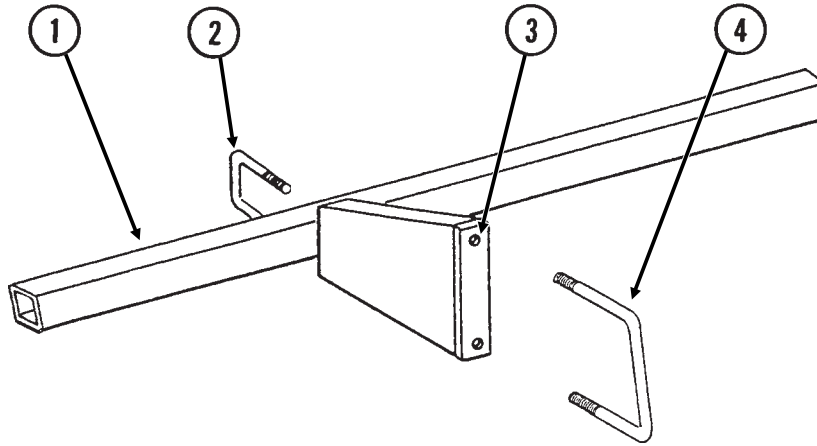
INTERPLANT® DRIVELINE

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|------------|------|---|
| 1. | GD0914-155 | - | Drill Shaft, 6 Row 30" |
| | GD0914-215 | - | Drill Shaft, 8 Row 30" |
| 2. | G10001 | - | Hex Head Cap Screw, 3/8"-16 x 1" |
| | G10229 | - | Lock Washer, 3/8" |
| | G10101 | - | Hex Nut, 3/8"-16 |
| 3. | GD0917 | 4 | Lock Collar, 7/8" Hex, Less Set Screws (Sub G1K269) |
| | G10145 | 4 | Set Screw, 5/16"-18 x 1/2" |
| 4. | GA2180 | - | Bearing Hanger, 7/8" Hex Bore |
| 5. | G10233 | - | Machine Bushing (As Required) |
| 6. | GA5107 | 2 | Sprocket, 19 Tooth |
| 7. | GD9106 | 2 | Mount |
| 8. | GD9229 | 4 | Spacer |
| 9. | GA5103 | 4 | Idler Sprocket W/Bearing, 15 Tooth (Sub GA7154) |
| | GA7154 | - | Idler Sprocket W/Bearing, 18 Tooth |
| 10. | G10581 | 4 | Hex Head Cap Screw, 1/2"-13 x 2 1/4" |
| | G10216 | 20 | Washer, 1/2" USS |
| | G10228 | 4 | Lock Washer, 1/2" |
| | G10102 | 4 | Hex Nut, 1/2"-13 |
| 11. | G3310-204 | 1 | Chain, No. 40, 204 Pitch Including Connector Link (Used With 15 Tooth Idler Sprockets) |
| | G3310-208 | - | Chain, No. 40, 208 Pitch Including Connector Link (Used With 18 Tooth Idler Sprockets) |
| | GR0912 | - | Connector Link, No. 40 |
| 12. | G10233 | - | Machine Bushing |
| 13. | GD11045 | - | Lock Clamp |
| 14. | G10031 | - | Hex Head Cap Screw, 5/16"-18 x 1 3/4" |
| | G10620 | - | Flange Nut, 5/16"-18 |
| 15. | GD8306 | 2 | U-Bolt, 7" x 5" x 1/2"-13 |
| | G10228 | 4 | Lock Washer, 1/2" |
| | G10102 | - | Hex Nut, 1/2"-13 |
| 16. | G10496 | 2 | External Inverted Snap Ring, 1 1/2" |
| 17. | GR1411 | 1 | Shim |
| 18. | GR1407 | 1 | Drive Shaft |
| 19. | GR1408 | 1 | Compression Spring |
| 20. | GR1409 | 1 | Knurled Collar |
| 21. | GR1410 | 1 | Pin |
| 22. | GR1413 | 1 | Spring |
| 23. | GR1405 | 1 | Lock Collar |
| 24. | GR1406 | 1 | Bushing |
| 25. | G10120 | 1 | Hex Socket Set Screw, 3/8"-16 x 1/2" |
| 26. | G10906 | 1 | Hex Socket Set Screw, 3/8"-16 x 1/4" |
| 27. | GR1412 | 1 | Sprocket, 19 Tooth |
| 28. | G10905 | 3 | Hex Socket Head Cap Screw, No. 10-24 x 3/8" |
| A. | GA8092 | - | Clutch Sprocket Assembly, 19 Tooth (Items 16-28) |
| B. | G1K269 | - | Lock Clamp Kit (Items 13 And 14) |

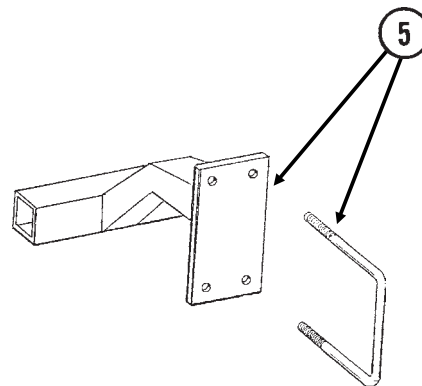
FERTILIZER OPENER MOUNTING BAR (Double Disc And Notched Single Disc Fertilizer Openers)

(TWL59b/TWL34b)

STYLE A



STYLE B



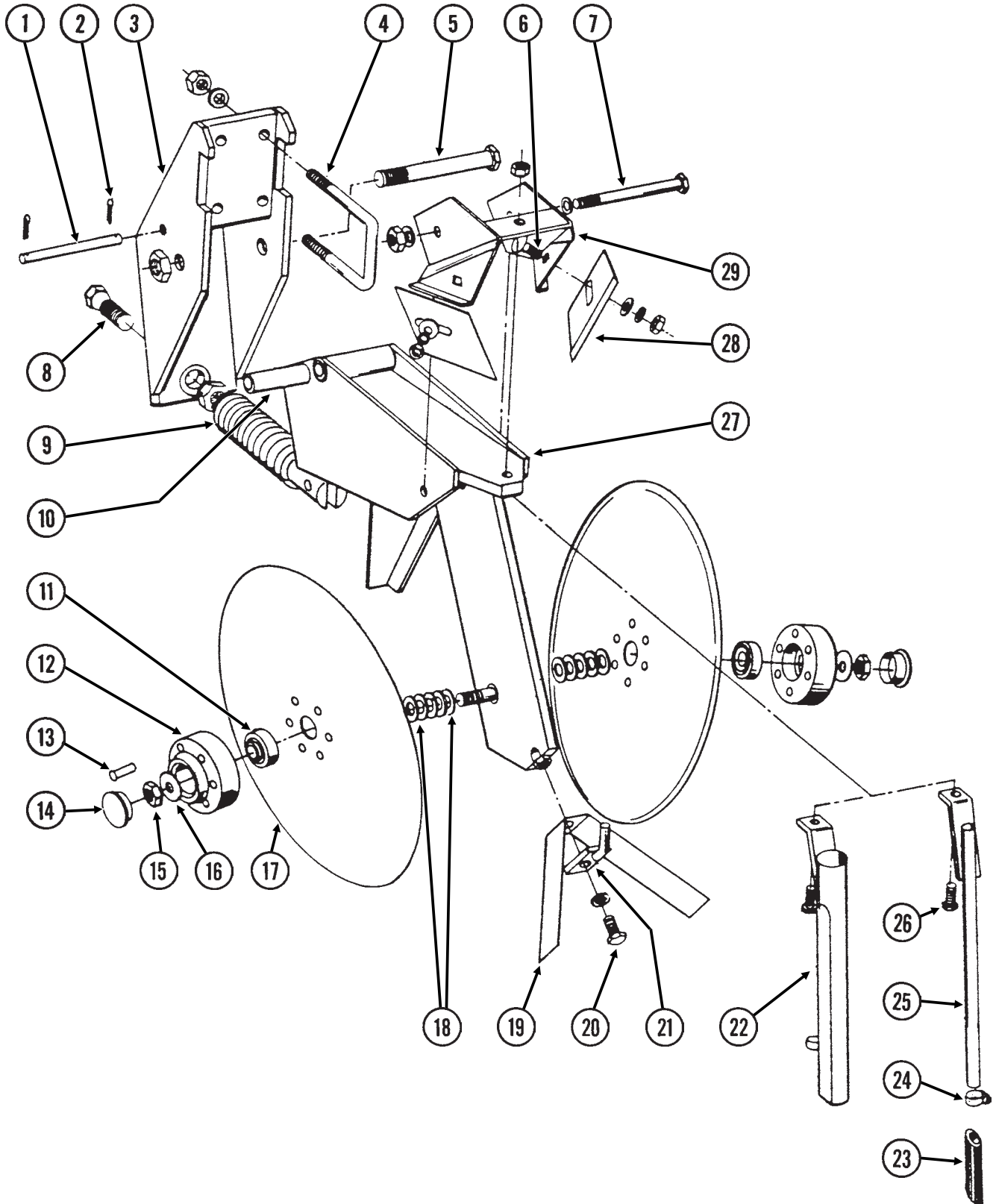
FERTILIZER OPENER MOUNTING BAR

(Double Disc And Notched Single Disc Fertilizer Openers)

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|------|-----------------------------------|
| 1. | GD0971-14 | 2 | Bar, 72", 6 Row 30" |
| | GD0971-04 | - | Bar, 100 1/4", 8 Row 30" |
| 2. | GD1138 | - | U-Bolt, 2 1/2" x 2 1/2" x 1/2"-13 |
| | G10228 | - | Lock Washer, 1/2" |
| | G10102 | - | Hex Nut, 1/2"-13 |
| 3. | GA5237 | 1 | Support, L.H. (Shown) |
| | GA5236 | - | Support, R.H. |
| 4. | GD1113 | - | U-Bolt, 5" x 7" x 5/8"-11 |
| | G10230 | - | Lock Washer, 5/8" |
| | G10104 | - | Hex Nut, 5/8"-11 |
| 5. | GA7135 | - | Mount (One Per Opener) W/U-Bolts |
| | GD1113 | - | U-Bolt, 5" x 7" x 5/8"-11 |
| | G10230 | - | Lock Washer, 5/8" |
| | G10104 | - | Hex Nut, 5/8"-11 |

DOUBLE DISC FERTILIZER OPENER

FOC007(PT25a)

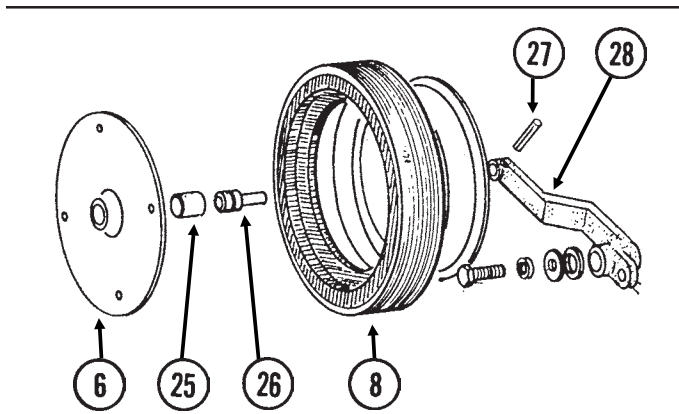
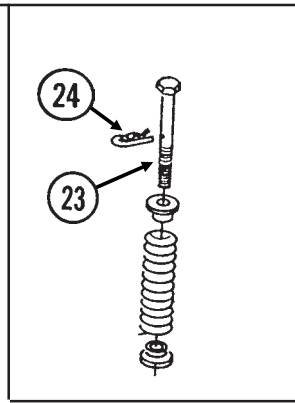
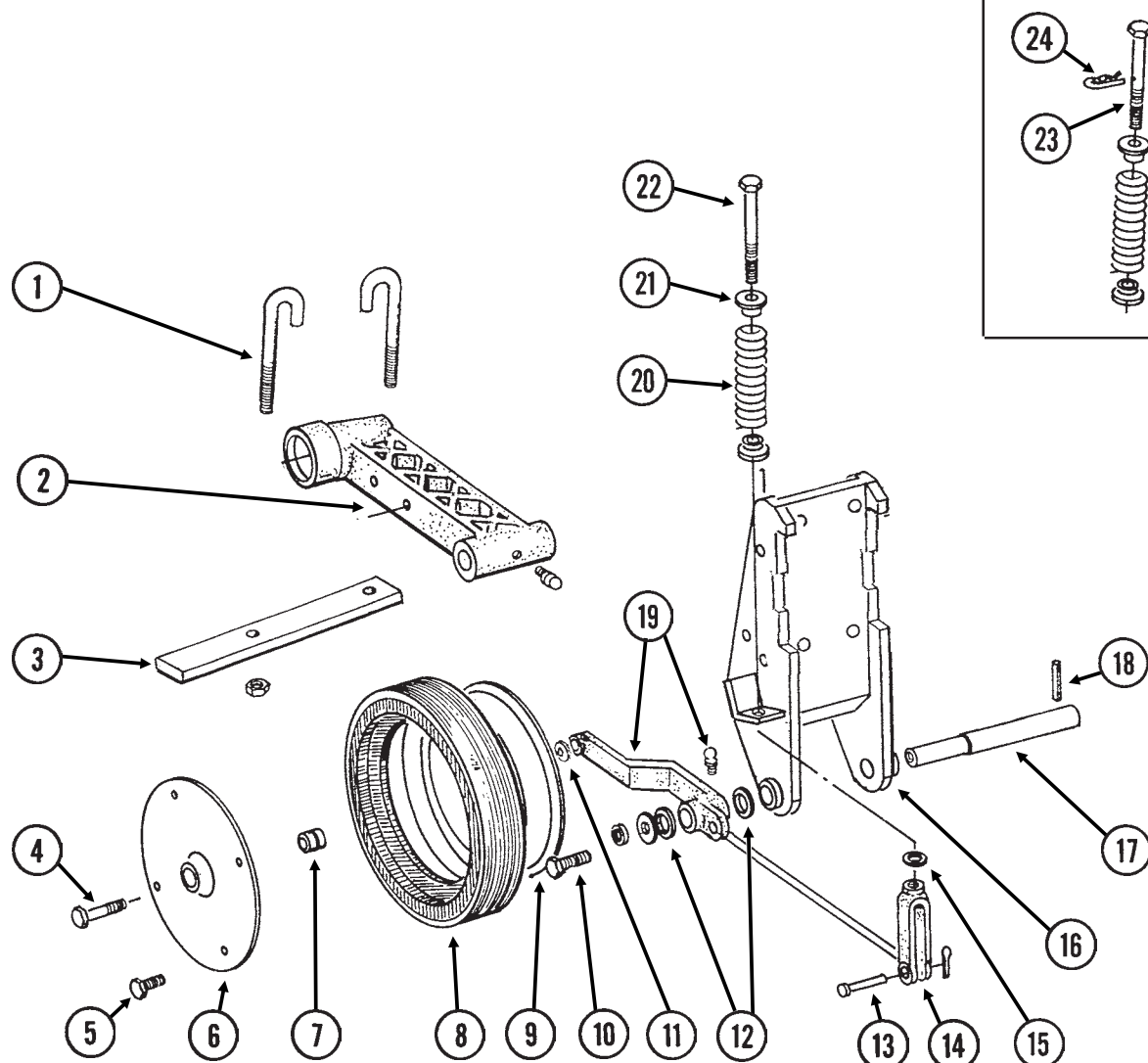


DOUBLE DISC FERTILIZER OPENER

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|-------------|---|
| | | (Per Assy.) | |
| 1. | GD1657 | 1 | Lockup Pin |
| 2. | G10451 | 2 | Cotter Pin, 1/8" x 1" |
| 3. | GA0785 | 1 | Bracket |
| 4. | GD1138 | 2 | U-Bolt, 2 1/2" x 2 1/2" x 1/2"-13 |
| | G10228 | 4 | Lock Washer, 1/2" |
| | G10102 | 4 | Hex Nut, 1/2"-13 |
| 5. | G10046 | 1 | Hex Head Cap Screw, 5/8"-11 x 5" |
| | G10107 | 1 | Lock Nut, 5/8"-11 |
| 6. | G10305 | 2 | Carriage Bolt, 3/8"-16 x 1" |
| | G10210 | 2 | Washer, 3/8" USS |
| | G10229 | 2 | Lock Washer, 3/8" |
| | G10101 | 2 | Hex Nut, 3/8"-16 |
| 7. | G10045 | 1 | Hex Head Cap Screw, 1/2"-13 x 4 1/2" |
| | G10111 | 1 | Lock Nut, 1/2"-13 |
| 8. | GD0962 | 1 | Hex Head Adjusting Bolt, 5/8"-18 |
| | G10499 | 1 | Jam Nut, 5/8"-18 |
| 9. | GA0328 | 1 | Spring |
| 10. | GD0487 | 1 | Bushing |
| 11. | GA2014 | 2 | Bearing |
| 12. | GB0134 | 2 | Hub |
| 13. | G10542 | 12 | Rivet, 1/4" x 1 5/16" |
| 14. | GD1132 | 2 | Dust Cap |
| 15. | G10503 | 1 | Jam Nut, R.H., 5/8"-11 |
| | G10504 | 1 | Jam Nut, L.H., 5/8"-11 |
| 16. | G10204 | 2 | Machine Bushing, 21/32" |
| 17. | GD1030 | 2 | Blade |
| 18. | G10213 | - | Machine Bushing, .030" |
| 19. | GD2589 | 1 | Inner Scraper |
| 20. | G10019 | 1 | Hex Head Cap Screw, 5/16"-18 x 1" |
| | G10232 | 1 | Lock Washer, 5/16" |
| 21. | GA0312 | 1 | Mount |
| 22. | GA1369 | - | Drop Tube, Dry Fertilizer |
| 23. | GD1797 | - | Extension |
| 24. | G10681 | - | Clamp, No. 6 |
| 25. | GA0318 | - | Drop Tube, Liquid Fertilizer |
| 26. | G10133 | 1 | Hex Head Cap Screw, 5/16"-18 x 1 1/2" |
| | G10109 | 1 | Lock Nut, 5/16"-18 |
| 27. | GA0308 | 1 | Shank |
| 28. | GD1673 | 2 | Scraper |
| 29. | GA0810 | 1 | Scraper Mount |
| A. | GA0320 | - | Disc And Bearing Assembly (Items 11, 12 And 17) |

HD SINGLE DISC FERTILIZER OPENER (Soil Press Wheel)

FOC016/FOC007(PT26a)

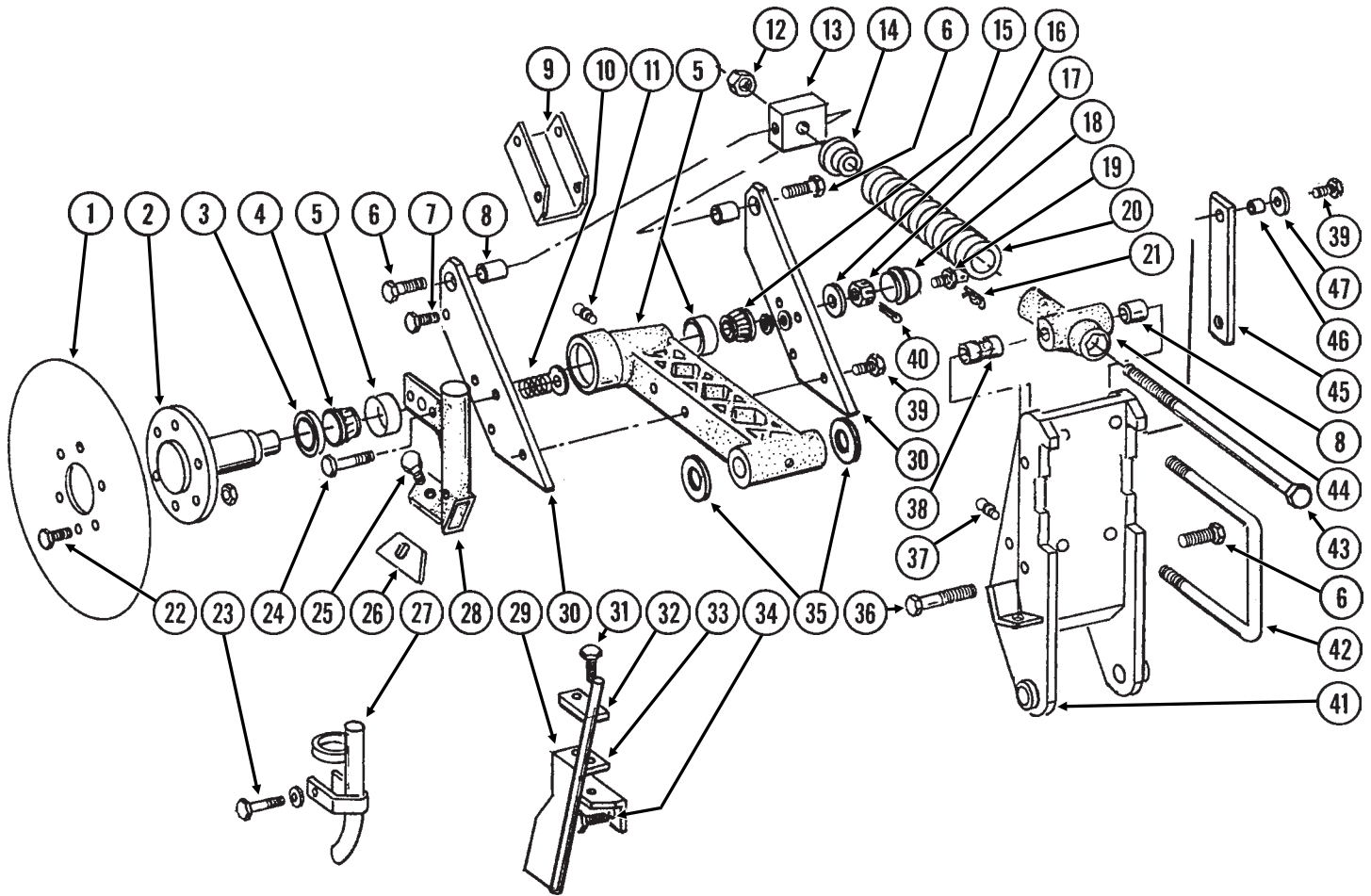


HD SINGLE DISC FERTILIZER OPENER (Soil Press Wheel)

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|-------------|--|
| | | (Per Assy.) | |
| 1. | GD9705 | 2 | J-Bolt |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 2. | | - | See "HD Single Disc Fertilizer Opener (Disc And Drop Tube)", Pages P68 And P69 |
| 3. | GD9706 | 1 | Lockup Bar |
| 4. | G10010 | 1 | Hex Head Cap Screw, 5/8"-11 x 3" |
| 5. | G10018 | 4 | Hex Head Cap Screw, 5/16"-18 x 5/8" |
| | G10109 | 4 | Lock Nut, 5/16"-18 |
| 6. | GD4888 | 1 | Half Wheel |
| 7. | GA6171 | 1 | Bearing |
| 8. | GD4850 | 1 | Offset Tire |
| 9. | GD1048 | 1 | Half Wheel |
| 10. | G10438 | 1 | Hex Head Cap Screw, 1/2"-13 x 3/4" |
| | G10228 | 1 | Lock Washer, 1/2" |
| | G10216 | 1 | Washer, 1/2" USS |
| 11. | G10230 | 1 | Lock Washer, 5/8" |
| 12. | G10526 | 10 | Bushing, .048" |
| 13. | G10560 | 1 | Clevis Pin, 1/2" x 1 3/4" |
| | G10456 | 1 | Cotter Pin, 1/8" x 3/4" |
| 14. | GD8218 | 1 | Yoke |
| 15. | G10205 | 1 | Washer, 5/8" SAE |
| 16. | | - | See "HD Single Disc Fertilizer Opener (Disc And Drop Tube)", Pages P68 And P69 |
| 17. | GD7911 | 1 | Pivot Pin |
| 18. | G10610 | 1 | Spring Pin, 3/8" x 2" |
| 19. | GA8306 | - | Wheel Arm W/Grease Fitting, R.H. |
| | GA8305 | 1 | Wheel Arm W/Grease Fitting, L.H. (Shown) |
| | G10640 | 1 | Grease Fitting, 1/4"-28 |
| 20. | GD8308 | 1 | Spring |
| 21. | GB0212 | 2 | Washer |
| 22. | GD9709 | 1 | Special Bolt |
| 23. | GD8214 | 1 | Special Bolt (If Equipped With G1K215 Lockup Kit) |
| 24. | G10592 | 1 | Hair Pin Clip, No. 11 |
| 25. | GB0118 | 1 | Sleeve |
| 26. | GA2022 | 1 | Bearing |
| 27. | G10603 | 1 | Spring Pin, 1/4" x 1 1/4" |
| 28. | GD8030 | - | Wheel Arm, R.H. |
| | GD8031 | 1 | Wheel Arm, L.H. (Shown) |
| A. | G1K215 | - | Lockup Kit (Items 1 And 3) |
| B. | GA6766 | - | Wheel Assembly (Items 5-9) |

HD SINGLE DISC FERTILIZER OPENER (Disc And Drop Tube)

FOC016/FOC007/FOC019(PT27b)



