

MODEL 3200
FLEX ECONO-FOLD® PLANTER
(Mechanical Seed Metering)
OPERATOR & PARTS
MANUAL

M0192

Rev. 7/10

This manual is applicable to: Model: 3200 Flex Econo-Fold® Planters
Serial Number: 680370 And On

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

Model Number _____ 3200 _____

Serial Number _____

Date Purchased _____

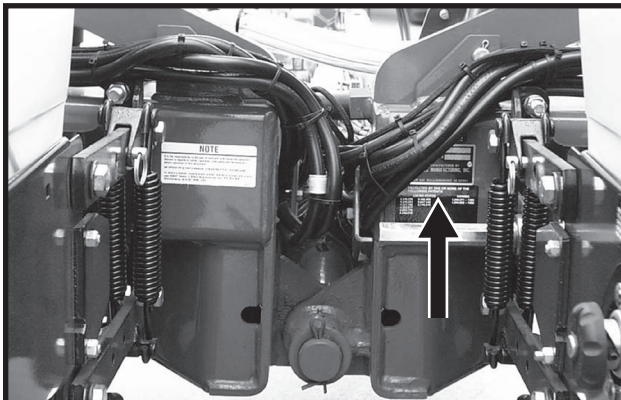
Monitor Serial Number _____
Measured Pulses Per Mile/Km (Radar Distance Sensor) _____
Measured Pulses Per Mile/Km (Magnetic Distance Sensor) _____

SERIAL NUMBER

The serial number plate is located on the planter frame to be readily available. It is suggested that your serial number and purchase date also be recorded above.

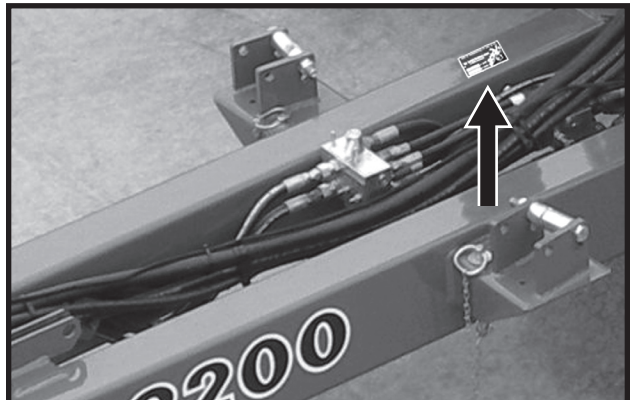
The serial number provides important information about your planter and may be required to obtain the correct replacement part. Always provide the model number and serial number to your KINZE® Dealer when ordering parts or anytime correspondence is made with KINZE Manufacturing, Inc.

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Prior to 2009 production

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2009 production and on

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PREDELIVERY/DELIVERY CHECKLIST

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 CHECKLIST

After the planter has been completely assembled, use the following checklist 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 are properly spaced and optional attachments are correctly assembled.
- Be sure shipping stand has been removed.
- 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 lug bolts to specified torque.
- Check to be sure all safety warning signs are correctly located and legible. Replace if damaged.
- Check to be sure all reflective decals and SMV sign are correctly located and visible when the planter is in transport position.
- 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 lockup devices are on the planter and correctly located.
- Be sure wing locking pins and eyebolts work properly.
- Check seed meters on test stand to ensure proper performance.
- Auxiliary safety chain is properly installed and hardware is torqued to specification.

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 _____ Delivery Date _____
Street Address _____ Model No. 3200 Serial No. _____
City, State/Province _____ Dealer Name _____
ZIP/Postal Code _____ Dealer No. _____

DELIVERY CHECKLIST

At the time the planter is delivered, the following checklist is to be used as 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 reflective decals 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 CHECKLIST

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 warning signs (decals), reflective decals and SMV sign are correctly located and that decals are 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

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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 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/or the words **NOTE, IMPORTANT, CAUTION, WARNING** or **DANGER** are used to call your attention to important information. The definition of each of these terms follows:

NOTE: Indicates a special point of information or addresses a machine adjustment.

IMPORTANT: Indicates an operation or maintenance condition which, if not corrected, could result in damage to machine, property, crops or the environment.



CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate personal injury.



WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious personal injury.



DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious personal injury.



WARNING: Some photos in this manual may show safety covers, shields or lockup devices removed for visual clarity. **NEVER OPERATE** the machine without all safety covers, shields and lockup devices 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. Additional copies of the Limited Warranty can be obtained through your KINZE® Dealer.

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.

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

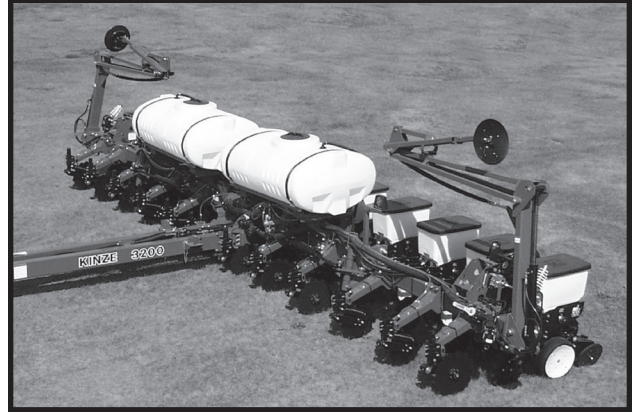
The Model 3200 Flex Econo-Fold® Planter is available in different sizes and row spacings and permits installation of various row unit attachments and liquid fertilizer options.

GENERAL INFORMATION

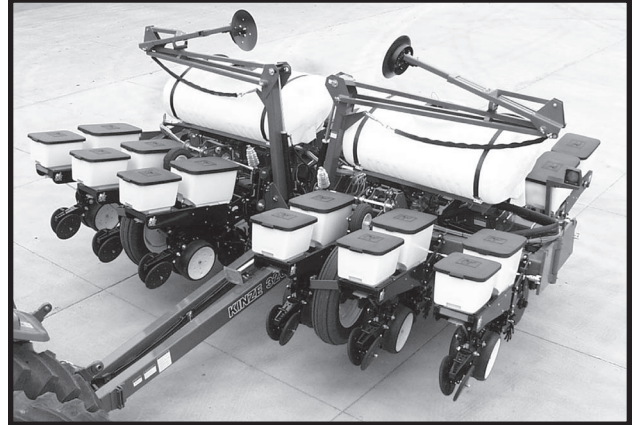
The information used in this manual was current at the time of printing. However, due to KINZE's ongoing product improvement, production changes may cause your machine to appear slightly different in detail. KINZE Manufacturing, Inc. reserves the right to change specifications or design without notice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

Right hand (R.H.) and left hand (L.H.), as used throughout this manual, are determined by facing in the direction the machine will travel when in use unless otherwise stated.

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INTRODUCTION

SPECIFICATIONS

BASE MACHINE TYPE - Pull Type - Two-Section Center-Flex/Manual Horizontal Front Fold
(Hydraulic Wing Fold Optional)

SEED METER TYPE - Mechanical Seed Metering System

PLANTING UNIT TYPES - Pull Row Units

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

DRIVE SYSTEM - Two 4.10" x 6" Spring-Loaded Contact Drive Tires With No. 40 Chain
- Two Quick-Adjust End Mounted Seed Transmissions With Machined Sprockets
- 7/8" Hex Drive/Drill Shafts With Spring-Loaded Wing Couplers
- Six 7.50" x 20" 8 Ply Transport/Ground Drive Tires

TYPE LIFT - Master/Slave Rephasing With Assist Cylinders (6 Cylinders)

ROW MARKERS - Three-Fold Low Profile With Depth Band On Marker Blades

HYDRAULICS - Dual SCV For Independent Operation Of Lift And Row Markers
- Hydraulic Sequence Valve With Flow Controls For Row Markers

DIMENSIONS/WEIGHTS

PLANTER SIZE	8 Row 36"/38"	12 Row 30"
Transport Width	14' 7"	16' 2"
Planting Width	27' 0"	31' 4"
Transport Height	9' 1"	9' 1"
Weight*	6444 lbs.	7548 lbs.

* Base machine weights include toolbar and hitch, row markers, hydraulic hoses, cylinders and fittings, tires, wheels and hubs, drive and drill shafts, seed transmissions, sprockets, chains and drive components, safety/warning lights, SMV sign, transport safety chains, parking jack, KINZE® plateless 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
 - KPM I
 - KPM II Stack-Mode With Magnetic Distance Sensor Or Radar Distance Sensor
 - KPM III With Magnetic Distance Sensor Or Radar Distance Sensor
- Half Rate (2 To 1) Drive Reduction Package
- Hydraulic Wing Fold Package
- Point Row Clutch Package
- Two-Speed Point Row Clutch Package
- Liquid Fertilizer Package With Piston Pump And Double Disc Or Notched Single Disc Fertilizer Opener Options


ROW UNIT OPTIONS/ATTACHMENTS

- Finger Pickup Or Brush-Type Seed Meters
- Closing Options
 - Rubber "V" Closing Wheels
 - Cast Iron "V" Closing Wheels
 - Covering Discs/Single Press Wheel
 - Drag Closing Attachment
- Granular Chemical Application
- Hopper Panel Extension Package
- Spring Tooth Incorporator
- Row Unit Mounted No Till Coulter
- Coulter Mounted Residue Wheels
- Row Unit Mounted Disc Furrowers
- Row Unit Mounted Bed Leveler
- Row Unit Mounted Residue Wheel
- Frame Mounted Coulter
- Residue Wheel Attachment Frame Mounted Coulter

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. Review these instructions frequently! 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 row marker assemblies are in operation.**


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


 **To avoid serious injury or death, care must be taken when operating row markers around overhead power lines.**


 **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.**

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

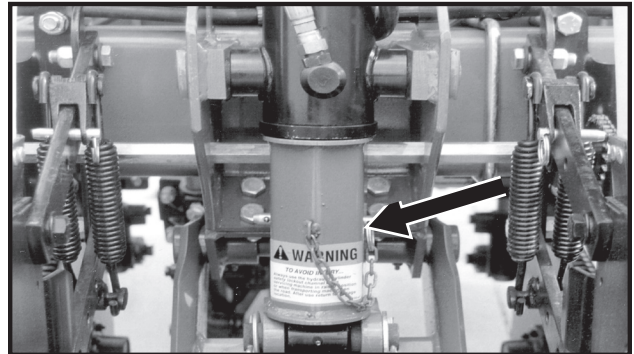
 **Do not allow anyone to stand between the tongue or hitch and the towing vehicle when backing up to the planter.**

 **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 safety hazards.**

 **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 on the container label and of the equipment manufacturer.**

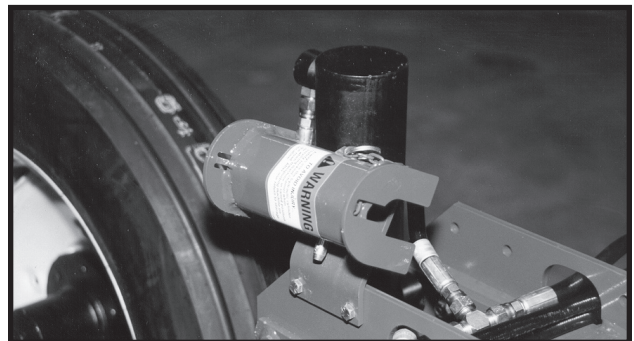
 **Always install safety lockup devices before transporting the planter or working under the unit.**

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Lift Cylinder Lockup In Transport Position

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Lift Cylinder Lockup In Storage Position

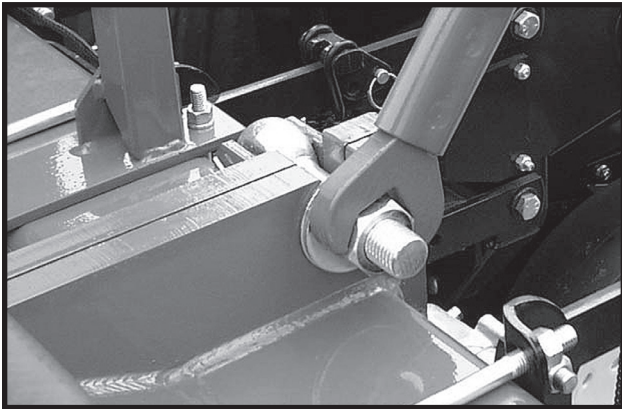
 **Always make sure safety/warning lights, reflectors/reflective decals and SMV sign are in place and visible prior to transporting the machine on public roads. In this regard, check federal, state/provincial and local regulations.**

 **Pressurized hydraulic fluid can penetrate body tissue and result in serious infection, injury, or death. Before applying pressure to the hydraulic system, make sure all connections are tight and that hoses and fittings have not been damaged. Leaks can be invisible. Keep away from suspected leaks. Relieve pressure in the hydraulic system before searching for leaks, disconnecting hoses, or performing any other work on the system. Fluid injected under the skin must be **IMMEDIATELY** removed by a surgeon familiar with this type of injury.**



SAFETY PRECAUTIONS

-  Always secure wing locking eyebolts before operating the planter.

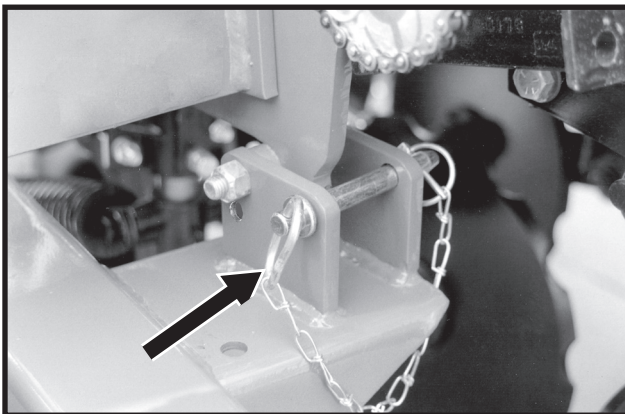
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Wing Locking Eyebolt

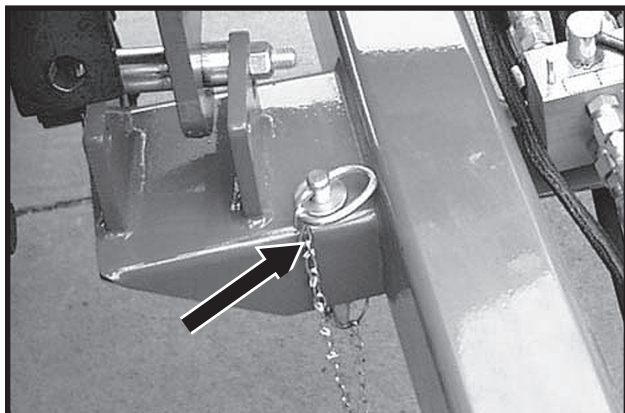
-  Avoid standing between the wings and main frame when folding the planter. Wings may swing suddenly.
-  Always make sure wings are secured with safety pins before transporting the planter.

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Wing Safety Pin In Transport Position


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Wing Safety Pin In Storage Position


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

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


-  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 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.

-  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.

-  Allow for unit length when making turns.

-  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.


-  Avoid sudden uphill turns on steep slopes.

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

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

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

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

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

-  Limit towing speed to 15 MPH. Tow only with farm tractor of minimum 75 HP.

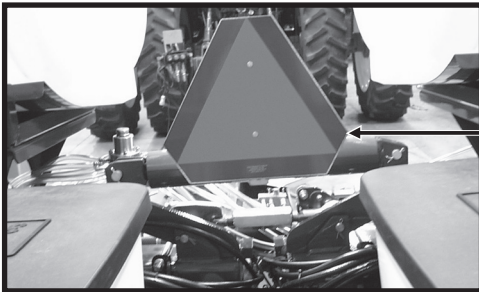
SAFETY WARNING SIGNS

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 the safety of 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 reflective decals and SMV sign periodically. Replace if they show loss of any of their reflective properties.**
- **When replacing decals, clean the machine surface thoroughly using soap and water or cleaning solution to remove all dirt and grease.**

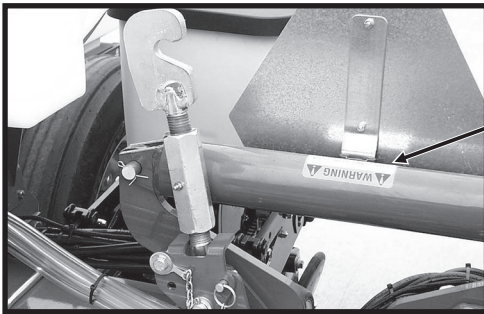
NOTE: Style and locations of SMV sign, reflective decals and safety/warning lights conform to ANSI/SAE S279.13 DEC2005 and ANSI/SAE S276.6 JAN2005.

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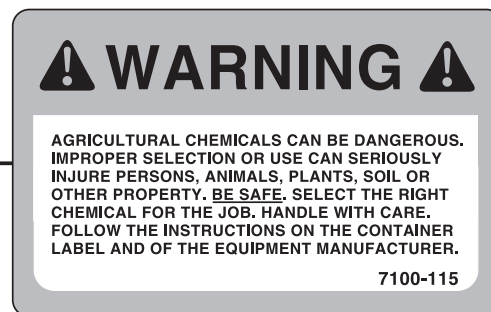
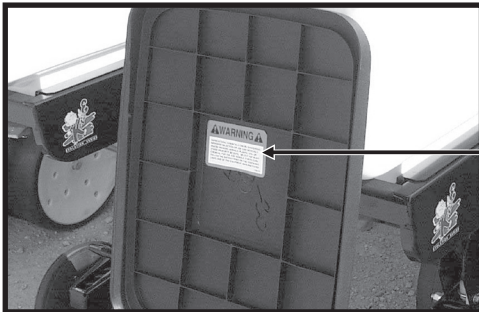
Part No. GD2199 SMV Emblem

D06029909



Part No. G7100-24 (Qty. 1)

D06039901



Part No. G7100-115
(Located On Underside Of Optional
Granular Chemical Hopper Lids)

SAFETY WARNING SIGNS

12 Row 30" Shown

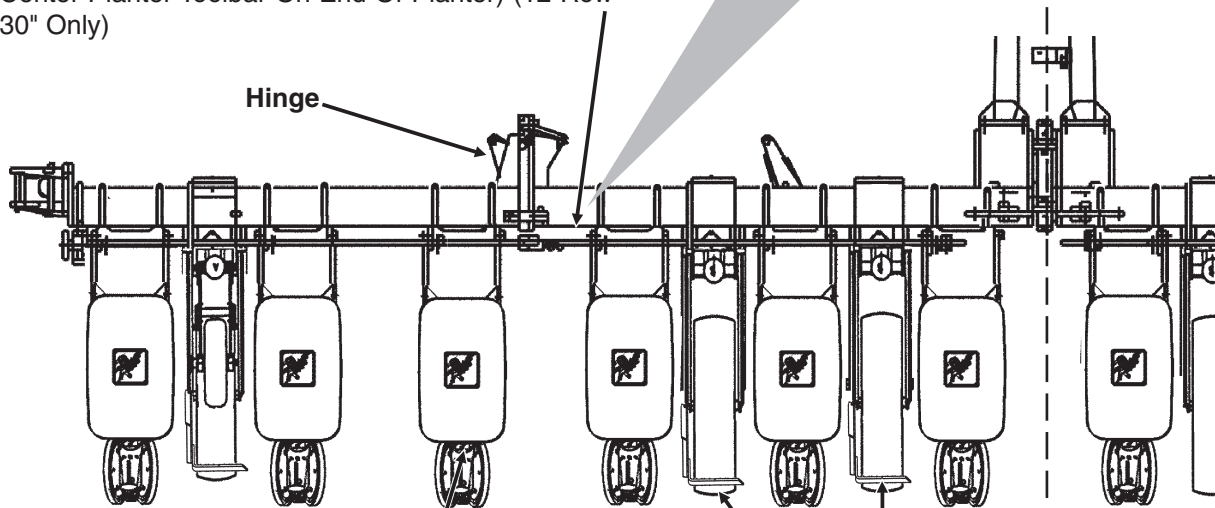
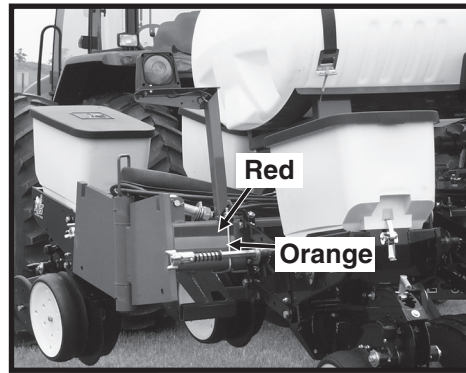
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Part No. G7100-258 Red Reflective Decal
(Qty. 2 - One Located On Top Of Rear Side Of Center Planter Toolbar On Each End Of Planter) (12 Row 30" Only)

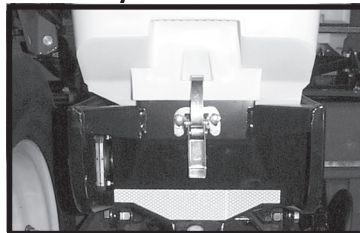
Part No. G7100-260 Orange Reflective Decal
(Qty. 2 - One Located On Bottom Of Rear Side Of Center Planter Toolbar On End Of Planter) (12 Row 30" Only)

D06060117



PartNo.G7100-262 Amber Reflective Decal (Qty. 2 - Forward-Facing In Transport Position - One Located On The Hopper Support On First Row Unit On Outer Side Of Hinge On Each Half Of Planter)

D060800114



PartNo.G7100-259 Amber Reflective Decal (Qty. 2 - Forward-Facing In Transport Position - One Located On The Granular Chemical Hopper Panel Extension On First Row Unit On Outer Side Of Hinge On Each Half Of Planter) (If Applicable)

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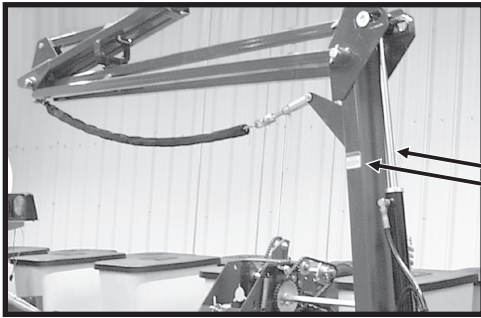


Part No. G7100-258 Red Reflective Decal (Qty. 4 - Rear-Facing In Transport Position - Located On Top Of Rear Side Of Transport Tire Scrapers)

Part No. G7100-260 Orange Reflective Decal (Qty. 4 - Rear-Facing In Transport Position - Located On Bottom Of Rear Side Of Transport Tire Scrapers)

SAFETY WARNING SIGNS

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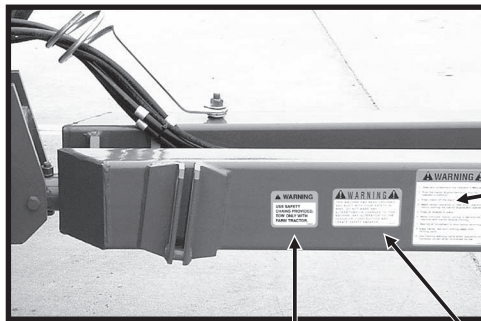
 WARNING



TO AVOID INJURY --
STAND CLEAR--KEEP OTHERS
AWAY WHEN RAISING OR LOWERING
MARKERS. BEFORE TRANSPORTING
PLANTER FULLY EXTEND HYDRAULIC
CYLINDERS AND INSTALL LOCKING
PINS WHERE PROVIDED.

7100-42

Part No. G7100-42 (Qty. 4 - Two Per Marker)

D06029911a



 WARNING 

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

7100-46

Part No. G7100-46 (Qty. 1)

 WARNING

USE SAFETY
CHAINS PROVIDED.
TOW ONLY WITH
FARM TRACTOR.

7100-302

Part No. G7100-302 (Qty. 1)

 WARNING 

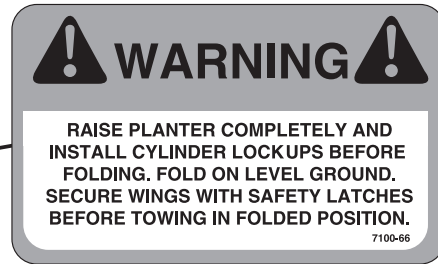
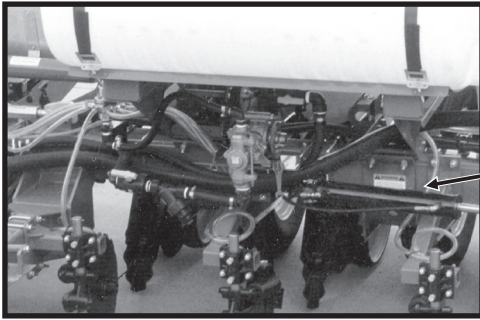
THIS MACHINE HAS BEEN DESIGNED
AND BUILT WITH YOUR SAFETY IN
MIND. DO NOT MAKE ANY
ALTERATIONS OR CHANGES TO THIS
MACHINE. ANY ALTERATION TO THE
DESIGN OR CONSTRUCTION MAY
CREATE SAFETY HAZARDS.

7100-90

Part No. G7100-90 (Qty. 1)

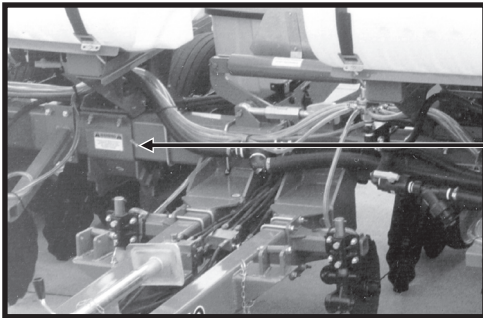
SAFETY WARNING SIGNS

08069714



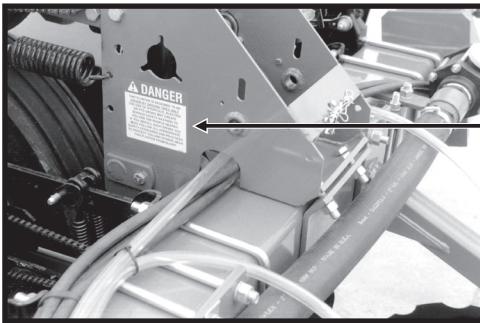
Part No. G7100-66 (Qty. 2 - Located On Upper Side Of Outer Wheel Module Arm Clamps)

08069714



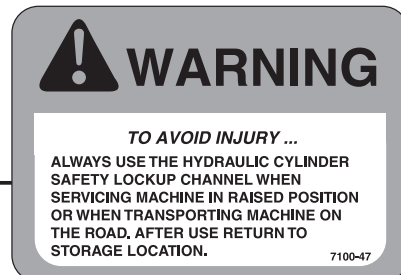
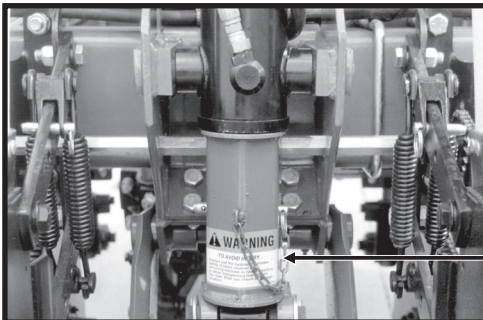
Part No. G7100-71 (Qty. 2 - Located On Upper Side Of Inner Wheel Module Arm Clamps)

08049721



Part No. G7100-89 (Qty. 2)

08059723



Part No. G7100-47 (Qty. 4)

MACHINE OPERATION

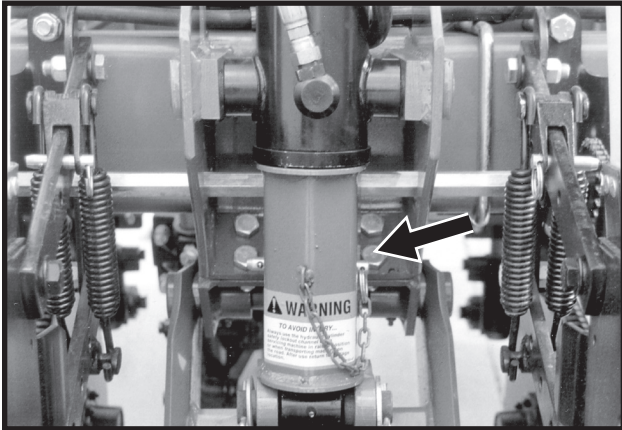
The following information is general in nature and was written to aid the operator in preparation of the tractor and planter for use, and to provide general operating procedures. The operator's experience, familiarity with the machine and the following information should combine for efficient planter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

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

LIFT CYLINDER LOCKUPS

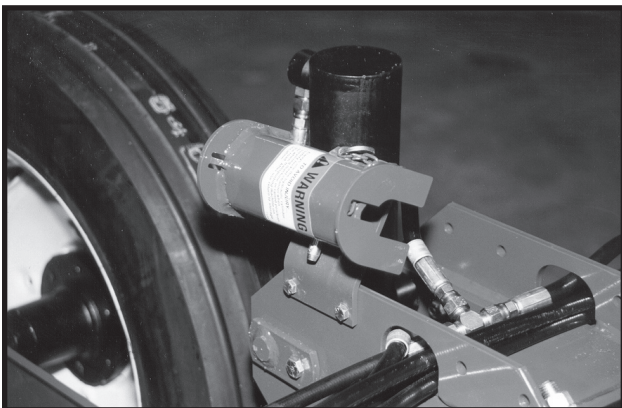
Always install all lift cylinder lockups before transporting the planter or working under the unit.

08059723



Lift Cylinder Lockup In Transport Position

03279814

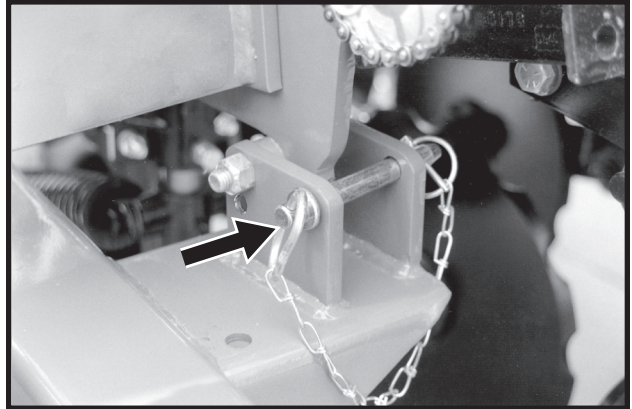


Lift Cylinder Lockup In Storage Position

WING SAFETY PINS

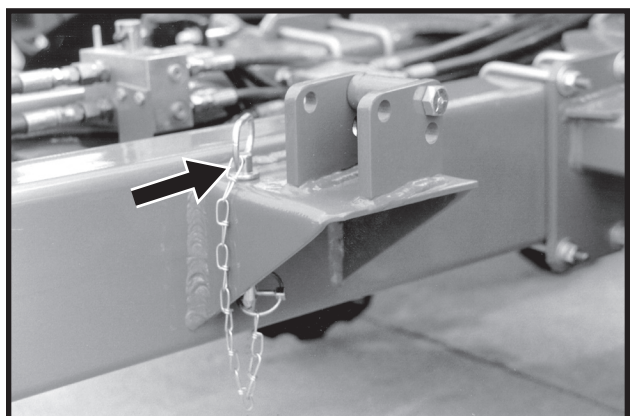
Always make sure wings are secured with safety pins before transporting the planter.

08049702b



Wing Safety Pin In Transport Position

08049707a



Wing Safety Pin In Storage Position

MACHINE OPERATION

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.

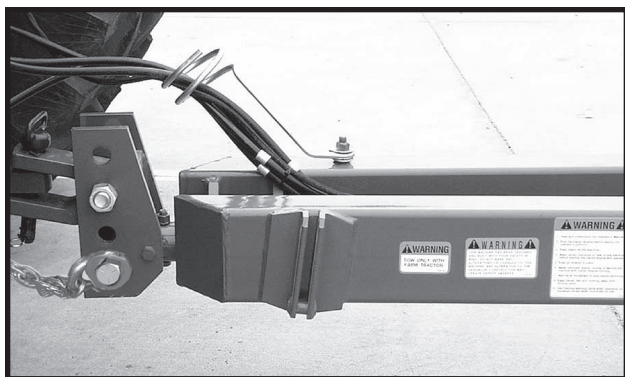
TRACTOR REQUIREMENTS

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.

TRACTOR PREPARATION AND HOOKUP

D06029911b



1. Adjust tractor drawbar to 13" to 17" above the ground. Adjust the drawbar so the hitch pin hole is directly below the center line of the PTO shaft. Make sure the drawbar is in a stationary position.
2. Back tractor to planter and connect with hitch pin. Make sure hitch pin is secured with locking pin or cotter pin.
3. The auxiliary attaching system (transport safety chain) provided with your planter should be used to ensure the connection is retained between the planter and tractor in the event of a hitch pin/drawbar failure. The safety chain is to be attached to the planter using an unused clevis mounting hole on the planter hitch. The mounting hardware should be torqued to 840 ft. lbs. Connect the hookend of the chain securely around a tractor frame member.

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

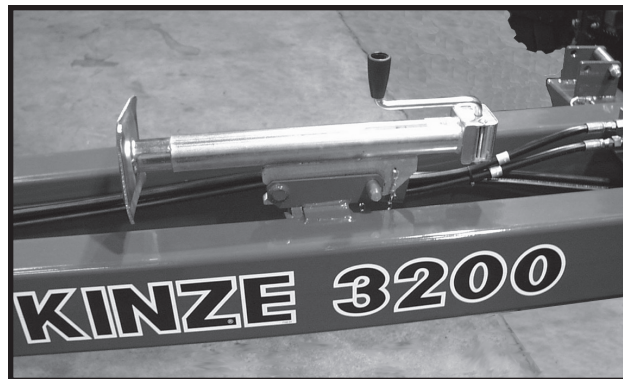
IMPORTANT: Always wipe hose ends to remove any dirt before connecting couplers to tractor ports.