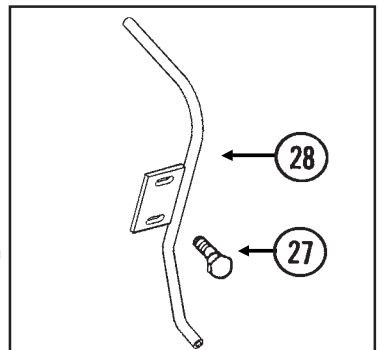
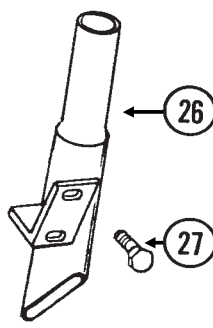
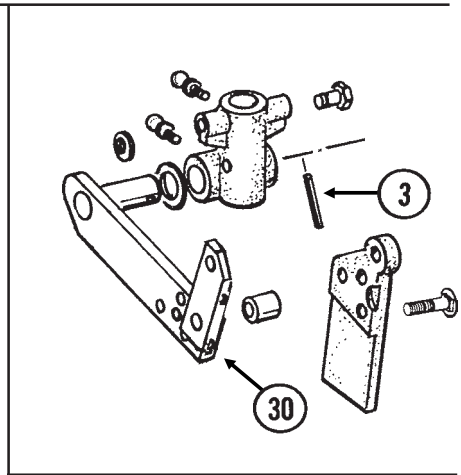
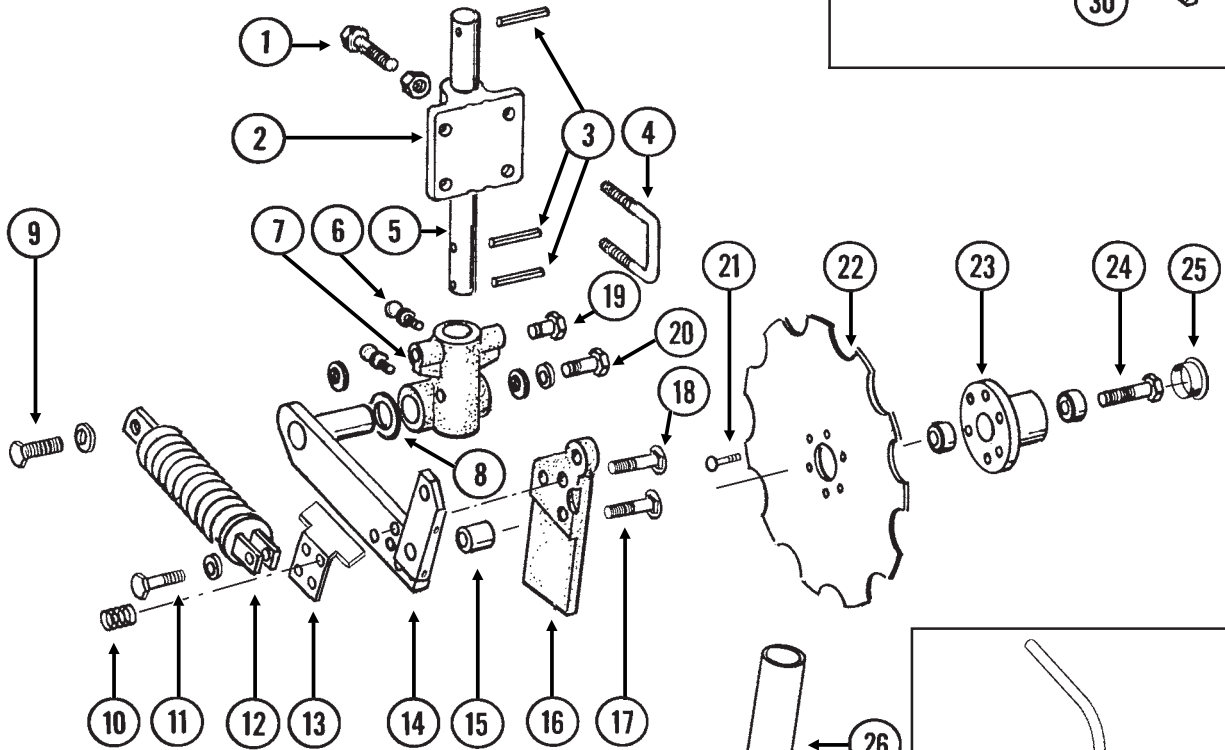
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|-------------|--------------------------------------|
| | | (Per Assy.) | |
| 1. | GD7900 | 1 | Blade, 18" |
| 2. | GB0205 | 1 | Spindle |
| 3. | GA4286 | 1 | Seal |
| 4. | GA4287 | 1 | Inner Bearing |
| 5. | GA5887 | 1 | Arm W/Cups |
| | GD6553 | - | Inner Cup |
| | GR0188 | - | Outer Cup |
| | G10205 | 3 | Washer, 5/8" SAE |
| 6. | G10007 | 3 | Hex Head Cap Screw, 5/8"-11 x 1 1/2" |
| 7. | G10001 | 2 | Hex Head Cap Screw, 3/8"-16 x 1" |
| | G10108 | 2 | Lock Nut, 3/8"-16 |
| 8. | GB0218 | 3 | Bushing, 19/32" |
| 9. | GD8238 | 1 | Channel |
| 10. | GD7962 | 2 | Spring |
| 11. | G10641 | 2 | Grease Fitting, 1/8" NPT |
| 12. | G10231 | 1 | Lock Washer, 3/4" |
| | G10105 | 1 | Hex Nut, 3/4"-10 |
| 13. | GD7908 | 1 | Block |
| 14. | GB0213 | 1 | Spring Guide |
| 15. | GA0237 | 1 | Outer Bearing |
| 16. | G10220 | 1 | Machine Bushing |
| 17. | G10507 | 1 | Slotted Nut, 1"-14 |
| 18. | GD1104 | 1 | Dust Cap |

HD SINGLE DISC FERTILIZER OPENER (Disc And Drop Tube)

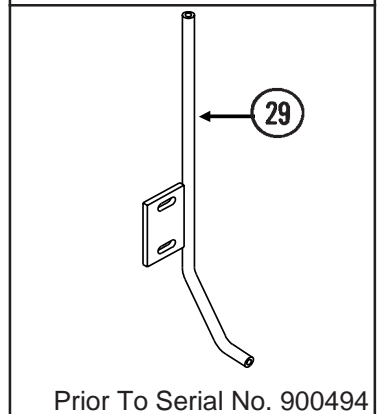
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|-------------|--|
| | | (Per Assy.) | |
| 19. | GD8276 | 1 | Pin |
| | G10237 | 1 | Lock Washer, 7/16" |
| | G10100 | 1 | Hex Nut, 7/16"-14 |
| 20. | GD10273 | 1 | Compression Spring |
| 21. | G10592 | 1 | Hair Pin Clip, No. 11 |
| 22. | G10594 | 6 | Bolt, 1/2"-13 x 1 1/2" |
| | G10111 | 6 | Lock Nut, 1/2"-13 |
| 23. | G10403 | 1 | Hex Head Cap Screw, 1/4"-20 x 2 1/2" |
| | G10209 | 2 | Washer, 1/4" USS |
| | G10110 | 1 | Lock Nut, 1/4"-20 |
| 24. | G10049 | 2 | Hex Head Cap Screw, 3/8"-16 x 2 1/2" |
| | G10210 | 2 | Lock Washer, 3/8" |
| | G10108 | 2 | Lock Nut, 3/8"-16 |
| 25. | G10599 | 1 | Carriage Bolt, 3/8"-16 x 1 1/4" |
| | G10210 | 1 | Washer, 3/8" |
| | G10229 | 1 | Lock Washer, 3/8" |
| | G10101 | 1 | Hex Nut, 3/8"-16 |
| 26. | GD7912 | 1 | Scraper |
| 27. | GA6408 | 1 | Liquid Drop Tube |
| 28. | GB0210 | - | Drop Tube, R.H. |
| | GB0209 | 1 | Drop Tube, L.H. (Shown) |
| 29. | GA7269 | 1 | Liquid Drop Tube, L.H. (Shown) |
| | GA7268 | - | Liquid Drop Tube, R.H. |
| 30. | GD8224 | 2 | Bar |
| 31. | G10004 | 2 | Hex Head Cap Screw, 3/8"-16 |
| | G10229 | 2 | Washer, 3/8" SAE |
| 32. | GD10487 | 1 | Clamp |
| 33. | GD10304 | - | Angle, R.H. |
| | GD10303 | 1 | Angle, L.H. (Shown) |
| 34. | G10016 | 2 | Hex Head Cap Screw, 1/2"-13 x 2" |
| | G10111 | 2 | Lock Nut, 1/2"-13 |
| 35. | G10322 | - | Bushing (As Required) |
| 36. | G10862 | 1 | Hex Head Cap Screw, 5/8"-11 x 3 1/4" |
| | G10205 | 2 | Washer, 5/8" SAE |
| | G10230 | 1 | Lock Washer, 5/8" |
| 37. | G10640 | 1 | Grease Fitting, 1/4"-28 |
| 38. | GD10242 | 1 | Bushing, 2 1/4" |
| 39. | G10039 | 5 | Hex Head Cap Screw, 1/2"-13 x 1 3/4" |
| | G10111 | 5 | Lock Nut, 1/2"-13 |
| 40. | G10459 | 1 | Cotter Pin, 3/16" x 1 1/2" |
| 41. | GA7240 | - | Opener Mount, R.H. |
| | GA7239 | 1 | Opener Mount, L.H. (Shown) |
| 42. | GD1113 | 2 | U-Bolt, 5" x 7" x 5/8"-11 |
| | G10230 | 4 | Lock Washer, 5/8" |
| | G10104 | 4 | Hex Nut, 5/8"-11 |
| 43. | GD7907 | 1 | Special Bolt |
| 44. | GB0206 | 1 | Guide Rod |
| 45. | GD8239 | 1 | Storage Strap |
| 46. | GD7904-02 | 1 | Tube |
| 47. | G10216 | 3 | Washer, 1/2" USS |
| A. | G7393X | - | Liquid Fertilizer Drop Tube Package, L.H. And R.H. (Items 29 And 31-34) |

NOTCHED SINGLE DISC FERTILIZER OPENER

FOC018(PT65/PT67/TWL334a/PT57en)



Serial No. 900494 & On



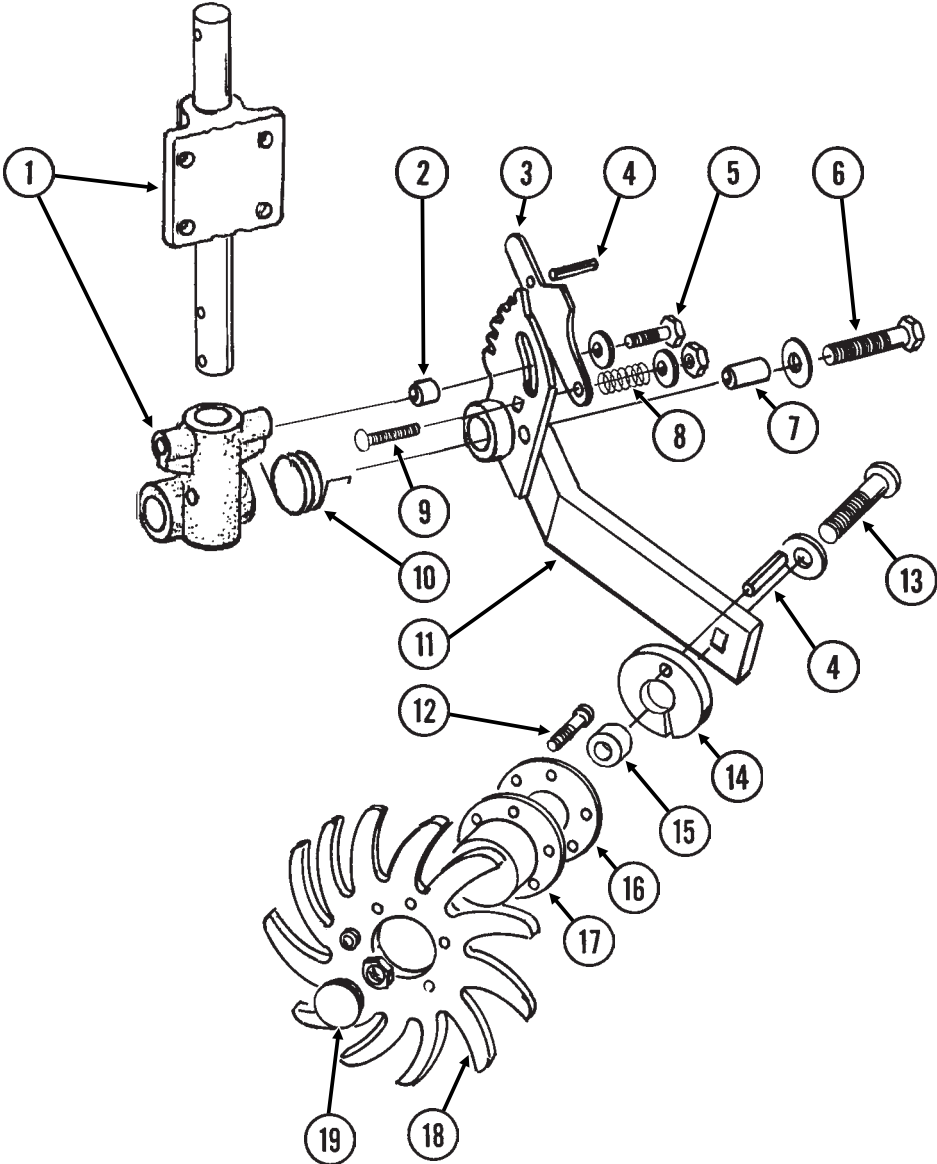
Prior To Serial No. 900494

NOTCHED SINGLE DISC FERTILIZER OPENER

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|-------------|---|
| | | (Per Assy.) | |
| 1. | G10014 | 2 | Hex Head Cap Screw, 1/2"-13 x 1" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 2. | GB0270 | 1 | Mount |
| 3. | G10476 | 3-4 | Spring Pin, 3/8" x 2 1/4" |
| 4. | GD1138 | 2 | U-Bolt, 2 1/2" x 2 1/2" x 1/2"-13 |
| | G10228 | 4 | Lock Washer, 1/2" |
| | G10102 | 4 | Hex Nut, 1/2"-13 |
| 5. | GD9908 | 1 | Shaft, 1 1/2" x 14" |
| 6. | G10641 | 2 | Grease Fitting, 1/8" NPT |
| 7. | GB0250 | 1 | Pivot |
| 8. | G10450 | 2 | Machine Bushing |
| 9. | GD7818 | 1 | Special Bolt |
| | GD7805 | 2 | Special Washer |
| 10. | GD11106 | 1 | Spring |
| 11. | G10047 | 1 | Hex Head Cap Screw, 3/8"-16 x 1 3/4" |
| | G10210 | 1 | Washer, 3/8" |
| | GD1026 | 1 | Spacer, 1 3/16" |
| | G10108 | 1 | Lock Nut, 3/8"-16 |
| 12. | GA6966 | 1 | Compression Spring Assembly |
| 13. | GD11097 | 1 | Shield |
| 14. | GA8007 | 1 | Pivot Arm, L.H. (Shown) |
| | GA8008 | - | Pivot Arm, R.H. |
| 15. | GD7817-05 | 1 | Spacer, 1 1/4" |
| 16. | GB0249 | 1 | Knife/Scraper, L.H. (Shown) |
| | GB0248 | - | Knife/Scraper, R.H. |
| 17. | G10306 | 2-3 | Carriage Bolt, 3/8"-16 x 2" |
| | G10108 | 2-3 | Lock Nut, 3/8"-16 |
| 18. | G10898 | 1 | Carriage Bolt, 3/8"-16 x 2 3/4" |
| | G10210 | 1 | Washer, 3/8" USS |
| | G10108 | 1 | Lock Nut, 3/8"-16 |
| 19. | G10438 | 1 | Hex Head Cap Screw, 1/2"-13 x 3/4" |
| 20. | G10007 | 1 | Hex Head Cap Screw, 5/8"-11 x 1 1/2" |
| | G10230 | 1 | Lock Washer, 5/8" |
| | G10217 | 1 | Washer, 5/8" USS |
| 21. | G10886 | 6 | Truss Head Bolt, 5/16"-18 x 1" |
| | G10106 | 6 | Hex Nut, 5/16"-18 |
| 22. | GD9934 | 1 | Blade, 16 3/4" |
| 23. | GA5654 | 1 | Hub W/Bearings |
| | GA2014 | - | Bearing |
| 24. | G10013 | 1 | Hex Head Cap Screw, 5/8"-11 x 3 1/2" |
| 25. | GD1132 | 1 | Dust Cap |
| 26. | GA6972 | 1 | Dry Drop Tube, R.H. |
| | GA6973 | - | Dry Drop Tube, L.H. (Shown) |
| 27. | G10043 | 2 | Hex Head Cap Screw, 5/16"-18 x 3/4" |
| | G10232 | 2 | Lock Washer, 5/16" |
| | G10219 | 2 | Washer, 5/16" USS |
| 28. | GA6984 | 1 | Liquid Drop Tube, R.H. (Serial No. 900494 & On) |
| | GA6985 | - | Liquid Drop Tube, L.H. (Shown) (Serial No. 900494 & On) |
| 29. | GA7830 | 1 | Liquid Drop Tube, R.H. (Prior To Serial No. 900494) |
| | GA7829 | - | Liquid Drop Tube, L.H. (Shown) (Prior To Serial No. 900494) |
| 30. | GA6967 | 1 | Pivot Arm, L.H. (Shown) |
| | GA6968 | - | Pivot Arm, R.H. |

RESIDUE WHEEL, NOTCHED SINGLE DISC FERTILIZER OPENER MOUNTED

DFC024(FRTZ165i)

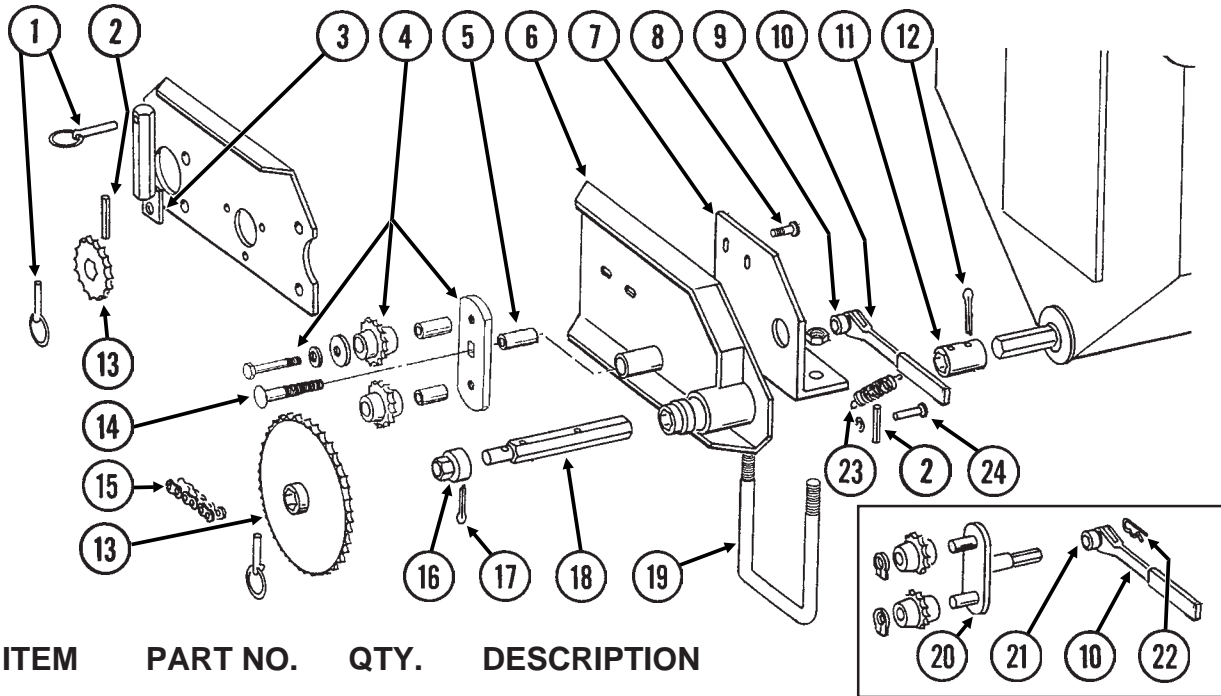


RESIDUE WHEEL, NOTCHED SINGLE DISC FERTILIZER OPENER MOUNTED

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|-------------|--|
| | | (Per Assy.) | |
| 1. | | - | See "Notched Single Disc Fertilizer Opener", Pages P70 And P71 |
| 2. | GD11053 | 1 | Bushing, 7/8" Long |
| 3. | GD11178 | 1 | Adjustment Lever |
| 4. | G10603 | 2 | Spring Pin, 1/4" x 1 1/4" |
| 5. | G10919 | 1 | Self-Locking Hex Head Cap Screw, 1/2"-13 x 1 3/4" |
| | G10216 | 1 | Washer, 1/2" USS |
| 6. | G10920 | 1 | Self-Locking Hex Head Cap Screw, 5/8"-11 x 3 1/2" |
| | GD7805 | 1 | Special Washer |
| 7. | GD11358 | 1 | Hardened Bushing, 2 1/8" Long |
| 8. | GD7962 | 1 | Spring |
| 9. | G10306 | 1 | Carriage Bolt, 3/8"-16 x 2" |
| | G10203 | 1 | Washer, 3/8" USS |
| | G10108 | 1 | Lock Nut, 3/8"-16 |
| 10. | GD11265 | 1 | Spring, L.H. (Shown) |
| | GD11266 | - | Spring, R.H. |
| 11. | GA7999 | 1 | Mount, L.H. (Shown) |
| | GA7998 | - | Mount, R.H. |
| 12. | G10133 | 6 | Hex Head Cap Screw, 5/16"-18 x 1 1/2" |
| | G10109 | 6 | Lock Nut, 5/16"-18 |
| 13. | G10908 | 1 | Carriage Bolt, 5/8"-11 x 3" |
| | G10503 | 1 | Hex Jam Nut, 5/8"-11 |
| 14. | GD11188 | 1 | Spacer |
| 15. | GD7817-04 | 1 | Spacer, 1 1/4" O.D. x 1/2" Long |
| 16. | GD9724 | 1 | Backing Plate |
| 17. | GA5654 | 1 | Hub W/Bearings |
| | GA2014 | - | Bearing |
| 18. | GD10552 | 2 | Wheel, 3/8" x 12" |
| 19. | GD1132 | 2 | Dust Cap |
| A. | GA7445 | - | L.H. Wheel Assembly (Items 12 And 16-18)(Shown) |
| | GA7446 | - | R.H. Wheel Assembly (Items 12 And 16-18) |

DRY FERTILIZER TRANSMISSION ASSEMBLY

PTD072(TWL60a)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|------|---|
| 1. | GD2558 | 3 | Lynch Pin, 1/4" |
| 2. | G10602 | 2 | Spring Pin, 1/4" x 1 1/2" |
| 3. | GA5229 | 1 | Sprocket Storage Rod |
| 4. | GA7336 | 1 | Idler W/Bolt-On Sprockets |
| | GD7426 | - | Sprocket |
| | GD1026 | - | Spacer, 1 3/16" |
| | G10210 | - | Washer, 3/8" USS |
| | G10229 | - | Lock Washer, 3/8" |
| | G10047 | - | Hex Head Cap Screw, 3/8"-16 x 1 3/4" |
| 5. | GD3180-17 | 1 | Sleeve, 2 5/16" |
| 6. | GA6579 | 1 | Plate W/Bearings And Grease Fitting |
| | GA5116 | - | Bearing |
| | GA5624 | - | Extended Bearing |
| | G10643 | - | Grease Fitting, 1/4"-28, 45° |
| 7. | GD9320 | 1 | Mount |
| 8. | G10574 | 2 | Carriage Bolt, 1/2"-13 x 1 1/4" |
| | G10216 | 4 | Washer, 1/2" USS |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 9. | GD10161 | 1 | Spacer, 3/8" |
| 10. | GA4235 | 1 | Ratchet Arm W/Protective Closure |
| | G10445 | - | Protective Closure |
| 11. | GD5886 | - | Coupler, 1 3/4" |
| 12. | G10460 | - | Cotter Pin, 1/4" x 2" |
| 13. | GA5105 | 1 | Sprocket, 15 Tooth |
| | GA5107 | 1 | Sprocket, 19 Tooth |
| | GA5114 | 1 | Sprocket, 30 Tooth |
| | GA5115 | 1 | Sprocket, 33 Tooth |
| | GA6337 | 1 | Sprocket, 35 Tooth |
| 14. | G10419 | 1 | Carriage Bolt, 1/2"-13 x 4 1/2" |
| | G10111 | 1 | Lock Nut, 1/2"-13 |
| 15. | G3310-155 | 1 | Chain, No. 40, 155 Pitch Including Connector Link And Offset Link |
| | GR0912 | - | Connector Link, No. 40 |
| | GR0911 | - | Offset Link, No. 40 |
| 16. | GD7127 | 1 | Shear Coupler |

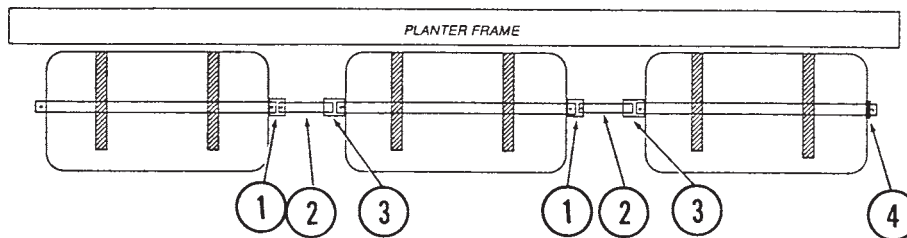
DRY FERTILIZER TRANSMISSION ASSEMBLY

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--|
| 17. | G10462 | 1 | Cotter Pin, $\frac{3}{16}$ " x 2" |
| 18. | GD7870 | 1 | Shaft, 7" |
| 19. | GD1134 | 1 | U-Bolt, 7" x 5" x $\frac{5}{8}$ "-11 |
| | G10230 | 2 | Lock Washer, $\frac{5}{8}$ " |
| | G10104 | 2 | Hex Nut, $\frac{5}{8}$ "-11 |
| 20. | GA5136 | 1 | Idler W/Sprockets And Rings |
| | GD7426 | - | Sprocket |
| | G10435 | - | Ring |
| 21. | GD6819 | 1 | Sleeve |
| 22. | G10670 | 1 | Hair Pin Clip, No. 3 |
| 23. | GD5857 | 1 | Spring |
| 24. | G10408 | 1 | Clevis Pin, $\frac{5}{16}$ " x $\frac{3}{4}$ " |
| | G10409 | 1 | Ring, $\frac{5}{16}$ " |