Pressurized hydraulic fluid can penetrate body tissue and result in serious infection, injury, or death. Before applying pressure to the hydraulic system, make sure all connections are tight and that hoses and fittings have not been damaged. Leaks can be invisible. Keep away from suspected leaks. Relieve pressure in the hydraulic system before searching for leaks, disconnecting hoses, or performing any other work on the system. Fluid injected under the skin must be IMMEDIATELY removed by a surgeon familiar with this type of injury.

5. 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 safety/warning lights on planter are working in conjunction with warning lights on tractor.
6. Raise jack stand and mount horizontally on storage bracket.

D05179901



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

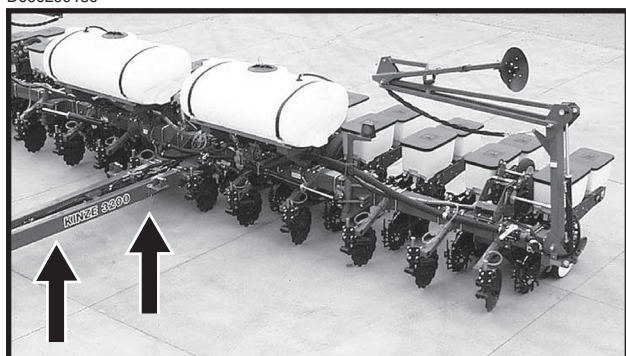
MACHINE OPERATION

LEVELING THE PLANTER

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

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

D06029915c

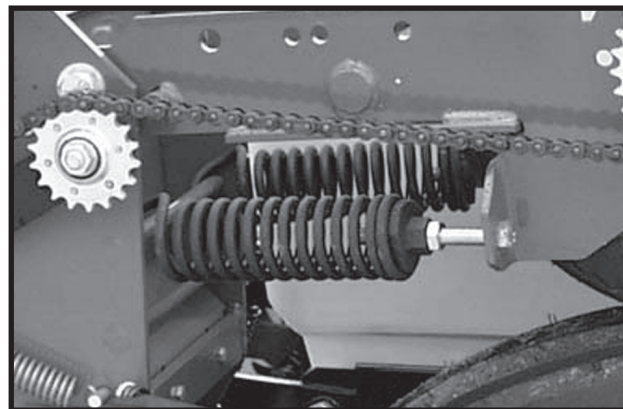


With the planter lowered to operating height, check to be sure the frame is level fore and aft. Recheck once planter is in the field.

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

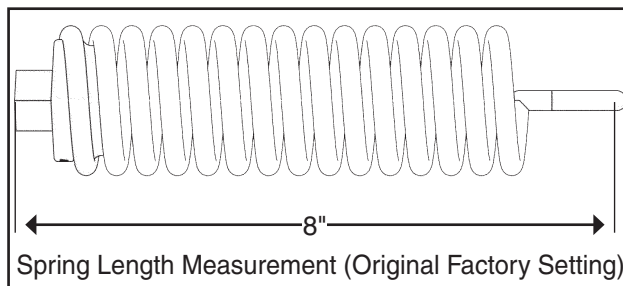
CONTACT WHEEL SPRING ADJUSTMENT

D06049909



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

A2068

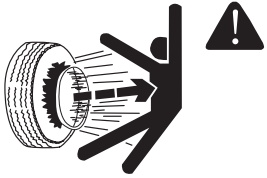


The basic setting for spring tension is approximately 200 lbs. of down force at tire contact point.

NOTE: Measurement must be taken in planting position with proper tire pressure.

MACHINE OPERATION

TIRE PRESSURE



WARNING: Rim and tire servicing, improper use of rims and tires, or worn or improperly maintained tires could result in a tire explosion. The explosive separation of rim and tire parts could result in death or serious personal injury.

To prevent tire explosion, do the following:

- Maintain proper tire pressure. Inflating a tire above or below the recommended pressure can cause tire damage.
- Mount tires only by properly trained personnel using proper equipment.
- Replace any tire with cuts or bubbles. Replace any damaged rims. Replace any missing lug bolts and nuts.
- Do not weld or heat wheel assembly. Heating increases tire pressure.

TRANSPORT TIRES



WARNING: Different rims are designed for different tire pressures. Over-inflation of tires on thinner rims could result in explosive separation of rim and tire that could result in death or serious personal injury.

To prevent tire explosion, do not exceed the following maximum pressures:

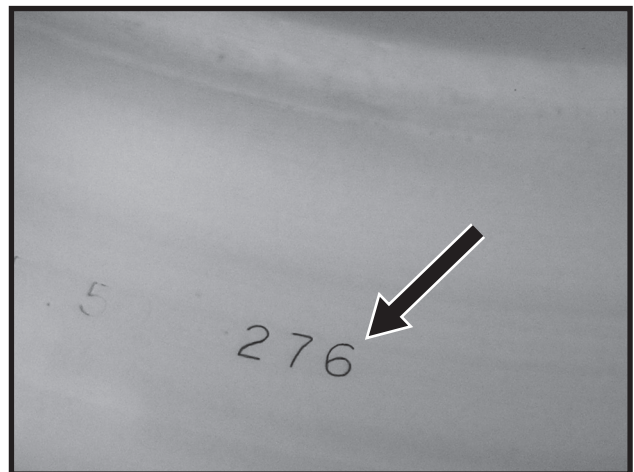
- Rims stamped with “224”: 75 psi (517.1 kPa) maximum pressure.
- Rims stamped with “276”: 100 psi (689.4 kPa) maximum pressure.

D03231013



Maximum Tire Pressure is 75 psi (517.1 kPa)

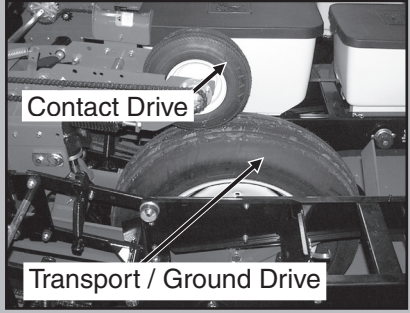
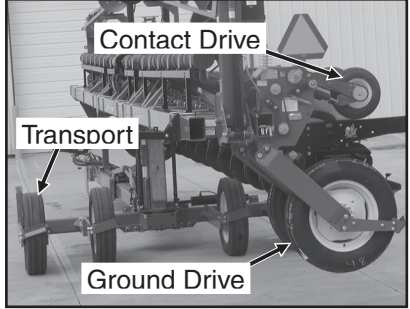
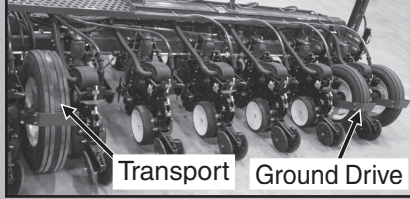
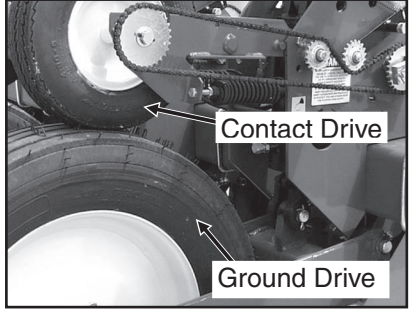
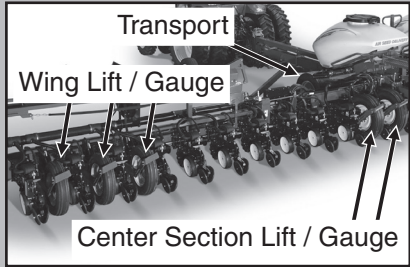
D03301009



Maximum Tire Pressure is 100 psi (689.4 kPa)

MACHINE OPERATION

Tire pressure should be checked regularly and maintained as follows:

Model / Tire Size / Tire Pressure	Tire Identification
<p>3000 / 3200 / 3500 Transport / ground drive - 7.50" x 20 40 psi (275.7 kPa) Contact drive - 4.10" x 6" 50 psi (344.7 kPa)</p>	
<p>3600 Transport (center section) 255-70R 22.5 ("224" rim)75 psi (517.1 kPa) recommended / 75 psi (517.1 kPa) max. Transport (center section) 255-70R 22.5" ("276" rim)75 psi (517.1 kPa) recommended / 100 psi (689.4 kPa) max. Ground drive (wings) 7.50" x 20"..... 40 psi (275.7 kPa) Contact drive - 4.80" x 8"..... 50 psi (344.7 kPa) Liquid fertilizer piston pump 7.60" x 15" 40 psi (275.7 kPa)</p>	
<p>3660 Transport (center section) 255-70R 22.5 ("224" rim)75 psi (517.1 kPa) recommended / 75 psi (517.1 kPa) max. Transport (center section) 255-70R 22.5" ("276" rim)75 psi (517.1 kPa) recommended / 100 psi (689.4 kPa) max. Ground drive (wings) 7.50" x 20"..... 40 psi (275.7 kPa) Liquid fertilizer piston pump 7.60" x 15" 40 psi (275.7 kPa)</p>	
<p>3700 Ground drive (wings) 255-70R 22.5 75 psi (517.1 kPa) Transport - 36" x 16" x 17.5" 75 psi (517.1 kPa) Contact drive - 4.80" x 8"..... 50 psi (344.7 kPa) Row marker - 16" x 6.5" x 8" 14 psi (96.5 kPa) Liquid fertilizer piston pump 4.10" x 6" 50 psi (344.7 kPa)</p>	
<p>3800 Center section lift / gauge - 41 x 11R22.5" radial load range H ("224" rim)75 psi (517.1 kPa) recommended / 75 psi (517.1 kPa) max. Center section lift / gauge - 41 x 11R22.5" radial load range H ("276" rim)75 psi (517.1 kPa) recommended / 100 psi (689.4 kPa) max. Wing lift / gauge - 7.50" x 20" 8 ply custom rib implement. . . 40 psi (275.7 kPa) Transport - 445-50R22.5R radial load range H 120 psi (827.3 kPa) Row marker - 20.5 x 8.0-10..... 35 psi (241.3 kPa) Liquid fertilizer piston pump - 7.60" x 15" rib implement . . . 40 psi (275.7 kPa)</p>	

MACHINE OPERATION

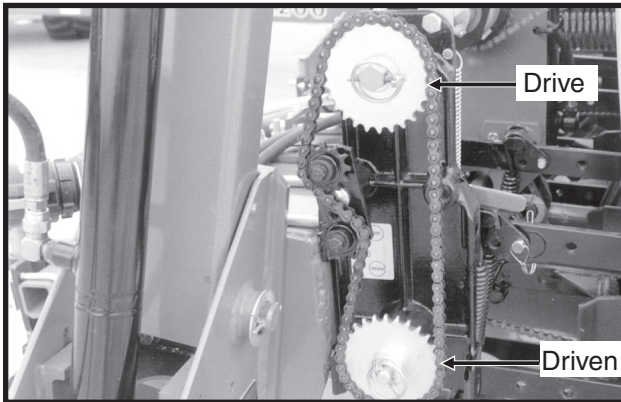
SEED RATE TRANSMISSION ADJUSTMENT

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

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

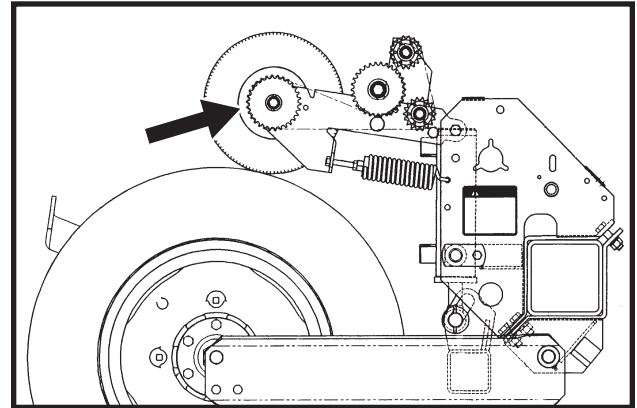
The planting rate charts found at the back of this section will aid you in selecting the correct sprocket combinations.

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STANDARD RATE DRIVE

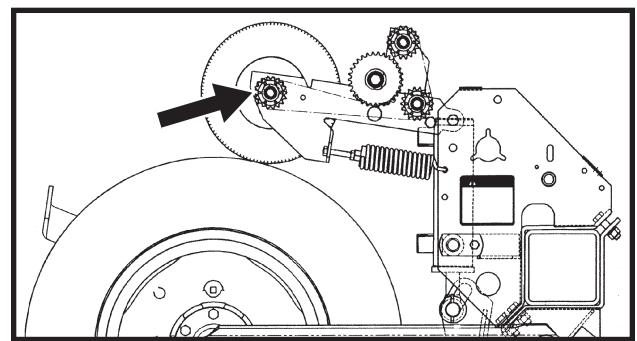
(A8115W)



Seed planting rate charts are based on the standard rate drive. The standard rate drive uses a 30 tooth sprocket on each contact drive tire. Using the 15 tooth half rate (2 to 1) drive sprocket in place of the 30 tooth sprocket will reduce the planting and application rates by approximately 50%. See "Half Rate (2 To 1) Drive".

HALF RATE (2 TO 1) DRIVE

(A8115X)



Half rate (2 to 1) drive is recommended only when desired population falls below that shown on planting rate charts. Replacing the 30 tooth drive sprocket, located at the contact drive wheel, with the 15 tooth half rate (2 to 1) drive sprocket will slow the planter transmission speed and reduce planting and application rates by approximately 50%.

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

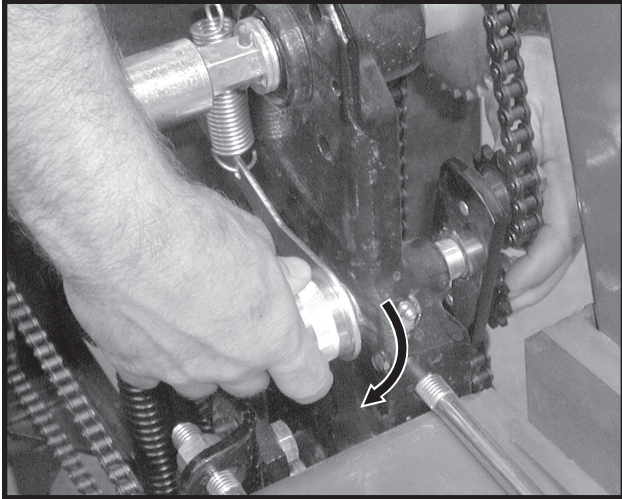
MACHINE OPERATION

WRAP SPRING WRENCH OPERATION

The chain idlers are equipped with wrap spring wrenches. Chain tension is released and/or added as shown below.

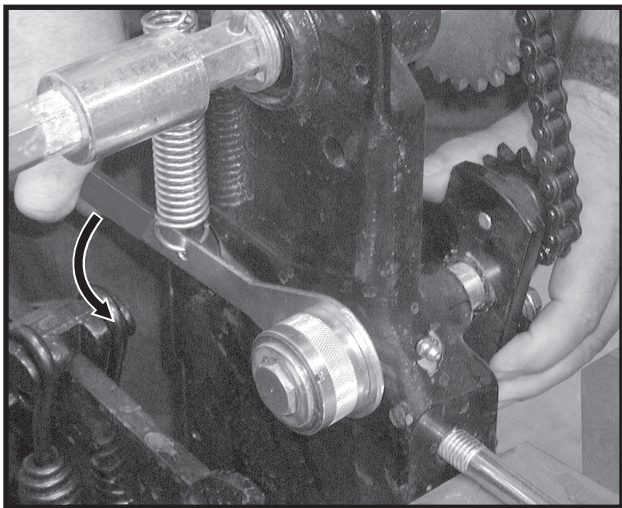
To release chain tension, rotate the knurled collar on the wrap spring wrench while rotating the chain idler away from the chain.

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To add chain tension, rotate the chain idler into the chain while rotating the handle to tension idler spring.

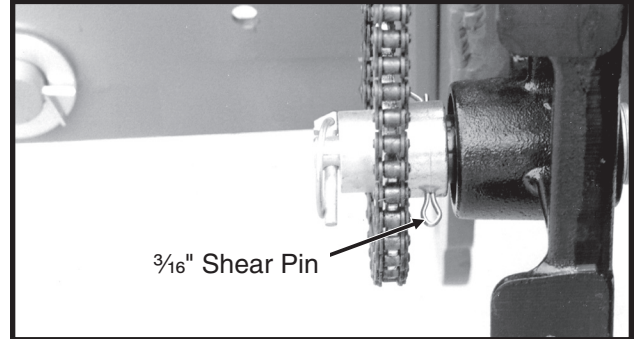
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SHEAR PROTECTION

The planter driveline and seed and granular chemical drivelines are protected from damage by shear pins.

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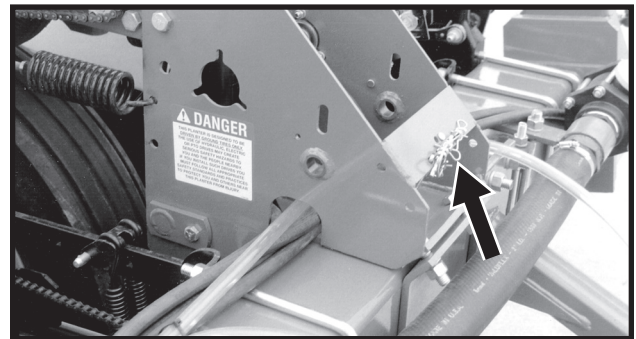


Transmission Shaft

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

NOTE: Drill shaft/transmission coupler alignment is critical.

08049721



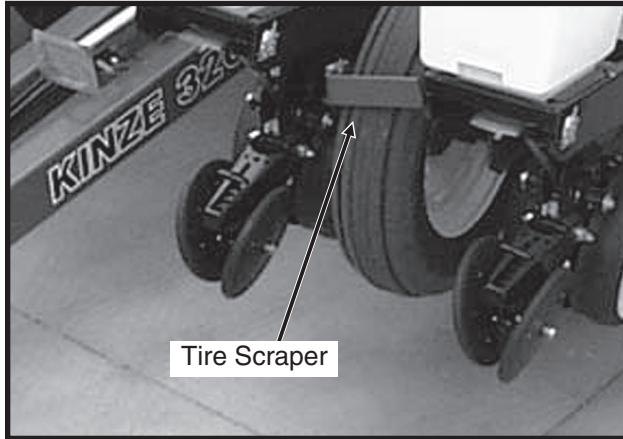
Additional shear pins can be found in the storage area located on the wheel module.

MACHINE OPERATION

TIRE SCRAPER

Due to the clearance between the wheel assembly and the transport tire, a tire scraper should always be used. This will help prevent a buildup of dirt/mud between the wheel arm assembly and the tire. Adjust the scraper so a 1/2" gap is maintained between the scrapers and tires.

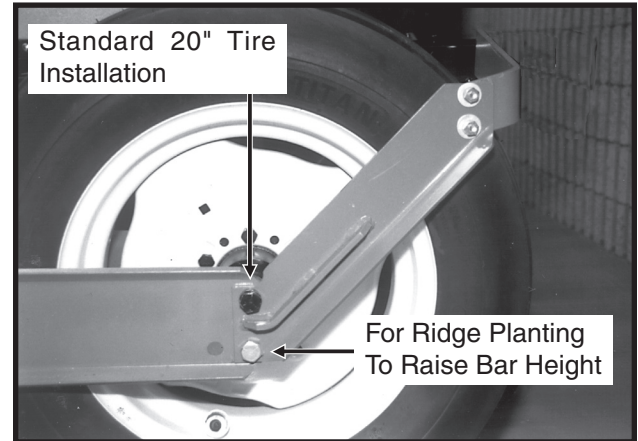
D06029902a



RIDGE PLANTING

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

83154-1a



MACHINE OPERATION

PLANTER HYDRAULIC LIFT OPERATION

The planter lift system consists of six cylinders with one master, one slave and one lift assist cylinder on each half of the planter.

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

IMPORTANT: The planter lift cylinders may get out of phase causing the planter to lift unevenly. On each master cylinder and each slave cylinder a valve located in the cylinder's piston allows the lift system to be rephased when the cylinders are cycled by lowering the planter to the ground and holding the hydraulic control for 5 to 10 seconds. Cycle the system until the planter lifts and lowers evenly.



WARNING: Always position lockup devices in "safety" position over the cylinder rods when transporting or storing planter. See "Safety Precautions".

FIELD TO TRANSPORT OPERATION - Manual Wing Fold



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

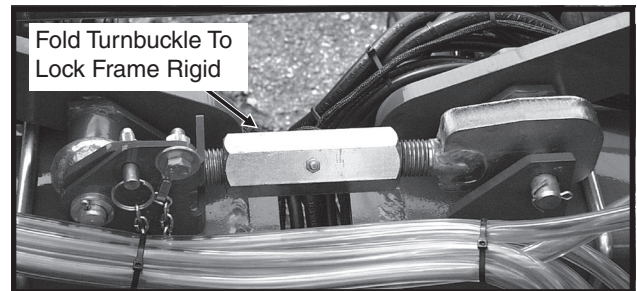
SUMMARIZED FIELD TO TRANSPORT SEQUENCE

- Raise row markers and lower planter.
- Position turnbuckle to hold frame in level position.
- Loosen wing locking eyebolts and swing over to unlock wings.
- Raise planter.
- Install lockups on center lift cylinders.
- Retract wing lift cylinders.
- Fold wings forward and lock in place.

NOTE: Read the following information for more detailed instructions.

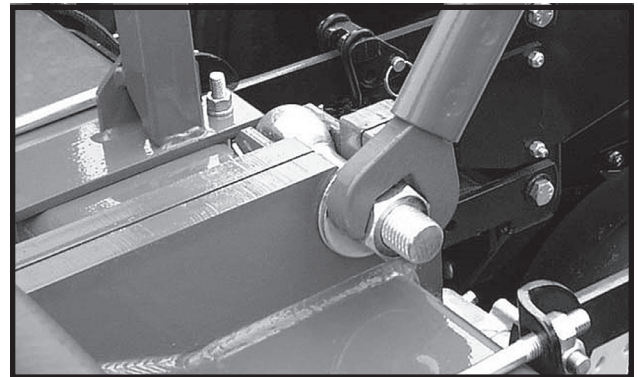
1. Fold the row markers into raised transport position and lower the planter to the ground.
2. Swing the center turnbuckle into position and tighten slightly to hold the planter frame level.

D06039903



3. Using the special wrench which is stored on the hitch of the planter, loosen the 1 1/4" hex nuts which secure the wing locking eyebolts.

D06029910

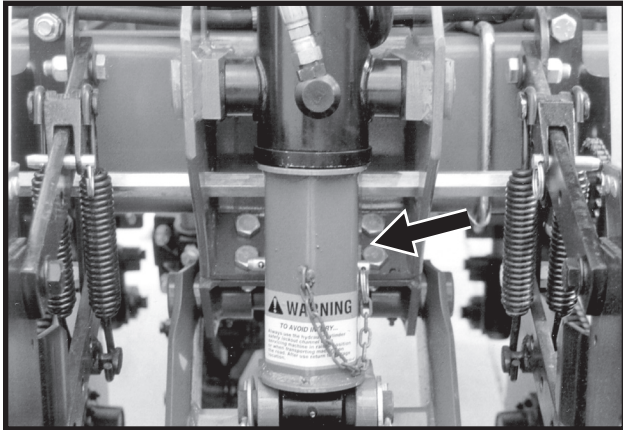


4. Swing the wing locking eyebolts over to release the planter wings.

MACHINE OPERATION

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

08059723



7. Place the tractor hydraulic control in the lowering position and hold until the wing cylinders are fully retracted and the wing tires are fully raised.
8. Fold each wing forward into transport position and lock the wings in place at the marker support and hitch using wing safety pins as shown below. Return wrench to storage position on tongue.

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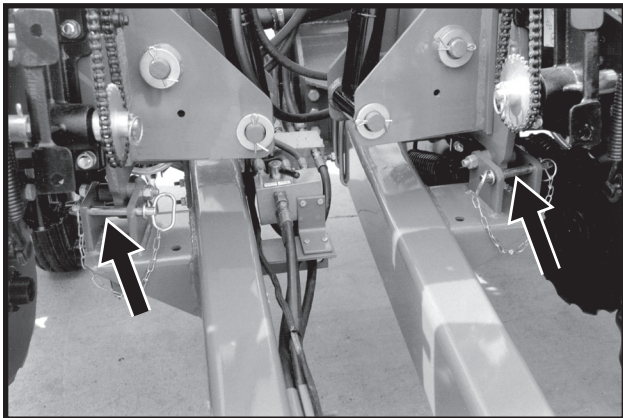


Photo Shows Both Wings Locked In Transport Position



WARNING: Make sure wings are properly locked in place prior to transporting. Wings could swing out if not locked.

TRANSPORT TO FIELD OPERATION - Manual Wing Fold



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

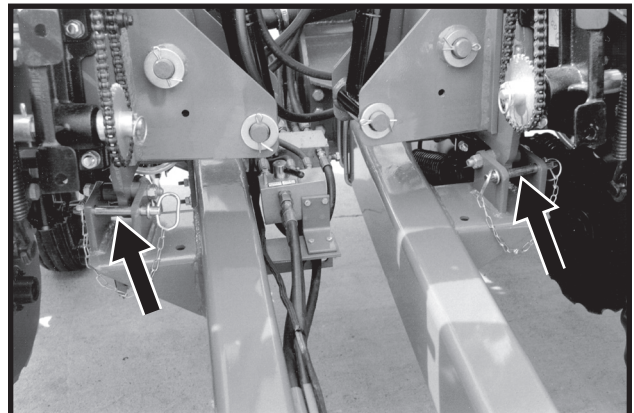
SUMMARIZED TRANSPORT TO FIELD SEQUENCE

- With center lift cylinders retracted and lockups in place, remove wing lock pins and fold wings out.
- Swing wing locking eyebolts into place.
- Extend lift cylinders.
- Remove center section lift cylinder lockups.
- Lower planter.
- Tighten wing locking eyebolts.
- Release turnbuckle at center of planter.

NOTE: Read the following information for more detailed instructions.

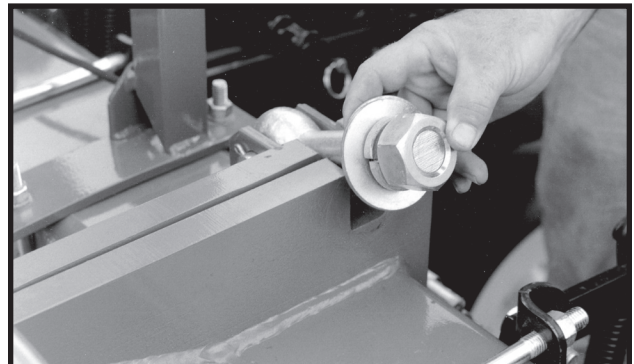
1. If the wing lift tires are not raised, with the cylinder lockups in place on the four center section lift cylinders, move the tractor hydraulic control to the lowering position until the cylinders are fully retracted and the wing tires are fully raised.
2. With the planter raised and the cylinder lockups in place, remove the wing lock pins at the marker support and hitch. Fold the wings out to operating position.

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

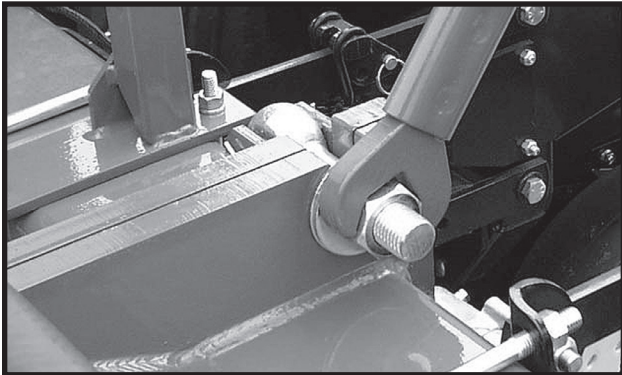
08049708



MACHINE OPERATION

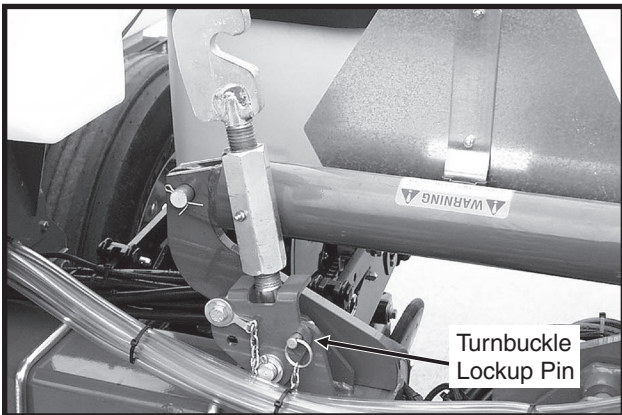
4. Operate the hydraulic control to extend the lift cylinders. (Wing wheel cylinders may not extend all the way.)
5. Remove the cylinder lockups from the four center section lift cylinders and place them in the storage position on the wheel modules.
6. Lower the planter. When the cylinders are fully retracted, hold the tractor's hydraulic control 5 to 10 seconds to rephase the system.
7. Using the special wrench which is stored on the hitch of the planter, tighten the 1 1/4" hex nuts to secure the wing locking eyebolts.

D06029910



8. Release the turnbuckle, located at the center of the planter frame, using the special wrench and latch the turnbuckle into the holder. Return wrench to storage position on tongue.

D06029909



FIELD TO TRANSPORT OPERATION - Hydraulic Wing Fold



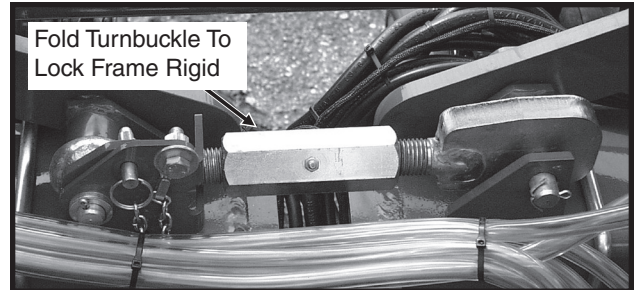
WARNING: Be sure the planter is on a level surface, fore and aft and side to side. Avoid standing between the wings and main frame when folding the planter. Wings may swing suddenly.

SUMMARIZED FIELD TO TRANSPORT SEQUENCE

- Raise row markers and lower planter.
 - Position turnbuckle to hold frame in level position.
 - Move selector valve to "FOLD" position.
 - Loosen wing locking eyebolts and swing over to unlock wings.
 - Raise planter.
 - Install lockups on center lift cylinders.
 - Retract wing lift cylinders.
 - Hydraulically fold wings forward. Lock wings in place.
- NOTE: Read the following information for more detailed instructions.

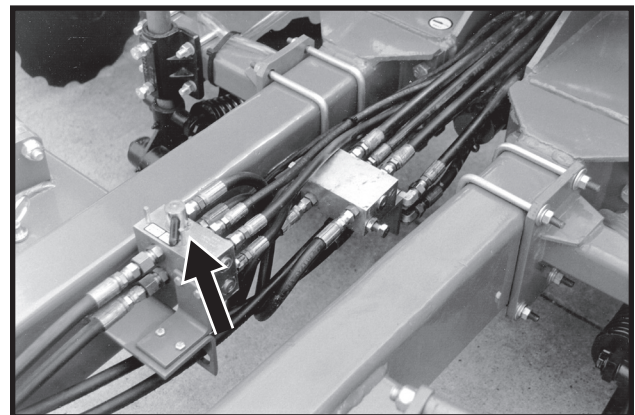
1. Fold the row markers into raised transport position and lower planter to the ground.
2. Swing the center turnbuckle into position and tighten slightly to hold the planter frame level.

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3. Move the lever on the hand operated selector valve to the "FOLD" position. (Relieve pressure from the hydraulic system before moving the selector handle.)

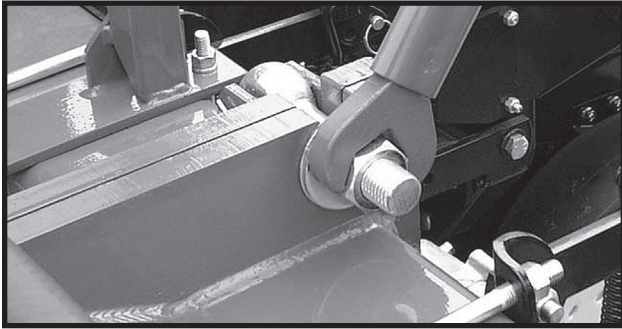
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MACHINE OPERATION

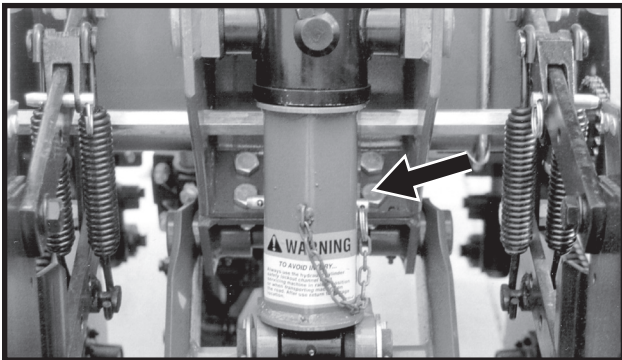
- Using the special wrench which is stored on the hitch of the planter, loosen the 1 1/4" hex nuts which secure the wing locking eyebolts. Swing the wing locking eyebolt on each wing over to release the planter wings. Return wrench to storage position on tongue.

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- Raise the planter.
- Install cylinder lockups on the four center section lift cylinders.