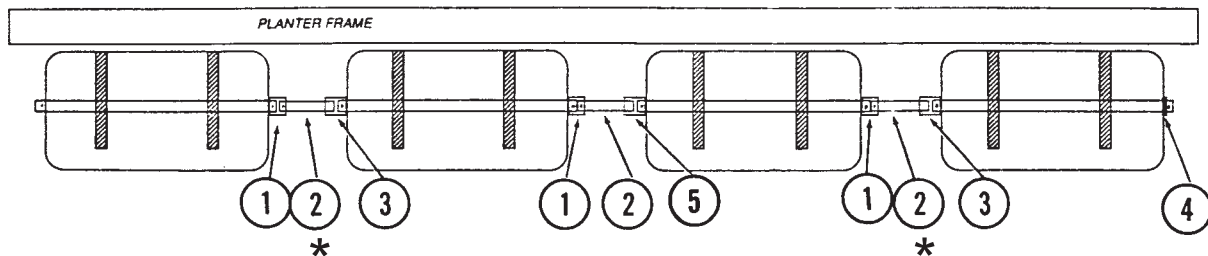
DRY FERTILIZER COUPLERS/SHAFTS

RH101190(PT33/PT35)

6 Row 30"



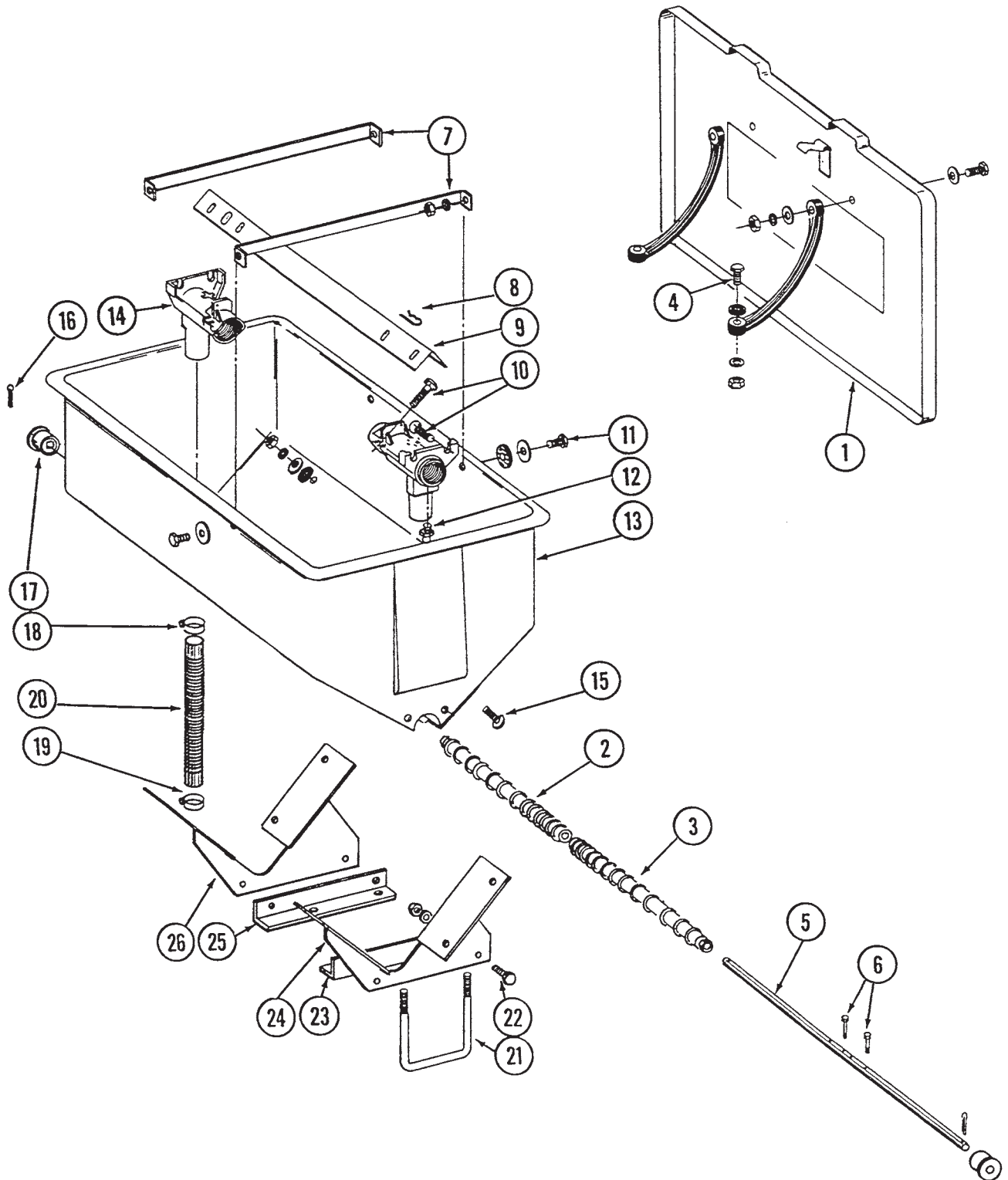
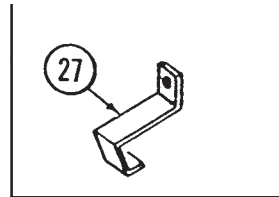
8 Row 30"



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-------------|------|---|
| 1. | GD5886 | - | Coupler, 1 $\frac{3}{4}$ " |
| 2. | GD2548-15.5 | - | Shaft, 15 $\frac{1}{2}$ " (*Trim 4" On 8 Row 30" Size With HD Single Disc Fertilizer Openers) |
| 3. | GD7867 | - | Coupler, 3" |
| 4. | G10233 | 2 | Machine Bushing |
| 5. | GD9378 | - | Coupler, 12" |

DRY FERTILIZER HOPPER AND MOUNTS

DFC009/DFC018/DFC023(TWL61)

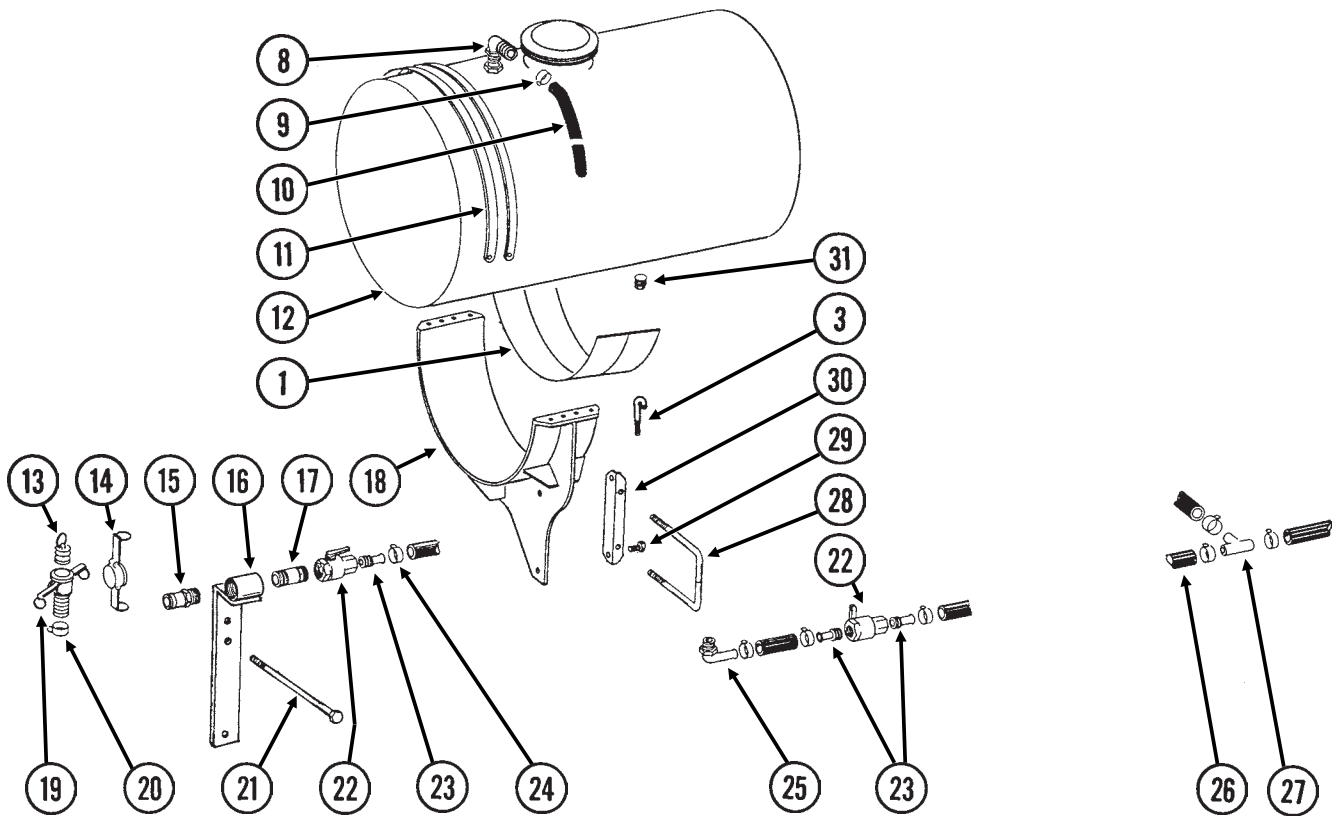
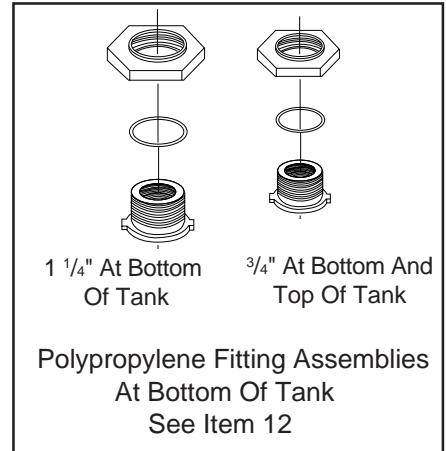
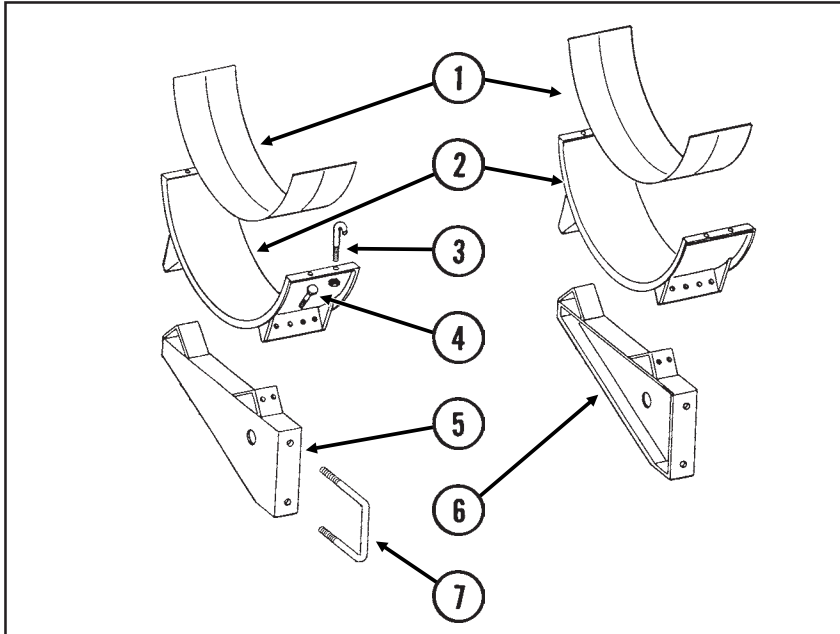


DRY FERTILIZER HOPPER AND MOUNTS

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|--------------|---|
| | | (Per Hopper) | |
| 1. | GA0898 | 1 | Lid With Retainers, Clips, Rivets, Rubber Straps And Hardware |
| | GD1380 | - | Front Clip |
| | GD2412 | - | Rear Retainer |
| | G10655 | - | Rivet, $\frac{3}{16}$ " x $\frac{13}{32}$ " |
| | GD1210 | - | Rubber Strap |
| | G10171 | - | Hex Head Cap Screw, $\frac{5}{16}$ "-18 x 1 $\frac{1}{4}$ " |
| | G10219 | - | Washer, $\frac{5}{16}$ " USS |
| | G10232 | - | Lock Washer, $\frac{5}{16}$ " |
| | G10106 | - | Hex Nut, $\frac{5}{16}$ "-18 |
| 2. | GB0198 | 1 | Auger, R.H. |
| 3. | GB0199 | 1 | Auger, L.H. |
| 4. | G10133 | 2 | Hex Head Cap Screw, $\frac{5}{16}$ "-18 x 1 $\frac{1}{2}$ " |
| | G10219 | 2 | Washer, $\frac{5}{16}$ " USS |
| | G10232 | 2 | Lock Washer, $\frac{5}{16}$ " |
| | G10106 | 2 | Hex Nut, $\frac{5}{16}$ "-18 |
| 5. | GD7848 | 1 | Shaft |
| 6. | G10587 | 2 | Hex Head Cap Screw, $\frac{1}{4}$ "-20 x 2", Stainless Steel |
| | G10588 | 2 | Hex Nut, $\frac{1}{4}$ "-20, Stainless Steel |
| 7. | GD1209 | 2 | Strap |
| 8. | G10670 | 2 | Hair Pin Clip, No. 3 |
| 9. | GD1207 | 1 | Baffle |
| 10. | G10303 | 8 | Carriage Bolt, $\frac{5}{16}$ "-18 x 1", Grade 2 |
| | G10219 | 8 | Washer, $\frac{5}{16}$ " USS |
| | G10232 | 8 | Lock Washer, $\frac{5}{16}$ " |
| | G10106 | 8 | Hex Nut, $\frac{5}{16}$ "-18 |
| 11. | G10171 | 4 | Hex Head Cap Screw, $\frac{5}{16}$ "-18 x 1 $\frac{1}{4}$ " |
| | G10201 | 4 | Special Washer |
| | GD1213 | 4 | Rubber Washer |
| | G10232 | 4 | Lock Washer, $\frac{5}{16}$ " |
| | G10106 | 4 | Hex Nut, $\frac{5}{16}$ "-18 |
| 12. | G10641 | 2 | Grease Fitting, $\frac{1}{8}$ " NPT |
| 13. | GD1379 | 1 | Hopper |
| 14. | GD1200 | 2 | Outlet Housing |
| 15. | G10303 | 8 | Carriage Bolt, $\frac{5}{16}$ "-18 x 1 $\frac{1}{4}$ " |
| | G10201 | 8 | Special Washer |
| | GD1213 | 8 | Rubber Washer |
| | G10232 | 8 | Lock Washer, $\frac{5}{16}$ " |
| | G10106 | 8 | Hex Nut, $\frac{5}{16}$ "-18 |
| 16. | G10460 | 2 | Cotter Pin, $\frac{1}{4}$ " x 2" |
| 17. | GB0200 | 2 | Bearing |
| 18. | G10676 | 2 | Clamp, No. 36 |
| 19. | G10672 | 2 | Clamp, No. 28 |
| 20. | GD3790 | 2 | Rubber Tube |
| 21. | GD1134 | 2 | U-Bolt, 7" x 5" x $\frac{5}{8}$ "-11 |
| | G10230 | 4 | Lock Washer, $\frac{5}{8}$ " |
| | G10104 | 4 | Hex Nut, $\frac{5}{8}$ "-11 |
| 22. | G10017 | 2 | Hex Head Cap Screw, $\frac{1}{2}$ "-13 x 1 $\frac{1}{2}$ " |
| | G10228 | 2 | Lock Washer, $\frac{1}{2}$ " |
| | G10102 | 2 | Hex Nut, $\frac{1}{2}$ "-13 |
| 23. | GD9131 | 1 | Angle, L.H. |
| 24. | GA6437 | 1 | Mount, L.H. |
| 25. | GD9132 | 1 | Angle, R.H. |
| 26. | GA6436 | 1 | Mount, R.H. |
| 27. | GD8722 | - | Holder (As Required) |
| A. | GA6503 | - | Hopper Sub-Assembly (Items 8,10 And 12-15) |
| B. | GA5667 | - | Hopper Hardware Box (Items 2-7, 11, 16 And 17) |

LIQUID FERTILIZER TANKS, SADDLES, MOUNTS, HOSES AND FITTINGS

LFC012rev(PT51/TWL62b)

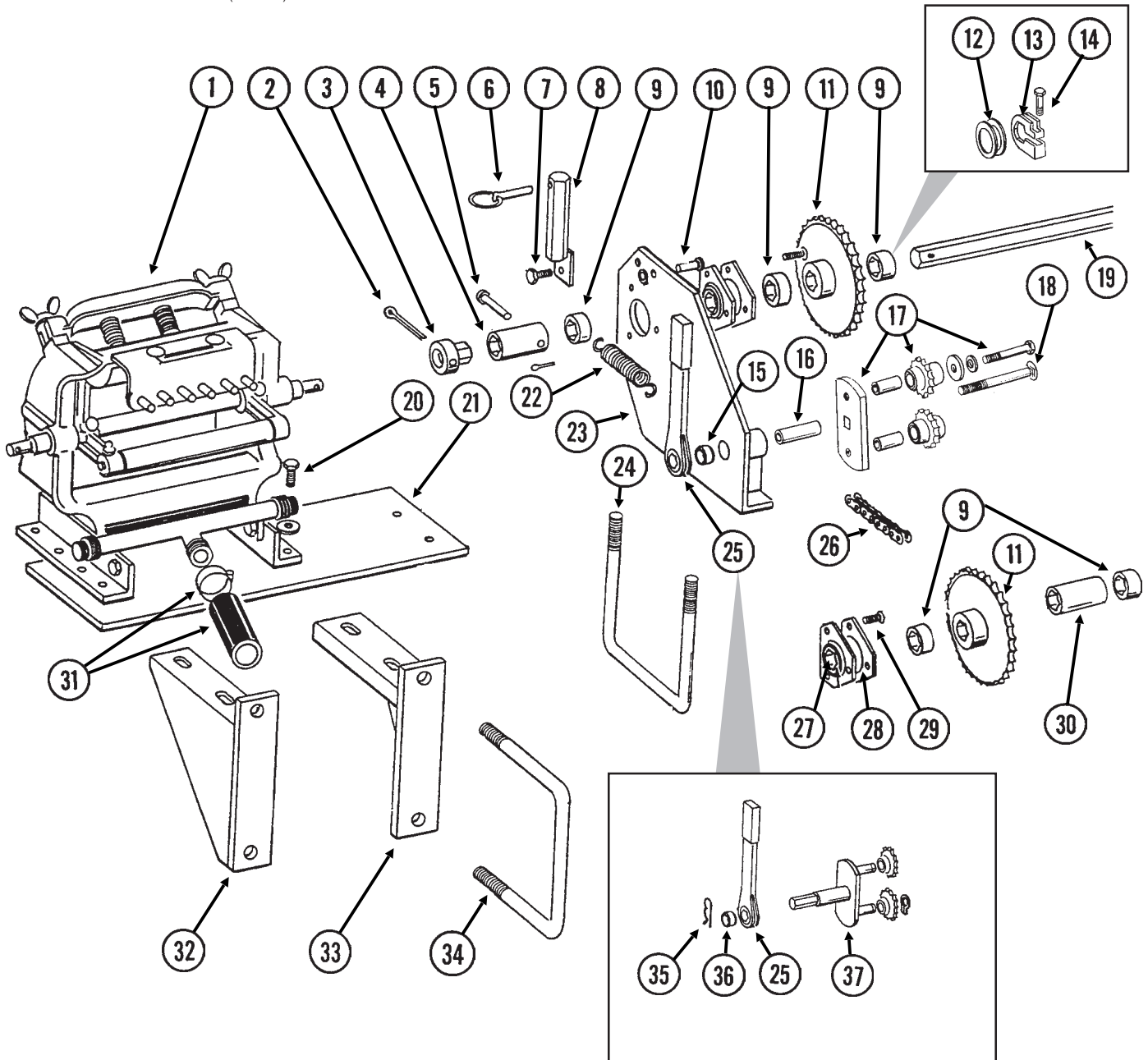


LIQUID FERTILIZER TANKS, SADDLES, MOUNTS, HOSES AND FITTINGS

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | GD1862 | 1 | Pad, 8" x 14' (For Two 30" Tanks) |
| 2. | GA5264 | 4 | Saddle |
| 3. | GD1337 | 16 | J-Bolt, $\frac{5}{16}$ " |
| | G10109 | 16 | Lock Nut, $\frac{5}{16}$ "-18 |
| 4. | G10003 | 16 | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{1}{2}$ " |
| | G10210 | 16 | Washer, $\frac{3}{8}$ " USS |
| | G10229 | 16 | Lock Washer, $\frac{3}{8}$ " |
| | G10101 | 16 | Hex Nut, $\frac{3}{8}$ "-16 |
| 5. | GA5799 | 2 | Saddle Mount (Sub GA7375 And GD10110) |
| 6. | GA5800 | 2 | Saddle Mount (Sub GA7375 And GD10110) |
| 7. | GD1113 | 4 | U-Bolt, 5" x 7" x $\frac{5}{8}$ "-11 |
| | G10230 | 8 | Lock Washer, $\frac{5}{8}$ " |
| | G10104 | 8 | Hex Nut, $\frac{5}{8}$ "-11 |
| 8. | G10917 | 2 | Elbow, 90°, $\frac{3}{4}$ " NPT To Barb |
| 9. | G10278 | 2 | Hose Clamp, No. 16 |
| 10. | G4205-03 | 1 | Hose, $\frac{3}{4}$ " x 97" ($\frac{3}{4}$ " x 48" Per Tank) |
| 11. | GD1520 | 8 | Band, 30" |
| 12. | GD1812 | 2 | Tank W/Lid and Fittings, 30" x 150 Gallon |
| | GR1005 | - | Fillwell, Threaded |
| | GR1006 | - | Lid, 10", Threaded |
| | GR0513 | - | $\frac{3}{4}$ " Polypropylene Fitting Assembly (Nut, Bushing And O-Ring) |
| | GR0508 | - | 1 $\frac{1}{4}$ " Polypropylene Fitting Assembly (Nut, Bushing And O-Ring) |
| 13. | GD1517 | 1 | Dust Plug |
| 14. | GD1515 | 1 | Dust Cap, 1 $\frac{1}{4}$ " |
| 15. | GD1514 | 1 | Adapter, 1 $\frac{1}{4}$ " Male NPT To Cam Lock |
| 16. | GA5917 | 1 | Quick Fill Mount |
| 17. | G10619 | - | Pipe Nipple, 1 $\frac{1}{4}$ " NPT |
| 18. | GA7375 | - | Tank Mount (2 Per Tank) |
| 19. | GD1516 | 1 | Adapter |
| 20. | G10672 | 1 | Clamp, No. 28 |
| 21. | G10829 | 2 | Hex Head Cap Screws, $\frac{1}{2}$ "-13 x 6 $\frac{1}{2}$ " (Used Between Light Assembly And Quick Fill Mount) |
| | G10216 | 2 | Washer, $\frac{1}{2}$ " USS |
| | G10228 | 2 | Lock Washer, $\frac{1}{2}$ " |
| | G10102 | 2 | Hex Nut, $\frac{1}{2}$ "-13 |
| 22. | GA4976 | - | Ball Valve, Full Port |
| | GR1015 | - | Body O-Ring |
| | GR1016 | - | Stem O-Ring |
| | GR1017 | - | Teflon Seat |
| | GR1018 | - | Ball |
| | GR1019 | - | Handle |
| 23. | G10626 | - | Adapter, 1 $\frac{1}{4}$ " NPT To 1 $\frac{1}{4}$ " Barb Fitting |
| 24. | G10674 | - | Clamp, No. 24 |
| 25. | G10629 | 2 | Elbow, 90°, 1 $\frac{1}{4}$ " NPT To Barb |
| 26. | G4200-02 | 1 | Hose, 1 $\frac{1}{4}$ " x 27', 6 Row 30" |
| | G4200-03 | - | Hose, 1 $\frac{1}{4}$ " x 32', 8 Row 30" |
| 27. | G10633 | 1 | Tee, 1 $\frac{1}{4}$ " Barb |
| 28. | GD1748 | - | U-Bolt, 7" x 7" x $\frac{3}{4}$ "-10 |
| | G10231 | - | Lock Washer, $\frac{3}{4}$ " |
| | G10105 | - | Hex Nut, $\frac{3}{4}$ "-10 |
| 29. | G10007 | - | Hex Head Cap Screw, $\frac{5}{8}$ "-11 x 1 $\frac{1}{2}$ " |
| | G10230 | - | Lock Washer, $\frac{5}{8}$ " |
| | G10104 | - | Hex Nut, $\frac{5}{8}$ "-11 |
| 30. | GD10110 | - | Mounting Angle (2 Per Tank) |
| 31. | G10096 | 2 | Plug, $\frac{3}{4}$ " Nylon |

LIQUID FERTILIZER SQUEEZE PUMP MOUNTING BRACKETS AND DRIVELINE

LFC009/LFC010/LFC024/PTD074(TWL63a)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | | - | See "Liquid Fertilizer Squeeze Pump", Pages P82 And P83 |
| 2. | G10462 | 1 | Cotter Pin, $\frac{3}{16}$ " x 2" |
| 3. | GD7127 | 1 | Shear Coupler |
| 4. | GD9048 | 1 | Coupler, 2 1/2" |
| 5. | G10558 | 1 | Clevis Pin, $\frac{5}{16}$ " x 1 3/4" |
| | G10456 | 1 | Cotter Pin, $\frac{1}{8}$ " x 3/4" |
| 6. | GD2558 | 1 | Lynch Pin, 1/4" |
| 7. | G10037 | 1 | Hex Head Cap Screw, 1/2"-13 x 1 1/4" |
| | G10228 | 1 | Lock Washer, 1/2" |
| | G10102 | 1 | Hex Nut, 1/2"-13 |
| 8. | GA5229 | 1 | Sprocket Storage Rod |
| 9. | GD0917 | 5 | Lock Collar, 7/8" Hex, Less Set Screws (Sub G1K269) |
| | G10145 | - | Set Screw, 5/16"-18 x 1/2" |

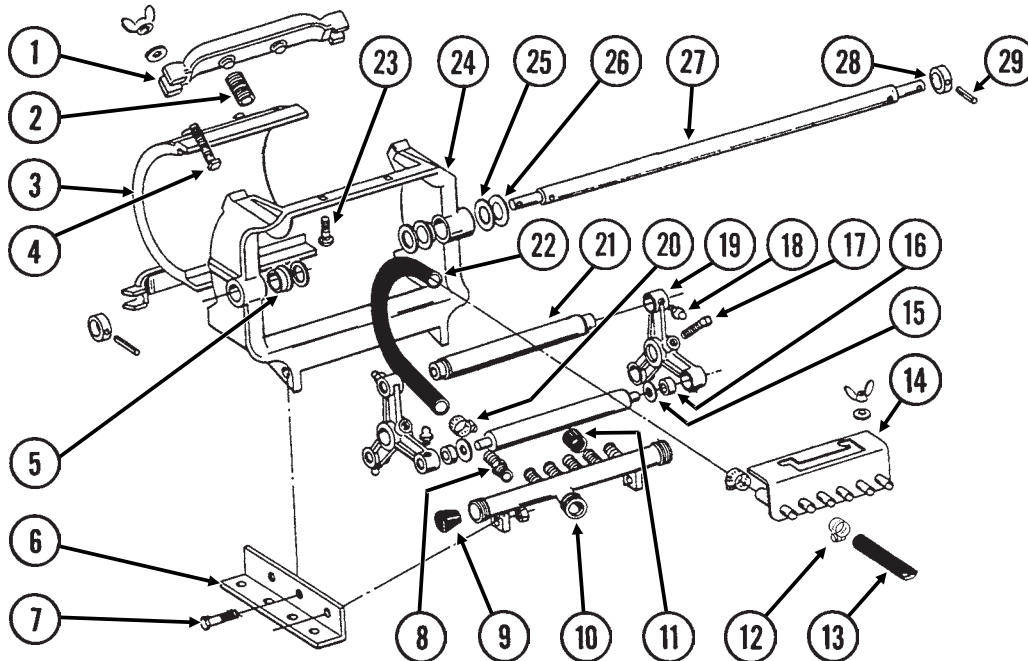
LIQUID FERTILIZER SQUEEZE PUMP MOUNTING BRACKETS AND DRIVELINE

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|------|--|
| 10. | G10478 | 1 | Clevis Pin, $\frac{5}{16}$ " x 1" |
| 11. | GA5105 | 1 | Sprocket, 15 Tooth |
| | GA5107 | 1 | Sprocket, 19 Tooth |
| | GA6513 | 1 | Sprocket, 32 Tooth |
| | GA5202 | 1 | Sprocket, 34 Tooth |
| | GA6514 | 1 | Sprocket, 46 Tooth |
| | GA6515 | - | Sprocket, 62 Tooth (Optional) |
| 12. | G10233 | 2 | Machine Bushing |
| 13. | GD11045 | 5 | Lock Clamp |
| 14. | G10031 | 5 | Hex Head Cap Screw, $\frac{5}{16}$ "-18 x 1 $\frac{3}{4}$ " |
| | G10620 | 5 | Flange Nut, $\frac{5}{16}$ "-18 |
| 15. | GD10161 | 1 | Spacer, $\frac{3}{8}$ " |
| 16. | GD3180-04 | 1 | Sleeve, 2 $\frac{1}{8}$ " |
| 17. | GA7336 | 1 | Idler W/Bolt-On Sprockets |
| | GD7426 | - | Sprocket |
| | GD1026 | - | Spacer, 1 $\frac{3}{16}$ " |
| | G10210 | - | Washer, $\frac{3}{8}$ " USS |
| | G10229 | - | Lock Washer, $\frac{3}{8}$ " |
| | G10047 | - | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{3}{4}$ " |
| 18. | G10865 | 1 | Carriage Bolt, $\frac{1}{2}$ "-13 x 4" |
| | G10111 | 1 | Lock Nut, $\frac{1}{2}$ "-13 |
| 19. | GD2548-30 | 1 | Shaft, 30" |
| 20. | G10004 | 4 | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{1}{4}$ " |
| | G10210 | 4 | Washer, $\frac{3}{8}$ " USS |
| | G10229 | 4 | Lock Washer, $\frac{3}{8}$ " |
| | G10101 | 4 | Hex Nut, $\frac{3}{8}$ "-16 |
| 21. | GD6165 | - | Plate, 8 Row 30" Only |
| 22. | GD5857 | 1 | Spring |
| 23. | GA6403 | 1 | Drive Plate W/Grease Fitting |
| | G10641 | - | Grease Fitting, $\frac{1}{8}$ " NPT |
| | G10640 | - | Grease Fitting, $\frac{1}{4}$ "-28 |
| 24. | GD1134 | 1 | U-Bolt, 7" x 5" x $\frac{5}{8}$ "-11 |
| | G10230 | 2 | Lock Washer, $\frac{5}{8}$ " |
| | G10104 | 2 | Hex Nut, $\frac{5}{8}$ "-11 |
| 25. | GA4235 | 1 | Ratchet Arm W/Protective Closure |
| | G10445 | - | Protective Closure |
| 26. | G3310-176 | 1 | Chain, No. 40, 176 Pitch Including Connector |
| | GR0912 | - | Connector Link, No. 40 |
| 27. | G2100-03 | 2 | Bearing, $\frac{7}{8}$ " Hex Bore, Spherical |
| 28. | G3400-01 | 4 | Flangette |
| 29. | G10303 | 6 | Carriage Bolt, $\frac{5}{16}$ "-18 x 1" |
| | G10232 | 6 | Lock Washer, $\frac{5}{16}$ " |
| | G10106 | 6 | Hex Nut, $\frac{5}{16}$ "-18 |
| 30. | GD1719 | 1 | Coupler, 4" |
| | G10409 | 1 | Retaining Ring |
| 31. | | - | See "Liquid Fertilizer Tanks, Saddles, Mounts, Hoses And Fittings", Pages P78 And P79 |
| 32. | GA4619 | 1 | Pump Mount, L.H. |
| 33. | GA4620 | 1 | Pump Mount, R.H. |
| 34. | GD1113 | 2 | U-Bolt, 5" x 7" x $\frac{5}{8}$ "-11 |
| | G10230 | 4 | Lock Washer, $\frac{5}{8}$ " |
| | G10104 | 4 | Hex Nut, $\frac{5}{8}$ "-11 |
| 35. | G10670 | 1 | Hair Pin Clip, No. 3 |
| 36. | GD6819 | 1 | Sleeve |
| 37. | GA5136 | 1 | Idler W/Sprockets And Rings |
| | GD7426 | - | Sprocket |
| | G10435 | - | Ring |
| A. | G1K269 | - | Lock Clamp Kit (Items 13 And 14) P81 |

LIQUID FERTILIZER SQUEEZE PUMP

6 ROW 30"

LFC011LFC010(PT47a)

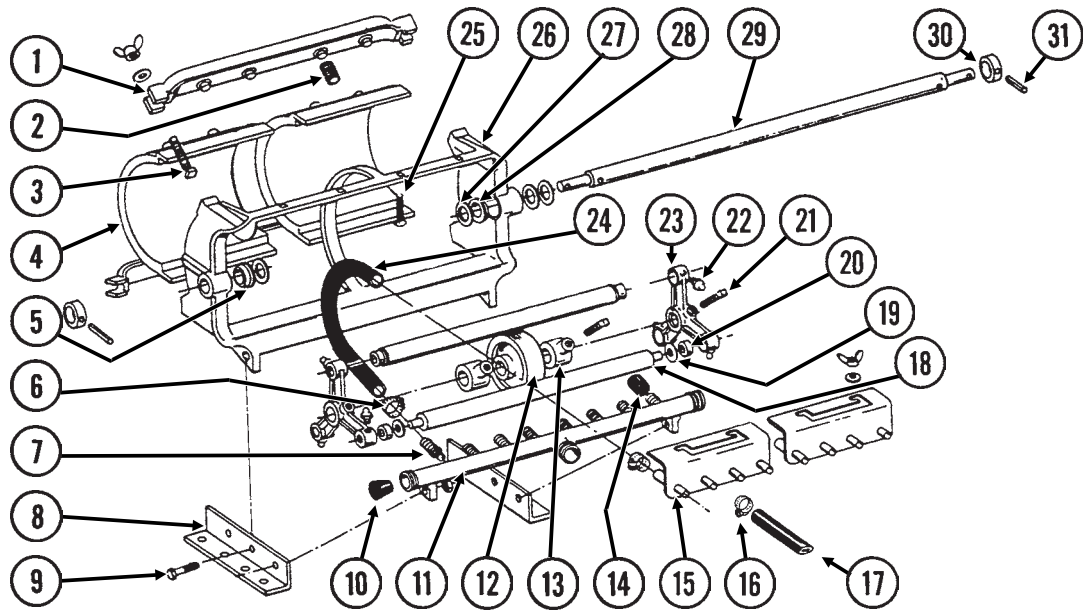


| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------------|---|
| | | (Per Pump) | |
| 1. | GR0216 | 2 | Spring Anchor Bar |
| 2. | GR0214 | 4 | Spring |
| 3. | GR0212 | 1 | Plate |
| 4. | G10130 | 4 | Square Head Machine Bolt, $\frac{5}{16}$ "-18 x $1 \frac{3}{4}$ " |
| | G10219 | 4 | Washer, $\frac{5}{16}$ " USS |
| | G10144 | 4 | Wing Nut, $\frac{5}{16}$ "-18 |
| 5. | GR0207 | 2 | Nylon Bushing |
| 6. | GR0213 | 2 | Angle |
| 7. | G10004 | 4 | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x $1 \frac{1}{4}$ " |
| | G10101 | 4 | Hex Nut, $\frac{3}{8}$ "-16 |
| 8. | GR0232 | 6 | Adapter |
| 9. | GR0217 | 2 | Manifold Plug |
| 10. | GR0228 | 1 | Intake Manifold |
| 11. | GR0211 | - | Rubber Cap |
| 12. | G10673 | 6 | Clamp, No. 8 |
| 13. | G4300-04 | - | Hose, $\frac{7}{16}$ " x 50' |
| 14. | GR0224 | 1 | Discharge Manifold |
| 15. | GR0229 | 6 | Nylon Bushing |
| 16. | GR0230 | 6 | Roller Bearing |
| 17. | G10131 | 2 | Set Screw, $\frac{5}{16}$ "-18 x $\frac{3}{4}$ " |
| 18. | G10640 | 8 | Grease Fitting, $\frac{1}{4}$ "-28 |
| 19. | GR0231 | 2 | Roller Arm |
| 20. | G10681 | 12 | Clamp, No. 6 |
| 21. | GR0233 | 3 | Roller |
| 22. | GR0215 | 6 | Metering Hose, $\frac{1}{2}$ " x 13" |
| 23. | G10303 | 2 | Carriage Bolt, $\frac{5}{16}$ "-18 x 1" |
| | G10219 | 2 | Washer, $\frac{5}{16}$ " USS |
| | G10144 | 2 | Wing Nut, $\frac{5}{16}$ "-18 |
| 24. | GR0208 | 1 | Frame |
| 25. | GR0225 | 2 | Shim, $\frac{1}{32}$ " |
| 26. | GR0226 | 2 | Shim, $\frac{3}{64}$ " |
| 27. | GD9107 | 1 | Shaft |
| 28. | GD9109 | 2 | Sleeve |
| 29. | G10718 | 2 | Spring Pin, $\frac{5}{16}$ " x $1 \frac{1}{8}$ " |
| A. | GA6511 | - | Squeeze Pump Complete, 6 Row (Items 1-11 And 14-29) |

LIQUID FERTILIZER SQUEEZE PUMP

8 ROW 30"

LFC010(PT48a)



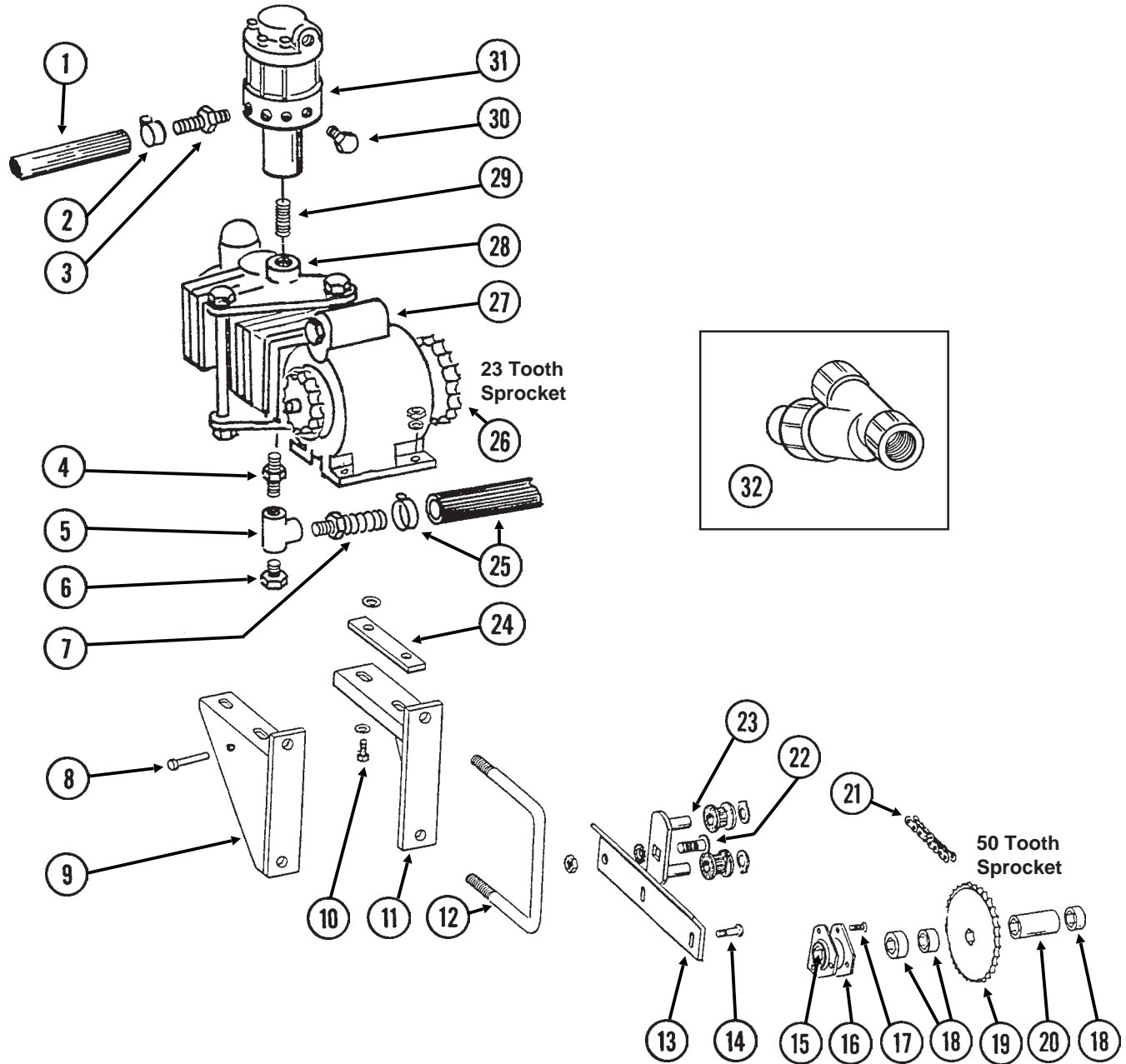
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------------|---|
| | | (Per Pump) | |
| 1. | GR0221 | 2 | Spring Anchor Bar |
| 2. | GR0214 | 8 | Spring |
| 3. | G10130 | 4 | Square Head Machine Bolt, $\frac{5}{16}$ "-18 x 1 $\frac{3}{4}$ " |
| | G10219 | 4 | Washer, $\frac{5}{16}$ " USS |
| | G10144 | 4 | Wing Nut, $\frac{5}{16}$ "-18 |
| 4. | GR0212 | 2 | Plate |
| 5. | GR0207 | 2 | Nylon Bushing |
| 6. | G10681 | 16 | Clamp, No. 6 |
| 7. | GR0232 | 8 | Adapter |
| 8. | GR0279 | 1 | Angle, Left |
| | GR0280 | 1 | Angle, Right |
| 9. | G10004 | 4 | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{1}{4}$ " |
| | G10101 | 4 | Hex Nut, $\frac{3}{8}$ "-16 |
| 10. | GR0217 | 2 | Manifold Plug |
| 11. | GR0284 | 1 | Intake Manifold |
| 12. | GR0281 | 1 | Back Up Roller |
| 13. | GR0282 | 2 | Set Collar |
| 14. | GR0211 | - | Rubber Cap |
| 15. | GR0236 | 1 | Discharge Manifold |
| 16. | G10673 | 8 | Clamp, No. 8 |
| 17. | G4300-05 | - | Hose, $\frac{7}{16}$ " x 100' |
| 18. | GR0283 | 3 | Roller |
| 19. | GR0229 | 6 | Nylon Washer |
| 20. | GR0230 | 6 | Bearing |
| 21. | G10131 | 2 | Set Screw, $\frac{5}{16}$ "-18 x $\frac{3}{4}$ " |
| 22. | G10640 | 8 | Grease Fitting, $\frac{1}{4}$ "-28 |
| 23. | GR0231 | 2 | Roller Arm |
| 24. | GR0215 | 8 | Metering Hose, $\frac{1}{2}$ " x 13" |
| 25. | G10303 | 4 | Round Head Machine Bolt, $\frac{5}{16}$ "-18 x 1" |
| | G10219 | 4 | Washer, $\frac{5}{16}$ " USS |
| | G10144 | 4 | Wing Nut, $\frac{5}{16}$ "-18 |
| 26. | GR0222 | 1 | Frame |
| 27. | GR0225 | 4 | Shim, $\frac{1}{32}$ " |
| 28. | GR0226 | 4 | Shim, $\frac{3}{64}$ " |
| 29. | GD9108 | 1 | Shaft |
| 30. | GD9109 | 2 | Sleeve |
| 31. | G10718 | 2 | Spring Pin, $\frac{5}{16}$ " x 1 $\frac{1}{8}$ " |
| A. | GA6512 | - | Squeeze Pump Complete, 8 Row (Items 1 - 15 And 18-31) |

LIQUID FERTILIZER PISTON PUMP MOUNTING BRACKETS AND DRIVELINE

LFC024/LFC025/LFC026(TWL64/FF65)

STYLE A DRIVE

50 Tooth Drive Sprocket And 23 Tooth Driven Sprocket



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|-------------|
|------|----------|------|-------------|

| | | | |
|----|----------|---|--|
| 1. | G4300-04 | - | Hose, 7/16" x 50', 6 Row |
| | G4300-05 | - | Hose, 7/16" x 100', 8 Row |
| 2. | G10673 | - | Hose Clamp, No. 8 (As Required) |
| 3. | GD8816 | - | Hose Barb (As Required), 1/4" NPT To 1/2" Barb |
| 4. | G10728 | 1 | Pipe Nipple, 1 1/2" NPT To 1 1/4" |

LIQUID FERTILIZER PISTON PUMP MOUNTING BRACKETS AND DRIVELINE

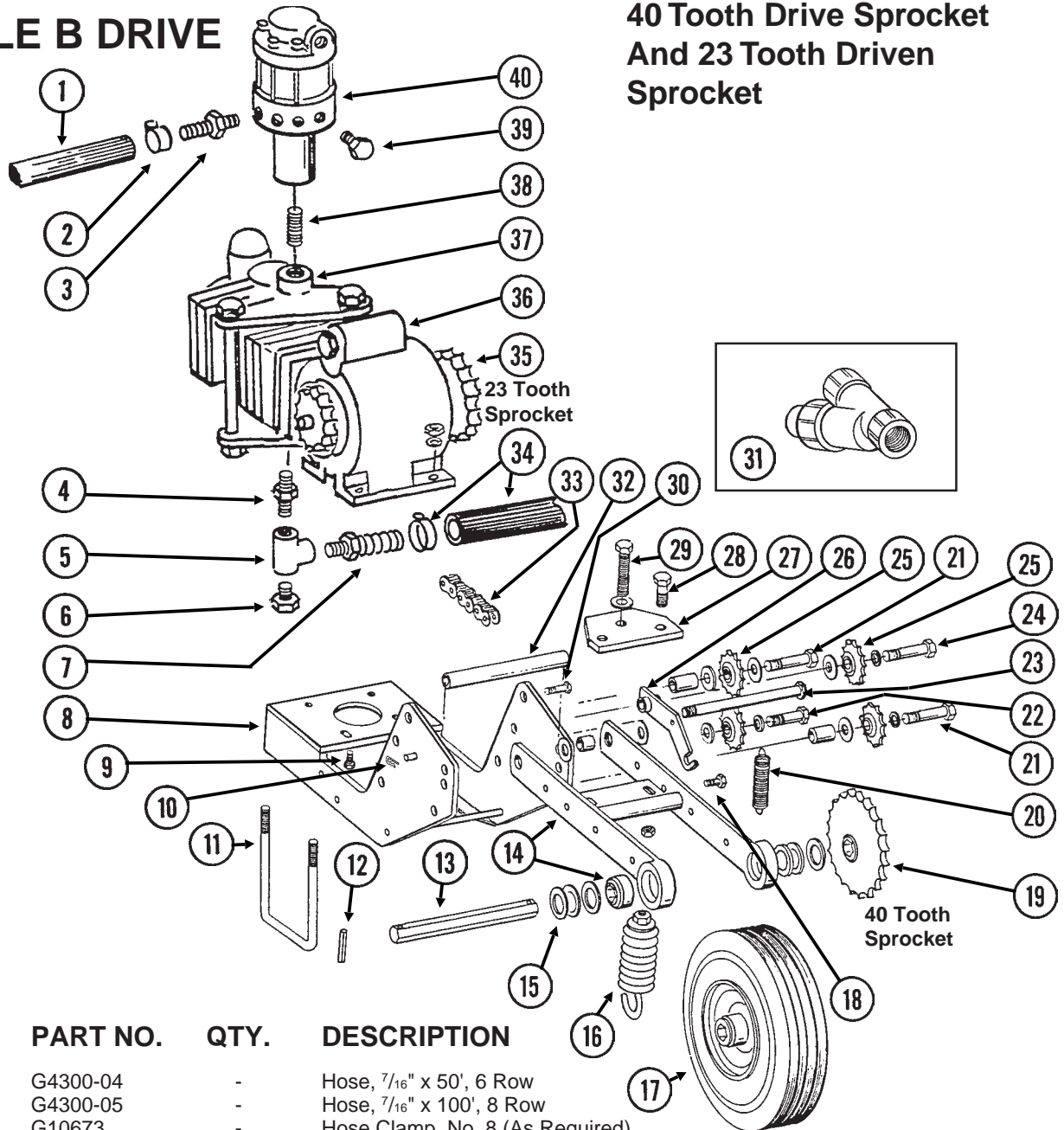
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|------|--|
| 5. | G10719 | 1 | Tee, 1 1/4" NPT |
| 6. | G10739 | 1 | Pipe Plug, 1 1/4" NPT |
| 7. | G10626 | - | Adapter, 1 1/4" NPT To 1 1/4" Barb Fitting |
| 8. | G10478 | 1 | Clevis Pin, 5/16" x 1" |
| | G10409 | 1 | Retaining Ring |
| | G10669 | 1 | Hair Pin Clip, No. 22 |
| 9. | GA4619 | 1 | Pump Mount, L.H. |
| 10. | G10048 | 4 | Hex Head Cap Screw, 3/8"-16 x 2" |
| | G10210 | 4 | Washer, 3/8" USS |
| | GR1122 | 4 | Mounting Pad |
| | G10229 | 4 | Lock Washer, 3/8" |
| | G10101 | 4 | Hex Nut, 3/8"-16 |
| 11. | GA4620 | 1 | Pump Mount, R.H. |
| 12. | GD1113 | 2 | U-Bolt, 5" x 7" x 5/8"-11 |
| | G10230 | 4 | Lock Washer, 5/8" |
| | G10104 | 4 | Hex Nut, 5/8"-11 |
| 13. | GD9244 | 1 | Idler Mount |
| 14. | G10003 | 2 | Hex Head Cap Screw, 3/8"-16 x 1 1/2" |
| | G10210 | 2 | Washer, 3/8" USS |
| | G10229 | 2 | Lock Washer, 3/8" |
| | G10101 | 2 | Hex Nut, 3/8"-16 |
| 15. | G2100-03 | 1 | Bearing, 7/8" Hex Bore, Spherical |
| 16. | G3400-01 | 2 | Flangette |
| 17. | G10303 | 3 | Carriage Bolt, 5/16"-18 x 1" |
| | G10232 | 3 | Lock Washer, 5/16" |
| | G10106 | 3 | Hex Nut, 5/16"-18 |
| 18. | GD0917 | 3 | Lock Collar, 7/8" Hex, Less Set Screws (Sub G1K269) |
| | G10145 | - | Set Screw, 5/16"-18 x 1/2" |
| 19. | GA5194 | 1 | Sprocket, 50 Tooth |
| 20. | GD1719 | 1 | Coupler, 4" |
| 21. | G3310-152 | 1 | Chain, No. 40, 152 Pitch Including Connector |
| | GR0912 | - | Connector Link, No. 40 |
| 22. | G10636 | 1 | Carriage Bolt, 1/2"-13 x 1 1/2" |
| | G10527 | 1 | Lock Washer, 1/2" Internal/External |
| | G10111 | 1 | Lock Nut, 1/2"-13 |
| 23. | GA0289 | 1 | Idler W/Spools And Retaining Rings |
| | GD1067 | - | Spool |
| | G10435 | - | Retaining Ring |
| 24. | GD9242 | 2 | Spacer |
| 25. | | - | See "Liquid Fertilizer Tanks, Saddles, Mounts, Hoses And Fittings", Pages P78 And P79 |
| 26. | GA6509 | 1 | Sprocket W/Set Screw, 23 Tooth |
| 27. | | - | See "Liquid Fertilizer Piston Pump (Crankcase Assembly)", Pages P90 And P91 |
| 28. | | - | See "Liquid Fertilizer Piston Pump (Cylinder Assembly)", Pages P92 And P93 |
| 29. | G10389 | 1 | Pipe Nipple, 3/4" NPT |
| 30. | G10292 | - | Plug, 1/4" NPT |
| 31. | | - | See "Liquid Fertilizer Piston Pump Flow Divider", Pages P98 And P99 |
| 32. | GA3893 | 1 | Strainer Complete |
| | GR0880 | - | Screen, No. 4 Mesh |
| | GR0881 | - | Gasket |
| | GR0882 | - | "Y" Body |
| | GR0883 | - | End Cap |