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- Place the tractor hydraulic control in the lowering position and hold until the wing cylinders are fully retracted and the wing tires are fully raised.
- Move the tractor hydraulic control to fold the wings forward into transport position. Lock wings in place at the marker support and hitch using wing safety pins as shown below.

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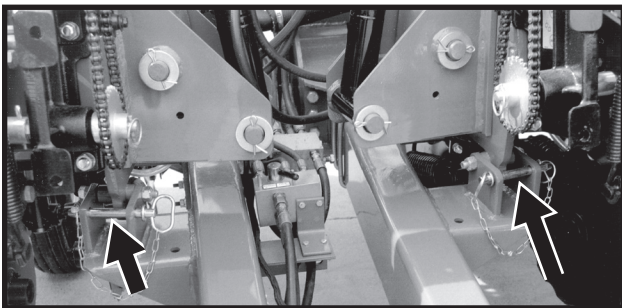


Photo Shows Both Wings Locked In Transport Position



WARNING: Make sure wings are properly locked in place prior to transporting. Wings could swing out if not locked.

TRANSPORT TO FIELD OPERATION - Hydraulic Wing Fold



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

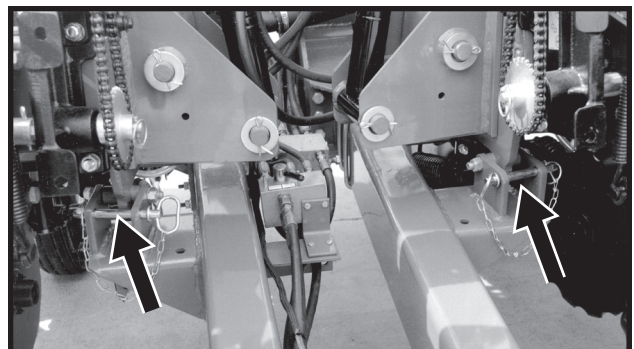
SUMMARIZED TRANSPORT TO FIELD SEQUENCE

- With center lift cylinders retracted and lockups in place, remove wing lock pins.
- Move selector valve to "FOLD" position.
- Hydraulically fold wings out.
- Swing wing locking eyebolts into place.
- Extend lift cylinders.
- Remove center section lift cylinder lockups.
- Lower planter.
- Tighten wing locking eyebolts.
- Release turnbuckle at center of planter.
- Move selector valve to "MARKER" position.

NOTE: Read the following information for more detailed instructions.

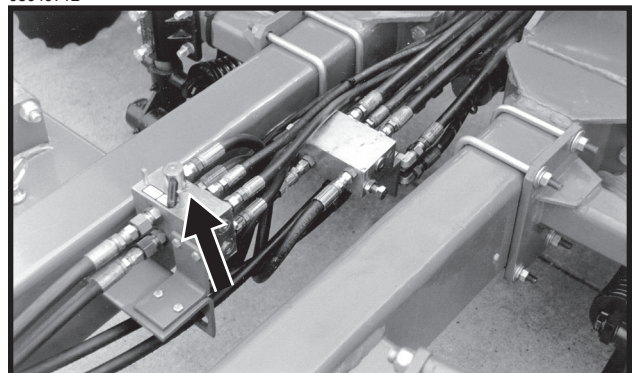
- If the wing lift tires are not retracted, with the cylinder lockups in place on the four center section lift cylinders, move the tractor hydraulic control to the lowering position until the cylinders are fully retracted and the wing tires are fully raised.
- With the planter raised and the cylinder lockups in place, remove the wing lock pins at the marker support and hitch.

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- Position the selector handle on the manual selector valve in the "FOLD" position.

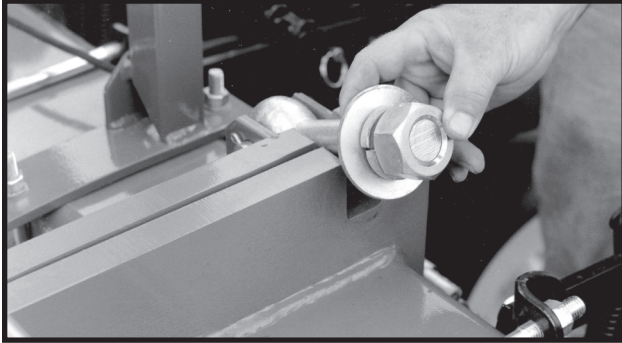
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MACHINE OPERATION

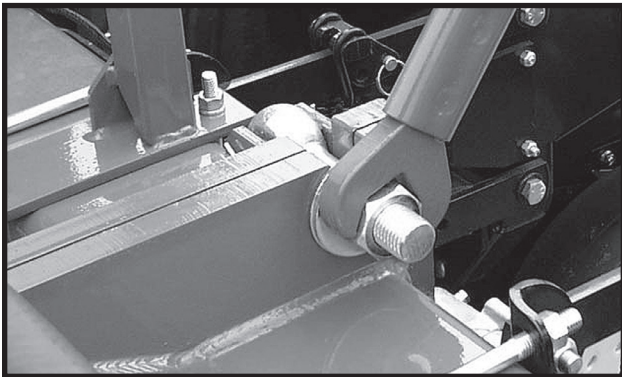
4. Move the tractor hydraulic lever and fold the wings out to operating position.
5. Swing the wing locking eyebolts into position to lock each wing.

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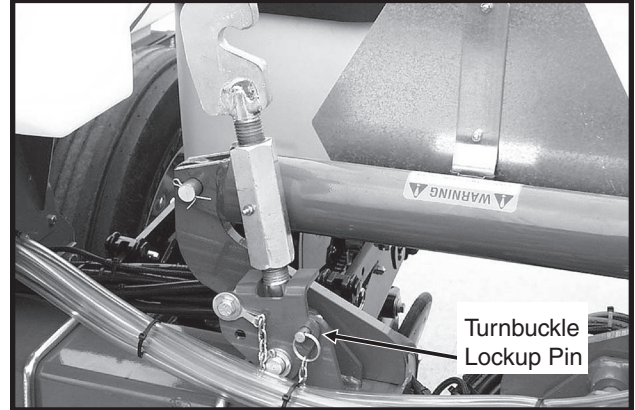
6. Operate the hydraulic control to extend the lift cylinders. (Wing wheel cylinders may not extend all the way.)
7. Remove the cylinder lockups from the four center section lift cylinders and place them in the storage position on the wheel modules.
8. Lower the planter. When the cylinders are fully retracted, hold the tractor's hydraulic control 5 to 10 seconds to rephase the system.
9. Using the special wrench which is stored on the hitch of the planter, tighten the 1 1/4" hex nuts to secure the wing locking eyebolts.

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10. Release the turnbuckle, located at the center of the planter frame, using the special wrench and latch the turnbuckle into the holder. Return wrench to the storage position on the tongue.

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11. Move the selector handle on the manual selector valve to the "MARKER" position. (Relieve pressure from the hydraulic system before moving the selector handle.)

HYDRAULIC ROW MARKER OPERATION

All Model 3200 planters are equipped with a dual valve hydraulic system. The dual valve system allows the row markers to be operated independently of the planter lift cylinders. Each time a marker is raised, the sequencing valve will direct flow to lower the opposite marker.

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



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

NOTE: On machines equipped with the hydraulic wing fold option, a hand operated selector valve on the hitch allows selection of the row marker or wing fold functions. Relieve pressure from the hydraulic system before moving the selector handle.



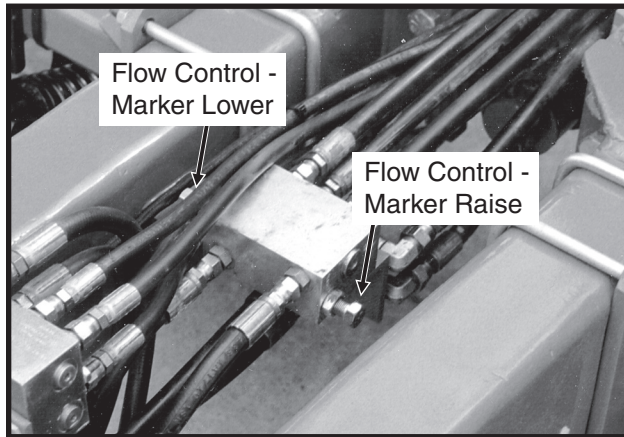
DANGER: To avoid serious injury or death, care must be taken when operating row markers around overhead power lines.

MACHINE OPERATION

ROW MARKER SPEED ADJUSTMENT

The marker hydraulic system includes two flow control valves. One flow control valve sets the lowering speed of both markers and one sets the raising speed of both markers. To adjust marker speed, loosen the jam nut and turn the control(s) clockwise, or IN, to slow the travel speed and counterclockwise, or OUT, to increase the travel speed. The flow controls determine the amount of oil flow restriction through the valves, therefore varying travel speed of the markers. Tighten jam nut after adjustments are complete.

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IMPORTANT: The flow controls should be properly adjusted before the marker assemblies are first put into use. Excessive marker travel speed can 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 the oil. The tractor hydraulic control will have to be held until the cylinder reaches the end of its stroke. This occurs most often on tractors with an open center hydraulic system.

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



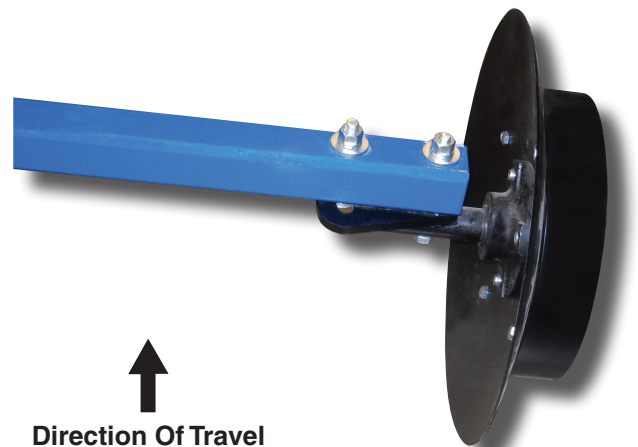
DANGER: To avoid serious injury or death, care must be taken when operating row markers around overhead power lines.

ROW MARKER LENGTH ADJUSTMENT

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

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

8 Rows x 30" Spacing = 240" Marker Dimension
--



The marker disc blade is installed so the concave side of the blade is inward. The spindle assembly is slotted so the hub and blade can be angled to throw more or less dirt. To adjust hub and spindle, loosen hardware and move assembly as required. Tighten bolts to specified torque.

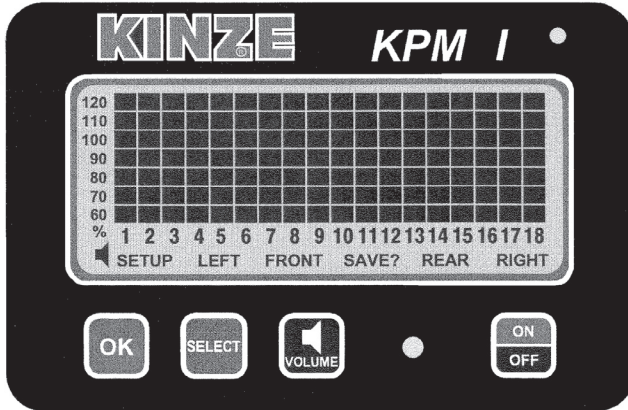
IMPORTANT: A marker disc blade assembly that is set at a sharper angle than necessary will add unnecessary stress to the complete row marker assembly and shorten the life of bearings and blades. Set the blade angle only as needed to leave a clear mark.

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, for use in more severe no till conditions, is available from KINZE® through your KINZE® Dealer.

KPM I ELECTRONIC SEED MONITOR

(MTR28)



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

Seed flow for up to 36 rows, in two 18 row sections (left/right or rear/front), may be monitored with one monitor. For less complicated applications (18 rows or less), all rows may be programmed in one section and the other section left disabled.

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.

The single backlit Liquid Crystal Display (LCD) shows the active section, the number of monitored rows per section, the relative seed rate for each row (using a bar graph display) and scrolls various alarm and warning messages when an alarm condition exists. A continuous audible alarm will sound upon system malfunction or underflow conditions for any monitored row. Alarms must be acknowledged by the user. Various warnings may sound the alarm or flash one or more icons.

The monitor will power down if no activity is detected within one hour. No activity means there has been no new seed flow and no operator push key input. (If Applicable)

* **NOTE: The primary harness, on all 3000 Series Planters, is hard-wired into the safety/warning light harness or control console harness included as standard equipment with the planter.**

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MONITOR KEY FUNCTIONS

Each key press is acknowledged by the monitor with a short beep.

OK

- Ends and saves the new setup during installation.
- Acknowledges and silences alarms in the operation mode.

SELECT

- Selects the application mode (rear/front or left/right) at the beginning of installation setup.
- Selects the active section(s) (rear, rear/front, left, right or left/right) in the operation mode.
- Has no affect on a system configured to monitor only one section.

VOLUME

- Pressing the key will turn the audible alarm on.
- Holding the key for periods of 2 seconds increases the volume until it reaches the maximum, at which time it rolls over to the minimum level.

ON/OFF

- Powers the unit on and off.

LCD FUNCTIONS

The monitor collects data on the planting rates from all active rows and calculates an average. This average will determine the 100% mark. Seed rate for each row is then compared to the average value and the result is displayed on the bar graph.

The information regarding each section is displayed alternately every 5 seconds. While operating a system with two sections programmed, one or both sections may be selected any time. When only one section is selected, the monitor calculates the average based on the remaining active rows from that section.

STEP 1 Press SELECT key once to show one section. The flashing icon shows the section that is not selected. The selected section is continuously displayed on the LCD.

EXAMPLE:The system is setup to display rear/front sections. Press SELECT key. The FRONT icon will be flashing and the REAR section will be displayed on the bar graph. After 1 minute the FRONT icon will stop flashing. The monitor will stay in this REAR only display through power down and power up. Each time the monitor is turned on while in REAR only mode, the FRONT icon will flash for 1 minute. Also if seed flow is sensed in the FRONT section while planting, the FRONT icon will resume flashing.

STEP 2 Press SELECT key again to activate both sections.

EXAMPLE: Press SELECT key a second time. The information regarding each section will display alternately every 5 seconds.

For simple applications, where only one section is programmed, the display will automatically lock on that section. Pressing SELECT key will have no affect.

NOTE:When alternating between two sections, the display will lock on the section containing the first recognized alarm until the alarm is acknowledged by pressing the OK key or the alarm condition is removed.

CHANGING THE AUDIBLE ALARM VOLUME

STEP 1 Press and hold down the VOLUME key.

STEP 2 The SETUP and VOLUME icons will turn on and the alarm will sound continuously. The intensity of the sound will change every 2 seconds. After the maximum volume is reached, the next change will set the volume to minimum and will continue to get louder every 2 seconds. When the desired volume is reached, release the key.

WARNINGS AND ALARMS

- 1. System Alarms** - A system alarm is activated when the monitor detects a faulty sensor or one of several other communication faults.

The corresponding row number starts flashing and the alarm sounds. All segments on the corresponding bar graph are turned off. Pushing the OK key to acknowledge the warning will turn the audible alarm off. The row number will continue to flash until the alarm condition is removed. If the monitor detects a faulty sensor and there is no planting activity present, the monitor will scroll "CHECK CONNECTION".

Another type of system alarm occurs when the monitor detects a data communication bus error. The three possible data communication bus errors are:

LCD Display	Error Condition
SYS HI	The data communication lead (green) has been shorted to the power lead (white).
SYS LO	The data communication lead (green) has been shorted to the ground lead (black).
SYS EC	An internal error has been detected.

- 2. Under Flow Alarms** - If the seed rate for one or more rows is less than 55% of the calculated average, the corresponding 60% segment will stay on, the corresponding row number starts flashing and the alarm sounds. Pushing the OK key to acknowledge the alarm will turn the alarm off. The 60% segment of the bar graph remains on and the row number continues to flash until the alarm condition is corrected.

NOTE: All alarms present within a short time before planting stops, are frozen on the screen and the text LOW or FAIL will display on the LCD. If the under flow is between 0% and 10%, this warrants a "FAIL" condition. If the under flow is between 10% and 55%, a "LOW" condition is generated. If multiple rows have an under flow condition, "FAIL" will display if any one or more rows is between 0% and 10%. This allows the user to identify and fix the problem rows.

NOTE: This warning will not trigger unless a minimum time of continuous planting has passed.

NOTE: If all the rows show a seed rate of zero, the condition will not generate an alarm. It will be assumed the planter has stopped. The row numbers and the bottom 60% segment will remain on for all selected rows.

3. **Multiple Alarms** - If more than one alarm condition occurs at the same time, pushing the OK key will acknowledge all alarms that are currently displayed. For example, if one row on the front and one row on the rear are alarming, pushing the OK key will only acknowledge one of them. However, if there are two alarms on the front, both alarms would be acknowledged with one push of the OK key.
4. **Section Not Selected Warning** - If the monitor was programmed for two sections and only one is currently selected for display (by pressing the SELECT key), the icon of the disabled section will flash for a period of 1 minute, then turn off at each power up. If seed flow is sensed in the disabled section, the icon for that section (front, left or right) will begin to flash.
5. **Seed Planting Stopped Warning** - When the monitor detects no seed flow on all rows, the monitor will emit 3 short beeps to alert the user. This warning will occur each time the planter is stopped, each time the planter is raised at the end of a row or if the mechanical drive fails while planting.

NOTE: This warning will not trigger unless a minimum time of continuous planting has passed.

6. **Seed Counting Sensor In Calibration Warning** - All seed counting sensors run a self-calibration sequence on power up. While in calibration the bottom segment of each corresponding bar graph will flash if the monitor detects movement or planting activity. If the monitor does not detect this, the message "WAIT CALIBRATION" will be scrolled.

7. **Seed Counting Sensor Too Dirty Warning** - After the seed counting sensors end their internal self-calibration, the monitor may detect one or more sensors are either too dirty or blocked. If the monitor detects planting or movement, the corresponding bar graph remains flashing. The monitor will display "CLEAN SENSORS" on the LCD if no movement or planting is detected, prompting the user to clean the tubes. If the tubes are dirty, they will still show seed flow with less accuracy. If the tubes are blocked the user will get an alarm as soon as planting starts. The corresponding bar graph will remain flashing until the problem is corrected and the monitor is powered down and then powered back up.

8. **Low Battery Warning** - The monitor is constantly monitoring its input voltage to quickly detect low power conditions. If the monitor detects that the input voltage has dropped below 11.0V, it will display "LOW POWER" on the LCD, provided that the monitor does not detect planting.

NOTE: After the alarms have been acknowledged and if the alarm condition is still present, the LCD will continue to display the alarm condition.

REPLACING A FAULTY SENSOR

To replace a faulty sensor; (a) disconnect the faulty sensor and check the monitor to be sure the correct sensor was disconnected, (b) turn the monitor off, (c) after a few seconds, turn the monitor back on and (d) plug in the replacement sensor. The monitor will chirp twice to acknowledge the new sensor was learned and saved.

To replace more than one faulty sensor, proceed as stated above beginning with the lowest numbered row in the rear or left section and continue to replace sensors in increasing order. Then move on to the front or right section and continue in ascending row number order.

NOTE: If the monitor is not turned off and then on, the replacement sensor(s) will be ignored until the next power on, at which point they will be randomly learned by the monitor.

FIELD OPERATION

(MTR28e/MTR28c/MTR28d/MTR28b)

Press the ON/OFF key to turn the monitor on and off.



Information regarding each section is displayed alternately every 5 seconds.

REAR/FRONT CONFIGURATION

- Press the SELECT key once to show REAR section only.
- Press the SELECT key a second time to return to each section being displayed alternately every 5 seconds.
- Press the SELECT key a third time to show REAR section only again.



LEFT/RIGHT CONFIGURATION

- Press the SELECT key once to show LEFT section only.
- Press the SELECT key a second time to show RIGHT section only.
- Press the SELECT key a third time to return to each section being displayed alternately every 5 seconds.



NOTE: SELECT key has no function when only a single section is being used.

Press the VOLUME key to increase or decrease volume. See “Changing The Audible Alarm Volume”.



Press the OK key to silence alarms. See “Warnings And Alarms”.



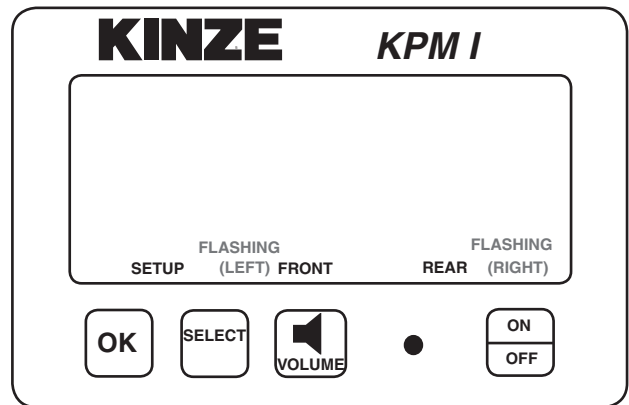
PROGRAMMING/CONNECTING SEED TUBES

STEP 1 All the seed tubes w/sensors must be disconnected from the harness and the monitor must be off.

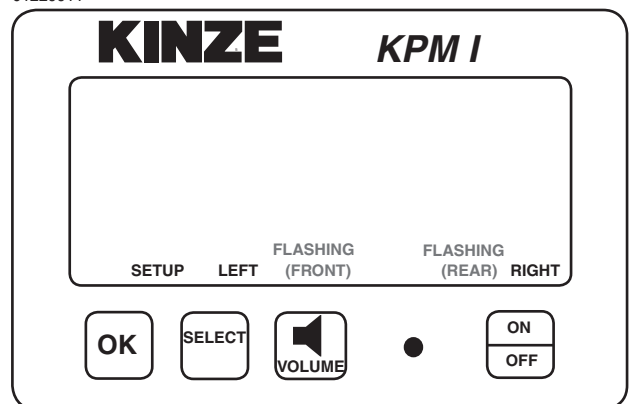
STEP 2 Press the ON key. The monitor automatically enters the setup procedure. If the monitor was accidentally powered on with no sensors attached, the user can turn the monitor off at this point and the previous configuration is not lost.

STEP 3 Press the SELECT key. Each time you press the SELECT key the mode will toggle between rear/front and left/right. The selected display will be solid and the configuration not currently selected will be flashing. By default the monitor starts in rear/front mode.

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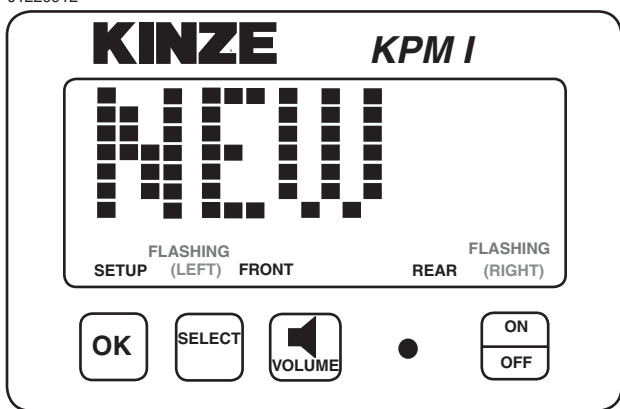
01229911



NOTE: Model 3200 planters will use the rear configuration only. When all rows can be viewed on a single display (rear), pressing the select key has no function.

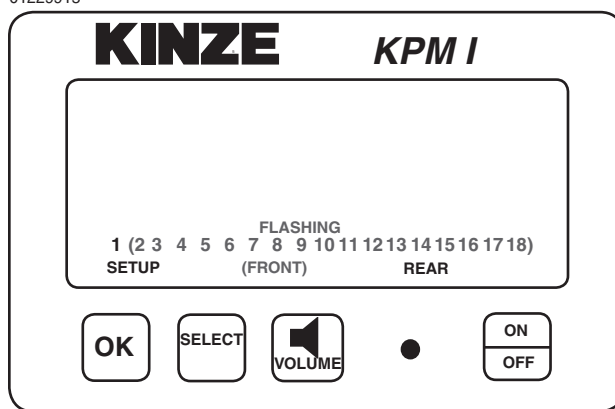
STEP 4 Press and hold the OK key to confirm the selection and continue holding until the row numbers appear on the display. During confirmation, the display will alternate between “NEW” and “SYS” to alert the user that the previous configuration will be lost. With the rear/front mode selected, the monitor automatically starts with the rear section. The REAR icon shows solid and the FRONT icon starts to flash. With the left/right mode selected, the monitor automatically starts with the left section. The LEFT icon shows solid and the RIGHT icon starts to flash.

01229912

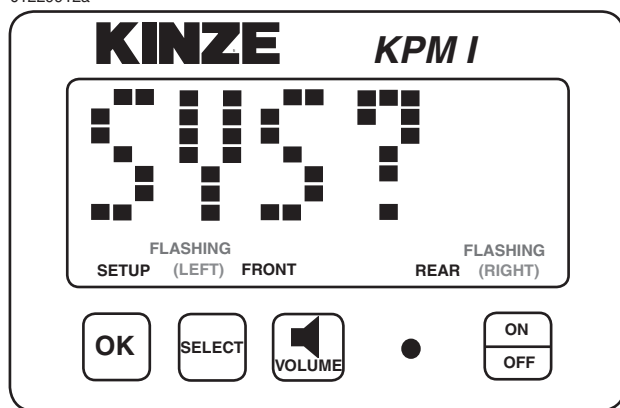


STEP 5 Plug each seed tube w/sensor into the harness in a predetermined order. Row 1 first, row 2 second and so on up to 18 rows. When a sensor is plugged in, the corresponding row number on the LCD display will stay solid, the monitor will chirp twice and the LED (Light Emitting Diode) on the seed tube sensor will turn on for approximately 30 seconds to show connection is made. NOTE: Unless there is a faulty sensor, the installer should just have to connect the sensors in the proper order without checking the monitor is acknowledging each sensor.

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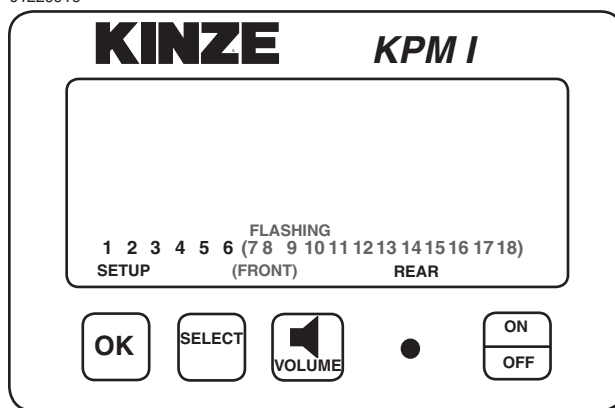


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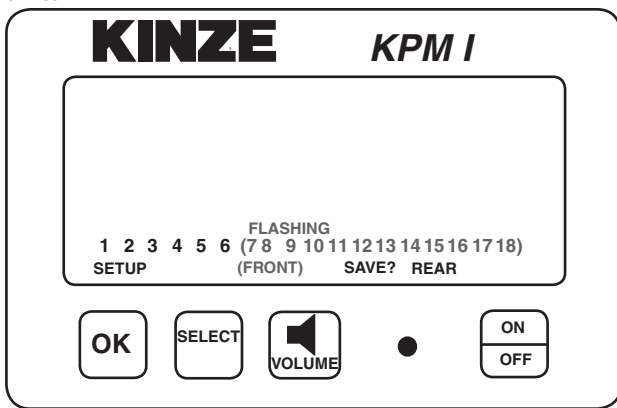
STEP 6 When all the seed tubes w/sensors for the current section are installed, check to be sure the monitor displays solid numbers for the number of sensors connected.

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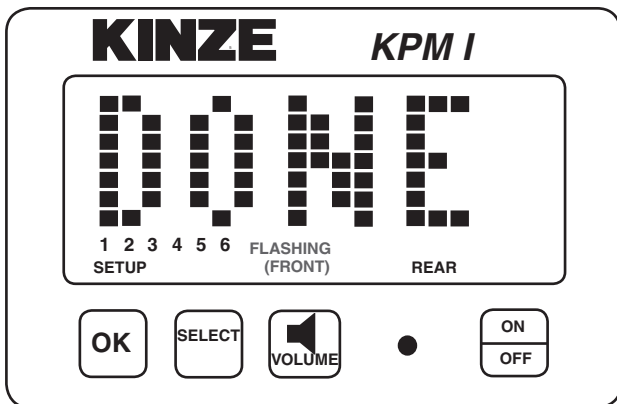


STEP 7 If this condition is satisfied, press and hold the OK key to save the setup for the current section. The SAVE? icon will show followed by continuous short beeps indicating the monitor is preparing to save. The installer has 5 seconds to decide if he wants to save the current configuration. During this time the short beeps will sound. To complete the save, hold the OK key pressed until the word “DONE” shows on the screen followed by a long beep and the SAVE? icon turns off. When the OK key is released the monitor will continue with the second section installation.

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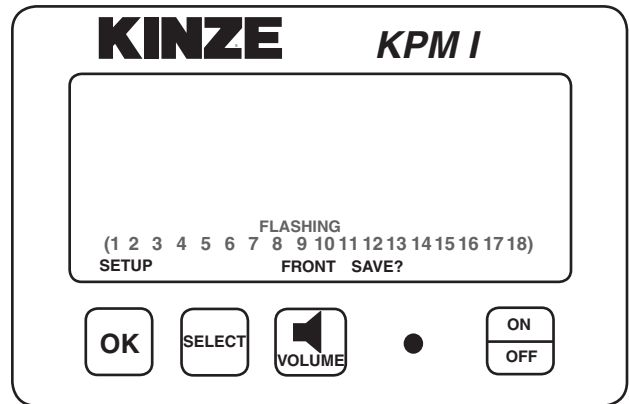


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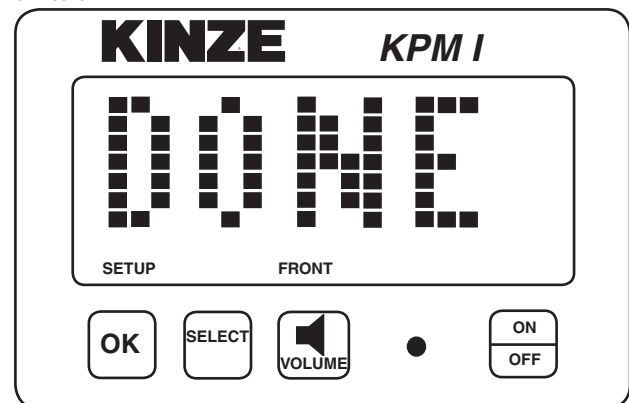


STEP 8 Follow STEPS 5 through 7 to install the second section. If no seed tubes are installed on the second section, press and hold the OK key until the word “DONE” shows on the screen followed by a long beep and the SAVE? icon turns off.

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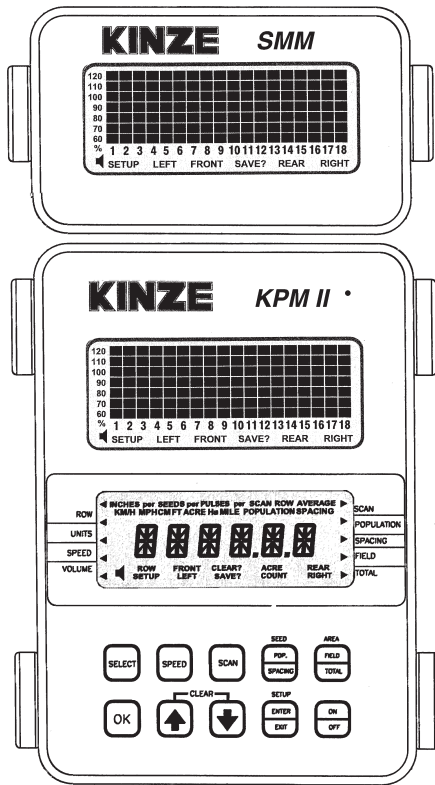


NOTE: Individual seed tubes may be unplugged for special situations. An alarm will sound which can be silenced by touching the OK key. The monitor will recognize each seed tube when reconnected.

See “KPM I/KPM II Stack-Mode Electronic Seed Monitors Troubleshooting” in the Maintenance Section.

KPM II STACK-MODE ELECTRONIC SEED MONITOR

(MTR41e)



NOTE: SMM console may not be applicable to all models.

The KPM II Stack-Mode electronic seed monitor system consists of (a) a KPM II Stack-Mode console, which is mounted on the tractor; (b) seed tubes with sensors, one of which is installed in each planter row unit; (c) a magnetic distance sensor, which is installed on the planter, or a radar distance sensor, which is installed on the tractor; (d) shaft rotation sensors, which are installed on the planter drill shafts; and (e) a planter harness (junction Y-harness and/or extension harness where applicable), to which the individual seed tube sensors connect. The primary harness, which connects the monitor console to the planter harness, is hard-wired into the safety/warning light harness or control console harness included as standard equipment with the planter.

The software design of the KPM II Stack-Mode console allows the use of an add-on SMM console for simultaneous viewing of the seed flow bar graphs for standard and/or Interplant® System rows (up to 36 rows in two sections). A total of 72 rows may be displayed in multiple sections (rear/front, left/right or four sections). The SMM console must be used to allow utilization of the four section feature.

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.

The KPM II Stack-Mode console has two backlit Liquid Crystal Displays (LCD). The upper display shows the active section, the number of monitored rows per section, the relative seed rate for each row (using a bar graph display) and scrolls various alarm and warning messages when an alarm condition exists. A continuous audible alarm will sound upon system malfunction or underflow conditions for any monitored row. Alarms must be acknowledged by the user. Various warnings may sound the alarm or flash one or more icons. The lower display is used to display alphanumeric data such as row spacing, units (Metric or English), speed, volume, seed population, seed spacing, field area, total area and distance sensor pulses per mile/kilometer.