LIQUID FERTILIZER PISTON PUMP MOUNTING BRACKETS AND DRIVELINE

LFC024/LFC025/LFC026(TWL64e/FF65)

STYLE B DRIVE

40 Tooth Drive Sprocket And 23 Tooth Driven Sprocket



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--|
| 1. | G4300-04 | - | Hose, 7/16" x 50', 6 Row |
| | G4300-05 | - | Hose, 7/16" x 100', 8 Row |
| 2. | G10673 | - | Hose Clamp, No. 8 (As Required) |
| 3. | GD8816 | - | Hose Barb (As Required), 1/4" NPT To 1/2" Barb |
| 4. | G10728 | 1 | Pipe Nipple, 1 1/2" NPT To 1 1/4" |
| 5. | G10719 | 1 | Tee, 1 1/4" NPT |
| 6. | G10739 | 1 | Pipe Plug, 1 1/4" NPT |
| 7. | G10626 | - | Adapter, 1 1/4" NPT To 1 1/4" Barb Fitting |
| 8. | GA7171 | 1 | Pump Mount |
| 9. | G10003 | 4 | Hex Head Cap Screw, 3/8"-16 x 1 1/2" |
| | GR1122 | 4 | Mounting Pad |
| | G10210 | 4 | Washer, 3/8" USS |
| | G10229 | 4 | Lock Washer, 3/8" |
| | G10101 | 4 | Hex Nut, 3/8"-16 |
| 10. | G10670 | - | Hair Pin Clip, No. 3P |
| 11. | GD1134 | 2 | U-Bolt, 7" x 5" x 5/8"-11 |
| | G10230 | 4 | Lock Washer, 5/8" |
| | G10104 | 4 | Hex Nut, 5/8"-11 |
| 12. | G10602 | 2 | Spring Pin, 1/4" x 1 1/2" |

LIQUID FERTILIZER PISTON PUMP MOUNTING BRACKETS AND DRIVELINE

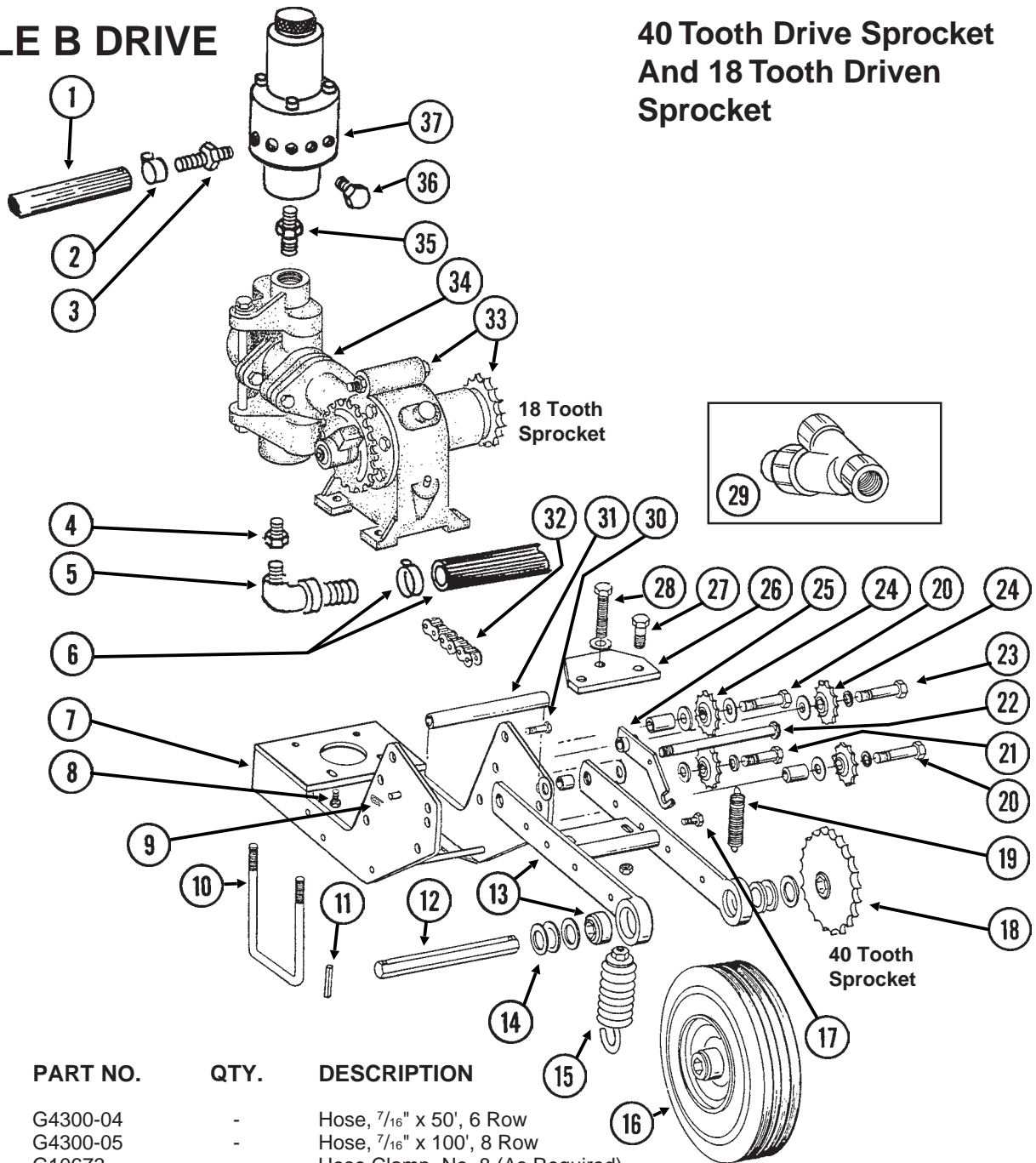
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|------|---|
| 13. | GD5797 | 1 | Shaft, 10" |
| | G10602 | 2 | Spring Pin, 1/4" x 1 1/2" |
| 14. | GA6415 | 1 | Wheel Arm W/Bearings |
| | GA5116 | - | Bearing |
| 15. | G10233 | 5 | Machine Bushing |
| 16. | GA2068 | 1 | Spring |
| 17. | GA5090 | 1 | Tire And Rim Assembly (Specify Brand*) |
| | GD5753 | 1 | Tire, 4.10" x 6" (Specify Brand*) |
| | GD5752 | 1 | Tube |
| 18. | G10003 | 1 | Hex Head Cap Screw, 3/8"-16 x 1 1/2" |
| | G10229 | 1 | Lock Washer, 3/8" |
| | G10101 | 2 | Hex Nut, 3/8"-16 |
| 19. | GA7180 | 1 | Sprocket, 40 Tooth |
| 20. | GD5857 | 1 | Spring |
| 21. | G10038 | 2 | Hex Head Cap Screw, 1/2"-13 x 3" |
| | GD10007 | 2 | Spacer, 1 1/8" |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 22. | G10016 | 1 | Hex Head Cap Screw, 1/2"-13 x 2" |
| | GD10161 | 1 | Spacer, 3/8" |
| | G10228 | 1 | Lock Washer, 1/2" |
| | G10102 | 1 | Hex Nut, 1/2"-13 |
| 23. | G10819 | 1 | Hex Head Cap Screw, 1/2"-13 x 8 1/2" |
| | G10228 | 1 | Lock Washer, 1/2" |
| | G10102 | 1 | Hex Nut, 1/2"-13 |
| 24. | G10038 | 1 | Hex Head Cap Screw, 1/2"-13 x 3" |
| | GD7904-04 | - | Sleeve, 1 1/8" |
| | G10228 | - | Lock Washer, 1/2" |
| | G10102 | - | Hex Nut, 1/2"-13 |
| 25. | GA7154 | 4 | Idler Sprocket, 18 Tooth |
| 26. | GA7179 | 1 | Idler Arm |
| 27. | GD10156 | 1 | Spring Mount |
| 28. | G10039 | 2 | Hex Head Cap Screw, 1/2"-13 x 1 3/4" |
| | G10206 | 2 | Washer, 1/2" |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 29. | G10371 | 1 | Hex Head Cap Screw, 1/2"-13 x 3" |
| | G10206 | 1 | Washer, 1/2" |
| | G10102 | 1 | Hex Nut, 1/2"-13 |
| 30. | G10005 | 2 | Hex Head Cap Screw, 5/8"-11 x 1 3/4" |
| | GB0218 | 2 | Bushing, 19/32" |
| | G10235 | 2 | Machine Bushing |
| | GD7805 | 2 | Hardened Washer |
| | G10107 | 2 | Lock Nut, 5/8"-11 |
| 31. | GA3893 | 1 | Strainer Complete |
| | GR0880 | - | Screen, No. 40 Mesh |
| | GR0881 | - | Gasket |
| | GR0882 | - | "Y" Body |
| | GR0883 | - | End Cap |
| 32. | GD10165 | 1 | Sleeve, 6 3/4" |
| 33. | G3310-160 | 1 | Chain, No. 40, 160 Pitch Including Connector Link |
| | GR0912 | - | Connector Link, No. 40 |
| 34. | | - | See "Liquid Fertilizer Tanks, Saddles, Mounts, Hoses And Fittings", Pages P78 And P79 |
| 35. | GA6509 | 1 | Sprocket W/Set Screw, 23 Tooth |
| 36. | | - | See "Liquid Fertilizer Piston Pump (Crankcase Assembly)", Pages P90 And P91 |
| 37. | | - | See "Liquid Fertilizer Piston Pump (Cylinder Assembly)", Pages P92 And P93 |
| 38. | G10389 | 1 | Pipe Nipple, 3/4" NPT |
| 39. | G10292 | - | Plug, 1/4" NPT |
| 40. | | - | See "Liquid Fertilizer Piston Pump Flow Divider", Pages P98 And P99 |

* Specific brand requests will be supplied only as available from current KINZE® stock. If a specific brand as requested is not on hand, the brand available will be supplied. Different brand tires may have different diameters. Change in tire brand could result in rate changes.

LIQUID FERTILIZER PISTON PUMP MOUNTING BRACKETS AND DRIVELINE

(FRTZ161c)

STYLE B DRIVE



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | G4300-04 | - | Hose, 7/16" x 50', 6 Row |
| | G4300-05 | - | Hose, 7/16" x 100', 8 Row |
| 2. | G10673 | - | Hose Clamp, No. 8 (As Required) |
| 3. | GD8816 | - | Hose Barb (As Required), 1/4" NPT To 1/2" Barb |
| 4. | G10615 | 1 | Reducing Bushing, 1 1/2" NPT To 1 1/4" |
| 5. | G10629 | 1 | Elbow, 1 1/4" NPT |
| 6. | | - | See "Liquid Fertilizer Tanks, Saddles, Mounts, Hoses And Fittings", Pages P78 And P79 |
| 7. | GA7171 | 1 | Pump Mount |
| 8. | G10003 | 4 | Hex Head Cap Screw, 3/8"-16 x 1 1/2" |
| | GR1122 | 4 | Mounting Pad |
| | G10210 | 4 | Washer, 3/8" USS |
| | G10229 | 4 | Lock Washer, 3/8" |
| | G10101 | 4 | Hex Nut, 3/8"-16 |
| | G10101 | 4 | Hex Nut, 3/8"-16 |
| 9. | G10670 | 1 | Hair Pin Clip, No. 3P |

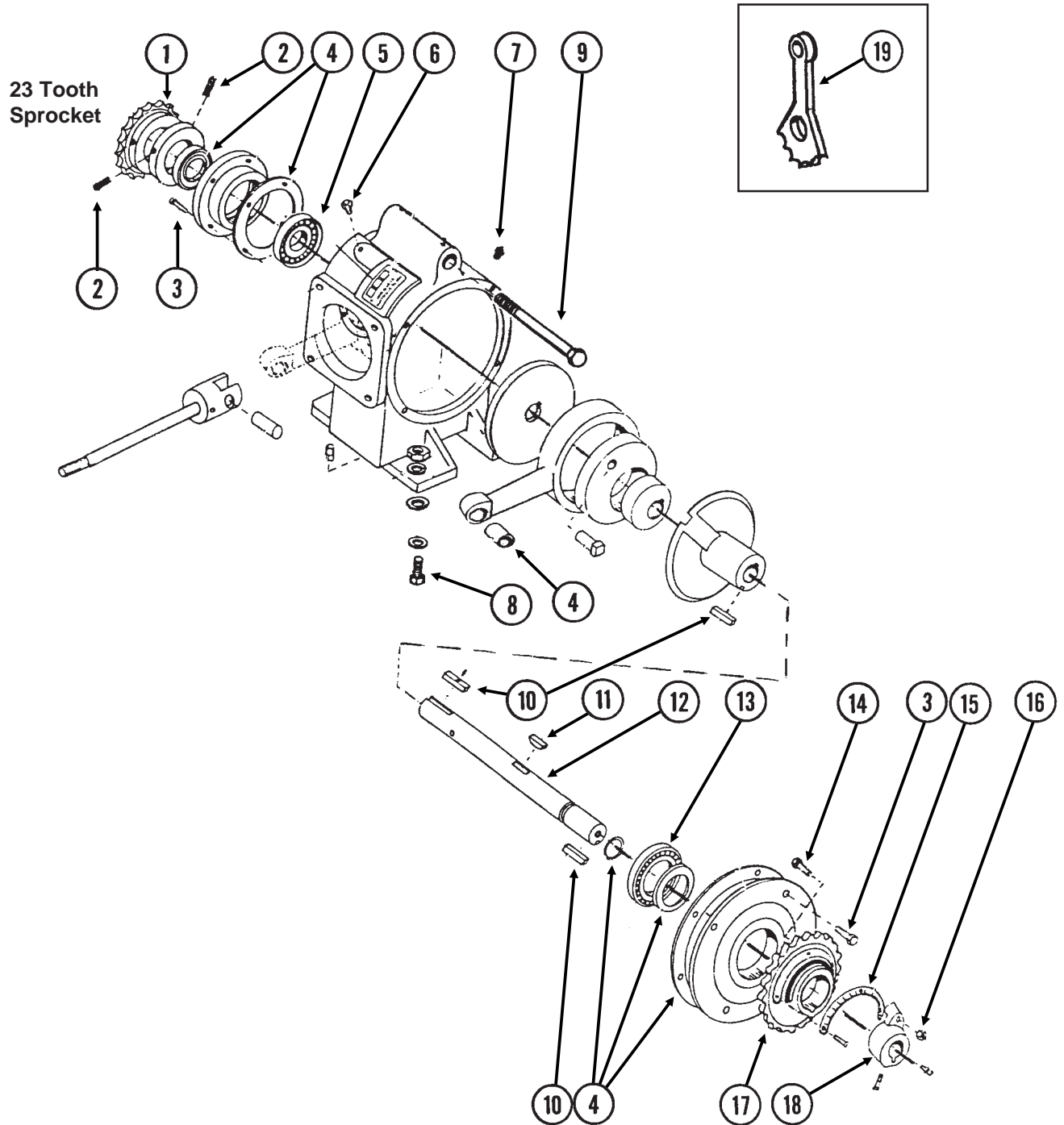
LIQUID FERTILIZER PISTON PUMP MOUNTING BRACKETS AND DRIVELINE

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|-----------|------|---|
| 10. | GD1134 | 2 | U-Bolt, 7" x 5" x 5/8"-11 |
| | G10230 | 4 | Lock Washer, 5/8" |
| | G10104 | 4 | Hex Nut, 5/8"-11 |
| 11. | G10602 | 2 | Spring Pin, 1/4" x 1 1/2" |
| 12. | GD5797 | 1 | Shaft, 10" |
| | G10602 | 2 | Spring Pin, 1/4" x 1 1/2" |
| 13. | GA6415 | 1 | Wheel Arm W/Bearings |
| | GA5116 | - | Bearing |
| 14. | G10233 | 5 | Machine Bushing |
| 15. | GA2068 | 1 | Spring |
| 16. | GA5090 | 1 | Tire And Rim Assembly (Specify Brand*) |
| | GD5753 | 1 | Tire, 4.10" x 6" (Specify Brand*) |
| | GD5752 | 1 | Tube |
| 17. | G10003 | 1 | Hex Head Cap Screw, 3/8"-16 x 1 1/2" |
| | G10229 | 1 | Lock Washer, 3/8" |
| | G10101 | 2 | Hex Nut, 3/8"-16 |
| 18. | GA7180 | 1 | Sprocket, 40 Tooth |
| 19. | GD5857 | 1 | Spring |
| 20. | G10038 | 2 | Hex Head Cap Screw, 1/2"-13 x 3" |
| | GD10007 | 2 | Spacer, 1 1/8" |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 21. | G10016 | 1 | Hex Head Cap Screw, 1/2"-13 x 2" |
| | GD10161 | 1 | Spacer, 3/8" |
| | G10228 | 1 | Lock Washer, 1/2" |
| | G10102 | 1 | Hex Nut, 1/2"-13 |
| 22. | G10819 | 1 | Hex Head Cap Screw, 1/2"-13 x 8 1/2" |
| | G10228 | 1 | Lock Washer, 1/2" |
| | G10102 | 1 | Hex Nut, 1/2"-13 |
| 23. | G10038 | 1 | Hex Head Cap Screw, 1/2"-13 x 3" |
| | GD7904-04 | - | Sleeve, 1 1/8" |
| | G10228 | - | Lock Washer, 1/2" |
| | G10102 | - | Hex Nut, 1/2"-13 |
| 24. | GA7154 | 4 | Idler Sprocket, 18 Tooth |
| 25. | GA7179 | 1 | Idler Arm |
| 26. | GD10156 | 1 | Spring Mount |
| 27. | G10039 | 2 | Hex Head Cap Screw, 1/2"-13 x 1 3/4" |
| | G10206 | 2 | Washer, 1/2" |
| | G10228 | 2 | Lock Washer, 1/2" |
| | G10102 | 2 | Hex Nut, 1/2"-13 |
| 28. | G10371 | 1 | Hex Head Cap Screw, 1/2"-13 x 3" |
| | G10206 | 1 | Washer, 1/2" |
| | G10102 | 1 | Hex Nut, 1/2"-13 |
| 29. | GA3893 | 1 | Strainer Complete |
| | GR0880 | - | Screen, No. 40 Mesh |
| | GR0881 | - | Gasket |
| | GR0882 | - | "Y" Body |
| | GR0883 | - | End Cap |
| 30. | G10005 | 2 | Hex Head Cap Screw, 5/8"-11 x 1 3/4" |
| | GB0218 | 2 | Bushing, 19/32" |
| | G10235 | 2 | Machine Bushing |
| | GD7805 | 2 | Hardened Washer |
| | G10107 | 2 | Lock Nut, 5/8"-11 |
| 31. | GD10165 | 1 | Sleeve, 6 3/4" |
| 32. | G3310-160 | 1 | Chain, No. 40, 160 Pitch Including Connector Link |
| | GR0912 | - | Connector Link, No. 40 |
| 33. | - | - | See "Liquid Fertilizer Piston Pump (Crankcase Assembly)", Pages P94 And P95 |
| 34. | - | - | See "Liquid Fertilizer Piston Pump (Cylinder Assembly)", Pages P96 And P97 |
| 35. | G10618 | 1 | Close Nipple, 1" NPT |
| 36. | G10292 | - | Plug, 1/4" NPT |
| 37. | - | - | See "Liquid Fertilizer Piston Pump Flow Divider", Pages P100 And P101 |

* Specific brand requests will be supplied only as available from current KINZE® stock. If a specific brand as requested is not on hand, the brand available will be supplied. Different brand tires may have different diameters. Change in tire brand could result in rate changes.

LIQUID FERTILIZER PISTON PUMP (Crankcase Assembly) Uses 23 Tooth Sprocket

John Blue® Model L-4405



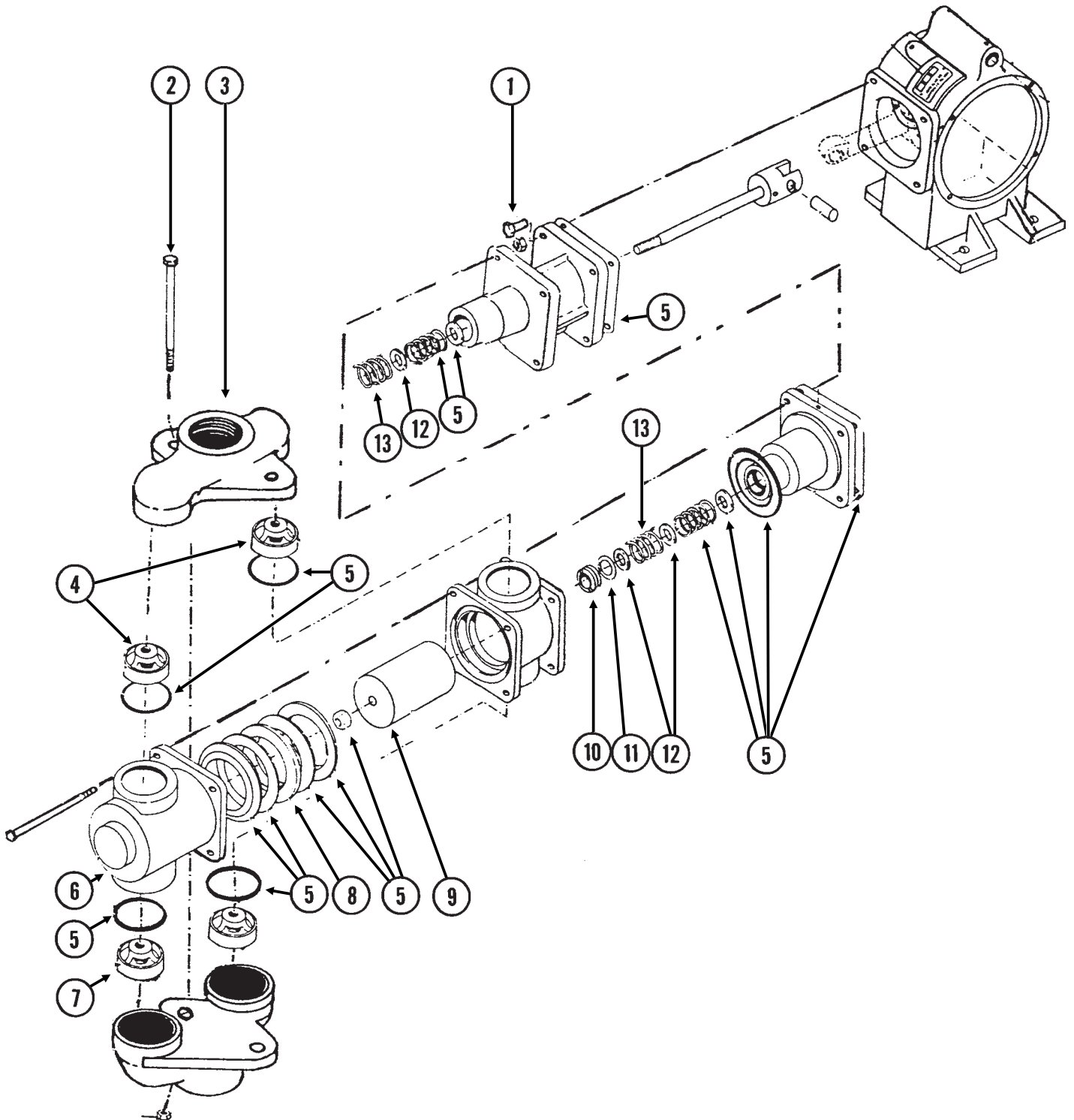
LIQUID FERTILIZER PISTON PUMP (Crankcase Assembly) Uses 23 Tooth Sprocket