The SMM console has one backlit Liquid Crystal Display (LCD) which functions the same as the upper display on the KPM II Stack-Mode console except it does not scroll alarm and warning messages. The SMM console must be programmed into the system before printed text will display on the LCD.

The monitor system will power down if no activity is detected within one hour. No activity means there has been no new seed flow and no operator push key input.

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MONITOR KEY FUNCTIONS

Push keys allow the user to select or change the operating mode, the active displays or the current configuration. Depending on the operating mode or the current display selected, some keys are valid while some are not. Each key press, if valid, is acknowledged by a short beep and an action is taken. If the key press has no action associated, the key press is considered invalid, and the user will not get any feedback.

SELECT

- Selects the application mode (rear/front, left/right or four sections up to a maximum of 72 rows) at the beginning of installation in the setup mode.
- Selects the active section(s) (rear, rear/front, left, right or left/right) in the operation mode.
- Has no affect on a system configured to monitor only one section.
- While programming the monitor, the key will select the digit to change.

SPEED

- Immediately displays the current ground speed.

SCAN

- If the current average population or average spacing is displayed, this key sequentially displays the seed population/spacing on each row.
- If the display shows functions other than average seed population or spacing, pressing SCAN will sequentially display speed, average seed population and average seed spacing.
- Pressing a second time freezes the display on the current row.
- Pressing a third time restarts the sequential display.

SEED POPULATION/SEED SPACING

- Immediately displays the average seed POPULATION and the average seed SPACING of all active rows.
- Each press alternates between seed spacing and seed population.

AREA FIELD/AREA TOTAL

- Immediately displays the field or total area planted since the field/total area was last cleared.
- Each press alternates between field area and total area.

OK

- Ends and saves the new setup during installation.
- Acknowledges and silences alarms in the operation mode.

UP ARROW AND DOWN ARROW

- Scrolls sequentially through the display options on the lower LCD display.
- Freezes on the current row in the scan mode.
- Scrolls sequentially through the rows when the population scan is frozen.
- Used to enter programmable values in the programming mode.
- The UP and DOWN Arrow keys can be pressed at the same time to start the CLEAR function.

SETUP ENTER/SETUP EXIT

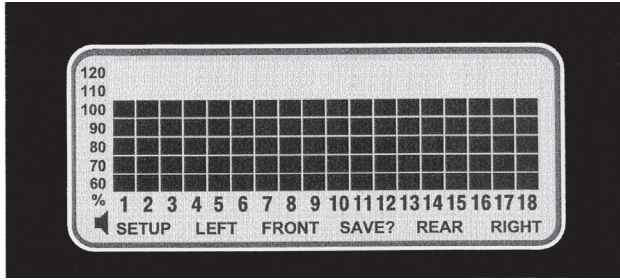
- Enters and exits the programming mode.

ON/OFF

- Powers the unit on and off.

UPPER LCD FUNCTIONS

(MTR29h)



The monitor collects data on the planting rates from all active rows and calculates an average. This average will determine the 100% mark. Seed rate for each row is then compared to the average value and the result is displayed on the bar graph.

With only the KPM II Stack-Mode console programmed into the system, the information regarding each section is displayed alternately every 5 seconds. While operating a system with two sections programmed, one or both sections may be selected any time. When only one section is selected, the monitor calculates the average based on the remaining active rows from that section.

With the SMM console programmed into the system, two sections are viewed at the same time. If the system configuration is for four sections, the display will alternate every 5 seconds between a pair of sections. The select key will lock the display on rear sections. The SMM console shows RIGHT in the left/right configuration, FRONT in the rear/front configuration and FRONT RIGHT/REAR RIGHT in four sections configuration. The KPM II Stack-Mode console shows LEFT in the left/right configuration, REAR in the rear/front configuration and FRONT LEFT/REAR LEFT in four sections configuration.

STEP 1 Press SELECT key once to show one section. The flashing icon shows the section that is not selected. The selected section icon is continuously displayed on the LCD.

EXAMPLE: The system is setup to display rear section on KPM II Stack-Mode console and front section on SMM console. Press SELECT key. The FRONT icon will be flashing and the REAR section will be displayed on the bar graph. The SMM console is only backlit. After 1 minute the front row icon will stop flashing. The monitor will stay in this REAR only display through power down and power up. Each time the monitor is turned on while in REAR only mode, the FRONT icon will flash for 1 minute.

If seed flow is sensed in the FRONT section while planting, the FRONT icon will resume flashing.

When the front section is disabled, the row spacing will automatically double to maintain the proper implement width in the monitor. A 23 or 24 row 15" configuration changes to a 12 row 30" configuration with a touch of the SELECT key.

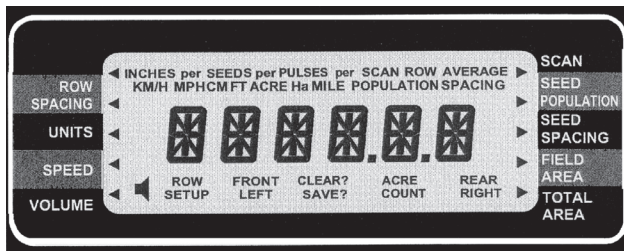
STEP 2 Press SELECT key again to activate both sections.

For simple applications, where only one section is programmed, the display will automatically lock on that section. Pressing the SELECT key will have no affect.

NOTE: When alternating between two sections, the display will lock on the section containing the first recognized alarm until the alarm is acknowledged by pressing the OK key or the alarm condition is removed.

LOWER LCD FUNCTIONS

(MTR29g)



- The UP and DOWN arrow keys will sequentially change what is being displayed on the lower LCD. Pressing the UP or DOWN arrow keys will move the arrow head icon (on the left and right hand side of the display) to another item. For example, if the arrow icon is pointing to SPEED, ground speed will be displayed on the LCD. Pressing the UP arrow key will move the icon to UNITS. The display will change to display all the icons used to represent the current (English or Metric) measurement system.
- The shortcut keys SPEED, SEED POPULATION/SPACING and AREA FIELD/TOTAL allow direct access to their respective displays. For example, no matter what is currently being displayed on the lower LCD, pressing the SPEED key will change the display to the current speed. Pressing the SEED POPULATION/SPACING or AREA FIELD/TOTAL keys will alternate between the two functions assigned to those keys.
- Pressing the SCAN key while displaying seed spacing or population will cause a sequential display of each individual row. Pressing the SCAN key a second time will freeze the display on the currently displayed row. The UP or DOWN arrow keys can be used to change the currently displayed row. Pressing the SCAN key will restart the automatic advancing of the scan function.
- Pressing the SCAN key while displaying speed will cause a sequential display of speed, average planter population and average seed spacing. Pressing the SCAN key a second time will freeze the display on the currently displayed reading.

ROW SPACING

Press the arrow keys to ROW SPACING to display the current spacing between rows in inches or centimeters. The ROW SPACING icons turn on, displaying a 3 digit, one decimal place format. In the area count mode, this function displays the implement width in feet or meters, using a 3 digit, no decimal places format.

UNITS

Press the arrow keys to UNITS to display all the icons from the currently selected English or Metric measurement system. For the English system, the icons are: INCH, MPH, FT, ACRE and MILE. For the Metric system, the icons are: CM, KM/H and Ha.

SPEED

Press the SPEED key to display the current speed in MPH or KM/H, using a 3 digit, one decimal place format.

VOLUME

Press the arrow keys to VOLUME to display the presently selected audible alarm volume. The SPEAKER icon turns on.

SCAN

Press the SCAN key to display the seed spacing or seed population (see Steps 1-3 following) of each individual row. (1)Pressing the SCAN key while displaying any other function will cause the monitor to sequentially display speed, average seed population and average seed spacing. (2)Pressing the SCAN key a second time will freeze the display. (3)Pressing the SCAN key a third time restarts the sequential display. The UP and DOWN arrow keys can be used to change the current display.

MACHINE OPERATION

KPM II STACK-MODE

SEED POPULATION/SEED SPACING

Each SEED POP/SPACING key press alternates between seed population and seed spacing.

Seed population displays the average number of seeds or the row average number of seeds per acre or seeds per hectare for all the active rows. The average is displayed using a 6 digits, no decimal places format. The AVERAGE POPULATION icon will turn on. When in the scan mode, the scan arrow and SCAN ROW POPULATION will appear. The ROW number icon and the current row will be displayed on the left and the population will be displayed on the right in 1000's using 3 digits, one decimal place (e.g. 32.9 means 32,900). When in scan freeze mode, the scan arrow and ROW POPULATION will turn on (scan arrow may be flashing). The UP and DOWN keys may be used to lock on the desired row.

Seed spacing displays the average distance or the row average distance between seeds for all active rows in inches per seed or centimeters per seed using a 3 digit, one decimal place format. When the average is displayed the AVERAGE SPACING icons are turned on. When in the scan mode, the scan arrow and SCAN ROW SPACING icons will appear. The ROW number icon and the current row will be displayed on the left and the spacing will be displayed on the right. The display will sequence to the next row every 5 seconds. When in scan freeze mode, the scan arrow and SPACING will turn on (scan arrow may be flashing). The UP and DOWN keys may be used to lock on the desired row.

FIELD AREA/TOTAL AREA

Each AREA FIELD/TOTAL key press alternates between field area and total area.

Field area displays the total number of acres or hectares using a 6 digit, one decimal place format.

NOTE: When FIELD AREA is selected, the UP or DOWN key must be held in slightly longer than normal so the monitor will not mistake this action with a CLEAR, which consists of the UP and DOWN arrow keys pressed simultaneously. A beep will sound when the function activates.

Total area displays the total number of acres or hectares using a 6 digit, one decimal place format. The total area counter updates every time the field area counter increments. Clearing the total area counter will also clear the field area counter.

When the monitor is programmed as a rear only or rear/front configuration and shaft rotation sensors are installed, pressing the UP arrow to move beyond row spacing lights an arrow on an unlabeled area above ROW SPACING. This is the automatically set division line between the L.H. shaft sensor and the R.H. shaft sensor. The display shows the first row on the rear section and the front section assigned to the R.H. shaft rotation sensor.

EXAMPLE: On a 12 Row 30" planter with Interplant® Package, the display would appear as follows:

092597-21



THIS DISPLAY IS NOT ACCESSIBLE ON LEFT/RIGHT CONFIGURATIONS OR SYSTEMS WITHOUT SHAFT ROTATION SENSORS.

PROGRAMMING - Changing The Audible Alarm Volume

STEP 1 To enter the programming mode, press and hold the SETUP key. The monitor will emit several short beeps, followed by a long beep. On the lower LCD, the SETUP icon turns on and the arrow head icon will flash, indicating that the user can select an item to program.

NOTE: The monitor must be in a programmable function (row spacing, units, speed, volume or area) to enter setup. The monitor will not enter setup in seed population or seed spacing.

STEP 2 Press the UP or DOWN arrow keys to move the flashing arrow to VOLUME. As the arrow icon moves, the lower LCD will display the current setting of the item selected.

STEP 3 Press the OK key and the flashing arrow becomes solid and the audible alarm will sound.

NOTE: The lower LCD will display the current volume and the SPEAKER icon is turned on. Settings are from 0 to 9.

- Use the UP or DOWN arrow keys to change the setting. With every UP arrow key push, the alarm will increment by one step between the minimum and the maximum. If the maximum level (9) is reached the volume rolls over to the minimum level (0).
- Pressing the DOWN arrow key lowers the volume until the minimum level (0) is reached, at which point the volume rolls over to the maximum level (9).

STEP 4 To exit without saving, press and release the OK key. The monitor will restore the lower LCD to show the setting of the item, and the arrow icon will flash, allowing the user to select another item to program.

To exit and save, press and hold the OK key. The monitor will emit several short beeps and SAVE? icon is turned on. After a short time a long beep is heard, and the lower LCD will display the word "DONE". Release the OK key. If the OK key is released BEFORE the word "DONE" is displayed, the changes WILL NOT BE SAVED. The word "DONE" MUST be displayed in order for the save to have occurred.

NOTE: The programming mode may be exited at any time, by pressing the SETUP key. Pressing this key will return the monitor to its normal operation. All items changed and saved will come into effect immediately. Any items changed, but not saved will revert to the original programmed value.

MACHINE OPERATION

KPM II STACK-MODE

PROGRAMMING - Units (Metric Or English)

STEP 1 To enter the programming mode, press and hold the SETUP key. The monitor will emit several short beeps, followed by a long beep. On the lower LCD, the SETUP icon turns on and the arrow head icon will flash, indicating that the user can select an item to program.

NOTE: The monitor must be in a programmable function (row spacing, units, speed, volume or area) to enter setup. The monitor will not enter setup in seed population or seed spacing.

STEP 2 Press the UP or DOWN arrow keys to move the flashing arrow to UNITS. As the arrow icon moves, the lower LCD will display the current setting of the item selected.

STEP 3 Press the OK key and the flashing arrow becomes solid and the audible alarm will sound.

NOTE: The lower LCD will alternately display all Metric icons or all English icons, indicating the Metric or English mode respectively.

- Use the UP or DOWN arrow keys to change the setting.

STEP 4 To exit without saving, press and release the OK key. The monitor will restore the lower LCD to show the setting of the item, and the arrow icon will flash, allowing the user to select another item to program.

To exit and save, press and hold the OK key. The monitor will emit several short beeps and SAVE? icon is turned on. After a short time a long beep is heard, and the lower LCD will display the word "DONE". Release the OK key. If the OK key is released BEFORE the word "DONE" is displayed, the changes WILL NOT BE SAVED. The word "DONE" MUST be displayed in order for the save to have occurred.

NOTE: The programming mode may be exited at any time, by pressing the SETUP key. Pressing this key will return the monitor to its normal operation. All items changed and saved will come into effect immediately. Any items changed, but not saved will revert to the original programmed value.

PROGRAMMING - Row Spacing

STEP 1 Prior to entering the programming mode, the application mode (rear/front, left/right or four sections) must be active. If the monitor is programmed in a rear/front configuration, both sections will be active (alternating every 5 seconds if the SMM console is not used). You can then set the row spacing to the Interplant® System row spacing.

EXAMPLE: On a 12 Row 30" with Interplant® Package set the row spacing to 15.0 with front active.

When the monitor is in normal field operation mode, disabling the front section will automatically change the row spacing to 30".

STEP 2 To enter the programming mode, press and hold the SETUP key. The monitor will emit several short beeps, followed by a long beep. On the lower LCD, the SETUP icon turns on and the arrow head icon will flash, indicating that the user can select an item to program.

NOTE: The monitor must be in a programmable function (row spacing, units, speed, volume or area) to enter setup. The monitor will not enter setup in seed population or seed spacing.

STEP 3 Press the UP or DOWN arrow keys to move the flashing arrow to ROW SPACING. As the arrow icon moves, the lower LCD will display the current setting of the item selected.

STEP 4 Press the OK key and the flashing arrow becomes solid and the audible alarm will sound.

NOTE: The lower LCD will display the current row spacing (in inches or centimeters) and ROW SPACING icon is turned on.

- The least significant digit of the displayed value will be blinking.
- This value can be changed by pressing either the UP or DOWN arrow keys.
- Once this digit is correct, press the MODE SELECT key and the blinking digit will move to the next significant digit, where the process can be repeated.

NOTE: The monitor limits the entry of row spacing to a minimum of 10.0 inches (25.4 cm) and to a maximum of 99.9 inches (253.7 cm). If the monitor is configured to a rear/front configuration, the limits change to a minimum of 5.0 inches (12.7 cm) and a maximum of 49.9 inches (126.8 cm).

STEP 5 To exit without saving, press and release the OK key. The monitor will restore the lower LCD to show the setting of the item and the arrow icon will flash, allowing the user to select another item to program.

To exit and save, press and hold the OK key. The monitor will emit several short beeps and SAVE? icon is turned on. After a short time a long beep is heard, and the lower LCD will display the word "DONE". Release the OK key. If the OK key is released BEFORE the word "DONE" is displayed, the changes WILL NOT BE SAVED. The word "DONE" MUST be displayed in order for the save to have occurred.

To exit setup mode, press the SETUP key.

NOTE: The programming mode may be exited at any time, by pressing the SETUP key. Pressing this key will return the monitor to its normal operation. All items changed and saved will come into effect immediately. Any items changed, but not saved will revert to the original programmed value.

MACHINE OPERATION

KPM II STACK-MODE

PROGRAMMING - Speed

STEP 1 To enter the programming mode, press and hold the SETUP key. The monitor will emit several short beeps, followed by a long beep. On the lower LCD, the SETUP icon turns on and the arrow head icon will flash, indicating that the user can select an item to program.

NOTE: The monitor must be in a programmable function (row spacing, units, speed, volume or area) to enter setup. The monitor will not enter setup in seed population or seed spacing.

STEP 2 Press the UP or DOWN arrow keys to move the flashing arrow to SPEED. As the arrow icon moves, the lower LCD will display the current setting of the item selected.

STEP 3 Press the OK key and the flashing arrow becomes solid and the audible alarm will sound. The R.H. digit on the display will be blinking.

The speed constant is used to record how many pulses are generated per mile (or kilometer) from the ground speed sensor. The lower LCD will display the current pulses per mile (or kilometer) using a 6 digit, no decimal place format. The PULSES per MILE (or PULSES per KM) icons are turned on.

NOTE: It is highly recommended that a field calibration be done to establish the PPM/PPKM (Pulses Per Mile/Kilometer) number on a new machine installation. Several factors can affect this value such as wheel slip on the magnetic distance sensor, mounting angle and height on the radar distance sensor, etc. IT IS NOT UNCOMMON FOR THE SPEED ON THE MONITOR TO VARY SLIGHTLY FROM THE TRACTOR SPEEDOMETER. *Adjusting the PPM/PPKM in the monitor to make the speed agree can cause serious errors in acre/hectare and population counts. Do field checks to verify populations and seed spacings.*

NOTE: On new system installations, the monitor will default to 500 PPM (310 PPKM). This will have to be changed to obtain accurate readings from the monitor.

- In field conditions, measure 330 feet ($\frac{1}{16}$ mile) or 100 meters, depending on the unit of measurement selected.

- Pull the tractor up to the starting line.

- Press the UP and DOWN arrow keys at the same time and hold them down until the CLEAR? icon is displayed and the monitor beeps several times. When the data is actually cleared, the monitor will emit a long beep and the number of pulses is cleared.

NOTE: If the PPM/PPKM number starts to count pulses with the tractor not moving, check the radar for vibration or other kinds of interference.

- Drive the tractor for 330 feet ($\frac{1}{16}$ mile) or 100 meters and stop.

- The monitor will count the number of pulses and display them.

STEP 4 To exit without saving, press and release the OK key. The monitor will restore the lower LCD to show the previous setting of the item, and the arrow icon will flash, allowing the user to select another item to program.

To exit and save, press and hold the OK key. The monitor will emit several short beeps and SAVE? icon is turned on. After a short time a long beep is heard, and the lower LCD will display the word "DONE". Release the OK key. If the OK key is released BEFORE the word "DONE" is displayed, the changes WILL NOT BE SAVED. The word "DONE" MUST be displayed in order for the save to have occurred.

NOTE: The programming mode may be exited at any time, by pressing the SETUP key. Pressing this key will return the monitor to its normal operation. All items changed and saved will come into effect immediately. Any items changed, but not saved will revert to the original programmed value.

NOTE: If a discrepancy occurs and digits must be changed, follow STEPS 1 and 2 to enter the programming mode and proceed as follows:

- Press the OK key and the flashing arrow becomes solid. The least significant digit of the displayed value will be blinking.
- This value can be changed by pressing either the UP or DOWN arrow keys.
- Once this digit is correct, press the SELECT key and the blinking digit will move to the next significant digit, where the process can be repeated.

The monitor limits the entry of pulses per mile or kilometer to a minimum of 500 PPM (310 PPKM), and to a maximum of 500,000 PPM (310,686 PPKM).

KEY Action	Flashing Digit	Display Value
Press The UP Key	Right Most Digit	2031, 2032, 2033
Press The SELECT Key	Second Digit From Right	2033
Press The DOWN Key	Second Digit From Right	2023, 2013, 2003, 2093, 2083
Press The SELECT Key Twice	Left Most Digit	2083
Press The DOWN Key	Left Most Digit	1083, 0500 (Min. Value), 9500, 8500

PROGRAMMING - Clearing Total Area

NOTE: Clearing the total area counter will also clear the field area counter.

STEP 1 To enter the programming mode, press and hold the SETUP key. The monitor will emit several short beeps followed by a long beep. On the lower LCD, the SETUP icon turns on and the arrow head icon will flash, indicating that the user can select an item to program.

NOTE: The monitor must be in a programmable function (row spacing, units, speed, volume or area) to enter setup. The monitor will not enter setup in seed population or seed spacing.

STEP 2 Press the UP or DOWN arrow keys to move the flashing arrow to TOTAL AREA. As the arrow icon moves, the lower LCD will display the current setting of the item selected.

STEP 3 Press the OK key and the flashing arrow becomes solid and the audible alarm will sound.

- The lower LCD will display the total area and the ACRE (or Ha) icon turns on.
- With the flashing arrow on TOTAL AREA, press the OK key.

• To reset the counter, press the UP and DOWN arrow keys at the same time and hold them down for a short period of time to clear the data. The CLEAR? icon will be displayed and the monitor will beep several times. When the data is actually cleared, the monitor will emit a long beep, and the total area is reset to zeros. After the long beep, the previous recorded total area is not retrievable. Once cleared, the user **may not** choose to exit programming mode without saving as described in STEP 4.

STEP 4 To exit and save, press and hold the OK key. The monitor will emit several short beeps and SAVE? icon is turned on. After a short time a long beep is heard, and the lower LCD will display the word "DONE". Release the OK key. If the OK key is released BEFORE the word "DONE" is displayed, the changes WILL NOT BE SAVED. The word "DONE" MUST be displayed in order for the save to have occurred.

NOTE: The programming mode may be exited at any time, by pressing the SETUP key. Pressing this key will return the monitor to its normal operation. All items changed and saved will come into effect immediately. Any items changed, but not saved will revert to the original programmed value.

AREA COUNTER/SPEEDOMETER MODE

If the monitor is installed with only a radar distance sensor (no seed tubes attached), the monitor becomes a speedometer. If (a) the monitor is connected to a radar distance sensor, (b) the signal cable from the back of the console is connected to a sensing switch (Part No. G1K249 Acre Counter Switch Kit) instead of the seed tubes and (c) the implement width in feet (or meters) is programmed into the monitor, the monitor will function as an area counter.

The seed spacing and seed population functions are not available in this mode. If the monitor is powered down, the seed tubes connected and the monitor powered up, the monitor will again show seed population and seed spacing in inches or centimeters. Row spacing reverts back to its programmed setting.

WARNINGS AND ALARMS

- 1. System Alarms** - A system alarm is activated when the monitor detects a faulty sensor or one of several other communication faults.

The corresponding row number starts flashing and the audible alarm sounds. All segments on the corresponding bar graph are turned off. Pushing the OK key to acknowledge the warning will turn the alarm off. The row number will continue to flash until the alarm condition is removed. If the monitor detects a faulty sensor and there is no planting activity present, the monitor will scroll "CHECK CONNECTION".

If the distance sensor is detected as faulty, the monitor will display either "PICKUP" or "RADAR", depending on the type of sensor installed, and the audible alarm will sound. The user can push the OK key to acknowledge the alarm. When the distance sensor is faulty, the monitor will change to a bar graph only mode where the rows are still displayed relative to each other. No area related information (speed, field area, total area, seed spacing or seed population) will be accumulated or displayed.

If a rotation shaft sensor is faulty, "LSHAFT", "RSHAFT" or "SHAFTS" will display.

Another type of system alarm occurs when the monitor detects a data communication bus error.

The four possible data communication bus errors are:

LCD Display	Error Condition
SYS HI	The data communication lead (green) has been shorted to the power lead (white).
SYS LO	The data communication lead (green) has been shorted to the ground lead (black).
SYS EC	An internal error has been detected.
COP	Cycled power ON/OFF to quickly.

- 2. Under Flow Alarms** - If the seed rate for one or more rows is less than 55% of the calculated average, the corresponding 60% segment will stay on, the corresponding row number starts flashing and the alarm sounds. Pushing the OK key to acknowledge the warning will turn the alarm off. The 60% segment of the bar graph remains on and the row number continues to flash until the alarm condition is corrected.

NOTE: All alarms present within a short time before planting stops are frozen on the screen and the text LOW or FAIL will display on the LCD. If the under flow is between 0% and 10%, this warrants a "FAIL" condition. If the under flow is between 10% and 55%, a "LOW" condition is generated. If multiple rows have an under flow condition, "FAIL" will display if any one or more rows is between 0% and 10%. This allows the user to identify and fix the problem rows.

NOTE: This warning will not trigger unless a minimum time of continuous planting has passed.

NOTE: If all the rows show a seed rate of zero, the condition will not generate an alarm. It will be assumed the planter has stopped. The row numbers and the bottom 60% segment will remain on for all selected rows.

- 3. Multiple Alarms** - If more than one alarm condition occurs at the same time, pushing the OK key will acknowledge all alarms that are currently displayed. For example, if one row on the front and one row on the rear are alarming, pushing the OK key will only acknowledge one of them. However, if there are two alarms on the front, both alarms would be acknowledged with one push of the OK key.

4. **Section Not Selected Warning** - If the monitor was programmed for two sections and only one is currently selected for display (by pressing the SELECT key), the icon of the disabled section will flash for a period of 1 minute, then turn off at each power up. If seed flow is sensed in the disabled section, the icon for that section (front, left or right) will begin to flash.
5. **Seed Planting Stopped Warning** - When the monitor detects no seed flow on all rows, the monitor will emit 3 short beeps to alert the user. This warning will occur each time the planter is stopped, each time the planter is raised at the end of a row or if the mechanical drive fails while planting.

NOTE: This warning will not trigger unless a minimum time of continuous planting has passed.

6. **Seed Counting Sensor In Calibration Warning** - All seed counting sensors run a self-calibration sequence on power up. While in calibration the bottom segment of each corresponding bar graph will flash if the monitor detects movement or planting activity. If the monitor does not detect this, the message "WAIT CALIBRATION" will be scrolled.
7. **Seed Counting Sensor Too Dirty Warning** - After the seed counting sensors end their internal self-calibration, the monitor may detect one or more sensors are either too dirty or blocked. If the monitor detects planting or movement, the corresponding bar graph remains flashing. The monitor will display "CLEAN SENSORS" on the top LCD if no movement or planting is detected, prompting the user to clean the tubes. If the tubes are dirty, they will still show seed flow with less accuracy. If the tubes are blocked the user will get an alarm as soon as planting starts. The corresponding bar graph will remain flashing until the problem is corrected and the monitor is powered down and then powered back up.
8. **Low Battery Warning** - The monitor is constantly monitoring its input voltage to quickly detect low power conditions. If the monitor detects that the input voltage has dropped below 11.0V, it will display "LO SYS" on the lower LCD on the KPM II Stack-Mode console, provided that the monitor does not detect speed or planting.

NOTE: After the alarms have been acknowledged and if the alarm condition is still present, the LCD will continue to display the alarm condition.

REPLACING A FAULTY SENSOR

NOTE: Stack-Mode Seed Sensors are identified by a blue 3-pin connector. Replace Stack-Mode Seed Sensors with like components only.

To replace a faulty sensor; (a) disconnect the faulty sensor and check the monitor to be sure the correct sensor was disconnected, (b) turn the monitor off, (c) after a few seconds, turn the monitor back on and (d) plug in the replacement sensor. The monitor will chirp twice to acknowledge the new sensor was learned and saved.

To replace more than one faulty sensor, proceed as stated above for rear/front or left/right configurations beginning with the lowest numbered row in the rear or left section and continue to replace sensors in ascending order. Then move on to the front or right section and continue in ascending order. For four section configurations, begin with rear/left and continue to rear/right, then front/left and ending with front/right.

If the monitor detects a faulty distance sensor, the lower LCD will immediately move to the speed display, show the word "PICKUP" or "RADAR" depending on the distance sensor installed, and the alarm will sound.

NOTE: If the monitor is not turned off and then on, the replacement sensor(s) will be ignored until the next power on, at which point the sensors will be randomly learned by the monitor.

MACHINE OPERATION

KPM II STACK-MODE

FIELD OPERATION

Press the ON/OFF key to turn the monitor on.



(MTR28e)

Information regarding each section is displayed alternately every 5 seconds.

REAR/FRONT CONFIGURATION (Without SMM Console Installed)

- Press the SELECT key once to show REAR section only. (Monitor sets correct row spacing.)
- Press the SELECT key a second time to return to each section being displayed alternately every 5 seconds on KPM II Stack-Mode console. (Monitor sets correct row spacing.)
- Press the SELECT key a third time to show REAR section only again.



(MTR28c)

REAR/FRONT CONFIGURATION (With SMM Console Installed)

- Press the SELECT key once to show REAR section only on KPM II Stack-Mode console. (Monitor sets correct row spacing.)
- Press the SELECT key a second time to show FRONT section on SMM console and REAR section on KPM II Stack-Mode console. (Monitor sets correct row spacing.)
- Press the SELECT key a third time to show REAR section only again.



(MTR28c)

FOUR SECTION CONFIGURATION (With SMM Console Installed)

- Press the SELECT key once to show REAR and LEFT sections on KPM II Stack-Mode console and REAR and RIGHT sections on SMM console. (Monitor sets correct row spacing.)
- Press the SELECT key a second time to return to all four sections, alternating right front and right rear on SMM console and alternating left front and left rear on KPM II Stack-Mode console. (Monitor sets correct row spacing.)
- Press the SELECT key a third time to show REAR and LEFT sections on KPM II Stack-Mode console and REAR and RIGHT sections on SMM console again.

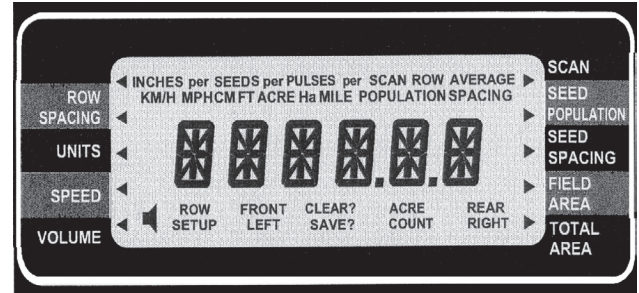


(MTR28c)

NOTE: SELECT key has no function when only a single section is being used.

At power up, the lower LCD will show speed (MPH or KM/H).

(MTR29g/MTR29b/MTR29a/MTR29c/MTR29f/MTR29c/MTR29f)



Press the UP or DOWN arrow keys to move the flashing arrow on the lower LCD to change what is displayed on the lower LCD.



Press the shortcut keys SPEED, SEED POPULATION/SEED SPACING or AREA FIELD/TOTAL for direct access to these displays.



(MTR29c/MTR29d/MTR29b/MTR29c)

Press the SEED POPULATION/SEED SPACING or AREA FIELD/TOTAL keys to alternate between the two functions assigned to that key.



Press the SEED POPULATION/SEED SPACING key to choose average seed spacing/population per acre.



Press the SCAN key to display individual rows starting at row 1.



Press the SCAN key again to lock on current row.

Press the SCAN key again to resume scrolling.

Use the UP or DOWN arrow keys to move to a particular row.



Press the SEED POPULATION/SEED SPACING key to go back to planter average.



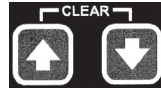
CLEARING FIELD AREA

(MTR29n/MTR28b)

To reset the counter, press the UP or DOWN arrow keys to move the arrow in the lower display to FIELD AREA.



Press the UP and DOWN arrow keys at the same time and hold them down for a short period of time to clear the data. The CLEAR? icon will be displayed and the monitor will beep several times. When the data is actually cleared, the monitor will emit a long beep, and the field area is reset to zero. After the long beep, the previous field area recorded is not retrievable.



NOTE: Clearing the field area counter will not clear the total area counter. See “Programming-Clearing Total Area” for clearing total area.

Press the OK key to silence alarms. See “Warnings And Alarms”.



MACHINE OPERATION

KPM II STACK-MODE

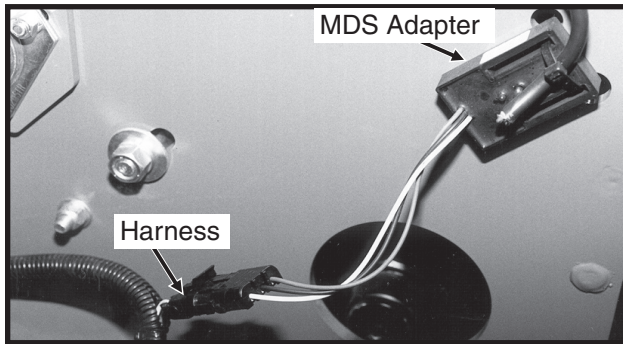
PROGRAMMING/CONNECTING SMM CONSOLE, SHAFT ROTATION SENSORS, SEED TUBES AND/OR RADAR/MAGNETIC DISTANCE SENSORS

STEP 1 All sensors (including the seed tubes w/ sensors, radar, magnetic distance, SMM console and shaft rotation sensors) must be unplugged from the harness and/or console and the monitor must be off.

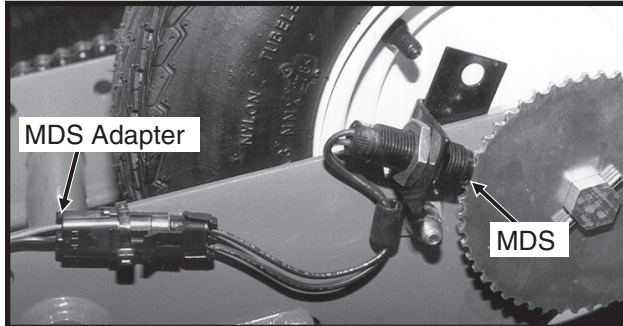
NOTE: If the monitor detects a radar sensor but no seed tubes at power up, it will automatically go into AREA COUNT mode. See “Area Counter/Speedometer Mode”.