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | | - | See "Liquid Fertilizer Piston Pump Mounting Brackets And Driveline", Pages P84-P87 |
| 2. | G10688 | 2 | Hex Socket Head Set Screw, $\frac{3}{8}$ "-16 x $\frac{5}{8}$ " |
| 3. | G10019 | 4 | Hex Bolt, $\frac{5}{16}$ "-18 x 1" |
| 4. | GR1173 | - | Repair Kit, Also Includes Item 5 On Pages 92 And 93 |
| 5. | GR1104 | 1 | Bearing |
| 6. | G10054 | 2 | Hex Bolt, $\frac{5}{16}$ "-18 x $\frac{1}{2}$ " |
| 7. | GR1107 | 1 | Vent Plug |
| 8. | | - | See "Liquid Fertilizer Piston Pump Mounting Brackets And Driveline", Pages P84-P87 |
| 9. | G10318 | 1 | Hex Head Cap Screw, $\frac{5}{8}$ "-11 x 4 $\frac{1}{2}$ " |
| | G10104 | 1 | Hex Nut, $\frac{5}{8}$ "-11 |
| 10. | GR1118 | 3 | Setting Arm Key |
| 11. | GR1112 | 1 | Woodruff Key |
| 12. | GR1148 | 1 | Crankshaft |
| 13. | GR1116 | 1 | Bearing |
| 14. | GR1167 | 1 | Square Head Bolt, $\frac{3}{8}$ "-16 x 1 $\frac{3}{4}$ " |
| 15. | GR1168 | 1 | Scale |
| 16. | G10108 | 1 | Lock Nut, $\frac{3}{8}$ "-16 |
| 17. | GR1114 | 1 | Flange |
| 18. | GR1165 | 1 | Arm |
| 19. | GR1100 | 1 | Adjustment Wrench |
| A. | GA6154 | - | Piston Pump Complete Less 23 Tooth Sprocket (L-4405), Includes Crankcase Assembly On This Page And Cylinder Assembly On Pages P92 And P93 |

LIQUID FERTILIZER PISTON PUMP (Cylinder Assembly) Uses 23 Tooth Sprocket

JB-L2190-991(FRTZ173)

John Blue® Model L-4405



LIQUID FERTILIZER PISTON PUMP (Cylinder Assembly)

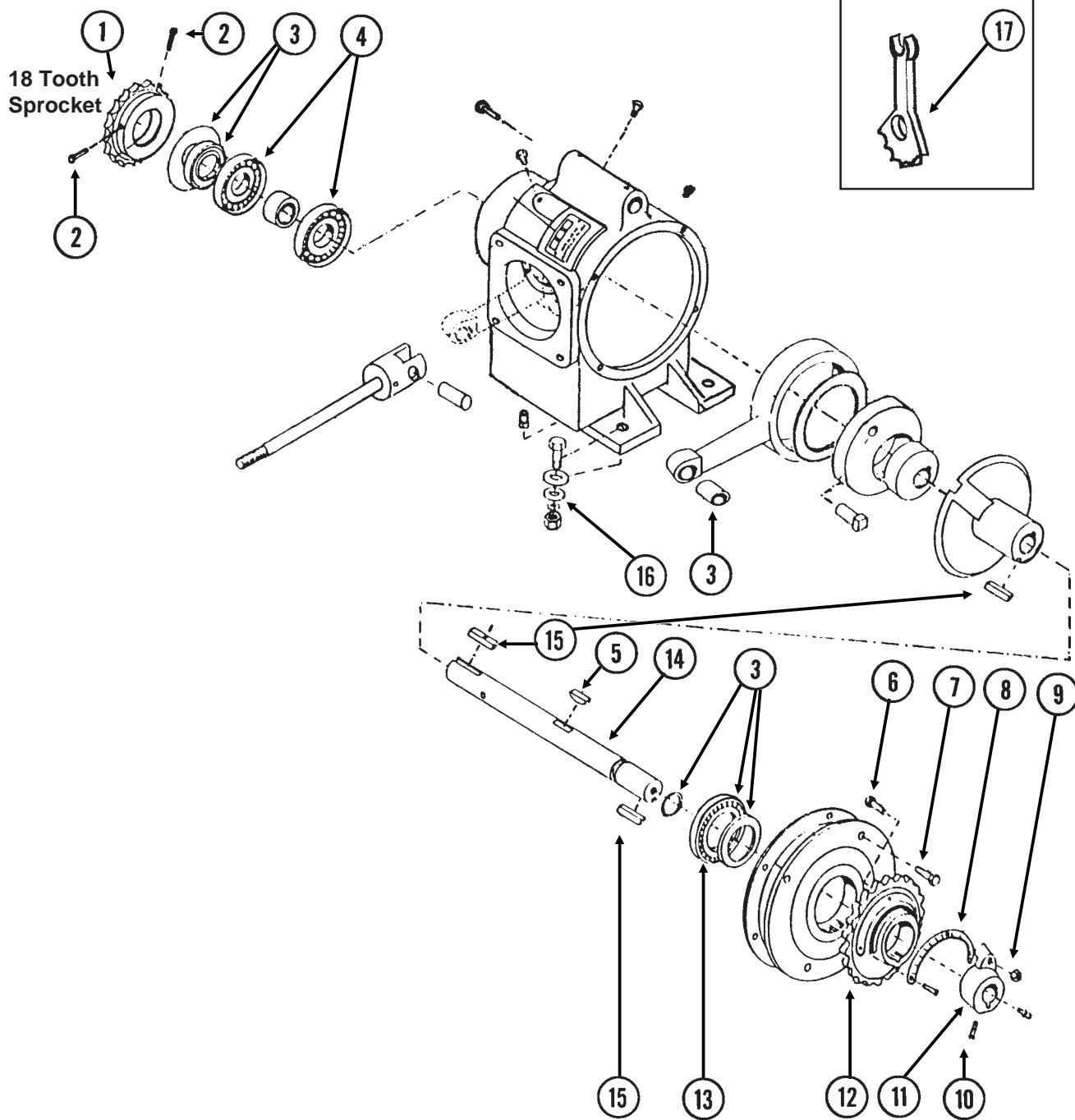
Uses 23 Tooth Sprocket

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | G10019 | 4 | Hex Head Cap Screw, $\frac{5}{16}$ "-18 x 1" |
| 2. | G10686 | 2 | Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 8" |
| | G10101 | 2 | Hex Nut, $\frac{3}{8}$ "-16 |
| 3. | GR1145 | 1 | Discharge Manifold |
| 4. | GR1144 | 2 | Discharge Valve |
| 5. | GR1173 | - | Repair Kit, Also Includes Item 4 On Pages P90 And P91 |
| 6. | GR1143 | 1 | Outboard Cylinder |
| 7. | GR1142 | 2 | Suction Valve |
| 8. | GR1137 | 1 | Flange Packing Washer |
| 9. | GR1136 | 1 | Plunger |
| 10. | GR1134 | 1 | Stuffing Box Insert |
| 11. | GR1133 | 1 | Retaining Ring |
| 12. | GR1129 | 3 | Washer |
| 13. | GR1130 | 2 | Packing Spring |

LIQUID FERTILIZER PISTON PUMP (Crankcase Assembly) Uses 18 Tooth Sprocket

JB-L4400-991/CCU077(FRTZ172a)

John Blue® Model LM-2455-R



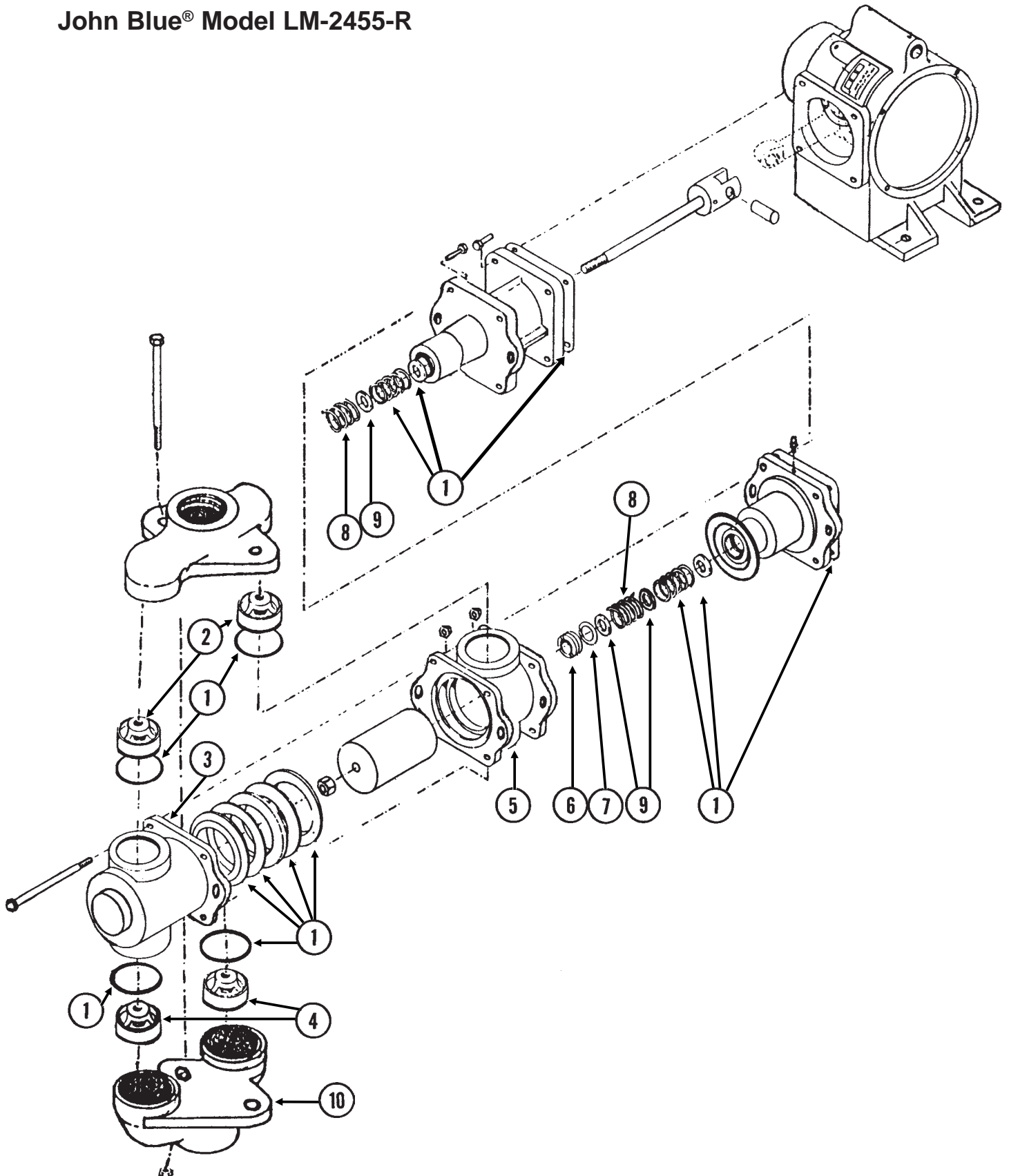
LIQUID FERTILIZER PISTON PUMP (Crankcase Assembly) Uses 18 Tooth Sprocket

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--|
| 1. | GR1389 | 1 | Sprocket, 18 Tooth |
| 2. | G10688 | 2 | Hex Socket Head Set Screw, $\frac{3}{8}$ "-16 x $\frac{5}{8}$ " |
| 3. | GR1425 | 1 | Repair Kit, Also Includes Item 1 On Pages P92 And P93 |
| 4. | GR1427 | 2 | Bearing |
| 5. | GR1420 | 1 | Woodruff Key, $\frac{3}{8}$ "-16 x 1 $\frac{3}{4}$ " |
| 6. | GR1167 | 1 | Square Head Bolt |
| 7. | G10043 | 4 | Hex Bolt, $\frac{5}{16}$ "-18 x $\frac{3}{4}$ " |
| 8. | GR1426 | 1 | Scale |
| 9. | G10108 | 1 | Lock Nut, $\frac{3}{8}$ "-16 |
| 10. | G10693 | 3 | Hex Socket Head Set Screw, $\frac{5}{16}$ "-18 x $\frac{3}{8}$ " |
| 11. | GR1165 | 1 | Arm |
| 12. | GR1114 | 1 | Flange |
| 13. | GR1116 | 1 | Bearing |
| 14. | GR1421 | 1 | Crankshaft |
| 15. | GR1118 | 2 | Setting Arm Key |
| 16. | | - | See "Liquid Fertilizer Piston Pump Mounting Brackets And Driveline", Pages P88 And P89 |
| 17. | GR1424 | 1 | Adjustment Wrench |
| A. | GA8069 | - | Piston Pump Complete With 18 Tooth Sprocket (LM-2455-R), Includes Crankcase Assembly On This Page And Cylinder Assembly On Pages P92 And P93 |

LIQUID FERTILIZER PISTON PUMP (Cylinder Assembly) Uses 18 Tooth Sprocket

JB-L2190-991(FRTZ171)

John Blue® Model LM-2455-R



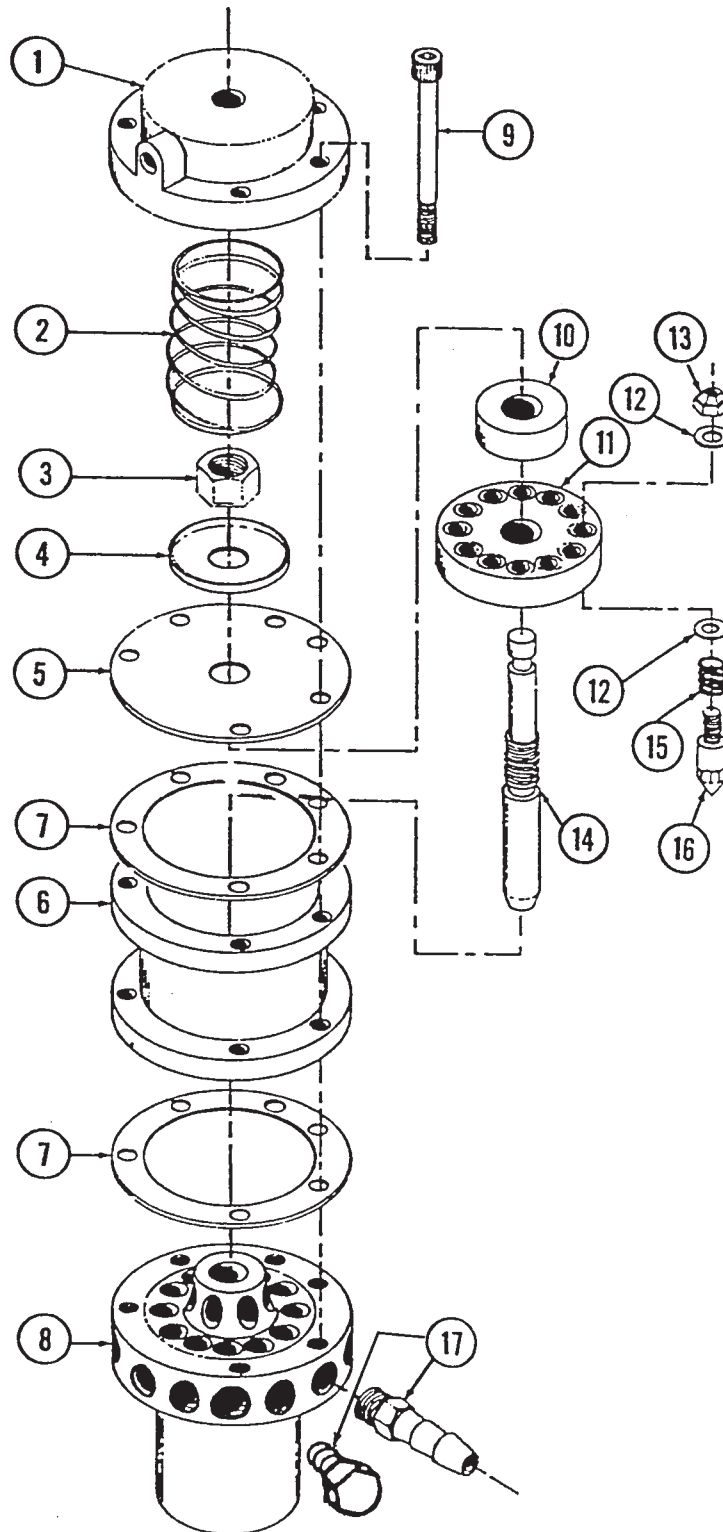
LIQUID FERTILIZER PISTON PUMP (Cylinder Assembly) Uses 18 Tooth Sprocket

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | GR1425 | 1 | Repair Kit, Also Includes Item 3 On Pages P94 And P95 |
| 2. | GR1144 | 2 | Discharge Valve |
| 3. | GR1423 | 1 | Outboard Cylinder |
| 4. | GR1142 | 2 | Suction Valve |
| 5. | GR1422 | 1 | Inboard Cylinder |
| 6. | GR1134 | 1 | Stuffing Box Insert |
| 7. | GR1133 | 1 | Retaining Ring |
| 8. | GR1130 | 2 | Packing Spring |
| 9. | GR1129 | 3 | Washer |
| 10. | GR1451 | 1 | Suction Manifold |

LIQUID FERTILIZER PISTON PUMP FLOW DIVIDER

JB-L2190-991(PT40)

John Blue® Flow Divider



LIQUID FERTILIZER PISTON PUMP FLOW DIVIDER

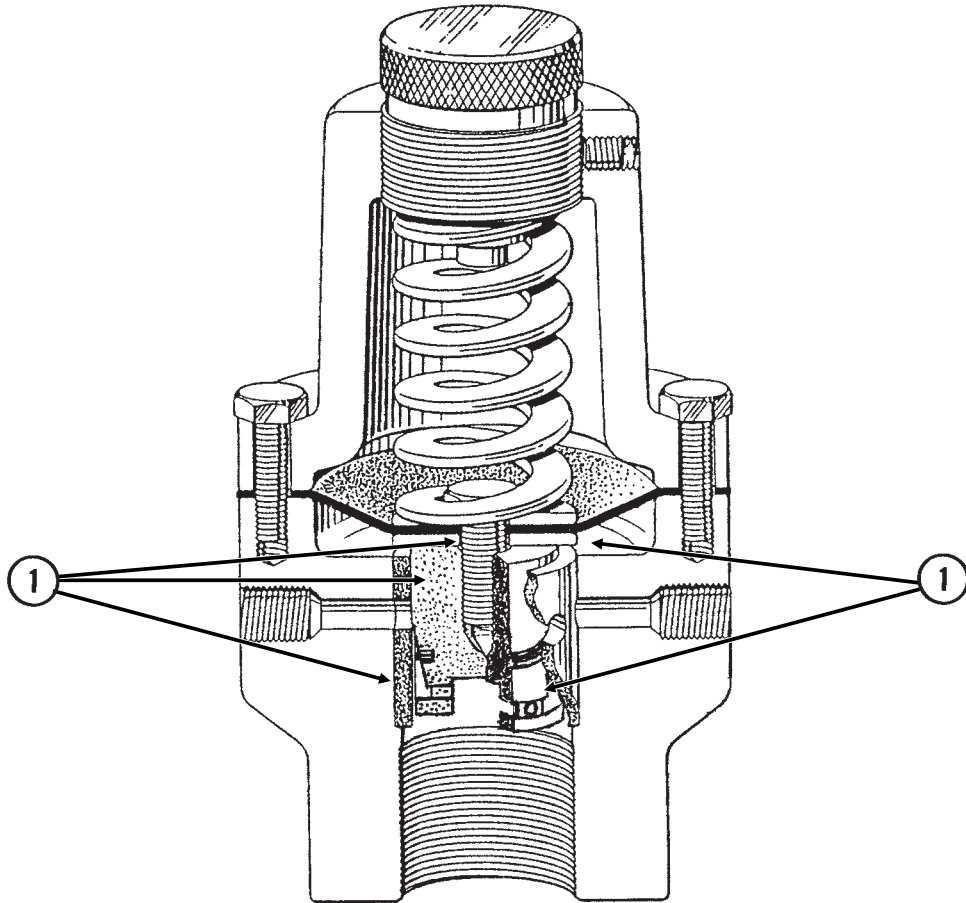
| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | GR1150 | 1 | Cap |
| 2. | GR1151 | 1 | Spring |
| 3. | G10358 | 1 | Hex Nut, $\frac{9}{16}$ "-18 |
| 4. | GR1152 | 1 | Plate |
| 5. | GR1153 | 1 | Diaphragm |
| 6. | GR1154 | 1 | Housing |
| 7. | GR1155 | 2 | Gasket |
| 8. | * | 1 | Manifold |
| 9. | GR1157 | 6 | Socket Screw, $\frac{1}{4}$ " |
| 10. | GR1158 | 1 | Lock |
| 11. | * | 1 | Disk |
| 12. | * | 24 | Stainless Steel Washer |
| 13. | * | 12 | Valve Nut |
| 14. | GR1162 | 1 | Plunger |
| 15. | * | 12 | Spring |
| 16. | * | 12 | Valve |
| 17. | | - | See "Liquid Fertilizer Piston Pump Mounting Brackets And Driveline", Pages P84-P87 |
| A. | GA6158 | 1 | Liquid Fertilizer Piston Pump Flow Divider Complete, 16 Outlet |

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

LIQUID FERTILIZER PISTON PUMP FLOW DIVIDER

(FRTZ159)

CDS® Flow Divider

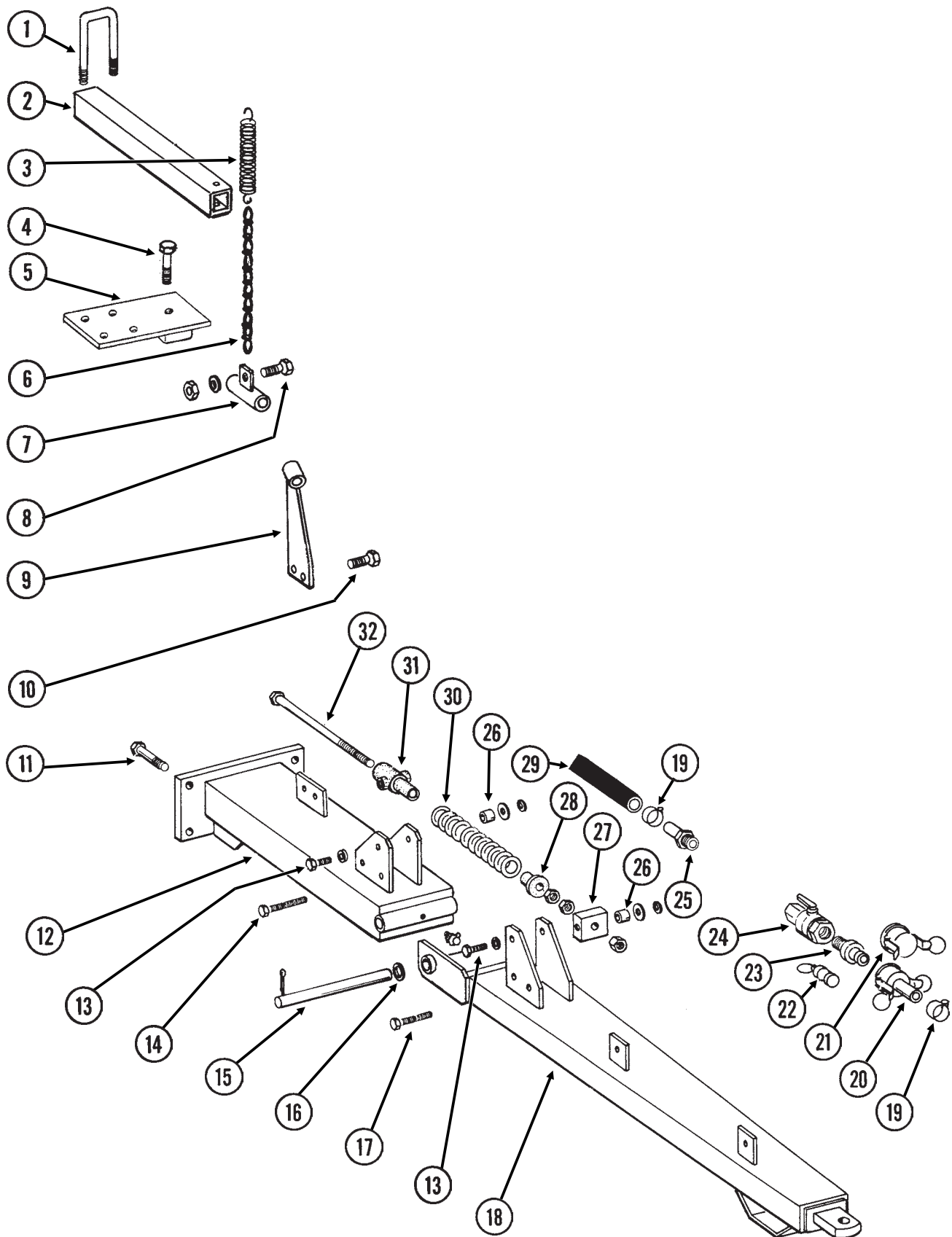


LIQUID FERTILIZER PISTON PUMP FLOW DIVIDER

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--|
| 1. | GR1388 | 1 | Repair Kit, Includes: (2)Washers, (1)Piston, (1)O-Ring, (1)Piston Bolt, (1)Piston Ring |
| A. | GA8068 | 1 | Liquid Fertilizer Piston Pump Flow Divider Complete, 12 Outlet |