NOTE: Disconnect magnetic distance sensor between MDS adapter and planter harness. **DO NOT** disconnect between MDS and MDS adapter.

01189909



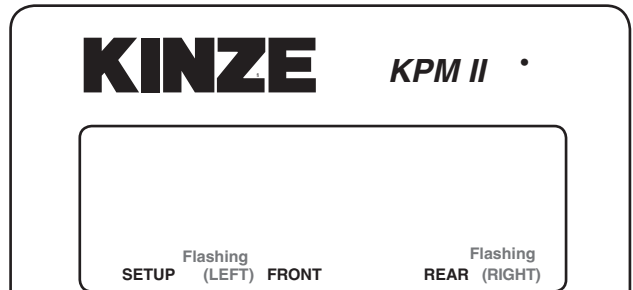
01189910



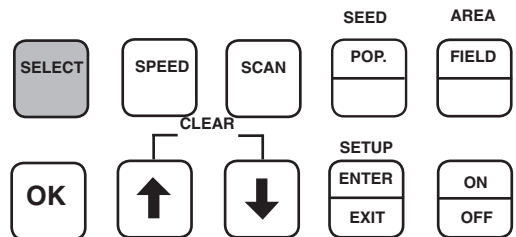
STEP 2 Press the ON key. The monitor automatically enters the setup procedure. Monitor will scroll “NO SENSOR” on top LCD of KPM II Stack-Mode console.

STEP 3 The monitor automatically defaults to rear/front. Press the SELECT key once for left/right and twice for four sections (front right/front left/rear right/rear left). The selected display will be solid and the configuration not currently selected will be flashing.

12060211



ROW	SETUP	SCAN
UNITS		SEED
SPEED		SEED
VOLUME		FIELD
		TOTAL

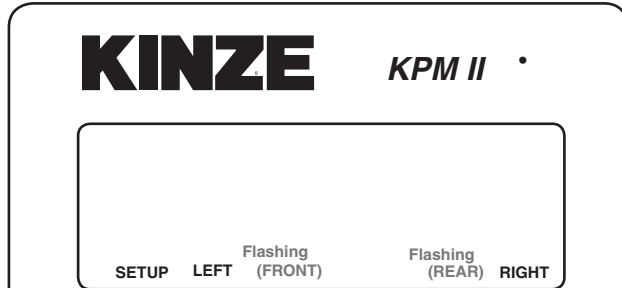


NOTE: SMM console may not be applicable to all models.

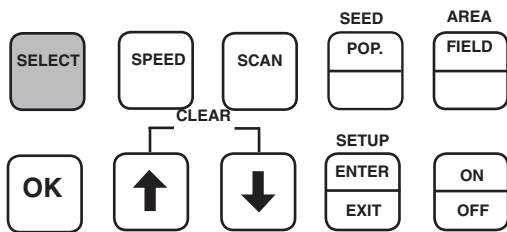
MACHINE OPERATION

KPM II STACK-MODE

12060211



ROW	SETUP	SCAN
UNITS		SEED
SPEED		SEED
VOLUME		FIELD
		TOTAL



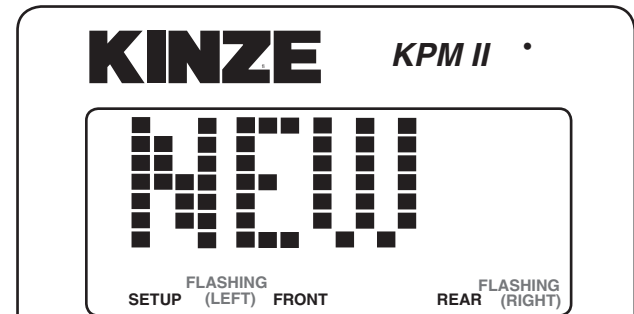
NOTE: SMM console may not be applicable to all models.

NOTE: Model 3200 planters select the rear configuration.

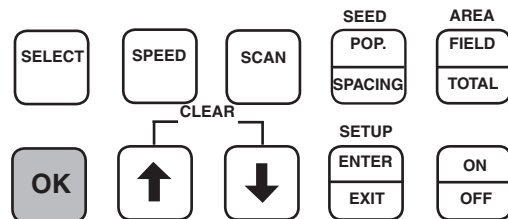
STEP 4 Press and hold the OK key to confirm selection. The upper display will alternate between “NEW” and “SYS?”.

The alarm will sound four short beeps followed by one long beep. At this point your selection has been saved and row numbers will appear flashing on the upper display of the KPM II.

12060211



ROW SPACING UNITS	SETUP	SCAN
SPEED		SEED POPULATION
VOLUME		SEED SPACING
		FIELD AREA
		TOTAL AREA



NOTE: SMM console may not be applicable to all models.

MACHINE OPERATION

KPM II STACK-MODE

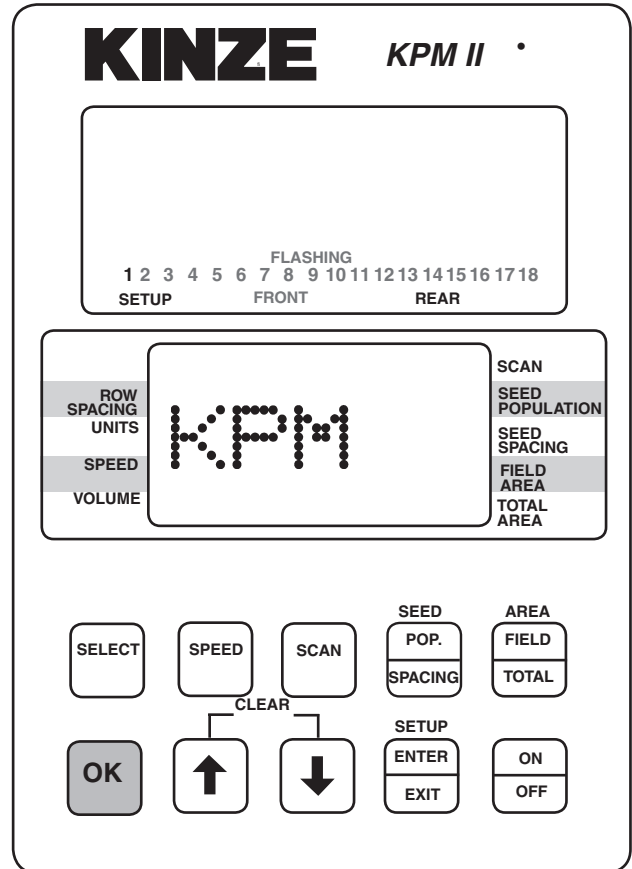
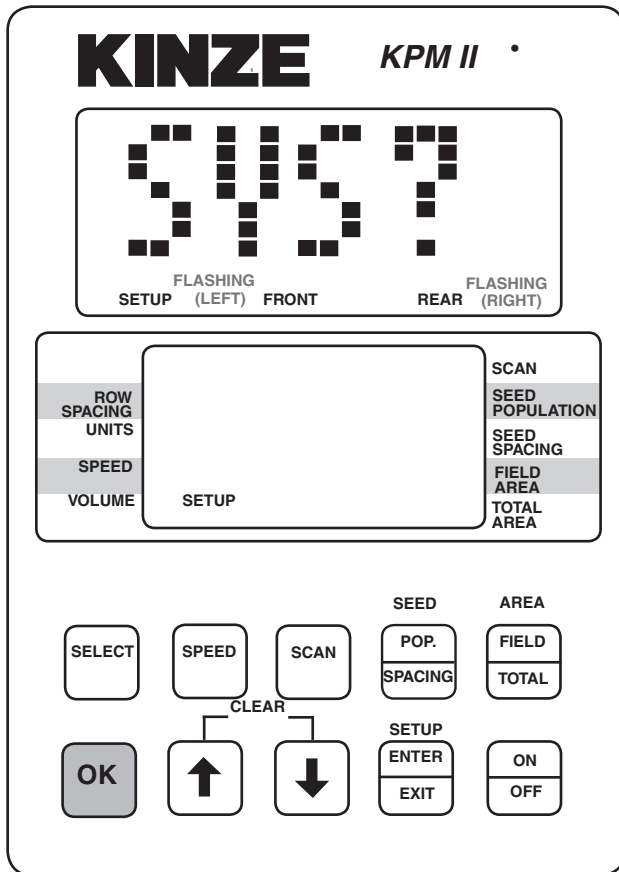
NOTE: Illustrated using rear/front configuration.
 The KPM II Stack-Mode console shows LEFT in the left/right configuration, REAR in the rear/front configuration and FRONT LEFT/REAR LEFT in the four sections configuration.

STEP 5 (If Applicable) Connect SMM console into junction Y-harness which was installed between the KPM II Stack-Mode console and the primary harness. The SMM console will show a lighted screen and KPM will show on the lower LCD.

12060211



12060211



NOTE: SMM console may not be applicable to all models.

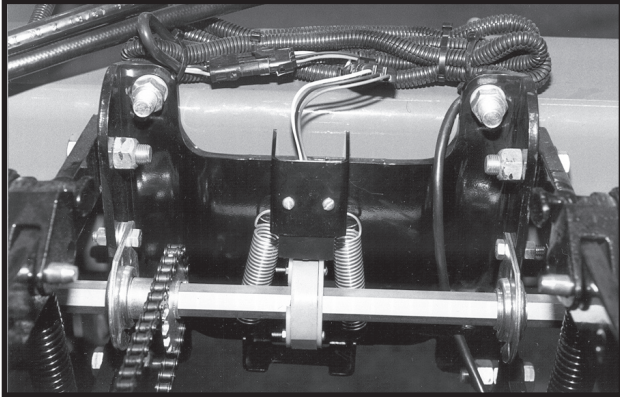
NOTE: SMM console may not be applicable to all models.

MACHINE OPERATION

KPM II STACK-MODE

STEP 6 If the monitor system includes shaft rotation sensors, these should be installed at this time. Plug in the L.H. shaft first, then the R.H. shaft. L.H. and R.H. is determined by facing in the direction the machine will travel when in use.

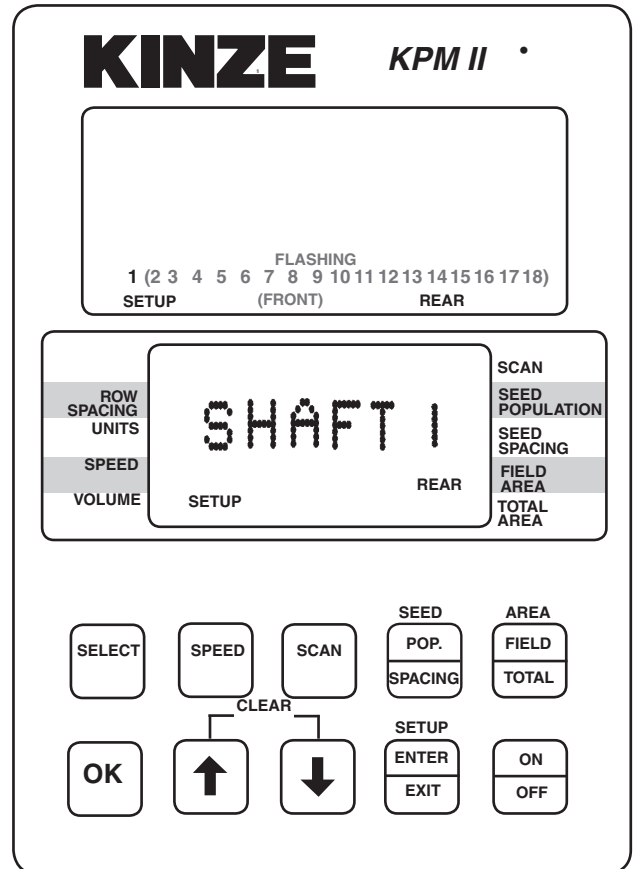
01189906



“LSHAFT” or “SHAFT 1” will display on the lower LCD when the first shaft rotation sensor is installed. “RSHAFT” or “SHAFT 2” will display when the second shaft rotation sensor is installed.

NOTE: Illustrated using rear/front configuration. The KPM II Stack-Mode console shows LEFT in the left/right configuration, REAR in the rear/front configuration and FRONT LEFT/REAR LEFT in the four sections configuration.

12060211



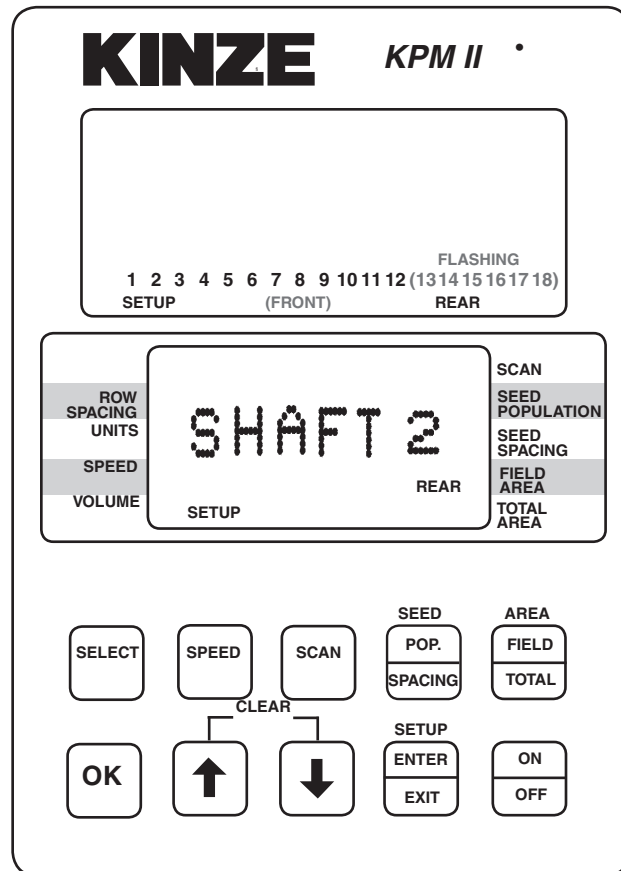
NOTE: SMM console may not be applicable to all models.

MACHINE OPERATION

KPM II STACK-MODE

STEP 6 (Continued)

12060211

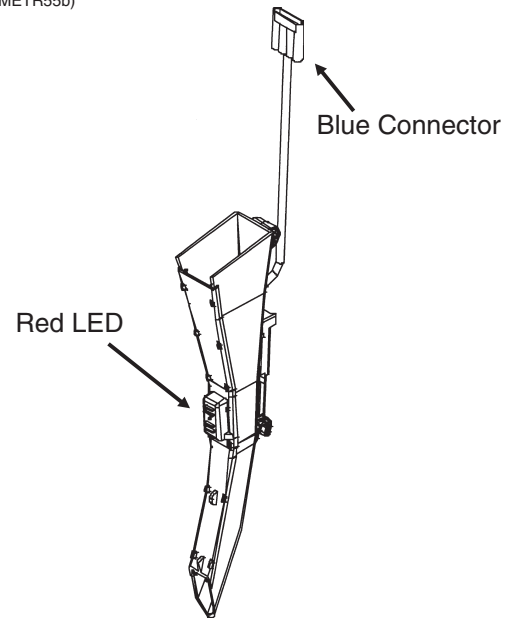


NOTE: SMM console may not be applicable to all models.

STEP 7 Determine which row you want as number one and plug the seed tube w/sensor into the harness.

Continue plugging in sensors along with shaft rotation sensors if so equipped. Row 1 first, row 2 second and so on up to 18 rows. When a sensor is plugged in, the corresponding row number on the upper LCD display will stay solid, the monitor will chirp twice and a red LED (Light Emitting Diode) on the seed tube sensor will turn on for approximately 30 seconds to show connection is made.

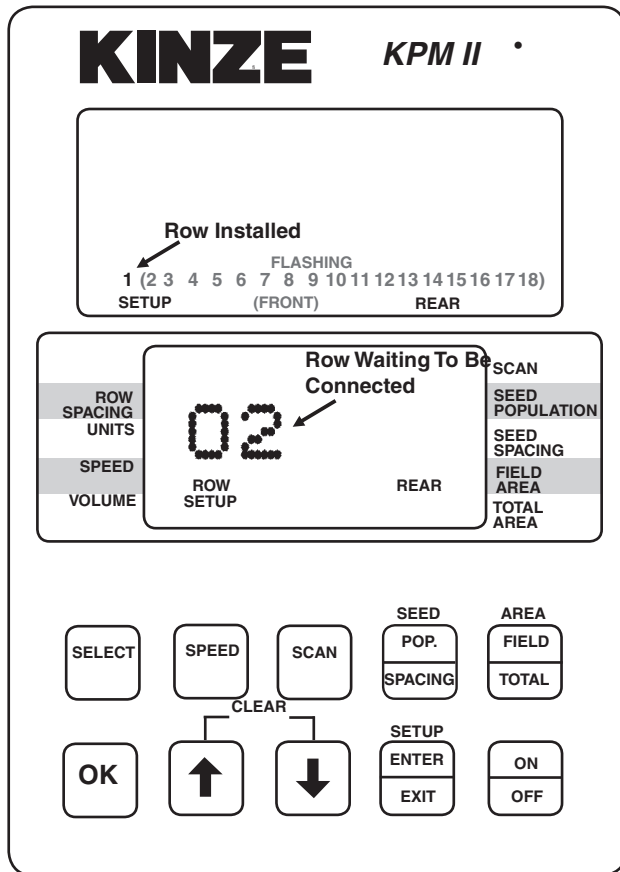
(METR55b)



STEP 7 (Continued)

NOTE: Illustrated using rear/front configuration.
 The KPM II Stack-Mode console shows LEFT in the left/right configuration, REAR in the rear/front configuration and REAR LEFT/FRONT LEFT in the four sections configuration.

12060211



NOTE: SMM console may not be applicable to all models.

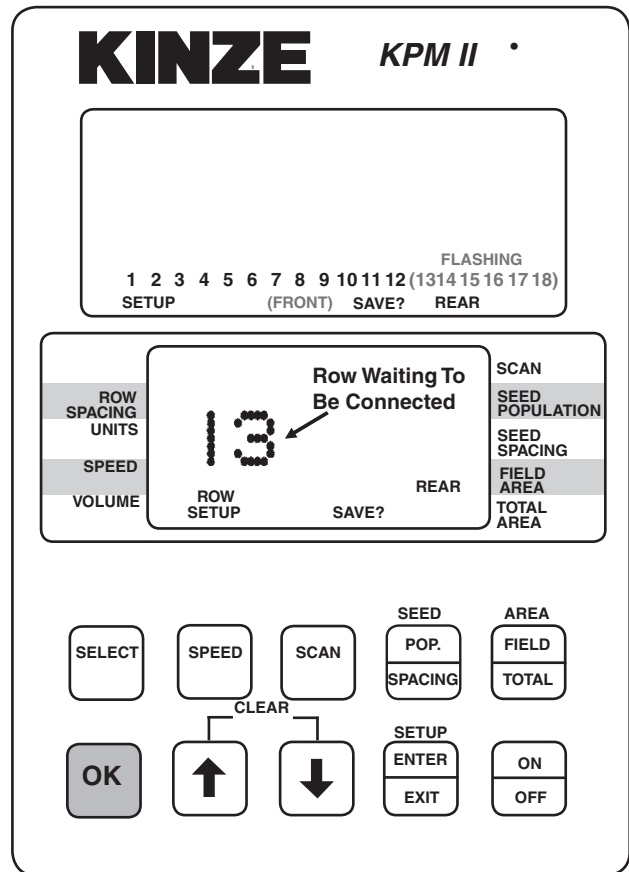
MACHINE OPERATION

KPM II STACK-MODE

STEP 8 When all the seed tubes for the current section (rear/front, left/right or four section) are installed, check to be sure the upper LCD on the KPM II Stack-Mode console displays solid numbers for the number of seed tubes connected. Press and hold the OK key to save the setup for the current section. The SAVE? icon will display followed by continuous short beeps indicating the monitor is preparing to save. The installer has 5 seconds to decide to save the current configuration. During this time, four short beeps will sound followed by a long beep and the SAVE? icon will turn off and the word “DONE” shows on the screen. The monitor will continue to the second section installation (If Applicable).

NOTE: Illustrated using rear/front configuration. The KPM II Stack-Mode console shows LEFT in the left/right configuration, REAR in the rear/front configuration and FRONT LEFT/REAR LEFT in the four sections configuration.

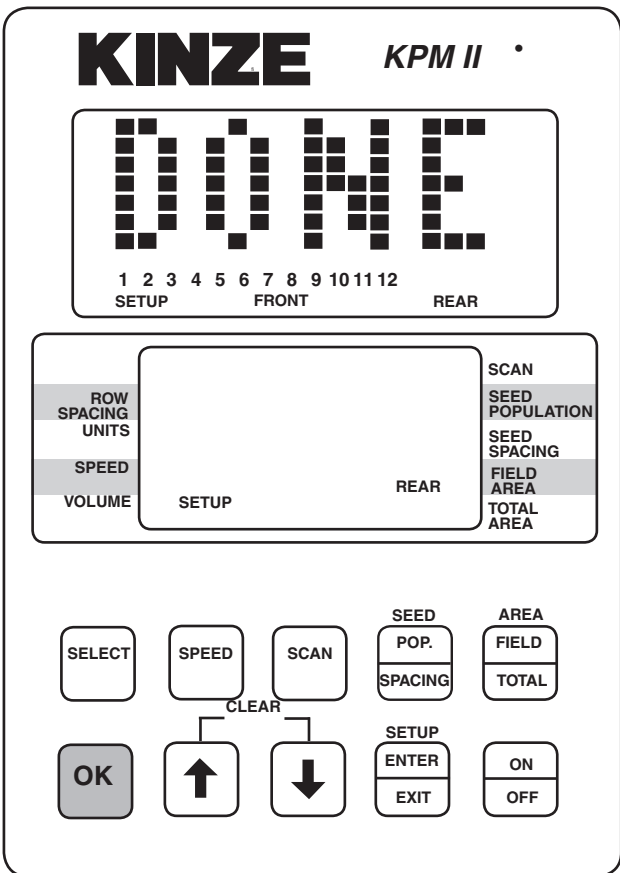
12060211



NOTE: SMM console may not be applicable to all models.

STEP 8 (Continued)

12060211



NOTE: SMM console may not be applicable to all models.

MACHINE OPERATION

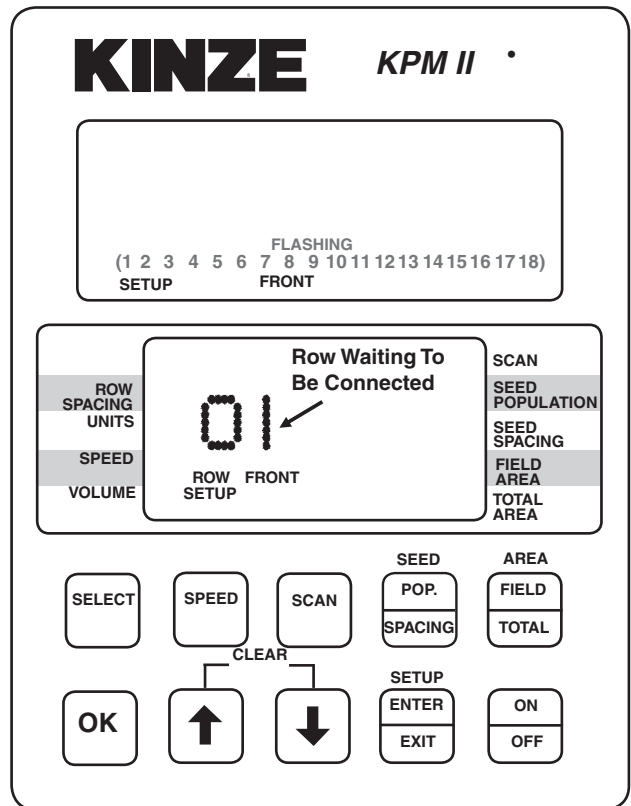
KPM II STACK-MODE

STEP 9 Follow STEPS 6, 7 and 8 to install the second, third and fourth sections (If Applicable). If no seed tubes are installed on the additional sections, press and hold the OK key. The word "DONE" will appear on upper display. The alarm will sound four short beeps followed by one long beep and the SAVE? icon turns off. The monitor has exited the setup mode. When you release the OK key the upper display will scroll "WAITING CALIBRATION". The lower display will show "GNDSPD" and the alarm will sound continually until the distance sensor is connected. See STEP 10.

NOTE: The SMM console LCD remains blank (except the backlighted screen) until the entire system is saved.

NOTE: Illustrated using rear/front configuration. The KPM II Stack-Mode console shows LEFT in the left/right configuration, REAR in the rear/front configuration and FRONT LEFT/REAR LEFT in the four sections configuration. The SMM console shows RIGHT in the left/right configuration, FRONT in the front/rear configuration and FRONT RIGHT/REAR RIGHT in four sections configuration.

12060212



NOTE: SMM console may not be applicable to all models.

MACHINE OPERATION

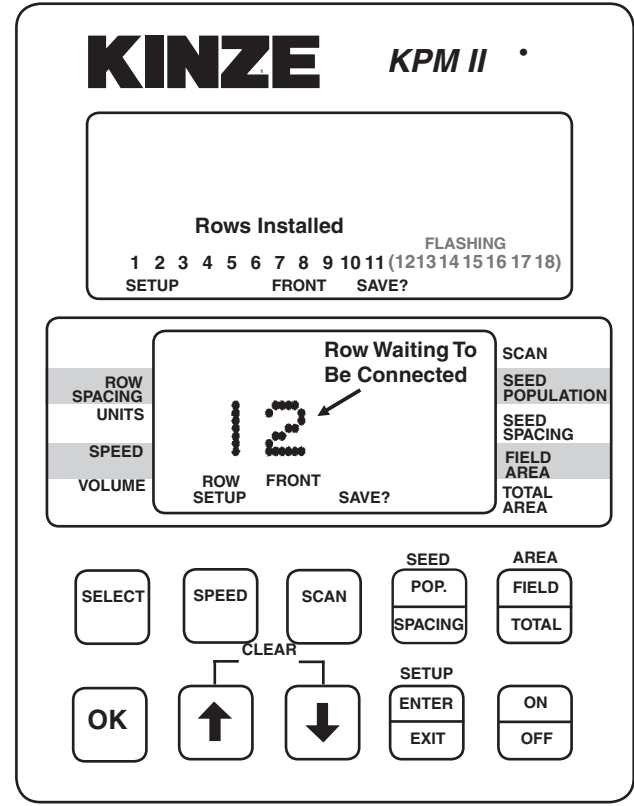
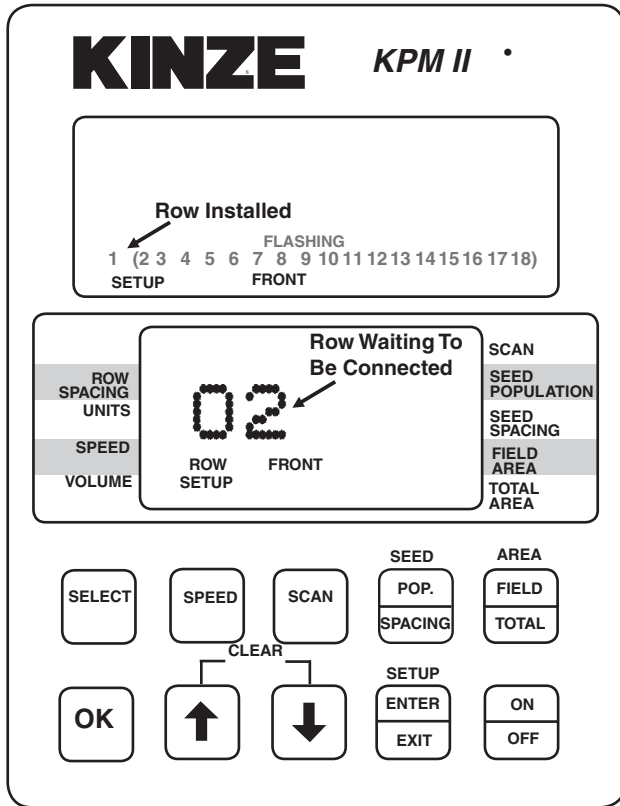
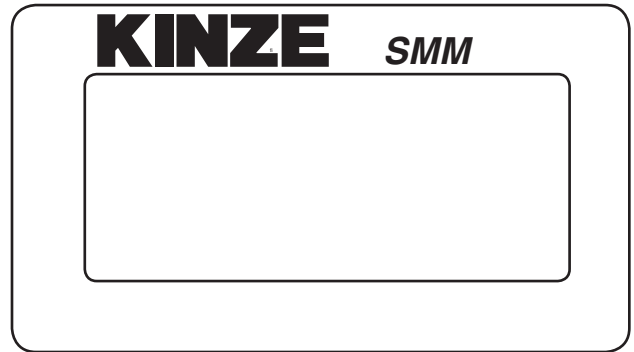
KPM II STACK-MODE

STEP 9 (Continued)

12060213



12060214



NOTE: SMM console may not be applicable to all models.

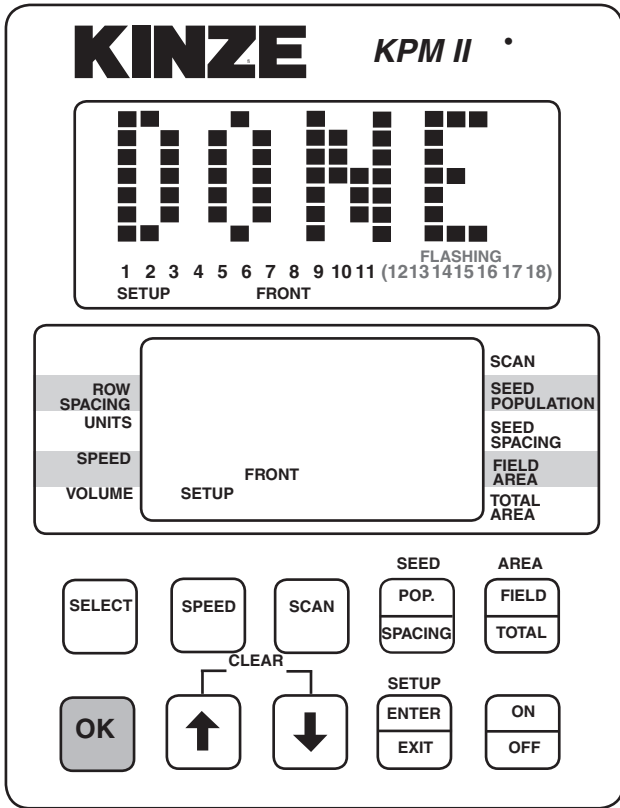
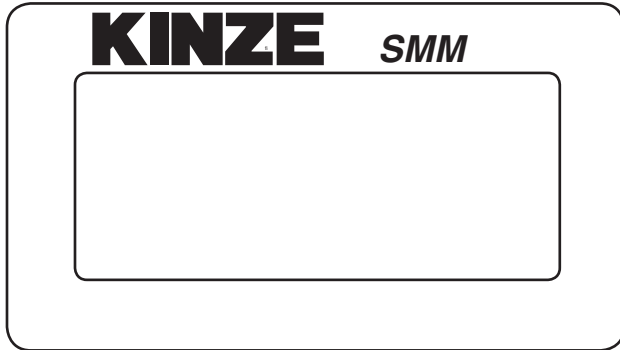
NOTE: SMM console may not be applicable to all models.

MACHINE OPERATION

KPM II STACK-MODE

STEP 9 (Continued)

12060215



NOTE: SMM console may not be applicable to all models.

STEP 10 With the lower display showing “GNDSPD”, connect the distance sensor. The monitor will display “PICKUP” if a magnetic distance sensor is connected or “RADAR” if a radar distance sensor is installed. Only one distance sensor can be connected at a time.

NOTE: To connect the radar distance sensor, install the 10" monitor/radar adapter between the console and radar distance sensor to adapt the monitor system to various tractor radar systems. **DO NOT CONNECT 10" MONITOR/RADAR ADAPTER PRIOR TO THIS STEP.**

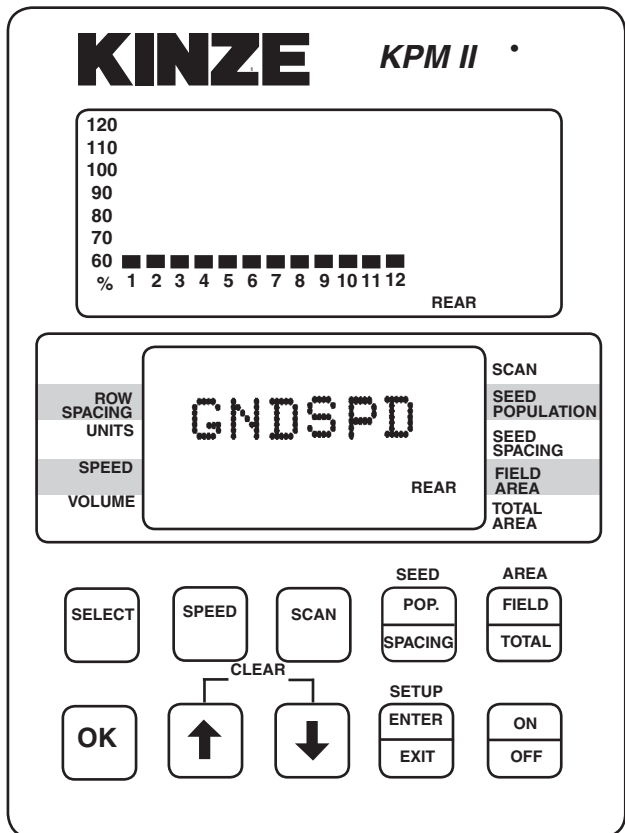
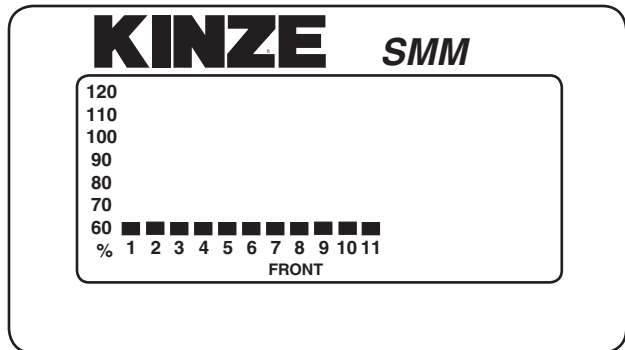
MACHINE OPERATION

KPM II STACK-MODE

STEP 10 (Continued)

NOTE: Illustrated using rear/front configuration.
 The KPM II Stack-Mode console shows LEFT in the left/right configuration, REAR in the rear/front configuration and FRONT LEFT/REAR LEFT in the four sections configuration. The SMM console shows RIGHT in the left/right configuration, FRONT in the rear/front configuration and FRONT RIGHT/REAR RIGHT in four sections configuration.

12060216

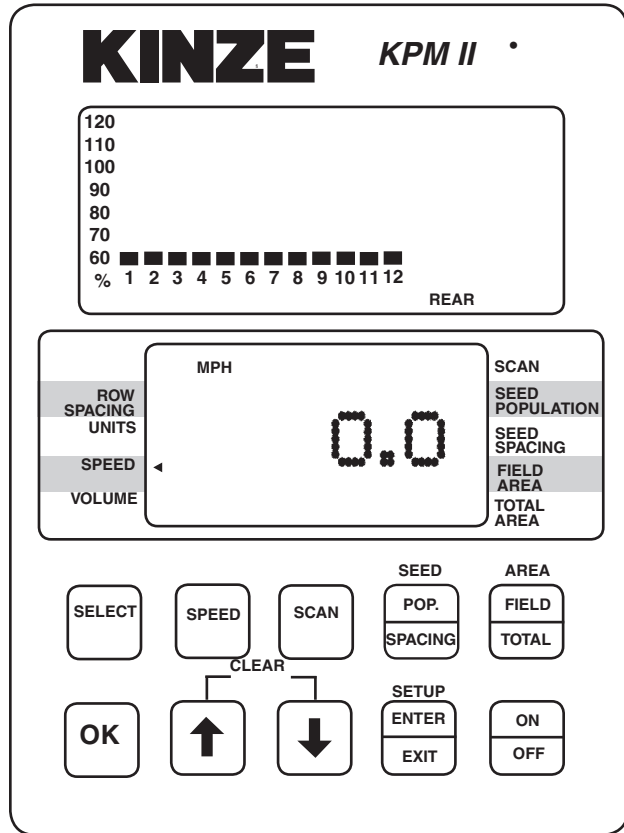
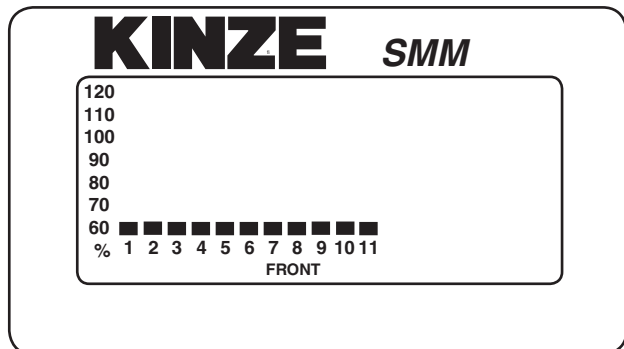


NOTE: SMM console may not be applicable to all models.

NOTE: To reprogram the system to monitor more or less rows (up to the maximum of 18 per section, 72 total in four section configuration), all sensors must be unplugged, followed by the complete setup procedure.

NOTE: Individual seed tubes may be unplugged for special situations. An alarm will sound which can be silenced by touching the OK key. The monitor will recognize the seed tube(s) when reconnected.

12060217



NOTE: SMM console may not be applicable to all models.

MACHINE OPERATION

KPM II STACK-MODE

ROW-BY-ROW ALARM LEVEL SETTING
 (Requires Version V2.05 Or Higher Software -
 KPM II Stack-Mode Monitors Only)

This feature allows the audio alarm to be disabled on selected rows in applications such as planting seed corn.

NOTE: The system should be programmed to monitor all planter rows prior to performing these steps.

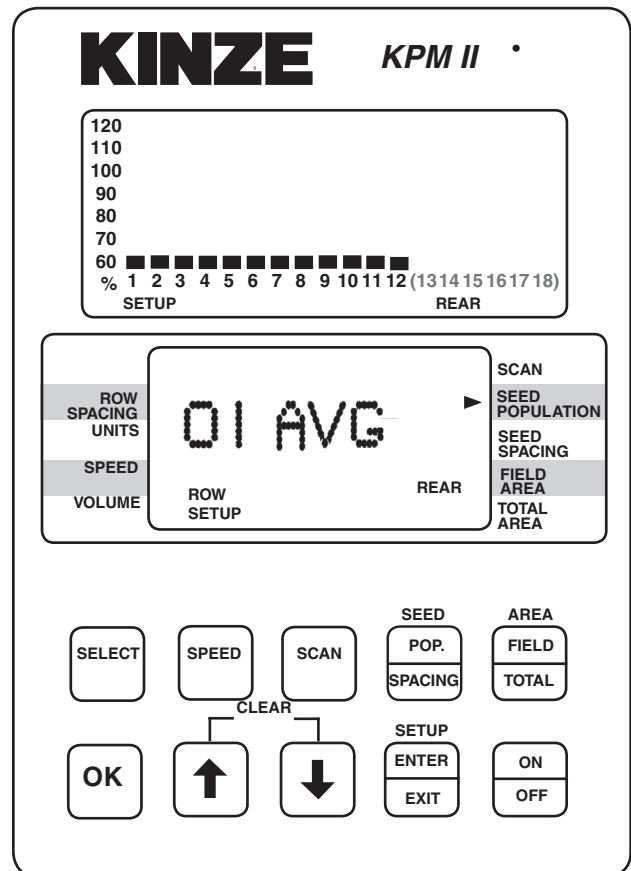
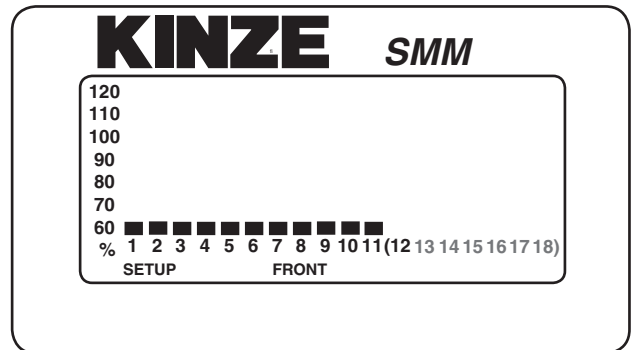
STEP 1 Enter the programming mode by pressing and holding the SETUP key. The monitor will emit several short beeps, followed by a long beep. On the lower LCD, the SETUP icon will turn on and the arrow head icon will flash, indicating the user can select an item to program.

NOTE: The monitor must be in a programmable function (row spacing, unit, speed, volume or area) to enter setup. The monitor will not enter setup in seed population or seed spacing.

STEP 2 Press the UP or DOWN arrow keys to move the flashing arrow to SEED POPULATION. As the arrow icon moves, the lower LCD will display the current setting of each item selected.

NOTE: Illustrated using rear/front configuration. The KPM II Stack-Mode console shows LEFT in the left/right configuration, REAR in the rear/front configuration and FRONT LEFT/REAR LEFT in the four sections configuration. The SMM console shows RIGHT in the left/right configuration, FRONT in the rear/front configuration and FRONT RIGHT/REAR RIGHT in four sections configuration.

12060218



NOTE: SMM console may not be applicable to all models.

STEP 3 Press the OK key. Row number starts flashing.

STEP 4 Arrow UP or DOWN to desired row.

STEP 5 Press SELECT key. "AVG" starts flashing.

STEP 6 Arrow UP or DOWN to choose one of the following options.

HIGH - For Early Alarm (70%)
AVG - For Standard Alarm Setting (55%)
LOW - For Failed Alarm Only (25%)
OFF - To Disable Row Alarm

STEP 7 Press and hold the OK key to save alarm setting. There will be four short beeps, one long beep and the word "DONE" will appear when the save is completed.

STEP 8 Repeat STEPS 3 through 7 for each row on which you wish to adjust the alarm setting.

STEP 9 When finished, press the SETUP key to exit setup mode.

NOTE: The programming mode may be exited at any time by pressing the SETUP key. Pressing this key will return the monitor to its normal operation. All items changed and saved will come into effect immediately. Any items changed, but not saved will revert to the original programmed value.

NOTE: Repeat STEPS 3 through 7 to change seed monitor back to the original settings when special row-by-row alarm level settings are no longer required.

NOTE:
See "Programming - Row Spacing" for programming applicable row spacing.

See "KPM I/KPM II Stack-Mode Electronic Seed Monitors Troubleshooting" in the Maintenance Section.

INTRODUCTION

MTR66



The KPM III electronic seed monitor system consists of

- A KPM III console, which is mounted on the tractor
- Seed tubes with sensors, one of which is installed in each planter row unit
- A magnetic distance sensor, which is installed on the planter, or a radar distance sensor, which is installed on the tractor
- Shaft rotation sensors (if applicable), which are installed on the planter drill shafts
- Vacuum, pneumatic down pressure, SDS and hydraulic level/temperature (If applicable), which are installed on the planter.
- Planter harnesses (junction Y-harness and/or extension harness where applicable), to which the individual seed tube sensors connect. The primary harness, which connects the monitor console to the planter harness, is hard-wired into the safety/warning light harness or control console harness included as standard equipment with the planter.

The software design of the KPM III console allows simultaneous viewing of seed flow bargraphs for standard and/or Interplant® System rows (up to 36 rows).

The monitor system is powered by the tractor battery. It requires 12 volts DC.

The console receives information from each of the sensors and displays this information.

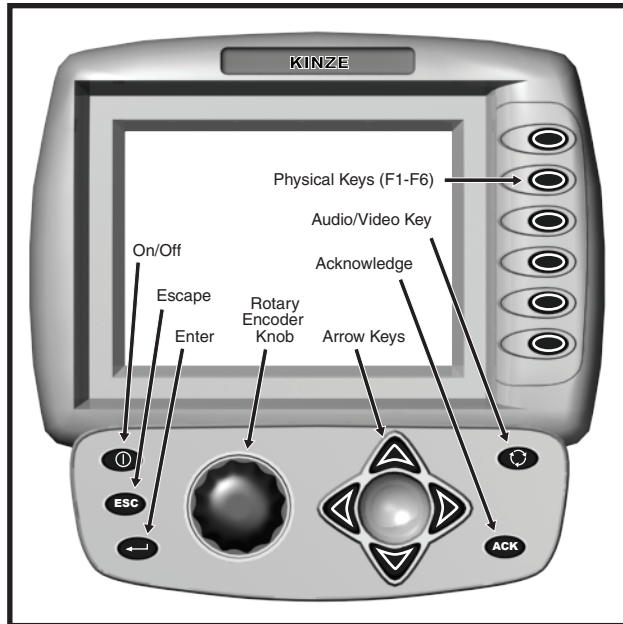
The KPM III console uses a single backlit Liquid Crystal Display (LCD) to show; the number of monitored rows, the relative seed rate for each row (using bargraph displays) and displays various alarm and warning messages when an alarm condition exists. A continuous audible alarm will sound upon system malfunction or underflow conditions for any monitored row. Alarms must be acknowledged by the user. Various warnings may sound the alarm or flash one or more messages. The LCD also shows alphanumeric data such as row spacing, units (Metric or English), speed (MPH or KM/H), volume, seed population, seed spacing, field area and total area.

The monitor system will power down if no activity is detected within one hour. No activity means there has been no new seed flow and no operator push key input.

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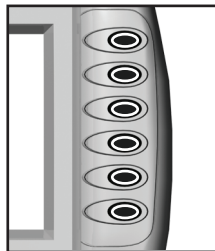
MONITOR KEY FUNCTIONS

Push keys allow the user to select or change the operating mode, the active displays or the current configuration. Depending on the operating mode or the current display selected, some keys may not be active. Each key press, if valid, is acknowledged by a short beep and an action is taken. If the key press has no action associated, the key press is considered invalid, and the user will not receive feedback.



PHYSICAL KEYS

- Located on R.H. side of console and referred to as F1, F2, F3, F4, F5 and F6
- Keys are referenced in descending order with F1 at the top and F6 at the bottom.



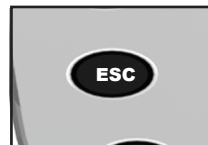
ON/OFF KEY

- Powers the unit on and off.



ESC KEY

- Used as the CANCEL (escape) key.



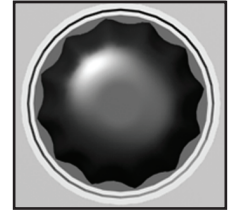
ENTER KEY

- Confirms or accepts the highlighted selection.



ROTARY ENCODER KNOB

- Turn knob clockwise to increase or counterclockwise to decrease value of item.
- Turn knob clockwise to scroll up or counterclockwise to scroll down.
- Press knob to enter selection.



AV (AUDIO/VIDEO) KEY

- Set alarm volume.
- Adjust the contrast.
- Adjust backlighting of the LCD display. Can be used at any time.



ACK (ACKNOWLEDGE) KEY

- Used to silence (acknowledge) the warning alarm when various error conditions occur.
- NOTE: Alarms can be viewed by pressing the STATUS key.**

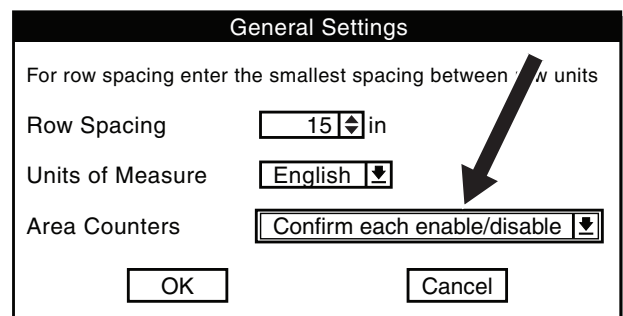


ARROW KEYS

- UP arrow key is used to move up.
- DOWN arrow key is used to move down.
- LEFT arrow key is used to move to the left.
- RIGHT arrow key is used to move to the right.



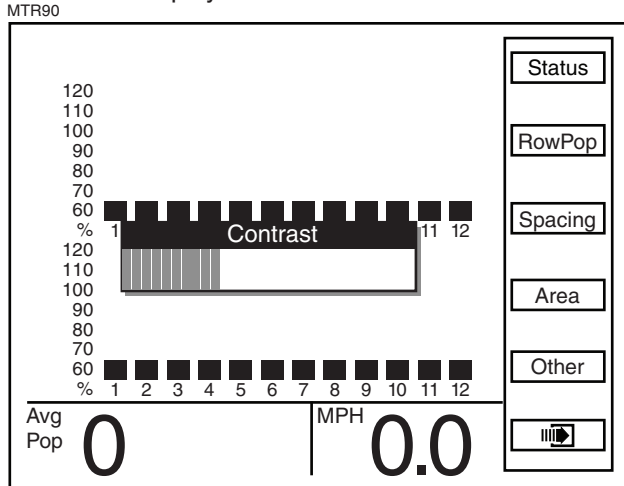
NOTE: Within the LCD, the black box around the smaller box as shown below indicates which field is selected/highlighted. Turning the rotary encoder knob or pressing the UP or DOWN arrow keys moves the black box. When the black box is positioned on a programmable item, such as Shaft Sensors, Speed Sensor, Front Row Units or Rear Row Units, pressing the knob or ENTER key will highlight the programmable item. A programmable item may only be changed when it is highlighted.



CHANGING VOLUME, CONTRAST AND BACKLIGHTING WITH THE AV KEY

The alarm, volume, LCD screen contrast, and backlighting may be adjusted at anytime, regardless of what is displayed on the screen.

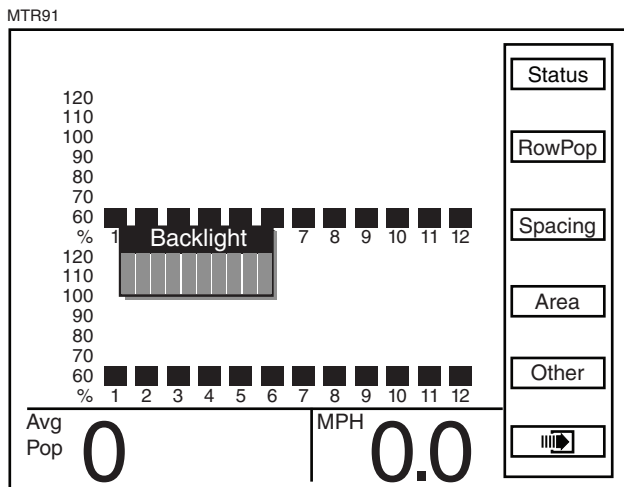
STEP 1 Press the AV key. The Contrast adjustment dialog box will appear in the center of the display.



STEP 2 Use the arrow keys or turn the rotary encoder knob to adjust contrast. The adjustment will be visible on the screen.

STEP 3 To adjust speaker or backlight, go to STEP 4. If finished press the Enter key to save and exit.

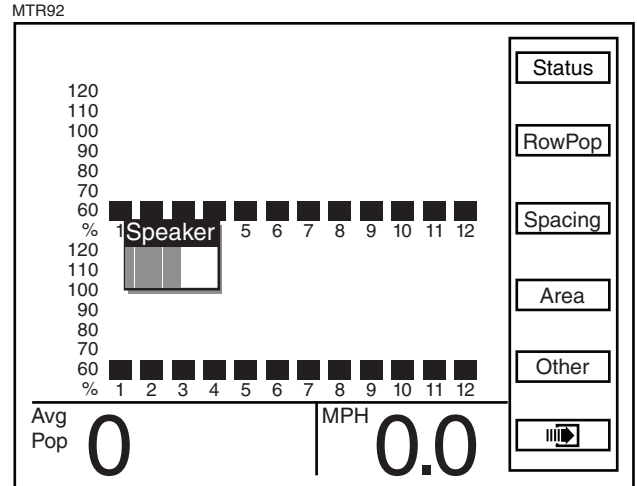
STEP 4 Press the AV button a second time. The Backlight adjustment dialog box will appear in the center of the display.



STEP 5 Use the arrow keys or turn the knob to adjust backlighting. The effect of the adjustment will be visible on the display.

STEP 6 To adjust speaker go to STEP 7. If finished press the Enter key to save and exit.

STEP 7 Press the AV button a third time. The Speaker adjustment dialog box will appear in the center of the display.

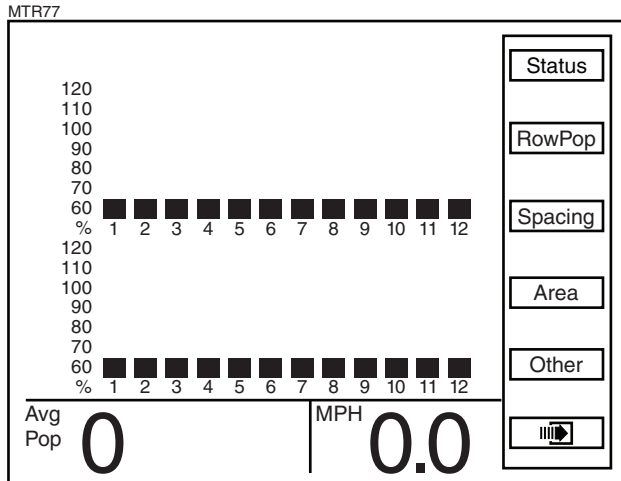


STEP 8 Use the arrow keys or turn the knob to adjust speaker volume. The volume of sound emitted from the speaker will change as adjustment is made.

STEP 9 Press the knob, Enter key or press the AV button a fourth time to save the volume, contrast and backlight settings.

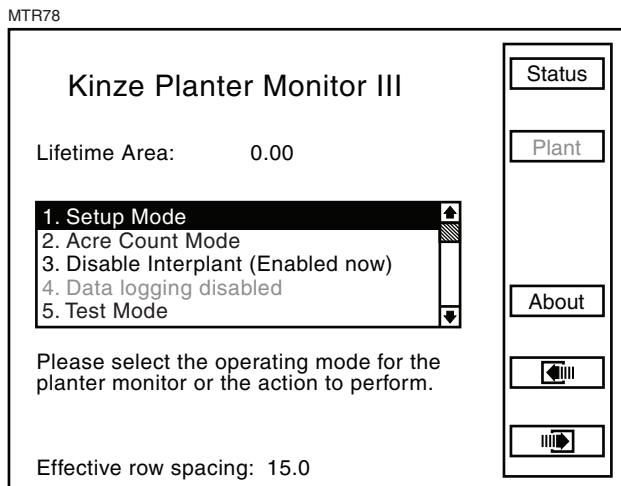
CONFIGURING PLANTER MONITOR

When the KPM III is powered on for the first time it will go directly into the Planter Configuration screen (STEP 4).



NOTE: The Planter Configuration screen displays the planter rows as programmed into the KPM III software. The above screen shows 12 front (Interplant®) rows and 12 rear rows. If the KPM III were programmed for 8 front (Interplant®) rows and 8 rear rows the screen would display 8 front and 8 rear rows.

STEP 1 Press the F6 key until Mode Selection screen appears.



NOTE: There are 5 choices on the Mode Selection screen;

1. Setup mode
2. Acre count mode
3. Disable Interplant® (Enabled now) mode
4. Data logging mode
5. Test mode

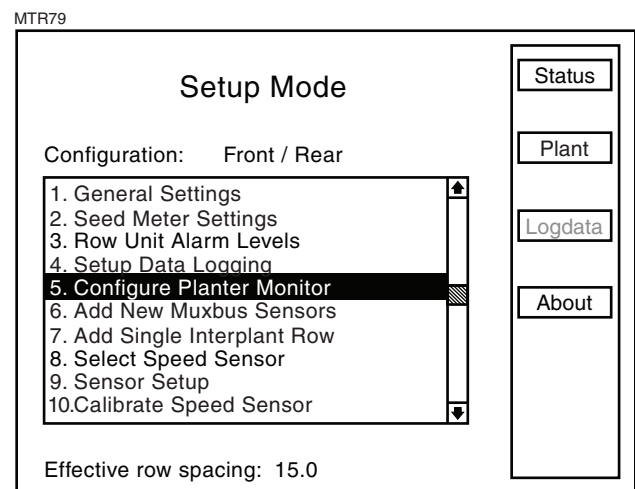
STEP 2 Select “1. Setup Mode” by turning the rotary encoder knob or using the arrow keys. Press the knob or Enter key to display the highlighted item.

NOTE: There are 10 choices on the Setup Mode screen;

1. General Settings
2. Seed Meter Settings
3. Row Unit Alarm Levels
4. Setup Data Logging
5. Configure Planter Monitor
6. Add New Muxbus Sensors
7. Add Single Interplant® Row
8. Select Speed Sensor
9. Sensor Setup
10. Calibrate Speed Sensor

STEP 3 Select “5. Configure Planter Monitor” by turning the knob or using the arrow keys. Press the knob or the Enter key to display the highlighted item.

NOTE: Press the F2 key next to Plant any time the Plant option is available to return to the Planter Configuration screen.



NOTE: The planter monitor cannot be reconfigured while planting.

STEP 4 If there are front rows (Interplant) on the planter, press the knob or Enter key to highlight the “Front Rows” field. A drop down number pad will appear. Turn the knob or use the arrow keys to highlight the correct value then press the knob to select the number, for numbers containing more than one digit select one digit at a time. When the desired quantity is displayed above the number pad press the Enter key to return to the “Kinze Planter Configuration” screen. If the planter has no front rows turn the knob or press the arrow keys to advance to “Rear Rows”.

MTR80

The screenshot shows the 'Kinze Planter Configuration' screen. The 'Planters Type' section has 'Front Rows' set to 0. A numeric keypad is visible with '0' highlighted. The 'Sensors Installed' section includes 'Speed' (Radar), 'Vacuum' (0), and 'SDS' (0). There are checkboxes for 'Hydraulic Level/Temp' and 'Downpressure Level', and a note 'SDS = Seed Delivery System'. 'OK' and 'Cancel' buttons are at the bottom.

STEP 5 Press the knob or Enter key to select the “Rear Rows” field. A drop down number pad will appear. Turn the knob or use the arrow keys to highlight the correct value then press the knob to select the number, for numbers containing more than one digit select one digit at a time. When the desired quantity is displayed above the number pad, press the Enter key to return to the “Kinze Planter Configuration” screen.

MTR81

The screenshot shows the 'Kinze Planter Configuration' screen. The 'Planters Type' section has 'Rear Rows' set to 0. A numeric keypad is visible with '0' highlighted. The 'Sensors Installed' section includes 'Speed' (Radar), 'Vacuum' (0), and 'SDS' (0). There are checkboxes for 'Hydraulic Level/Temp' and 'Downpressure Level', and a note 'SDS = Seed Delivery System'. 'OK' and 'Cancel' buttons are at the bottom.

STEP 6 Rotate the knob or use the arrow keys to advance to “Shafts” field. Press the knob or Enter key to select the “Shaft” field. A drop down menu will appear. Turn the knob or use the arrow keys to highlight the number of “Shafts” on the planter. When the correct value is displayed, press the knob or Enter key to return to the “Kinze Planter Configuration” screen.

MTR82

The screenshot shows the 'Kinze Planter Configuration' screen. The 'Planters Type' section has 'Front Rows' (11), 'Rear Rows' (12), and 'Shafts' (2). A drop-down menu for 'Shafts' is open, showing options 0, 1, 2, and 4. The 'Sensors Installed' section includes 'Speed' (Radar), 'Vacuum' (0), and 'SDS' (0). There are checkboxes for 'Hydraulic Level/Temp' and 'Downpressure Level', and a note 'SDS = Seed Delivery System'. 'OK' and 'Cancel' buttons are at the bottom.

STEP 7 Turn the knob or use the arrow keys to advance to the “Speed” field. Press the knob or Enter key and a drop down menu will appear; select either “Radar” or “Coil Pick-Up” (MDS) by turning the knob or using the arrow keys. When the desired selection is highlighted press the knob or Enter key.

MTR83

The screenshot shows the 'Kinze Planter Configuration' screen. The 'Planters Type' section has 'Front Rows' (11), 'Rear Rows' (12), and 'Shafts' (2). The 'Sensors Installed' section has 'Speed' set to Radar. A drop-down menu for 'Speed' is open, showing 'Radar' and 'Coil Pick-Up'. 'Vacuum' is 0 and 'SDS' is 0. There are checkboxes for 'Hydraulic Level/Temp' and 'Downpressure Level', and a note 'SDS = Seed Delivery System'. 'OK' and 'Cancel' buttons are at the bottom.

STEP 8 If applicable, turn the knob or use the arrow keys to advance to “Vacuum”. Press the knob or Enter key and a drop down menu will appear. Select the correct number of vacuum sensors by turning the knob or using the arrow keys. Confirm the selection by pressing the knob or Enter key.

STEP 9 If applicable, turn the knob or use the arrow keys to advance to “SDS” (Seed Delivery System), Press the knob or Enter key. A drop down menu will appear. Select the correct number of SDS Sensors by turning the knob or using the arrow keys. Press the knob or Enter key to confirm selection.

STEP 10 If applicable, turn the knob or use the arrow keys to advance to “Hydraulic Level/Temp”. Press the knob or Enter key to select or deselect. When selected, a check mark will appear in the box.

STEP 11 If applicable, turn the knob or use the arrow keys to advance to “Downpressure Level”. Press the knob or Enter key to select or deselect. When selected, a check mark will appear in the box.

STEP 12 Advance to “OK” by using the knob or arrow keys. Press the knob or the Enter key to save the information.

MTR84

Kinze Planter Configuration	
Planter Type	Sensors Installed
Front Rows <input type="text" value="11"/>	Speed <input type="text" value="Radar"/>
Rear Rows <input type="text" value="12"/>	Vacuum <input type="text" value="0"/>
Shafts <input type="text" value="2"/>	SDS <input type="text" value="0"/>
There should be one sensor for each Row and each Shaft.	<input type="checkbox"/> Hydraulic Level/Temp <input type="checkbox"/> Downpressure Level SDS = Seed Delivery System
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

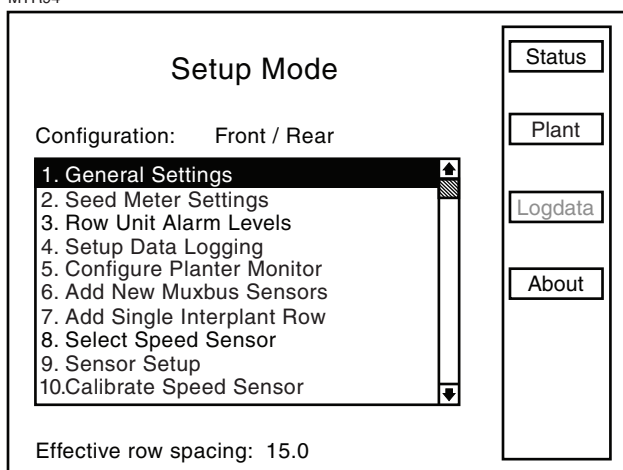
NOTE: To prevent the configuration from being saved select “Cancel” and press the rotary encoder knob or Enter key. The display will return to the “Setup Mode” screen without saving any changes.

NOTE: When OK is selected the monitor automatically advances to the Sensor Setup screen. Sensor Setup can also be selected from the Setup Mode screen. See pages 45-46 (PROGRAMMING/CONNECTING SEED TUBES, SHAFT ROTATION SENSORS AND/OR RADAR/MAGNETIC DISTANCE SENSORS)

GENERAL SETTINGS
(Programming Interplant® condition, row spacing and units) (Metric or English)

STEP 1 Turn the knob or use the arrow keys to highlight “1. General Settings”. Press the knob or the Enter key to display the highlighted item.

MTR94



NOTE: When English is selected inches are displayed, if Metric is selected centimeters are displayed.

STEP 2 Press the knob or Enter key to enter the correct value for “Row Spacing”. A drop down number pad will appear. Turn the knob or use the arrow keys to highlight the first digit of the desired number and press the knob. The number will appear in the “Row Spacing” line. Turn the knob or use the arrow keys to highlight the next digit of the number and press the knob. The number will appear in the “Row Spacing” line. When the correct number is displayed in the “Row Spacing” line, press the Enter key to return to the “General Settings” screen.

NOTE: The narrowest row spacing the planter is equipped to plant should be entered for “Row Spacing”. Example: 12 Row 30 with Interplant®, row spacing would be set to 15.

STEP 3 Turn the knob or use the arrow keys to highlight the “Units of Measure” field. Select the “Units of Measure” field by pressing the knob or Enter key, a drop down menu will appear. Highlight either “English” or “Metric” by turning the knob or using the arrow keys. When the correct entry is highlighted, press the knob or Enter key to accept the unit of measure entry and return to the “General Settings” screen.

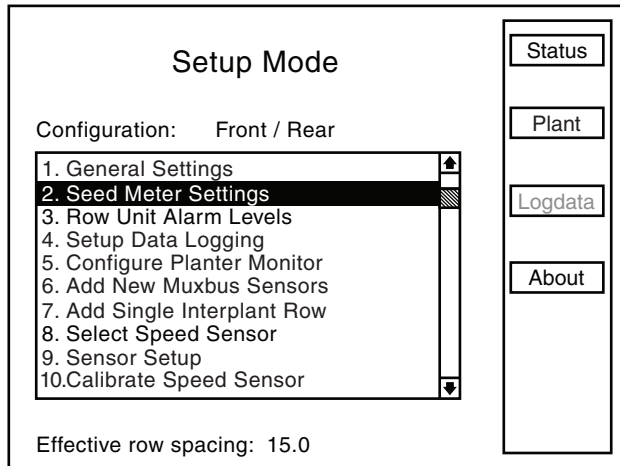
STEP 4 Turn the knob or use the arrow keys to highlight the “Area Counters” field. Select the “Area Counters” field by pressing the knob or Enter key, a drop down menu will appear. Turn the knob or use the arrow keys to highlight either “Confirm each enable/disable”, “Don’t confirm again today”, or “Don’t confirm enable/disable”. When the desired selection is highlighted, press the knob or Enter key to accept the selection and return to the “General Settings” screen.

STEP 5 Once the correct values have been inputted into the “General Settings” screen the “OK” button can be selected to save the changes, or the “Cancel” button can be selected to discard the changes that have been made. Turn the knob or use the arrow keys to highlight either “OK” or “Cancel” and press the knob or Enter key to return to the “Setup Mode” screen.

SEED METER SETTINGS

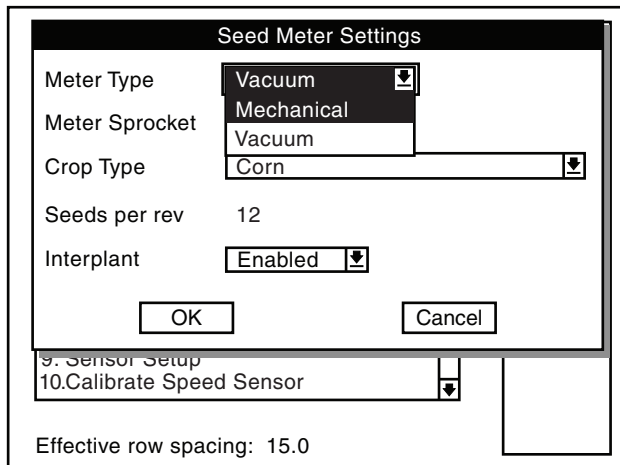
STEP 1 Scroll to “2. Seed Meter Settings” by turning the rotary encoder knob or using the arrow keys. Press the knob or Enter key to display the highlighted item.