REAR TRAILER HITCH

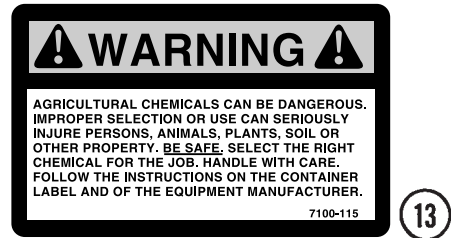
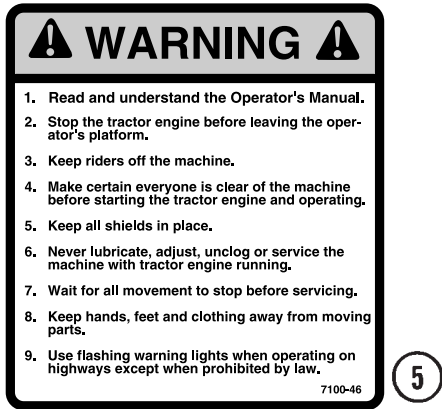
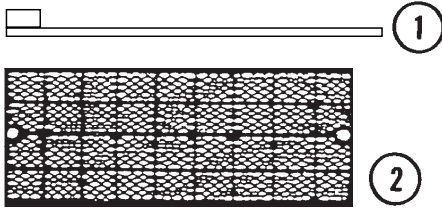
PHA032/LFC003(TWL47b)



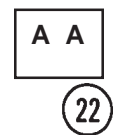
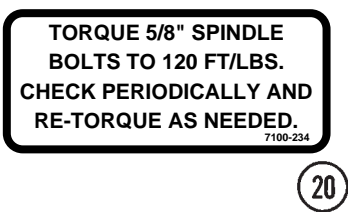
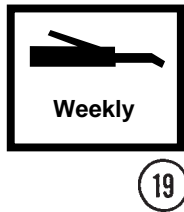
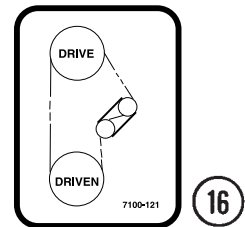
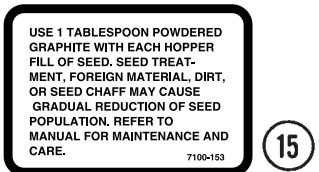
REAR TRAILER HITCH

| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|--|
| 1. | GD2721 | 2 | U-Bolt, 2" x 2" x 1/2"-13 |
| | G10228 | 4 | Lock Washer, 1/2" |
| | G10102 | 4 | Hex Nut, 1/2"-13 |
| 2. | GD10196 | - | Hanger Tube |
| 3. | GD0829 | - | Spring |
| 4. | G10013 | 1 | Hex Head Cap Screw, 5/8"-11 x 3 1/2" (As Required) |
| | G10217 | 1 | Washer, 5/8" USS (As Required) |
| | G10230 | 1 | Lock Washer, 5/8" (As Required) |
| | G10056 | - | Hex Head Cap Screw, 3/4"-10 x 3 1/2" (As Required) |
| | G10218 | - | Washer, 3/4" USS (As Required) |
| | G10231 | - | Lock Washer, 3/4" (As Required) |
| 5. | GA7211 | 1 | Mount |
| 6. | G3305-03 | - | Twin Loop Chain |
| 7. | GA7209 | - | Hose Support |
| 8. | G10064 | 1 | Hex Head Cap Screw, 1/4"-20 x 1" |
| | G10209 | 2 | Washer, 1/4" USS |
| | G10110 | 1 | Lock Nut, 1/4"-20 |
| 9. | GA7208 | - | Hose Support |
| 10. | G10004 | 2 | Hex Head Cap Screw, 3/8"-16 x 1 1/4" |
| | G10108 | 2 | Lock Nut, 3/8"-16 |
| 11. | G10826 | 5 | Hex Head Cap Screw, 1"-8 x 2 1/2" |
| | G10396 | 5 | Lock Nut, 1"-8 |
| 12. | GA6960 | 1 | Hitch |
| 13. | G10007 | 4 | Hex Head Cap Screw, 5/8"-11 x 1 1/2" |
| | GD7805 | 4 | Special Washer |
| | G10230 | 4 | Lock Washer, 5/8" |
| 14. | G10756 | 1 | Hex Head Cap Screw, 3/8"-16 x 6" |
| | G10229 | 1 | Lock Washer, 3/8" |
| | G10101 | 1 | Hex Nut, 3/8"-16 |
| | GD3547 | 1 | Shaft |
| 16. | G10226 | 2 | Washer, 1 1/4" SAE |
| | G10460 | 2 | Cotter Pin, 1/4" x 2" |
| 17. | G10172 | 1 | Hex Head Cap Screw, 3/8"-16 x 5" |
| | G10229 | 1 | Lock Washer, 3/8" |
| | G10101 | 1 | Hex Nut, 3/8"-16 |
| 18. | GA6961 | 1 | Hitch |
| 19. | G10672 | 6 | Clamp, No. 28 |
| 20. | GD1516 | 1 | Adapter |
| 21. | GD1515 | 1 | Dust Cap, 1 1/4" |
| 22. | GD1517 | 1 | Dust Plug |
| 23. | GD1514 | 1 | Adapter |
| 24. | GA4976 | 1 | Ball Valve, Full Port |
| | GR1015 | - | Body O-Ring |
| | GR1016 | - | Stem O-Ring |
| | GR1017 | - | Teflon Seat |
| | GR1018 | - | Ball |
| | GR1019 | - | Handle |
| 25. | G10626 | 1 | Adapter, 1 1/4" NPT To 1 1/4" Barb |
| 26. | GB0218 | 4 | Bushing, 19/32" |
| 27. | GD7908 | 1 | Tap Block |
| 28. | GB0213 | 1 | Spring Seat |
| 29. | G4200-01 | 1 | Hose, 1 1/4" x 22' |
| 30. | GD2115 | 1 | Spring |
| 31. | GB0206 | 1 | Rod Guide |
| 32. | GD7907 | 1 | Special Bolt |
| | G10105 | 3 | Hex Nut, 3/4"-10 |

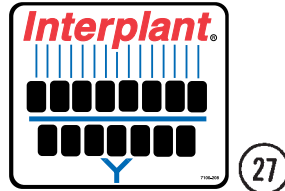
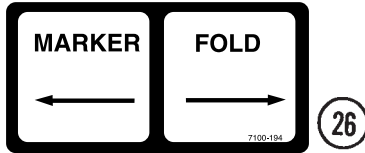
SMV SIGN, DECALS, REFLECTORS AND TIE STRAPS



KINZE 14



SMV SIGN, DECALS, REFLECTORS AND TIE STRAPS

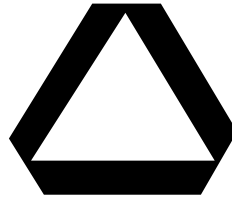


NOTE

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.

AN OPERATOR & PARTS MANUAL IS AVAILABLE FOR THIS MACHINE.

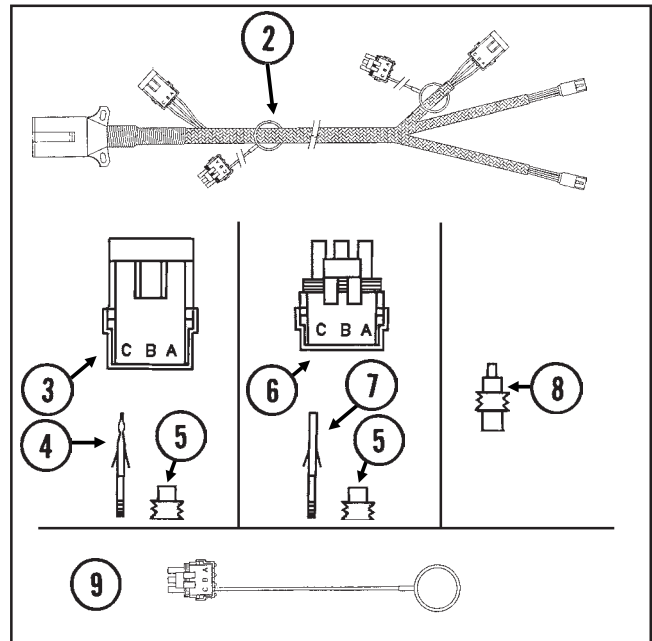
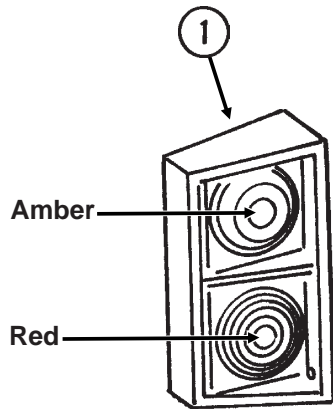
To obtain a manual, furnish model number and serial number and contact your KINZE Dealer or KINZE Manufacturing, Inc., P.O. Box 806 Williamsburg, IA 52361-0806 USA



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|------------|------|---|
| 1. | GD1162 | - | Tie Strap, 28" |
| | GD1512 | - | Tie Strap, 6" |
| | GD2117 | - | Tie Strap, 14 1/2" |
| | GD2984 | - | Tie Strap, 33" |
| 2. | G7200-03 | 4 | Reflector, Red |
| | G7200-04 | 2 | Reflector, Amber |
| 3. | G7100-02 | 3 | Decal, Warning |
| 4. | G7100-42 | - | Decal, Warning (2 Per Marker) |
| 5. | G7100-46 | 1 | Decal, Warning |
| 6. | G7100-56 | 1 | Decal, Warning |
| 7. | G7100-63 | 2 | Decal, Caution |
| 8. | G7100-68 | 4 | Decal, Warning |
| 9. | G7100-75 | 4 | Decal, Caution |
| 10. | G7100-83 | - | Decal, Warning (1 Per Marker Lockup) |
| 11. | G7100-89 | 2 | Decal, Danger |
| 12. | G7100-90 | 1 | Decal, Warning |
| 13. | G7100-115 | - | Decal, Warning (1 Per Granular Chemical Hopper Lid) |
| 14. | G7100-104 | 2 | Decal, KINZE®, 3" x 12" |
| 15. | G7100-153 | - | Decal, Information (1 Per Brush-Type Seed Meter) |
| 16. | G7100-121 | 1 | Decal, Transmission |
| 17. | G7100-116 | - | Decal, Grease Daily |
| 18. | G7100-111 | - | Decal, Oil Daily |
| 19. | G7100-110 | - | Decal, Grease Weekly |
| 20. | G7100-234 | - | Decal, Bolt Torque |
| 21. | G7100-195 | - | Decal, Logo (2 Per Row Unit) |
| 22. | GD10057-01 | - | Hose Identification Sleeve, Red AA |
| | GD10057-02 | - | Hose Identification Sleeve, Red BB |
| | GD10057-03 | - | Hose Identification Sleeve, Blue AA |
| | GD10057-04 | - | Hose Identification Sleeve, Blue BB |
| 23. | G7100-191 | 2 | Decal, 2500 |
| 24. | G7100-182 | - | Decal, Meter Alignment (1 Per Row Unit) |
| 25. | G7100-177 | 1 | Decal, Twin-Line®, 3/4" x 3" |
| 26. | G7100-194 | 1 | Decal, Instruction |
| 27. | G7100-208 | 2 | Decal, Interplant® |
| 28. | GR0146 | - | Powdered Graphite, 1 Pound |
| 29. | G7100-215 | 1 | Decal, Danger |
| 30. | G7100-217 | 1 | Decal, Note |
| 31. | GD2199 | 1 | SMV Sign |
| 32. | GR0155 | - | Blue Paint, Aerosol |
| 33. | GR1367 | - | Talc, 8 Pounds |

ELECTRICAL COMPONENTS

(TWL23/ELC9/ELC8/MTR27a)



| ITEM | PART NO. | QTY. | DESCRIPTION |
|------|----------|------|---|
| 1. | GA6699 | 1 | Double Light Assembly |
| | GA6700 | 1 | Double Light Assembly (Shown) |
| | GR1203 | - | Red Lens |
| | GR1204 | - | Amber Lens |
| | GR1205 | - | Cover |
| | GR1206 | - | Rubber Grommet (4) |
| | GR1207 | - | Lamp Unit |
| | GR1208 | - | Bulb |
| 2. | GA6835 | - | Light Wiring Harness W/7 Terminal Female Connector, 438", 6 Row 30" |
| | GA6836 | - | Light Wiring Harness W/7 Terminal Female Connector, 486", 8 Row 30" |
| | GA5385 | - | 7 Terminal Female Connector |
| 3. | GD11079 | - | Housing |
| 4. | GD11080 | - | Pin Contact, No. 18 |
| 5. | GD11081 | - | Seal |
| 6. | GD11090 | - | Housing |
| 7. | GD11091 | - | Socket Contact, No. 18 |
| 8. | GD11089 | - | Sealing Plug |
| 9. | GA8047 | - | Dust Plug |
| A. | G1K248 | - | Harness Ends Repair Kit, Includes:(3)GD11079, (9)GD11081 And (9)GD11080 (Items 3-5) |
| B. | G1K252 | - | Harness Ends Repair Kit, Includes:(3)GD11090, (9)GD11081 And (9)GD11091(Items 5-7) |

NUMERICAL INDEX

| Part No. | Page | Part No. | Page | Part No. | Page |
|----------|--|----------|---|----------|---|
| A1002 | P57 | G10027 | P31, P35 | G10111 | P7, P8, P9, P19, P21, .. P22, P23, P25, P27, P42, ... P65, P69, P74, P81, P85 |
| A1018 | P55, P57 | G10028 | P35 | G10120 | P33, P61 |
| A1021 | P55, P57 | G10031 | P33, P41, P61, P81 | G10128 | P42, P43 |
| A1023 | P55, P57 | G10033 | P22, P42 | G10130 | P82, P83 |
| A1026 | P55, P57 | G10036 | P19, P25 | G10131 | P82, P83 |
| A1041 | P55, P57 | G10037 | P4, P27, P32, P35, P43, P80 | G10133 | P8, P22, P23, P45, P47, P65, P73, P77 |
| A1048 | P55, P57 | G10038 | P87, P89 | G10144 | P82, P83 |
| A1055 | P55, P57 | G10039 | P21, P35, P69, P87, P89 | G10145 | P41, P61, P80, P85 |
| A1073 | P55 | G10043 | P71, P95 | G10148 | P23 |
| A1076 | P55, P57 | G10045 | P22, P65 | G10152 | P7 |
| A1090 | P55, P57 | G10046 | P65 | G10168 | P48 |
| A1107 | P55, P57 | G10047 | P43, P71, P74, P81 | G10171 | P7, P77 |
| A1141 | P55, P57 | G10048 | P31, P33, P85 | G10172 | P33, P103 |
| A1153 | P55, P57 | G10049 | P9, P17, P69 | G10201 | P3, P17, P27, P77 |
| A1194 | P55, P57 | G10053 | P37, P42, P43 | G10203 | P43, P73 |
| A1195 | P55, P57 | G10054 | P91 | G10204 | P3, P5, P10, P65 |
| A3105 | P55, P57 | G10055 | P9, P25 | G10205 | P31, P37, P67, P68, P69 |
| A3137 | P55, P57 | G10056 | P103 | G10206 | P3, P23, P25, P37, P87, P89 |
| A3151 | P55 | G10061 | P31 | G10208 | P3 |
| A3183 | P57 | G10062 | P9 | G10209 | P11, P17, P69, P103 |
| A5460 | P50 | G10064 | P8, P33, P103 | G10210 | P2, P3, P4, P7, P8, P9, .. P11, P17, P27, P37, P39, .. P43, P65, P69, P71, P74, ... P79, P81, P85, P86, P88 |
| A6363 | P35 | G10068 | P25 | G10213 | P3, P65 |
| A6364 | P32 | G10069 | P5 | G10216 | P3, P7, P21, P22, P61, ... P67, P69, P73, P74, P79 |
| A6401 | P32 | G10087 | P35 | G10217 | P25, P29, P71, P103 |
| A7380 | P35 | G10096 | P79 | G10218 | P103 |
| D7626 | P27 | G10100 | P69 | G10219 | P7, P39, P71, P77, P82, P83 |
| D7627 | P27 | G10101 | P2, P3, P4, P10, P11, .. P14, P17, P27, P31, P33, .. P37, P39, P59, P61, P65, .. P69, P79, P81, P82, P83, P85, P86, P87, P88, P89, P93, P103 | G10220 | P68 |
| D9645 | P35 | G10102 | P4, P7, P22, P25, P27, .. P31, P32, P35, P42, P43, .. P45, P47, P48, P61, P63, .. P65, P67, P71, P74, P77, ... P79, P80, P87, P89, P103 | G10226 | P45, P47, P103 |
| G10001 | P2, P37, P39, P43, P61, P68 | G10103 | P8, P14, P33 | G10227 | P14, P33 |
| G10003 | P3, P7, P8, P27, P79, ... P85, P86, P87, P88, P89 | G10104 | P4, P25, P27, P29, P31, .. P33, P63, P69, P75, P77, .. P79, P81, P85, P86, P89, P91 | G10228 | P3, P4, P22, P25, P27, .. P31, P32, P35, P42, P43, .. P45, P47, P48, P61, P63, .. P65, P67, P71, P74, P77, ... P79, P80, P87, P89, P103 |
| G10004 | P3, P4, P10, P27, P31, P59, P69, P81, P82, P83, P103 | G10105 | P31, P35, P68, P79, P103 | G10229 | P2, P3, P4, P7, P8, P10, .. P11, P14, P17, P27, P31, .. P37, P39, P43, P59, P61, .. P65, P69, P74, P79, P81, P85, P86, P87, P88, P89, P103 |
| G10005 | P31, P33, P37, P87, P89 | G10106 | P5, P7, P21, P25, P33, .. P37, P39, P43, P45, P47, P71, P77, P81, P85 | G10230 | P4, P5, P27, P29, P31, .. P33, P35, P43, P45, P47, .. P63, P67, P69, P71, P75, .. P77, P79, P81, P85, P86, P89, P103 |
| G10006 | P7, P22, P30 | G10107 | P7, P8, P19, P21, P25, .. P30, P37, P43, P65, P87, P89 | G10231 | P31, P32, P35, P68, P79, P103 |
| G10007 | P4, P68, P71, P79, P103 | G10108 | P3, P9, P17, P27, P31, .. P33, P37, P39, P68, P69, ... P71, P73, P91, P95, P103 | | |
| G10008 | P25, P35, P45, P47 | G10109 | P5, P7, P8, P22, P23, P65, P67, P73, P79 | | |
| G10009 | P23 | G10110 | P11, P69, P103 | | |
| G10010 | P5, P67 | | | | |
| G10012 | P25 | | | | |
| G10013 | P8, P71, P103 | | | | |
| G10014 | P3, P71 | | | | |
| G10015 | P7 | | | | |
| G10016 | P35, P69, P87, P89 | | | | |
| G10017 | P21, P27, P42, P77 | | | | |
| G10018 | P5, P7, P67 | | | | |
| G10019 | P10, P65, P91, P93 | | | | |
| G10020 | P12 | | | | |
| G10021 | P12 | | | | |
| G10022 | P12, P17, P33 | | | | |
| G10023 | P17 | | | | |
| G10025 | P32 | | | | |
| G10026 | P35 | | | | |

NUMERICAL INDEX

| Part No. | Page | Part No. | Page | Part No. | Page |
|----------|--|----------|--|----------|--|
| G10232 | P5, P7, P10, P33, P37, .. P39, P43, P45, P47, P65, P71, P77, P81, P85, | G10464 | P41 | G10620 | P3, P10, P11, P12, P17, P41, P61, P81 |
| G10233 | .. P37, P39, P42, P61, P75, P81, P87, P89 | G10470 | P12 | G10621 | .. P10, P11, P12, P17, P18 |
| G10235 | P37, P39, P87, P89 | G10476 | P71 | G10622 | P3, P18, P27 |
| G10236 | P31 | G10478 | P43, P81, P85 | G10626 | P79, P85, P86, P103 |
| G10237 | P69 | G10482 | P35 | G10629 | P79, P88 |
| G10239 | P31 | G10496 | P61 | G10633 | P79 |
| G10278 | P79 | G10499 | P65 | G10636 | P35, P85 |
| G10292 | P85, P87, P89 | G10500 | P12 | G10637 | P17 |
| G10303 | P7, P39, P43, P77, P81, P82, P83, P85 | G10501 | P22, P37, P39 | G10638 | P33 |
| G10304 | P3 | G10503 | P3, P21, P65, P73 | G10640 | P5, P19, P25, P32, P67, P69, P81, P82, P83 |
| G10305 | P2, P10, P18, P65 | G10504 | P3, P65 | G10641 | P43, P45, P47, P68, P71, P77, P81 |
| G10306 | ... P14, P37, P39, P71, P73 | G10507 | P68 | G10643 | P74 |
| G10307 | P3, P27 | G10520 | P11 | G10655 | P77 |
| G10308 | P18 | G10521 | P17 | G10660 | P17 |
| G10309 | P10 | G10523 | P14 | G10669 | P3, P85 |
| G10310 | P11, P14 | G10526 | P3, P67 | G10670 | P17, P43, P75, P77, P81, P86, P88 |
| G10311 | P17 | G10527 | P85 | G10671 | P35 |
| G10312 | P3, P10, P17, P37, P39 | G10529 | P18 | G10672 | P77, P79, P103 |
| G10318 | P21, P91 | G10531 | P13 | G10673 | .. P82, P83, P84, P86, P88 |
| G10322 | P69 | G10536 | P21, P45, P47 | G10674 | P79 |
| G10323 | P12 | G10542 | P65 | G10676 | P77 |
| G10326 | P3 | G10544 | P48 | G10680 | P14 |
| G10328 | P3 | G10545 | P4, P27 | G10681 | P65, P82, P83 |
| G10348 | P22 | G10546 | P17 | G10686 | P93 |
| G10358 | P99 | G10551 | P3 | G10688 | P91, P95 |
| G10371 | P22, P87, P89 | G10552 | P3 | G10690 | P12 |
| G10389 | P85, P87 | G10553 | P10 | G10693 | P95 |
| G10396 | P103 | G10555 | P3 | G10716 | P31 |
| G10401 | P12 | G10558 | P80 | G10717 | P31 |
| G10403 | P33, P69 | G10560 | P67 | G10718 | P82, P83 |
| G10408 | P75 | G10567 | P17 | G10719 | P85, P86 |
| G10409 | P43, P75, P81, P85 | G10570 | P17 | G10722 | P48 |
| G10412 | P4, P27, P39 | G10572 | P21, P25 | G10724 | P48 |
| G10417 | P29 | G10573 | P25 | G10725 | P48 |
| G10418 | P29 | G10574 | P19, P22, P25, P74 | G10728 | P84, P86 |
| G10419 | P74 | G10581 | P25, P61 | G10732 | P4, P27 |
| G10427 | P3, P7 | G10582 | P25 | G10739 | P85, P86 |
| G10430 | P41 | G10584 | P13 | G10747 | P8, P9, P25 |
| G10435 | P43, P75, P81, P85 | G10585 | P21 | G10751 | P4, P27, P39 |
| G10438 | P33, P67, P71 | G10587 | P77 | G10752 | P4 |
| G10445 | P43, P74, P81 | G10588 | P77 | G10756 | P103 |
| G10450 | P71 | G10592 | P67, P69 | G10757 | P14 |
| G10451 | P3, P65 | G10594 | P69 | G10758 | P14 |
| G10452 | P14 | G10597 | P21 | G10765 | P30 |
| G10455 | P10 | G10599 | P27, P69 | G10770 | P9 |
| G10456 | P67, P80 | G10602 | .. P12, P13, P17, P37, P39, ... P42, P74, P86, P87, P89 | G10779 | P35 |
| G10457 | P10, P31 | G10603 | P12, P13, P67, P73 | G10801 | P7 |
| G10459 | P69 | G10604 | P12 | G10814 | P3 |
| G10460 | .. P41, P43, P45, P47, P74, P77, P103 | G10605 | P2 | G10819 | P87, P89 |
| G10462 | P43, P75, P80 | G10606 | P35 | G10826 | P103 |
| G10463 | P7 | G10609 | P17 | G10829 | P79 |
| | | G10610 | P67 | G10844 | P48 |
| | | G10615 | P88 | | |
| | | G10618 | P89 | | |
| | | G10619 | P79 | | |