MTR159

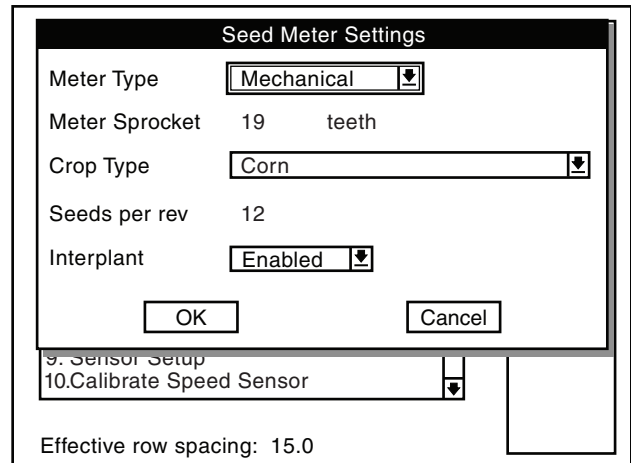


STEP 2 Select meter type by highlighting “Meter Type” and pressing the knob or Enter key, then highlight “Mechanical” or “Vacuum” and press the knob or enter key.

MTR212

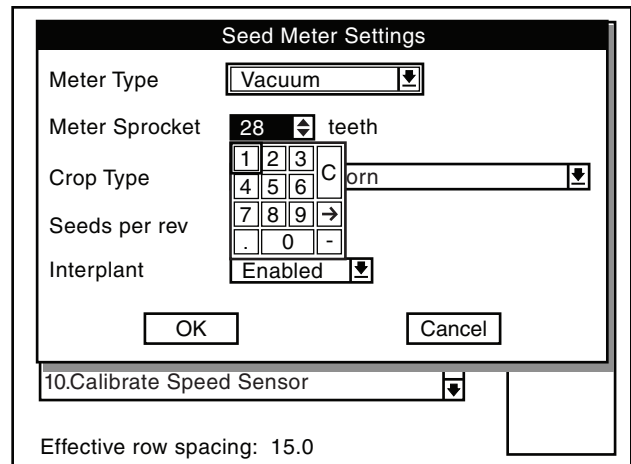


MTR210



NOTE: When Mechanical “Meter Type” is selected “Meter Sprocket” automatically sets.

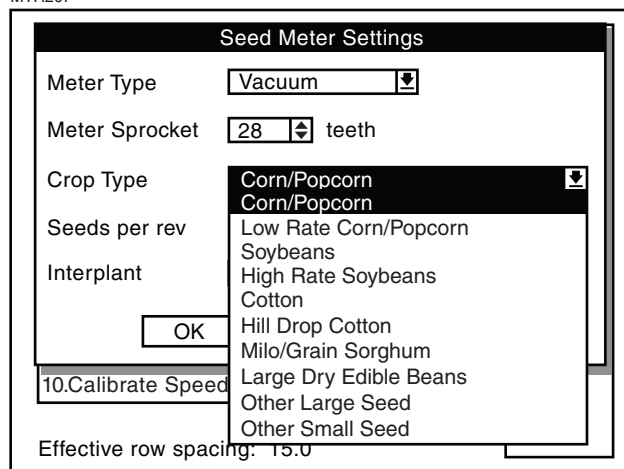
MTR206



NOTE: When Vacuum “Meter Type” is selected “Meter Sprocket” automatically defaults to 28 teeth. To change “Meter Sprocket” select “Meter Sprocket” by turning the knob or using the arrow keys. Press the knob or enter key, a drop down number pad will appear. Turn the knob or use the arrow keys to highlight the first digit of the desired number and press the knob. When the correct number is obtained press the knob or enter key.

STEP 3 Turn the knob or use the arrow keys to highlight “Crop Type”. Press the knob or Enter key to display the crop drop down menu.

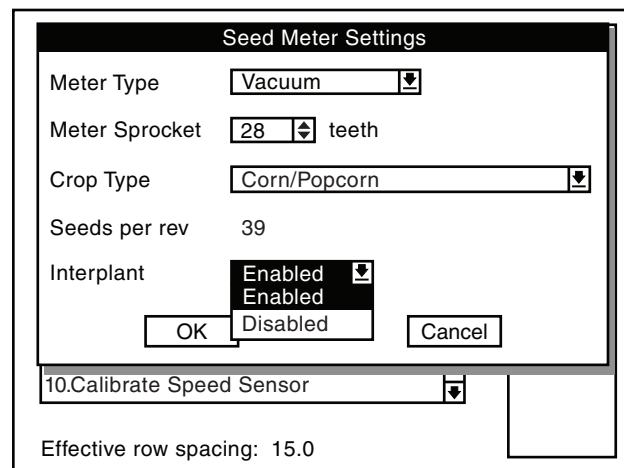
MTR207



STEP 4 Turn the knob or use the arrows keys to highlight a crop for planting then press the knob or Enter key. Once crop type is entered, the “Seeds per rev” is set automatically.

STEP 5 (If Applicable) Turn the knob or use the arrow keys to highlight “Interplant”. Press the knob or Enter key to display the Interplant® drop down menu.

MTR208



STEP 6 Turn the knob or use the arrow keys to highlight either “enable” or “disable” and press the knob or Enter key.

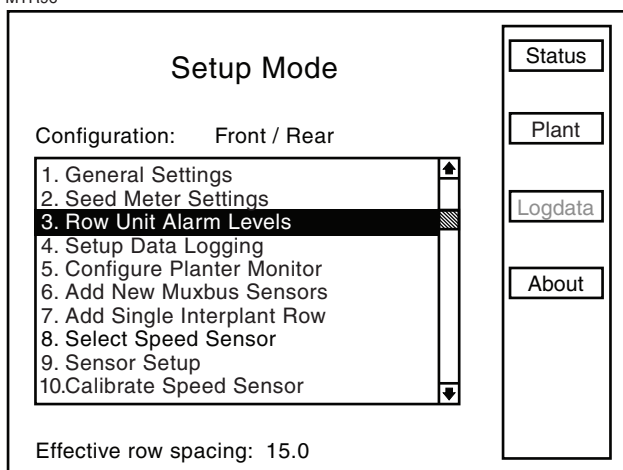
STEP 7 When all changes have been made, highlight “OK” and press the knob or Enter key to return to the “Set Mode” screen.

PROGRAMMING ROW UNIT ALARM LEVELS

The Row Unit Alarm Levels allow the thresholds for the seed rate alarms to be set. The default is 50% or Average. If the average population drops below 50% for a given row a seed rate alarm will be generated for that row unit. The alarm threshold can be set to 70%, 50%, 0% or disabled, or any custom percentage desired for any row.

NOTE: When the alarm threshold is disabled for any row no seed rate alarm will be generated.

MTR96

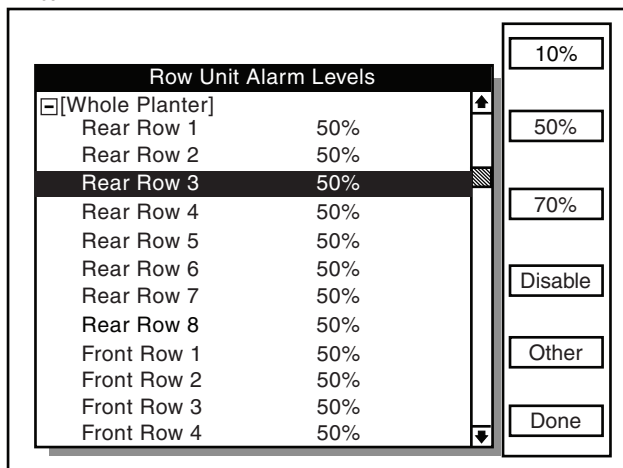


The alarm thresholds can be set for the whole planter, any planter section or individual rows.

NOTE: A section is determined by a set of rows driven by one or more shafts, designated to a single shaft sensor.

STEP 1 Select “3. Row Unit Alarm Levels” by turning the knob or using the arrow keys. Press the knob or Enter key to display the highlighted item.

MTR98



STEP 2 To set the alarm thresholds for the whole planter, turn the knob or use the arrow keys to highlight the “[Whole Planter]” line. Press the key next to the desired threshold. When the desired threshold has been specified for all row units, press the F6 key next to “Done”.

NOTE: Only configured rows will appear on the screen.

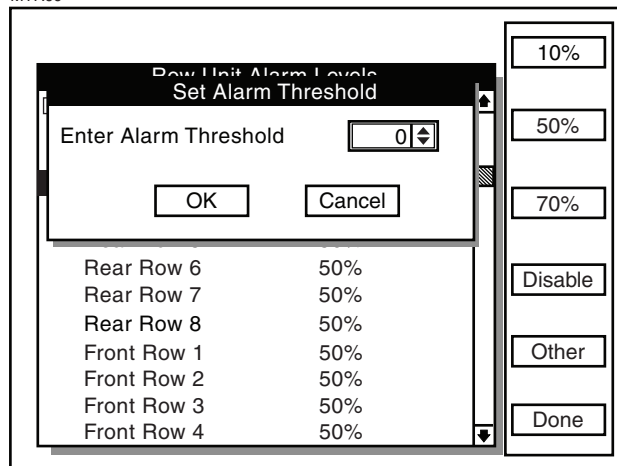
To set the alarm thresholds for all the rows in one section, highlight the desired section. Press the key next to the desired threshold. When the desired threshold has been specified for all row units, press the F6 key next to “Done”.

To set the alarm thresholds for individual rows, highlight the desired row. Press the key next to the desired threshold. When the desired threshold has been specified for all row units, press the F6 key next to “Done”.

To disable the row unit alarm, highlight the desired section or individual row. Press the F4 key next to “Disable”. When the alarm is desired again highlight the disabled section or row. Press the key next to the desired threshold.

To enter a threshold not listed, highlight the desired section or individual row. Press the F5 key next to “Other”. Press the knob or Enter key and a drop down key pad will appear. Turn the knob or use the arrow keys to highlight the first digit of the desired number and press the knob. The number will appear in the “Enter Alarm Threshold” line. Highlight the next digit of the number and press the knob. The number will appear in the line. When the correct number is displayed, press the Enter key to return to the “Set Alarm Threshold” screen. Turn the knob or use the arrow keys to advance to “OK”. Press the knob or Enter key to accept the threshold levels.

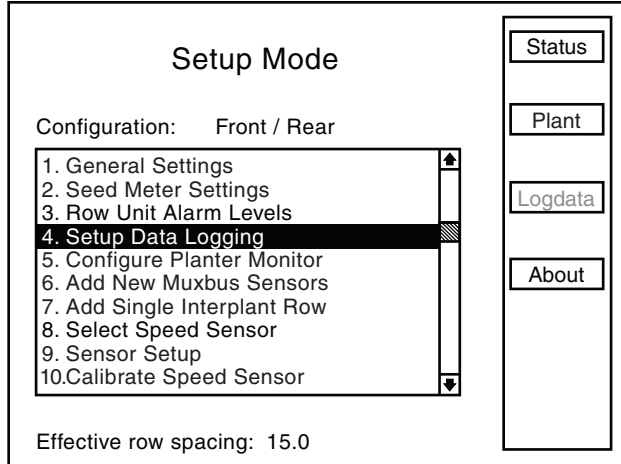
MTR99



DATA LOGGING MODE

STEP 1 Scroll to “4. Setup Data Logging” by turning the rotary encoder knob or using the arrow keys. Press the knob or Enter key to display the highlighted item.

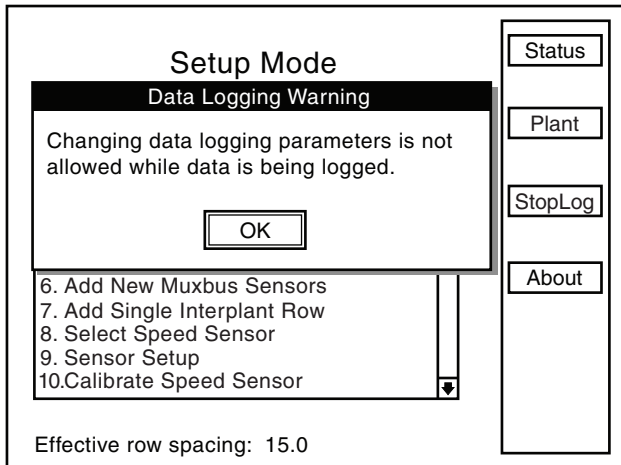
MTR164



NOTE: Data logging changes cannot be made while data is being logged. If the monitor is logging data the following warning will appear. To stop data logging and continue.

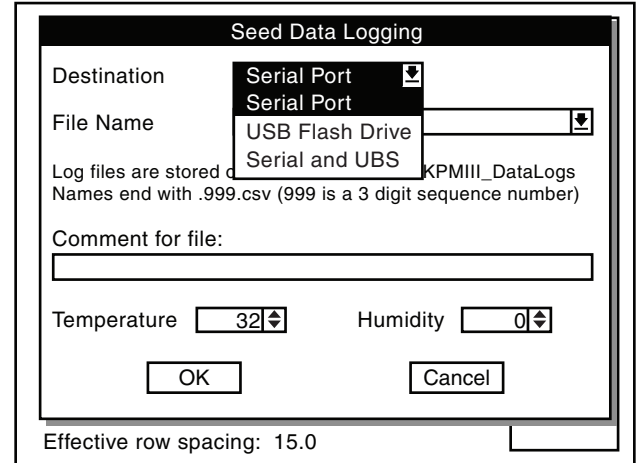
- Press the knob or Enter key to close the warning.
- Then in the “Setup Mode” press the F3 key next to “StopLog”.

MTR165



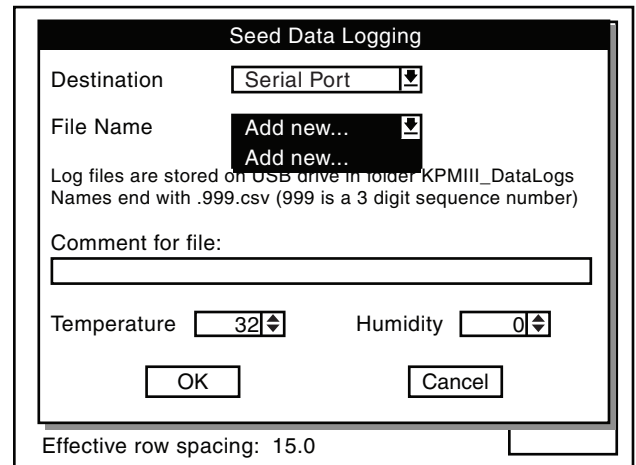
STEP 2 Turn the knob or use the arrow keys to highlight the “Destination” box then press the knob or Enter key. Highlight the desired option either “Serial Port”, “USB Flash Drive”, or “Serial and USB” and press the knob or Enter key.

MTR166



STEP 3 Use the knob or arrow keys to highlight the “File Name” box. Press the knob or Enter key and a drop down list of the files will be displayed. Select “Add new...” to enter a file name and press the knob or enter key to display a keyboard.

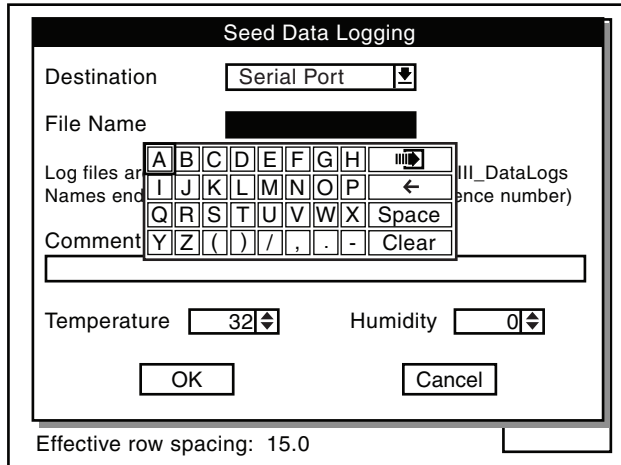
MTR167



STEP 4 Select “Add new...” to enter a file name and press the knob or enter key to display a keyboard.

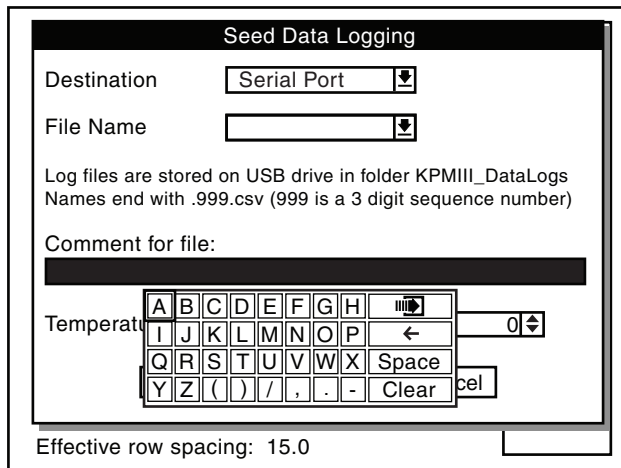
STEP 5 Add a new file name by using the drop down keyboard. Spell out the file name by highlighting each letter and pressing the knob or Enter key.

MTR168



STEP 6 Use the knob or arrow keys to scroll to the “Comment for file” box. Press the knob or Enter key to display the drop down keyboard. Use the keyboard to enter a Comment for the file then press the Enter key.

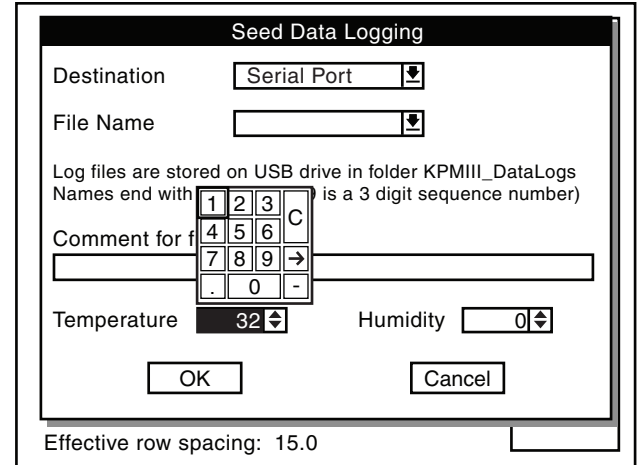
MTR169



STEP 7 Use the knob or arrow keys to scroll to the Temperature box. Press the knob or Enter key to display the drop down keyboard. Use the keyboard to enter the temperature then press the Enter key.

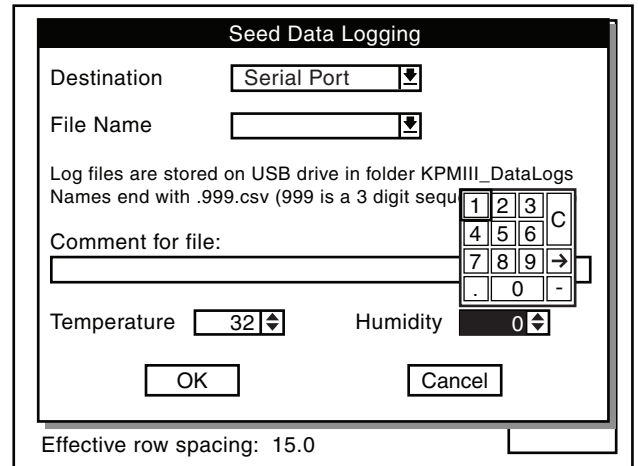
STEP 8 Use the knob or arrow keys to scroll to the Humidity box. Press the knob or Enter key to display the drop down keyboard. Use the keyboard to enter the humidity then press the Enter key.

MTR170



STEP 9 Use the knob or arrow keys to scroll to the “OK” button and press the knob or Enter key. The display will return to the Setup Mode screen.

MTR171



STEP 10 Press the F2 key next to Plant to return to Planter configuration screen.

STEP 11 Press the F3 key next to “Logdata” to begin logging.

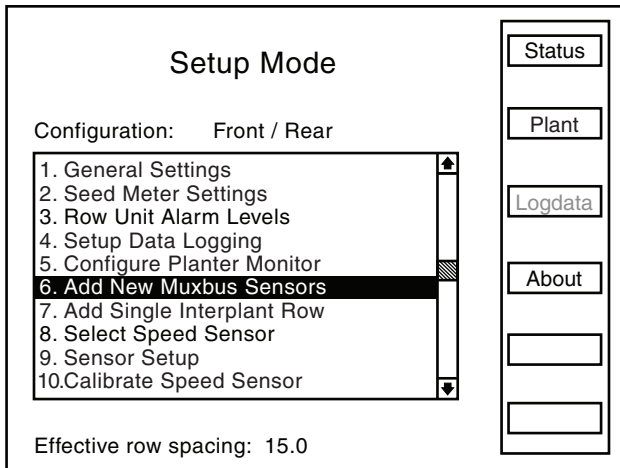
STEP 12 Press the F3 key next to “Stoplog” to end logging.

**ADDING INTERPLANT® ROWS
(If only Rear Rows Have Previously Been Programmed)**

NOTE: The planter monitor configuration must contain an odd number of front rows before the single Interplant® row unit can be added.

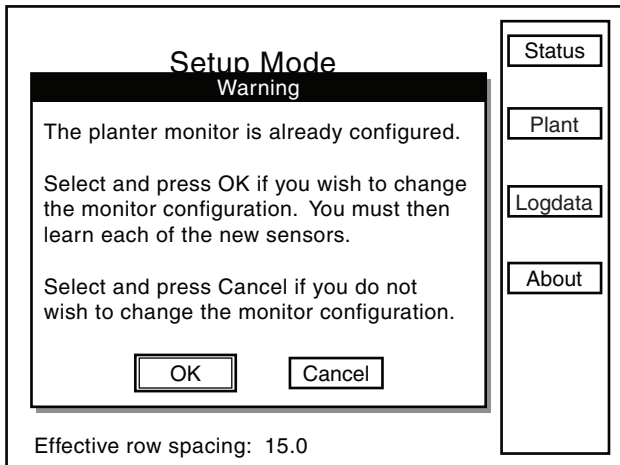
STEP 1 Highlight “6. Add New Muxbus Sensors” by turning the knob or using the arrow keys. Press the knob or Enter key to display the highlighted item.

MTR119



STEP 2 The note shown below will appear. Highlight “OK” by turning the knob or using the arrow keys. Press the knob or Enter key to make the selection.

MTR120



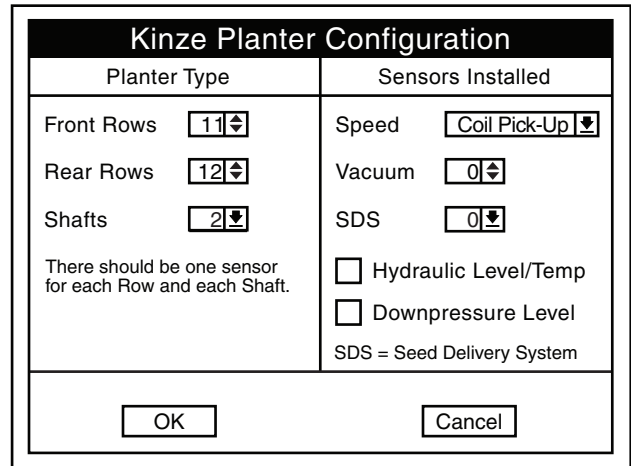
NOTE: To prevent the configuration from being changed, select Cancel, then press the knob, Enter key or ESC key.

STEP 3 Turn the knob or use the arrow keys to highlight the “Front Rows” field and press the knob or Enter key and a drop down number pad will appear.

STEP 4 Turn the knob or use the arrow keys to highlight the first digit of the desired number and press the knob to select the number, for numbers containing more than one digit select one digit at a time. The number will appear in the “Front Rows” line. When the correct number is displayed on the “Front Rows” line, press the Enter key to return to the “Kinze Planter Configuration” screen.

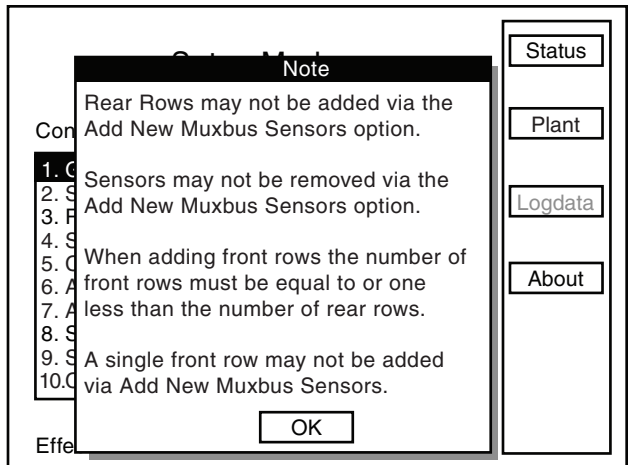
NOTE: To prevent the configuration from being changed select Cancel, then press the knob, Enter key or ESC key.

MTR121



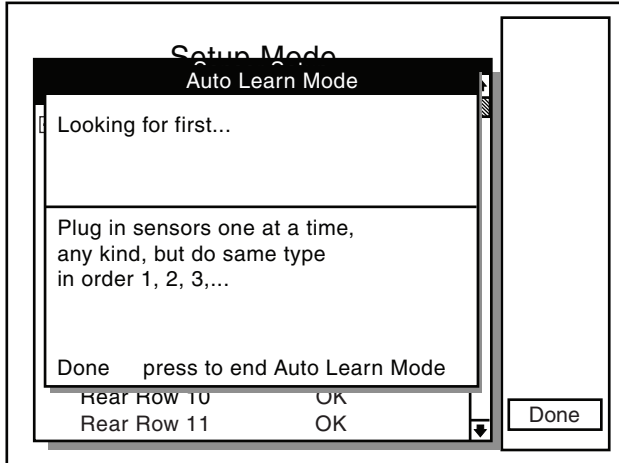
NOTE: Attempting to add rear rows while adding new Muxbus sensors will cause the following note to appear.

MTR122



STEP 5 The sensor configuration screen will appear. With “[Auto Detect]” highlighted press the F1 key next to “Install”. Install sensors from left to right in the same way rear unit sensors were installed.

MTR123



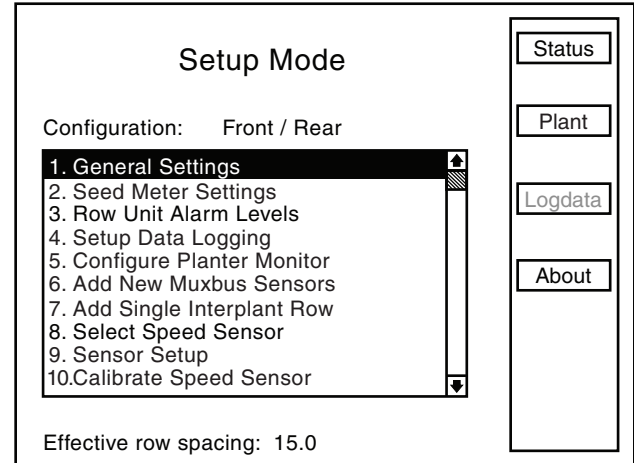
STEP 6 When all sensors are learned select F1 to end installation. The “Auto Learn Mode” box will appear. Press the F6 key next to “Done”.

STEP 7 Scroll down to verify the front rows are learned. Select “OK” by pressing the knob or the Enter key. Press the F6 key next to “Done”. The display will return to the “Setup Mode Screen”.

NOTE: “OK” will appear next to each sensor if no errors are detected.

STEP 8 Turn the knob or use the arrow keys to highlight “1. General Settings”. Press the knob or use the Enter key to make the selection.

MTR124



STEP 9 Turn the knob or use the arrow keys to highlight the “Row Spacing” field. Press the knob or Enter key to make the selection. A drop down number pad will appear. Adjust the row spacing to Interplant spacing by turning the knob or use the arrow keys to highlight the correct value then press the knob to select the number, for numbers containing more than one digit select one digit at a time.

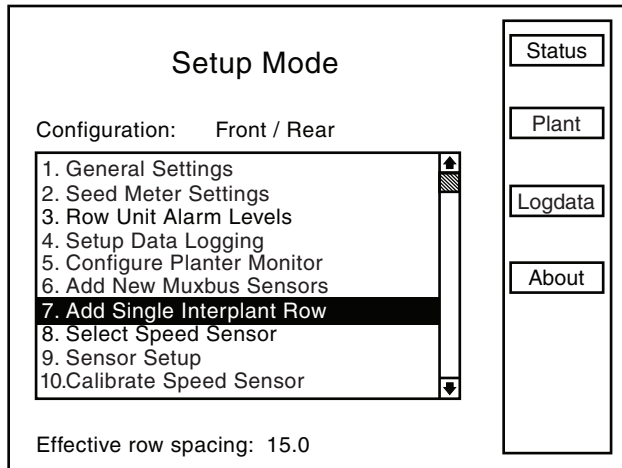
NOTE: To prevent the configuration from being changed select Cancel, then press the knob, Enter key or ESC key.

STEP 10 Turn the knob or use the arrow keys to advance to the “OK” button. Press the knob or Enter key to save the row spacing and return to the “Setup Mode” screen.

ADDING EVEN-ROW PACKAGE (If Front Rows Have Previously Been Programmed)

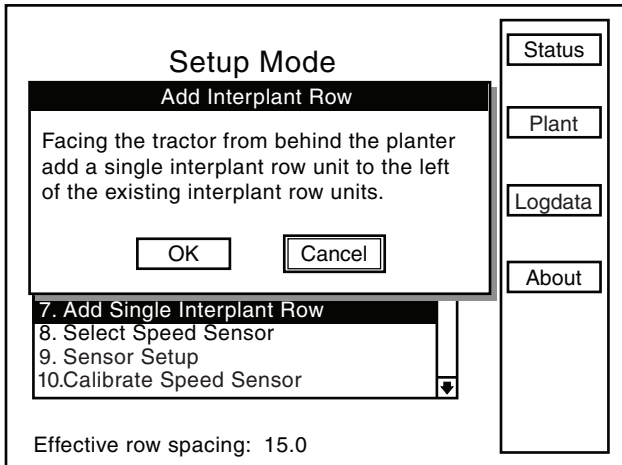
STEP 1 Turn the knob or use the arrow keys to highlight “7. Add Single Interplant® Row”. Press the knob or the Enter key to display the highlighted item.

MTR126



STEP 2 To confirm the note below turn the knob or use the arrow keys to highlight the “OK” button, then press the knob or Enter key to confirm. If the single Interplant® row is not to be added select the “Cancel” key and press the knob or Enter key to cancel or press the ESC key.

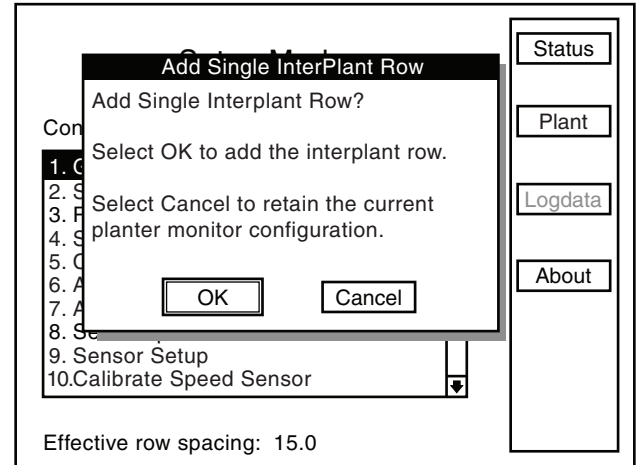
MTR127



STEP 3 To “Add Single Interplant® Row” the following screen will appear.

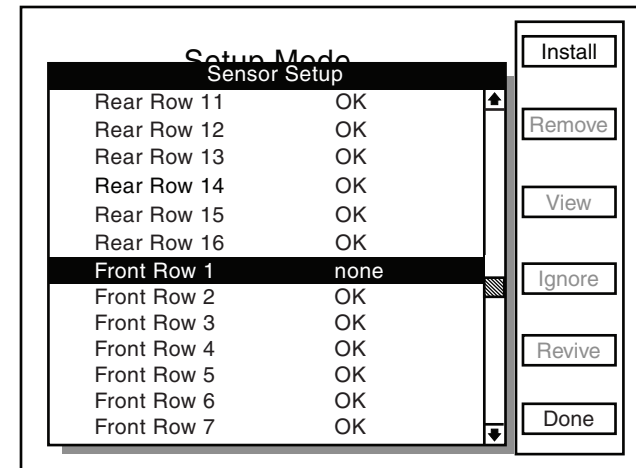
If the single Interplant® row is to be added turn the knob or use the arrow keys to highlight the “OK” button and then press the knob or Enter key to add the Interplant® row. If the single Interplant® row is not to be added select the Cancel key and press the knob or Enter key to cancel or press the ESC key.

MTR128



STEP 4 The “Sensor Setup” screen will appear. Plug in the new sensor then scroll down to highlight “Front Row 1” by turning the knob or using the arrow keys. Press the F1 key next to Install to learn the new sensor.