NUMERICAL INDEX

| Part No. | Page | Part No. | Page | Part No. | Page |
|-----------|----------------------------|-------------|----------|----------|--|
| G10862 | P69 | G6400-08-06 | P55, P57 | GA1369 | P65 |
| G10864 | P14 | G6400-L-06 | P55, P57 | GA1676 | P48 |
| G10865 | P81 | G6500-08 | P55, P57 | GA1677 | P48 |
| G10867 | P42 | G6500-08-06 | P55, P57 | GA1678 | P48 |
| G10886 | P71 | G6801-06-08 | P55, P57 | GA1679 | P48 |
| G10890 | P39 | G6801-08 | P55, P57 | GA1720 | P4 |
| G10898 | P71 | G7100-02 | P105 | GA2007 | P10 |
| G10905 | P61 | G7100-104 | P105 | GA2012L | P3 |
| G10906 | P61 | G7100-110 | P105 | GA2012R | P3 |
| G10908 | P73 | G7100-111 | P105 | GA2013 | P3 |
| G10917 | P79 | G7100-115 | P105 | GA2014 | P3, P7, P9, P21, P22, ... P23, P25, P65, P71, P73 |
| G10919 | P73 | G7100-116 | P105 | GA2016 | P10 |
| G10920 | P73 | G7100-121 | P105 | GA2018 | P12 |
| G1K212 | P3 | G7100-153 | P105 | GA2019 | P12 |
| G1K213 | P15 | G7100-177 | P105 | GA2020 | P12 |
| G1K215 | P67 | G7100-182 | P105 | GA2022 | P67 |
| G1K234 | P29 | G7100-191 | P105 | GA2027 | P11 |
| G1K248 | P106 | G7100-194 | P105 | GA2054 | P7 |
| G1K252 | P106 | G7100-195 | P105 | GA2058 | P11 |
| G1K253 | P39 | G7100-208 | P105 | GA2068 | P37, P39, P87, P89 |
| G1K269 | P41, P61, P81 | G7100-215 | P105 | GA2075 | P14 |
| G1K272 | P3 | G7100-217 | P105 | GA2076 | P17 |
| G1K273 | P27 | G7100-234 | P105 | GA2094 | P18 |
| G2100-03 | P37, P39, P43, P81, P85 | G7100-42 | P105 | GA2142 | P35 |
| G2700-08 | P55, P57 | G7100-46 | P105 | GA2148 | P35 |
| G2701-08 | P55 | G7100-56 | P105 | GA2180 | P61 |
| G306-08 | P55, P57 | G7100-63 | P105 | GA2327 | P11 |
| G3303-114 | P17 | G7100-68 | P105 | GA3893 | P85, P87, P89 |
| G3303-16 | P10 | G7100-75 | P105 | GA4223 | P59 |
| G3303-96 | P27 | G7100-83 | P105 | GA4229 | P59 |
| G3303-98 | P10 | G7100-89 | P105 | GA4230 | P59 |
| G3305-01 | P18 | G7100-90 | P105 | GA4235 | P43, P74, P81 |
| G3305-03 | P103 | G7192X | P4 | GA4286 | P68 |
| G3310-08 | P43 | G7200-03 | P105 | GA4287 | P68 |
| G3310-116 | P39 | G7200-04 | P105 | GA4309 | P50 |
| G3310-117 | P37 | G7393X | P69 | GA4444 | P17 |
| G3310-152 | P85 | GA0167 | P48 | GA4619 | P81, P85 |
| G3310-155 | P74 | GA0237 | P68 | GA4620 | P81, P85 |
| G3310-160 | P87, P89 | GA0243 | P48 | GA4693 | P35 |
| G3310-176 | P81 | GA0245 | P48 | GA4822 | P10 |
| G3310-204 | P61 | GA0257 | P48 | GA4976 | P79, P103 |
| G3310-208 | P61 | GA0289 | P85 | GA4994 | P29 |
| G3310-80 | P43 | GA0308 | P65 | GA4995 | P29 |
| G3310-92 | P43 | GA0312 | P65 | GA5090 | P37, P39, P87, P89 |
| G3314-40 | P17 | GA0318 | P65 | GA5097 | P50 |
| G3400-01 | P37, P39, P43, P81, P85 | GA0320 | P65 | GA5103 | P61 |
| G4200-01 | P103 | GA0328 | P65 | GA5105 | P37, P39, P43, P74, P81 |
| G4200-02 | P79 | GA0378 | P41 | GA5106 | P42, P43 |
| G4200-03 | P79 | GA0785 | P65 | GA5107 | P42, P61, P74, P81 |
| G4205-03 | P79 | GA0810 | P65 | GA5108 | P42 |
| G4300-04 | P82, P84, P86, P88 | GA0811 | P2 | GA5109 | P42 |
| G4300-05 | P83, P84, P86, P88 | GA0860 | P3 | GA5110 | P42 |
| G6400-06 | P53, P55, P57 | GA0895 | P35 | GA5111 | P42 |
| G6400-08 | P55, P57 | GA0898 | P77 | GA5112 | P42 |
| | | GA0899 | P48 | GA5113 | P42 |
| | | GA1306 | P3 | | |

NUMERICAL INDEX

| Part No. | Page | Part No. | Page | Part No. | Page |
|----------|------------------------------|----------|-----------------|----------|--------------------|
| GA5114 | P74 | GA5796 | P13 | GA6512 | P83 |
| GA5115 | P74 | GA5798 | P25 | GA6513 | P81 |
| GA5116 | P37, P43, P74, P87, P89 | GA5799 | P79 | GA6514 | P81 |
| GA5121 | P32 | GA5800 | P79 | GA6515 | P81 |
| GA5136 | P75, P81 | GA5834 | P13 | GA6522 | P49 |
| GA5146 | P42 | GA5846 | P27 | GA6523 | P49 |
| GA5157 | P37, P39 | GA5873 | P59 | GA6524 | P49 |
| GA5164 | P41 | GA5874 | P59 | GA6525 | P49 |
| GA5165 | P41 | GA5876 | P59 | GA6529 | P35 |
| GA5188 | P47 | GA5877 | P59 | GA6532 | P45, P47 |
| GA5194 | P85 | GA5880 | P3, P59 | GA6579 | P74 |
| GA5202 | P43, P81 | GA5881 | P59 | GA6585 | P45, P47 |
| GA5229 | P74, P80 | GA5882 | P59 | GA6586 | P45, P47 |
| GA5236 | P63 | GA5883 | P59 | GA6597 | P8 |
| GA5237 | P63 | GA5884 | P59 | GA6608 | P31 |
| GA5264 | P79 | GA5887 | P68 | GA6613 | P8 |
| GA5385 | P106 | GA5917 | P79 | GA6614 | P5 |
| GA5459 | P50 | GA5982 | P13 | GA6615 | P5 |
| GA5526 | P45, P47 | GA6020 | P50 | GA6618 | P7 |
| GA5533 | P17 | GA6027 | P13 | GA6619 | P7 |
| GA5552 | P53 | GA6038 | P13 | GA6620 | P7 |
| GA5553 | P15 | GA6147 | P59 | GA6623 | P31 |
| GA5554 | P15 | GA6154 | P91 | GA6633 | P13 |
| GA5560 | P15 | GA6158 | P99 | GA6699 | P106 |
| GA5561 | P15 | GA6168 | P13 | GA6700 | P106 |
| GA5564 | P27 | GA6171 | P5, P7, P8, P67 | GA6733 | P7 |
| GA5572 | P53 | GA6182 | P13 | GA6741 | P14 |
| GA5600 | P59 | GA6184 | P13 | GA6766 | P67 |
| GA5622 | P19, P25 | GA6187 | P13 | GA6792 | P32 |
| GA5623 | P15 | GA6337 | P74 | GA6801 | P7 |
| GA5624 | P43, P74 | GA6349 | P49 | GA6832 | P22 |
| GA5625 | P19 | GA6350 | P49 | GA6833 | P22 |
| GA5628 | P43 | GA6371 | P31 | GA6834 | P22 |
| GA5629 | P43 | GA6372 | P29 | GA6835 | P106 |
| GA5630 | P25 | GA6402 | P31 | GA6836 | P106 |
| GA5631 | P25 | GA6403 | P81 | GA6838 | P22 |
| GA5635 | P25 | GA6404 | P31 | GA6849 | P35 |
| GA5636 | P25 | GA6408 | P69 | GA6850 | P33 |
| GA5637 | P25 | GA6415 | P37, P87, P89 | GA6858 | P45, P47 |
| GA5640 | P19, P25 | GA6417 | P37 | GA6859 | P45, P47 |
| GA5643 | P25 | GA6418 | P31 | GA6884 | P51 |
| GA5651 | P4 | GA6420 | P30 | GA6907 | P14 |
| GA5654 | P21, P22, P23, P25, P71, P73 | GA6422 | P30 | GA6937 | P9 |
| GA5667 | P77 | GA6428 | P35 | GA6960 | P103 |
| GA5698 | P13 | GA6434 | P8 | GA6961 | P103 |
| GA5699 | P13 | GA6435 | P35 | GA6966 | P71 |
| GA5715 | P21 | GA6436 | P77 | GA6967 | P71 |
| GA5718 | P21 | GA6437 | P77 | GA6968 | P71 |
| GA5719 | P21 | GA6438 | P52 | GA6972 | P71 |
| GA5746 | P15 | GA6442 | P45 | GA6973 | P71 |
| GA5786 | P27 | GA6478 | P13 | GA6984 | P71 |
| GA5787 | P27 | GA6496 | P35 | GA6985 | P71 |
| GA5788 | P27 | GA6497 | P32 | GA7022 | P31 |
| GA5794 | P13 | GA6503 | P77 | GA7135 | P63 |
| GA5795 | P13 | GA6509 | P85, P87 | GA7153 | P33 |
| | | GA6511 | P82 | GA7154 | P42, P61, P87, P89 |

NUMERICAL INDEX

| Part No. | Page | Part No. | Page | Part No. | Page |
|----------|---------------|------------|--|----------|---|
| GA7156 | P42 | GB0196 | P25 | GD10165 | P87, P89 |
| GA7171 | P86, P88 | GB0198 | P77 | GD10196 | P103 |
| GA7179 | P87, P89 | GB0199 | P77 | GD10226 | P12 |
| GA7180 | P87, P89 | GB0200 | P77 | GD10242 | P69 |
| GA7208 | P103 | GB0205 | P68 | GD1026 | P3, P17, P27, P37, P39, P43, P71, P74, P81 |
| GA7209 | P103 | GB0206 | P69, P103 | GD1027 | P3 |
| GA7211 | P103 | GB0209 | P69 | GD10273 | P69 |
| GA7239 | P69 | GB0210 | P69 | GD10283 | P48 |
| GA7240 | P69 | GB0212 | P67 | GD1030 | P3, P65 |
| GA7255 | P13 | GB0213 | P68, P103 | GD10303 | P69 |
| GA7268 | P69 | GB0218 | P4, P8, P25, P27, P30, P37, P39, P68, P87, P89, P103 | GD10304 | P69 |
| GA7269 | P69 | | | GD1033 | P3 |
| GA7271 | P23 | GB0219 | P8, P9 | GD1035 | P10 |
| GA7336 | P43, P74, P81 | GB0227 | P19, P25 | GD1036 | P10 |
| GA7369 | P39 | GB0230 | P32 | GD1037 | P10 |
| GA7375 | P79 | GB0233 | P7, P8, P9 | GD1039 | P12 |
| GA7410 | P4 | GB0234 | P32 | GD1040 | P12 |
| GA7412 | P23 | GB0239 | P7 | GD1041 | P12 |
| GA7434 | P35 | GB0243 | P10 | GD1042 | P12 |
| GA7445 | P23, P73 | GB0245 | P9 | GD1045 | P12 |
| GA7446 | P22, P23, P73 | GB0248 | P71 | GD1046 | P12 |
| GA7543 | P35 | GB0249 | P71 | GD10464 | P10, P17 |
| GA7580 | P9 | GB0250 | P71 | GD10473 | P3, P7 |
| GA7826 | P39 | GB0254 | P8 | GD1048 | P5, P67 |
| GA7829 | P71 | GB0259 | P42 | GD10487 | P69 |
| GA7830 | P71 | GB0270 | P71 | GD10519 | P23 |
| GA7998 | P73 | GD0453-02 | P45 | GD1051L | P11 |
| GA7999 | P73 | GD0453-03 | P47 | GD1051R | P11 |
| GA8007 | P71 | GD0453-06 | P45 | GD10526 | P23 |
| GA8008 | P71 | GD0487 | P65 | GD1053 | P11 |
| GA8047 | P106 | GD0652 | P45, P47 | GD10532 | P32 |
| GA8068 | P101 | GD0740 | P31 | GD1054 | P11 |
| GA8069 | P95 | GD0746 | P48 | GD1055 | P11 |
| GA8092 | P61 | GD0829 | P103 | GD10552 | P22, P23, P73 |
| GA8167 | P27 | GD0840 | P48 | GD1056 | P17 |
| GA8305 | P67 | GD0914-155 | P61 | GD1058 | P17 |
| GA8306 | P67 | GD0914-165 | P41 | GD1059L | P17 |
| GA8343 | P12 | GD0914-215 | P61 | GD1059R | P17 |
| GB0102 | P2 | GD0914-225 | P41 | GD1060 | P17 |
| GB0103 | P3 | GD0917 | P41, P61, P80, P85 | GD1061 | P17 |
| GB0104 | P3 | GD0962 | P65 | GD1063 | P17 |
| GB0105 | P2 | GD0971-04 | P63 | GD1065 | P3 |
| GB0107 | P10 | GD0971-14 | P63 | GD1066 | P3 |
| GB0108 | P10 | GD0973 | P5 | GD1067 | P85 |
| GB0110 | P12 | GD10007 | P87, P89 | GD10710 | P27 |
| GB0111 | P12 | GD10010 | P35 | GD1072 | P17 |
| GB0115 | P17 | GD10036 | P4 | GD10731 | P31 |
| GB0116 | P17 | GD10057-01 | P105 | GD10733 | P12 |
| GB0118 | P67 | GD10057-02 | P105 | GD1079 | P9 |
| GB0120 | P12 | GD10057-03 | P105 | GD10795 | P35 |
| GB0121 | P17 | GD10057-04 | P105 | GD1083 | P12 |
| GB0134 | P65 | GD10110 | P79 | GD1085 | P8 |
| GB0181 | P29 | GD10129 | P33 | GD1086 | P5 |
| GB0183 | P17 | GD10156 | P87, P89 | GD10867 | P3 |
| GB0184 | P17 | GD10161 | P43, P74, P81, P87, P89 | GD1089 | P17 |
| GB0186 | P4, P27 | | | | |

NUMERICAL INDEX

| Part No. | Page | Part No. | Page | Part No. | Page |
|----------|--|-------------|--------------------|---------------|---|
| GD1090 | P14 | GD1517 | P79, P103 | GD5835 | P43 |
| GD1104 | P68 | GD1520 | P79 | GD5857 | P22, P30, P37, P39, P43, P75, P81, P87, P89 |
| GD11045 | P41, P61, P81 | GD1657 | P65 | GD5875 | P31, P45, P47 |
| GD11053 | P73 | GD1673 | P65 | GD5886 | P41, P74, P75 |
| GD11079 | P106 | GD1719 | P81, P85 | GD5892 | P31 |
| GD11080 | P106 | GD1748 | P79 | GD5949 | P50 |
| GD11081 | P106 | GD1755 | P13 | GD5951 | P49 |
| GD11089 | P106 | GD1797 | P65 | GD6165 | P81 |
| GD1109 | P4, P7, P8, P27 | GD1812 | P79 | GD6291 | P59 |
| GD11090 | P106 | GD1862 | P79 | GD6501 | P12 |
| GD11091 | P106 | GD2115 | P103 | GD6533 | P3, P7 |
| GD11097 | P71 | GD2117 | P59, P105 | GD6551 | P43 |
| GD1110 | P3 | GD2128 | P10, P27 | GD6553 | P68 |
| GD11106 | P71 | GD2161 | P45, P47 | GD6574 | P49 |
| GD1113 | P4, P27, P33, P63, P69, P79, P81, P85 | GD2169 | P31, P35 | GD6783 | P33 |
| GD1115L | P14 | GD2199 | P105 | GD6793 | P43 |
| GD1115R | P14 | GD2412 | P77 | GD6819 | P43, P75, P81 |
| GD1116 | P14 | GD2423 | P14 | GD6825-10.375 | P39 |
| GD11178 | P73 | GD2460 | P18 | GD6957 | P35 |
| GD1118 | P14 | GD2548-15.5 | P75 | GD6958 | P35 |
| GD11188 | P73 | GD2548-30 | P81 | GD7120 | P50 |
| GD1120 | P3 | GD2558 | P42, P74, P80 | GD7122 | P50 |
| GD1121 | P11 | GD2589 | P65 | GD7124 | P50 |
| GD11218 | P27 | GD2597 | P48 | GD7127 | P43, P74, P80 |
| GD11219 | P17 | GD2721 | P45, P47, P103 | GD7137 | P31 |
| GD11233 | P27 | GD2734-01 | P43 | GD7140 | P29 |
| GD11239 | P17 | GD2947 | P14 | GD7148 | P17 |
| GD11265 | P73 | GD2971-09 | P31 | GD7258 | P17 |
| GD11266 | P73 | GD2971-10 | P17 | GD7318 | P3, P27 |
| GD1130 | P3 | GD2984 | P105 | GD7426 | P37, P39, P43, P74, P75, P81 |
| GD1132 | P21, P22, P23, P25, P65, P71, P73 | GD3180-03 | P31 | GD7588 | P17 |
| GD1134 | P75, P77, P81, P86, P89 | GD3180-04 | P81 | GD7589 | P17 |
| GD11358 | P73 | GD3180-16 | P43 | GD7591 | P17 |
| GD1138 | P63, P65, P71 | GD3180-17 | P74 | GD7592 | P17 |
| GD1143 | P18 | GD3181-12 | P7 | GD7618 | P10 |
| GD1144 | P18 | GD3214 | P45, P47 | GD7619 | P4 |
| GD1145 | P18 | GD3389 | P35 | GD7626 | P27 |
| GD11490 | P35 | GD3398 | P35 | GD7803 | P19, P25 |
| GD1162 | P105 | GD3547 | P103 | GD7804 | P19, P25 |
| GD1200 | P77 | GD3790 | P77 | GD7805 | P4, P21, P25, P27, P30, P31, P37, P39, P71, P73, P87, P89, P103 |
| GD1207 | P77 | GD4086 | P55, P57 | GD7811 | P25 |
| GD1209 | P77 | GD4563 | P59 | GD7815 | P25 |
| GD1210 | P77 | GD4564 | P59 | GD7816 | P25 |
| GD1213 | P77 | GD4632 | P50 | GD7817-01 | P21, P25 |
| GD1255 | P41 | GD4743 | P31 | GD7817-04 | P21, P23, P25, P73 |
| GD1256 | P41 | GD4850 | P67 | GD7817-05 | P71 |
| GD1337 | P79 | GD4887-01 | P43 | GD7817-09 | P25 |
| GD1353 | P5 | GD4888 | P67 | GD7818 | P25, P71 |
| GD1379 | P77 | GD5752 | P37, P39, P87, P89 | GD7822 | P43 |
| GD1380 | P77 | GD5753 | P37, P39, P87, P89 | GD7823 | P21, P25 |
| GD1512 | P105 | GD5756 | P37, P39, P43 | GD7831 | P25 |
| GD1514 | P79, P103 | GD5797 | P37, P87, P89 | GD7848 | P77 |
| GD1515 | P79, P103 | GD5824 | P42 | | |
| GD1516 | P79, P103 | GD5827 | P37, P39, P42 | | |
| | | GD5829 | P42 | | |
| | | GD5830 | P43 | | |

NUMERICAL INDEX

| Part No. | Page | Part No. | Page | Part No. | Page |
|-----------|---------------|----------|---------------|----------|--|
| GD7867 | P75 | GD9130 | P35 | GR0236 | P83 |
| GD7870 | P75 | GD9131 | P77 | GR0270 | P35 |
| GD7878 | P13 | GD9132 | P77 | GR0279 | P83 |
| GD7888 | P35 | GD9227 | P31 | GR0280 | P83 |
| GD7889 | P21 | GD9229 | P61 | GR0281 | P83 |
| GD7890 | P21 | GD9238 | P49 | GR0282 | P83 |
| GD7900 | P68 | GD9239 | P49 | GR0283 | P83 |
| GD7904-02 | P69 | GD9240 | P3, P17, P27 | GR0284 | P83 |
| GD7904-04 | P87, P89 | GD9241 | P49 | GR0375 | P32, P35 |
| GD7907 | P69, P103 | GD9242 | P85 | GR0434 | P35 |
| GD7908 | P68, P103 | GD9244 | P85 | GR0508 | P79 |
| GD7911 | P67 | GD9254 | P19, P25 | GR0513 | P79 |
| GD7912 | P69 | GD9290 | P7 | GR0515 | P29 |
| GD7962 | P68, P73 | GD9305 | P7 | GR0516 | P29 |
| GD8030 | P67 | GD9320 | P74 | GR0517 | P29 |
| GD8031 | P67 | GD9378 | P75 | GR0582 | P59 |
| GD8214 | P67 | GD9562 | P7 | GR0583 | P59 |
| GD8218 | P67 | GD9705 | P67 | GR0594 | P59 |
| GD8224 | P69 | GD9706 | P67 | GR0595 | P59 |
| GD8237 | P13 | GD9709 | P67 | GR0664 | P12 |
| GD8238 | P68 | GD9715 | P22 | GR0676 | P59 |
| GD8239 | P69 | GD9720 | P22 | GR0807 | P59 |
| GD8249 | P4, P27 | GD9724 | P22, P23, P73 | GR0866 | P59 |
| GD8276 | P69 | GD9786 | P9 | GR0880 | P85, P87, P89 |
| GD8306 | P61 | GD9787 | P9 | GR0881 | P85, P87, P89 |
| GD8307 | P21, P25 | GD9816 | P14 | GR0882 | P85, P87, P89 |
| GD8308 | P67 | GD9908 | P71 | GR0883 | P85, P87, P89 |
| GD8460 | P8 | GD9934 | P71 | GR0911 | P37, P39, P74 |
| GD8722 | P77 | GD9971 | P33 | GR0912 | P37, P39, P43, P61, P74, P81, P85, P87, P89 |
| GD8750 | P17 | GR0146 | P105 | GR0927 | P50 |
| GD8751 | P59 | GR0150 | P48 | GR0933 | P12 |
| GD8770 | P59 | GR0151 | P48 | GR0959 | P50 |
| GD8771 | P59 | GR0155 | P105 | GR0983 | P49 |
| GD8778 | P13 | GR0188 | P68 | GR0999 | P50 |
| GD8816 | P84, P86, P88 | GR0193 | P32, P35 | GR1001 | P50 |
| GD8843 | P19, P25 | GR0196 | P10, P17, P27 | GR1005 | P79 |
| GD8844 | P19, P25 | GR0207 | P82, P83 | GR1006 | P79 |
| GD8893-01 | P27 | GR0208 | P82 | GR1015 | P79, P103 |
| GD9046 | P31 | GR0211 | P82, P83 | GR1016 | P79, P103 |
| GD9047 | P43 | GR0212 | P82, P83 | GR1017 | P79, P103 |
| GD9048 | P80 | GR0213 | P82 | GR1018 | P79, P103 |
| GD9051 | P35 | GR0214 | P82, P83 | GR1019 | P79, P103 |
| GD9052 | P32 | GR0215 | P82, P83 | GR1032 | P53 |
| GD9077 | P41 | GR0216 | P82 | GR1033 | P53 |
| GD9078 | P41 | GR0217 | P82, P83 | GR1034 | P53 |
| GD9093 | P32 | GR0221 | P83 | GR1035 | P53 |
| GD9106 | P61 | GR0222 | P83 | GR1036 | P53 |
| GD9107 | P82 | GR0224 | P82 | GR1037 | P53 |
| GD9108 | P83 | GR0225 | P82, P83 | GR1038 | P53 |
| GD9109 | P82, P83 | GR0226 | P82, P83 | GR1039 | P53 |
| GD9120 | P8 | GR0228 | P82 | GR1040 | P53 |
| GD9121 | P35 | GR0229 | P82, P83 | GR1041 | P53 |
| GD9122 | P35 | GR0230 | P82, P83 | GR1042 | P53 |
| GD9123 | P35 | GR0231 | P82, P83 | GR1043 | P53 |
| GD9124 | P35 | GR0232 | P82, P83 | GR1044 | P53 |
| GD9129-01 | P31 | GR0233 | P82 | | |

NUMERICAL INDEX

| Part No. | Page | Part No. | Page | Part No. | Page |
|----------|---------------|----------|----------|----------|------|
| GR1045 | P53 | GR1203 | P106 | | |
| GR1046 | P53 | GR1204 | P106 | | |
| GR1047 | P53 | GR1205 | P106 | | |
| GR1048 | P53 | GR1206 | P106 | | |
| GR1062 | P3, P59 | GR1207 | P106 | | |
| GR1066 | P10 | GR1208 | P106 | | |
| GR1067 | P59 | GR1281 | P51 | | |
| GR1069 | P59 | GR1282 | P51 | | |
| GR1077 | P59 | GR1289 | P51 | | |
| GR1078 | P59 | GR1327 | P12 | | |
| GR1079 | P59 | GR1348 | P59 | | |
| GR1080 | P59 | GR1367 | P105 | | |
| GR1081 | P59 | GR1388 | P101 | | |
| GR1083 | P59 | GR1389 | P95 | | |
| GR1084 | P59 | GR1405 | P61 | | |
| GR1085 | P59 | GR1406 | P61 | | |
| GR1087 | P3, P59 | GR1407 | P61 | | |
| GR1096 | P52 | GR1408 | P61 | | |
| GR1100 | P91 | GR1409 | P61 | | |
| GR1104 | P91 | GR1410 | P61 | | |
| GR1107 | P91 | GR1411 | P61 | | |
| GR1112 | P91 | GR1412 | P61 | | |
| GR1114 | P91, P95 | GR1413 | P61 | | |
| GR1116 | P91, P95 | GR1420 | P95 | | |
| GR1118 | P91, P95 | GR1421 | P95 | | |
| GR1122 | P85, P86, P88 | GR1422 | P97 | | |
| GR1129 | P93, P97 | GR1423 | P97 | | |
| GR1130 | P93, P97 | GR1424 | P95 | | |
| GR1133 | P93, P97 | GR1425 | P95, P97 | | |
| GR1134 | P93, P97 | GR1426 | P95 | | |
| GR1136 | P93 | GR1427 | P95 | | |
| GR1137 | P93 | GR1451 | P97 | | |
| GR1142 | P93, P97 | | | | |
| GR1143 | P93 | | | | |
| GR1144 | P93, P97 | | | | |
| GR1145 | P93 | | | | |
| GR1148 | P91 | | | | |
| GR1150 | P99 | | | | |
| GR1151 | P99 | | | | |
| GR1152 | P99 | | | | |
| GR1153 | P99 | | | | |
| GR1154 | P99 | | | | |
| GR1155 | P99 | | | | |
| GR1157 | P99 | | | | |
| GR1158 | P99 | | | | |
| GR1162 | P99 | | | | |
| GR1165 | P91, P95 | | | | |
| GR1167 | P91, P95 | | | | |
| GR1168 | P91 | | | | |
| GR1171 | P59 | | | | |
| GR1173 | P91, P93 | | | | |
| GR1177 | P52 | | | | |
| GR1178 | P52 | | | | |
| GR1183 | P49 | | | | |
| GR1184 | P49 | | | | |
| GR1185 | P49 | | | | |