MTR129



REPROGRAMMING SPEED SENSOR

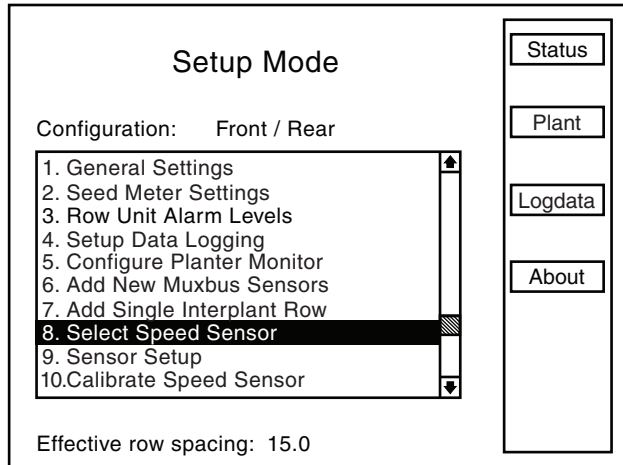
This setting must be specified when the monitor is first configured. It will be necessary to reprogram to use an alternate speed sensor.

NOTE: Speed sensors may not be changed while planting.

RADAR TO MAGNETIC DISTANCE SENSOR

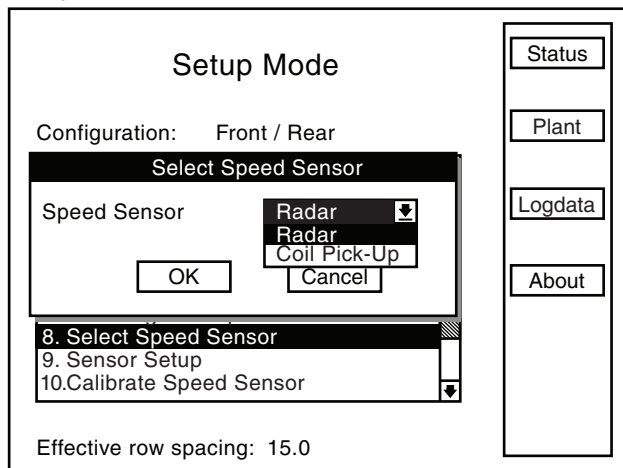
STEP 1 Turn the knob or use the arrow keys to highlight “8. Select Speed Sensor”. Press the knob or Enter key to display the highlighted item.

MTR109



STEP 2 Press the knob or Enter key, a drop down menu will appear. Turn the knob or use the arrow keys to highlight “Coil Pick-Up” and press the knob or Enter key.

MTR110



STEP 3 Turn the knob or use the arrow keys to highlight the “OK” button and press the knob or Enter key to return to the “Setup Mode” screen.

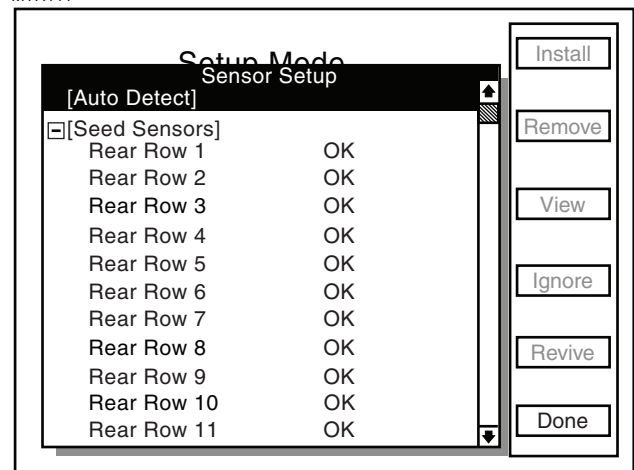
STEP 4 Turn the knob or use the arrow keys to highlight “9. Sensor Setup” and press the knob or Enter key.

STEP 5 Unplug the radar from the tractor.

NOTE: To prevent the configuration from being changed select Cancel, then press the rotary encoder knob, Enter key or ESC key.

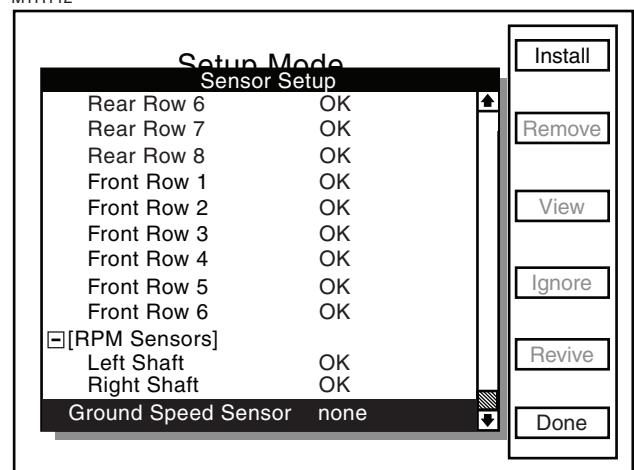
STEP 6 Plug in Magnetic Distance Sensor (MDS) and press the F1 key next to Install. Press the knob or Enter key to save information. The Sensor Setup screen will appear.

MTR111



STEP 7 Turn the knob or use the arrow keys to scroll down to “Ground Speed Sensor”.

MTR112



STEP 8 Press the F1 key next to Install. The monitor will beep twice to confirm selection.

STEP 9 Press the F6 key next to Done. The display will return to the Setup Mode screen.

STEP 10 Press the F2 key by “Plant” to return to the Planter Configuration screen.

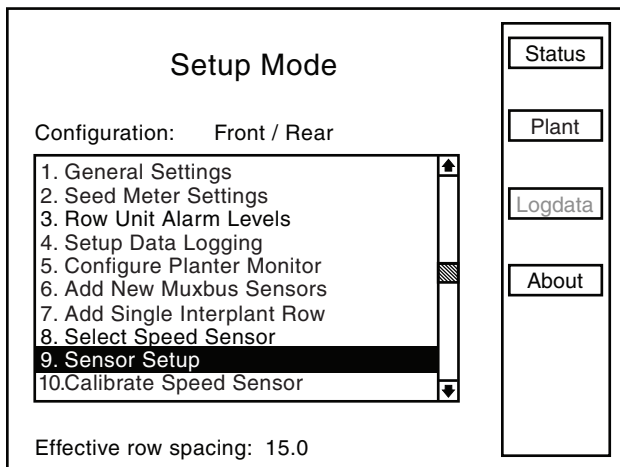
NOTE: When switching between speed sensors, verify the distance pulse count is correct for the chosen sensor. There will be significant distance pulse count variation between radar and coil pick-up sensors.

MAGNETIC DISTANCE SENSOR (MDS) TO RADAR

STEP 1 Turn the knob or use the arrow keys to choose “9. Sensor Setup”. Turn the knob or use the arrow keys to highlight “Ground Speed Sensor”. Press the F2 key next to Remove to remove the Ground speed Sensor.

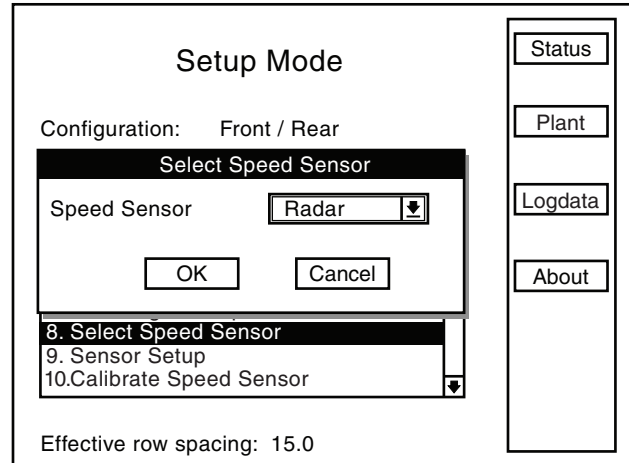
STEP 2 Press the F6 key next to Done. The display will return to the Setup Mode screen.

MTR114



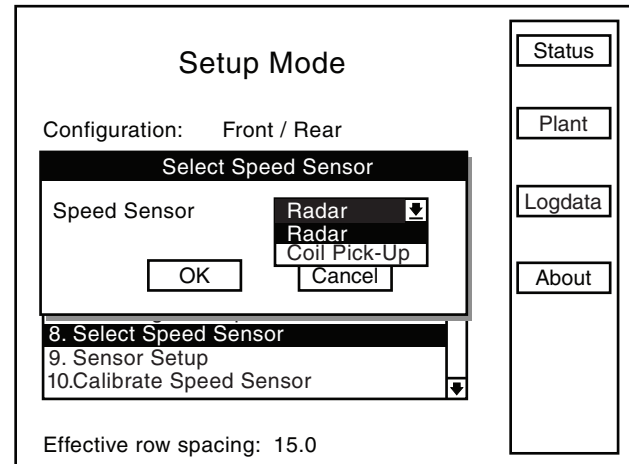
STEP 3 Turn the knob or use the arrow keys to highlight “8. Select Speed Sensor” and press the knob or Enter key.

MTR116



STEP 4 Press the knob or Enter key to select the “Speed Sensor” field and a drop down menu will appear.

MTR117



NOTE: To prevent the configuration from being changed select Cancel, then press the rotary encoder knob, Enter key or ESC key.

STEP 5 Turn the knob or use the arrow keys to highlight “Radar” and press the knob or Enter key.

STEP 6 Turn the knob or use the arrow keys to highlight the “OK” button and press the knob or Enter key.

STEP 7 Plug in Radar, turn the knob or use arrow keys to advance to “OK”. Press the knob or Enter key to save the information. The display will return to the Setup Mode screen.

STEP 8 Press the F2 key next to Plant to return to Planter Configuration screen.

NOTE: When switching between speed sensors, verify the distance pulse count is correct for the chosen sensor. There will be significant distance pulse count variation between radar and magnetic distance sensors.

**PROGRAMMING/CONNECTING SEED TUBES,
SHAFT ROTATION SENSORS AND/OR RADAR/
MAGNETIC DISTANCE SENSORS**

NOTE: The Sensor Setup screen automatically appears after the Planter Monitor is configured in the Configure Planter Monitor selection in the Setup Mode screen.

IMPORTANT: All sensors MUST be unplugged before programming begins.

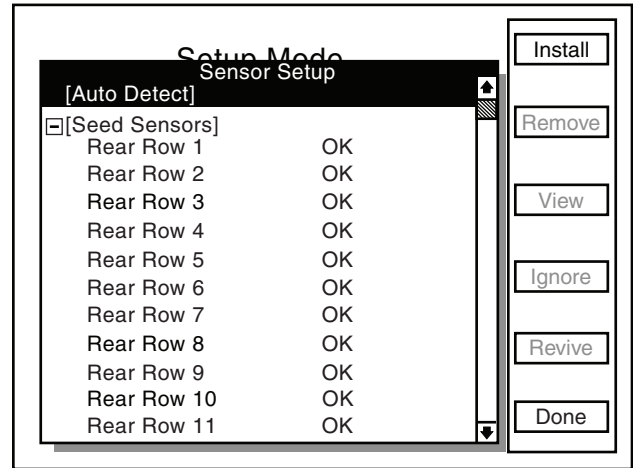
STEP 1 To access Mode Selection, press F6 key until the Mode Selection screen appears.

STEP 2 Select "1. Setup Mode" by turning the rotary encoder knob or press the arrow keys. Press the knob or Enter key to display the highlighted item.

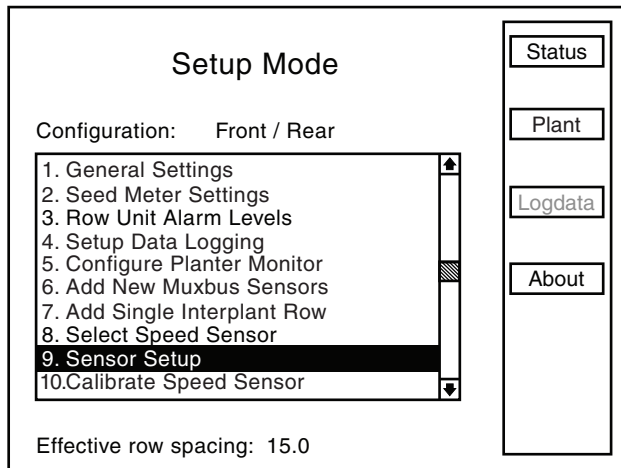
STEP 3 Select "9. Sensor Setup" by turning the knob or using the arrow keys. Press the knob or Enter key to display the highlighted item.

STEP 4 Attach the planter harness to the KPM III. Do NOT connect any of the sensors to the planter harness. With [Auto Detect] selected press the F1 key next to Install.

MTR86



MTR85



STEP 5 Plug in the first pull row unit seed sensor (row 1), working from left to right across the planter. Once all pull row unit sensors have been connected, if applicable, interplant unit sensors should be connected following the same pattern. When a sensor is connected to the planter harness wait for the monitor to acknowledge the sensor with two beeps.

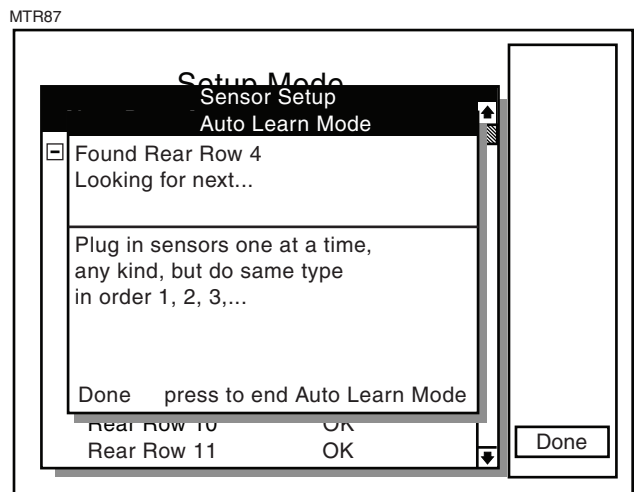
NOTE: If the monitor fails to acknowledge a sensor disconnect the sensor temporarily then reconnect the sensor and wait for the monitor to acknowledge the sensor with two beeps. If the monitor still fails to acknowledge the sensor try connecting a different sensor in this location.

Connect shaft rotation sensors or speed sensors in the same way seed sensors were connected, making sure to work from left to right across the planter.

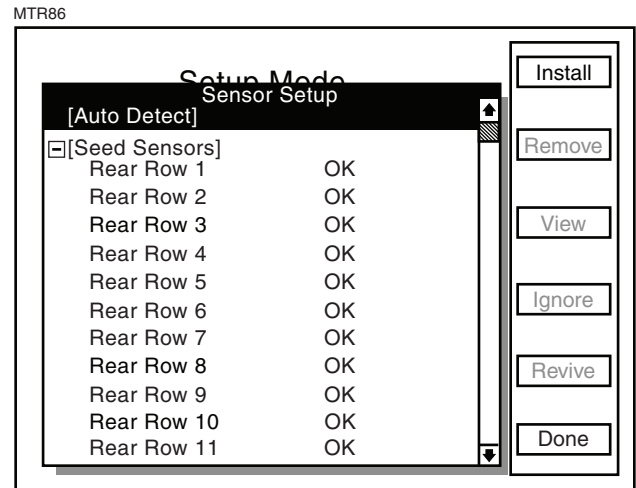
(If applicable) plug in SDS, vacuum or PDP (pneumatic down pressure) sensors in the same way seed sensors were connected.

Progress is displayed on the LCD screen as sensors are connected. The example below indicates that the last seed sensor found was Rear Row 4 and the monitor is looking for the next sensor.

When all sensors are installed press the F6 key to end the installation and return to the "Setup Mode" screen.

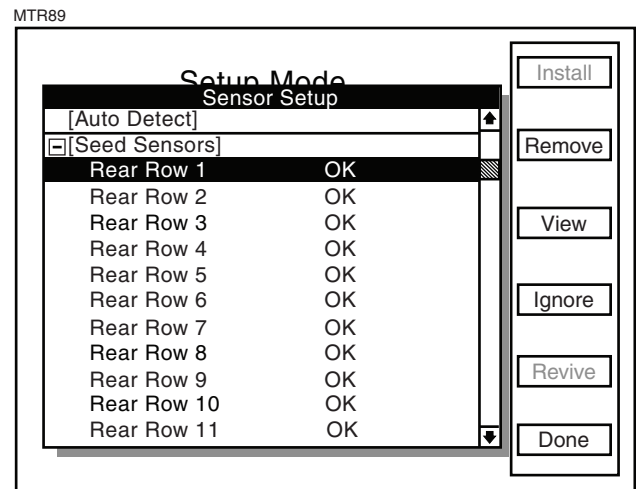


NOTE: After each sensor has been installed "OK" will appear after the sensor name on the LCD screen.



STEP 6 When "OK" appears behind ALL sensors, press the F6 key next to Done. The "Setup Mode" menu will then appear.

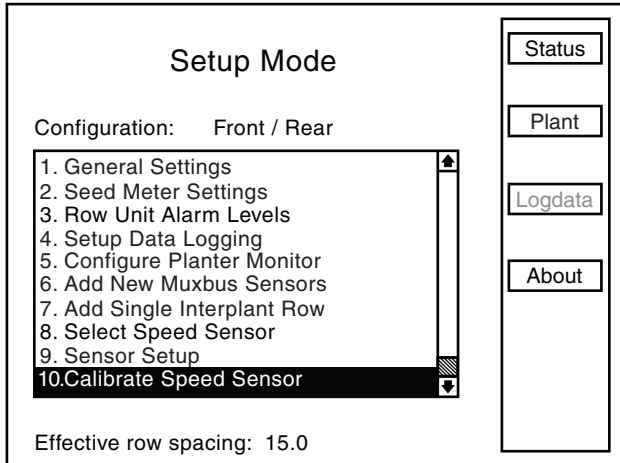
NOTE: If "OK slow" appears after a sensor, the sensor is able to communicate but at a slower speed. For the system to run at top speed of 9600 baud the slow sensor must be replaced.



SPEED SENSOR CALIBRATION/PROGRAMMING

- STEP 1** Turn the knob or use the arrow keys to highlight "10. Calibrate Speed Sensor" and press the knob or Enter key.

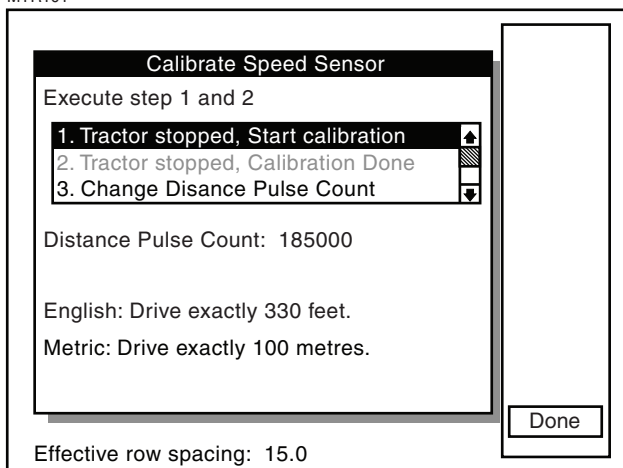
MTR100



The Distance Pulse Count is used to record how many pulses are generated per mile/kilometer from the ground speed sensor.

NOTE: A field calibration must be performed to establish the Distance Pulse Count number. Several factors can affect this value, such as wheel slip on the magnetic distance sensor. IT IS NOT UNCOMMON FOR THE SPEED ON THE MONITOR TO VARY SLIGHTLY FROM THE TRACTOR SPEEDOMETER. Adjusting the Distance Pulse Count in the monit or to make the speed agree with the tractor can cause serious errors in acre/hectare and population/spacing readings. Do field checks to verify populations and seed spacing.

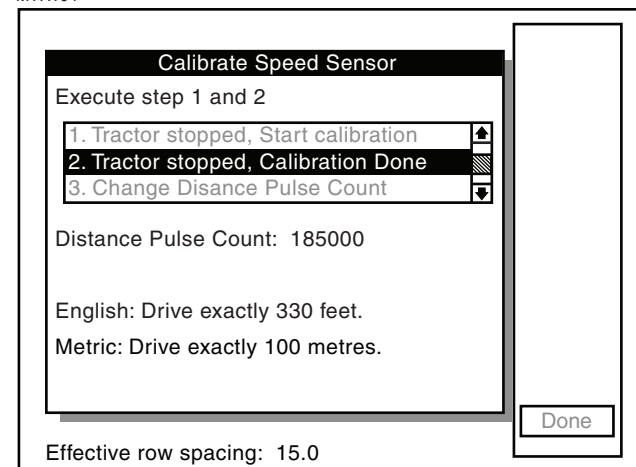
MTR101



- In field conditions, measure 330 feet or 100 meters, depending on the unit of measurement selected. Place a marker at the start point and end point.

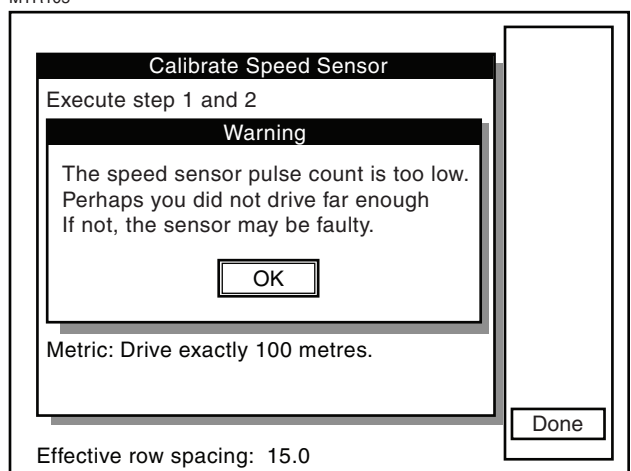
- Pull the tractor up to the starting point.
- Turn the knob or use the arrow keys to highlight "1. Tractor stopped, Start calibration" and press the knob or Enter key.
- Drive the tractor for 330 feet or 100 meters.
- The Monitor will count the number of pulses and display them.
- Stop the tractor at the end point.
- Turn the knob or use the arrow keys to highlight "2. Tractor stopped, Calibration Done" and press the knob or Enter key.

MTR104



NOTE: If the warning box below appears, click OK and repeat the procedure.

MTR105



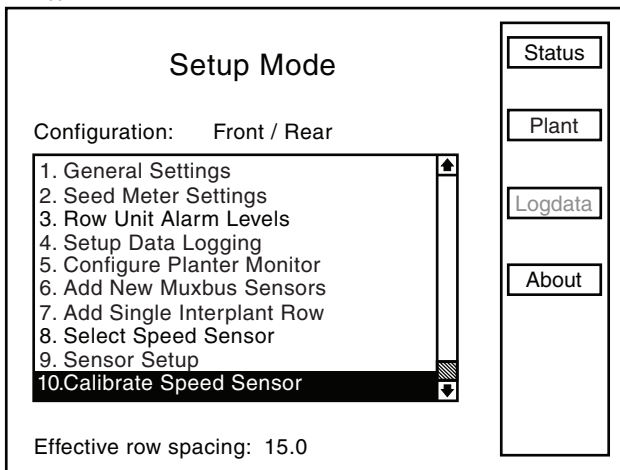
NOTE: Repeat the above steps multiple times. Record and average the values. Use this average for the Distance Pulse Count number constant.

NOTE: The Distance Pulse Count will vary from the above example.

When the correct distance pulse count is known, calibration is not needed and the following steps may be used.

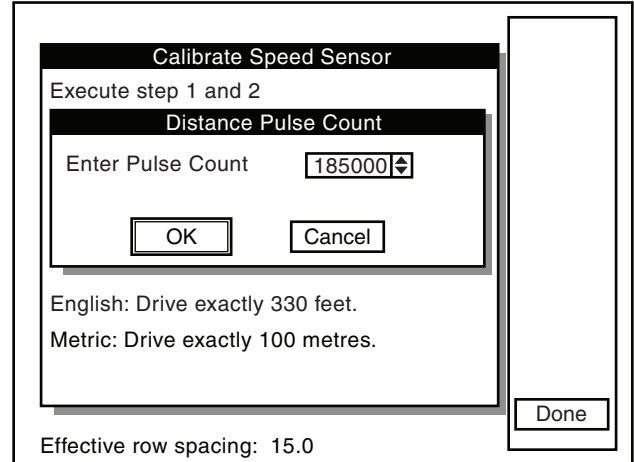
STEP 1 Turn the knob or use the arrow keys to highlight “10. Calibrate Speed Sensor” and press the knob or Enter key

MTR106



STEP 2 Turn the knob or use the arrow keys to highlight “3. Change Distance Pulse Count” and press the knob or Enter key. Highlight the “Enter Pulse Count” line and press the knob or Enter key and a drop down key pad will appear.

MTR107



NOTE: The Distance Pulse Count will vary from the above example.

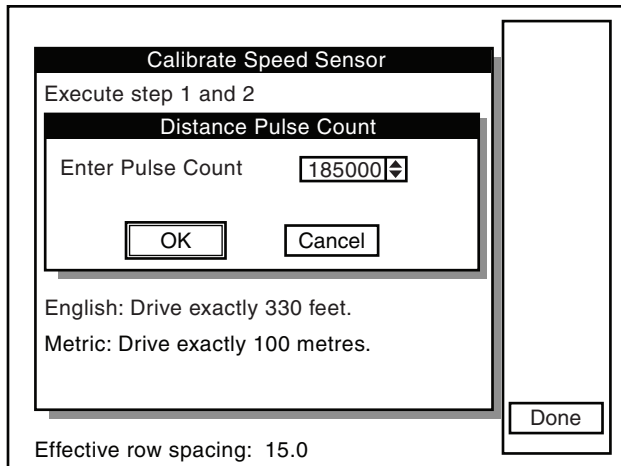
STEP 3 Turn the knob or use the arrow keys to highlight the first digit of the average pulse count and press the knob. The number will appear in the “Enter Pulse Count” line. Highlight the next digit of the number and press the knob. Repeat this procedure until the entire number is entered then press the Enter key.

STEP 4 Turn the knob or use the arrow keys to highlight “OK” then press the knob or Enter key to return to the “Calibrate Speed Sensor” screen.

STEP 5 Press F6 key next to “Done” to return to “Setup Mode” screen.

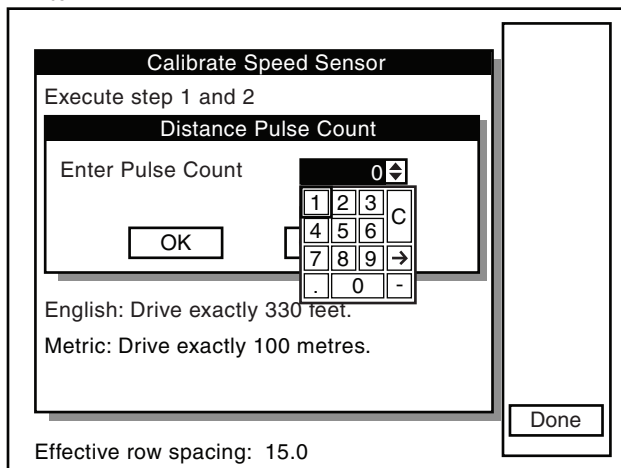
The monitor will display the current pulses per mile/kilometer using a 6 digit, no decimal place format labeled "Distance Pulse Count". Turn the knob or use the arrow keys to highlight "Change Pulse Count" then press the knob or Enter key. The "Distance Pulse Count" box will appear.

MTR102



- When the "Enter Pulse Count" value is highlighted press the knob or Enter key and a drop down keypad will appear. Turn the knob or use the arrow keys to highlight "0", zero, and press the knob or Enter key. Turn the knob or use the arrow keys to highlight "OK" and press the knob or Enter key to return to the "Calibrate Speed Sensor" screen.

MTR103



NOTE: If the Distance Pulse Count number starts to count pulses with the tractor not moving, check radar distance sensor for vibration or other interference.

ACRE COUNT MODE

NOTE: When a tractor is equipped with a radar distance sensor, accumulating area without a planter attached is possible.

STEP 1 Install an “Acre Count Switch Kit”.

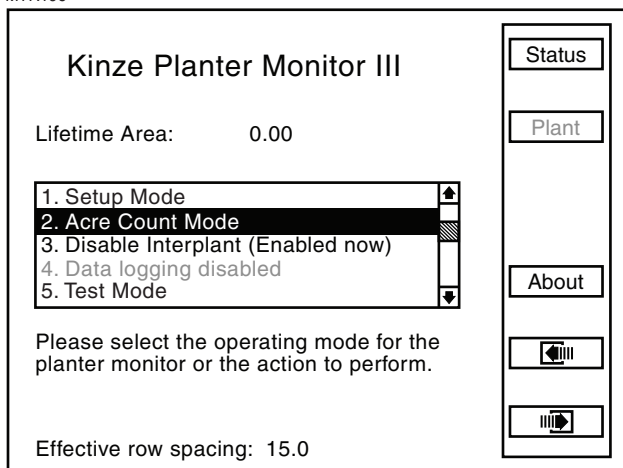
STEP 2 Enter into “Acre Count Mode”.

Acre Count Switch Kit

STEP 1 With the monitor OFF, attach an Acre Count Switch Kit to the Muxbus connector and then turn monitor “ON”.

STEP 2 Press the F6 key until the Mode Selection screen appears. Turn the rotary encoder knob or use the arrow keys to highlight “2. Acre Count Mode”. Press the knob or Enter key.

MTR196



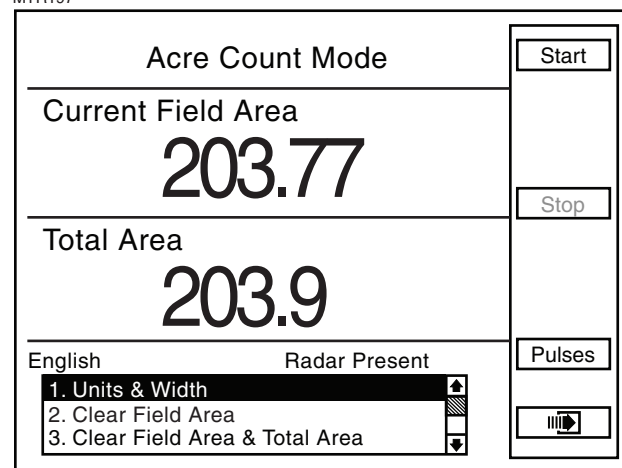
NOTE: If the radar unit is not detected a warning will appear.

NOTE: When using the acre count mode option, area (acres or hectares) is accumulated in “Lifetime Area Counter”.

NOTE: DO NOT BEGIN ACCUMULATING AREA IF THE RADAR UNIT HAS NOT BEEN CALIBRATED. Always check the distance pulse count value immediately after entering acre count mode and before pressing start.

STEP 3 Turn the knob or use the arrow keys to highlight “Units & Width” and press the knob or Enter key.

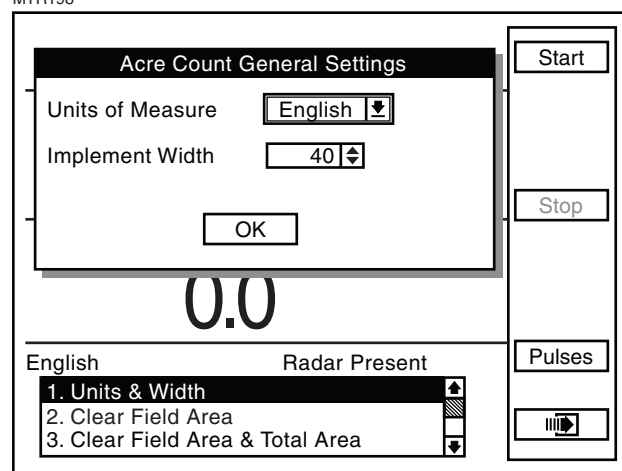
MTR197



STEP 4 A box named “Acre Count General Settings” will appear. Highlight the correct units of measure “English” or “Metric” by turning the knob or using the arrow keys. Press the knob or Enter key to make the selection.

STEP 5 Turn the knob or use the arrow keys to highlight the “Implement Width” box and press the knob or Enter key and a drop down number pad will appear.

MTR198



STEP 6 Turn the knob or use the arrow keys to highlight the correct value then press the knob to select the number, for numbers containing more than one digit select one digit at a time. When the desired quantity is displayed above the number pad, press the Enter key.

STEP 7 Turn the knob or use the arrow keys to highlight the “OK” button. Then press the knob or Enter key to save the changes that have been made.

NOTE: The implement width entered in acre count mode has no effect on planting mode settings.

NOTE: Tractor should be at a complete stop before starting.

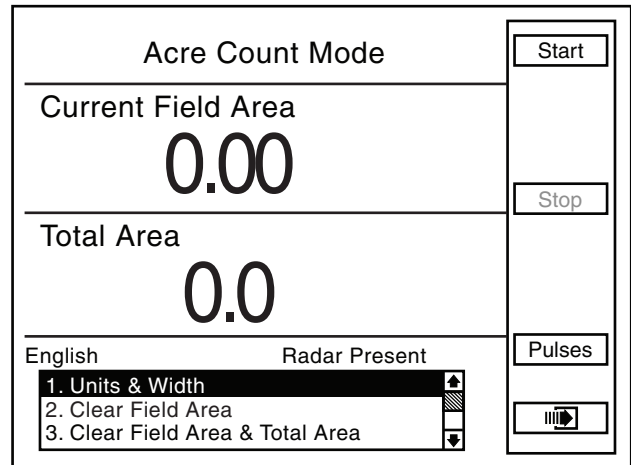
STEP 8 To begin accumulating area press the F1 key next to Start.

STEP 9 To stop accumulating area or to move to a different location, press the F3 key next to Stop.

There are two counters in the Acre Count Mode (Field Area Counter and Total Area Counter). The “Field Area” counter can be cleared independent of the “Total Area” counter, however clearing the “Total Area” counter also clears the “Field Area” counter.

- To Clear Field Area. Highlight “Clear Field Area” and press the knob or Enter key. A note will appear verifying the decision to reset the field area to zero. Highlight “OK” and press the knob or Enter key to clear the field. Highlight “Cancel” and press the knob or the Enter key to retain the current field value.

MTR199



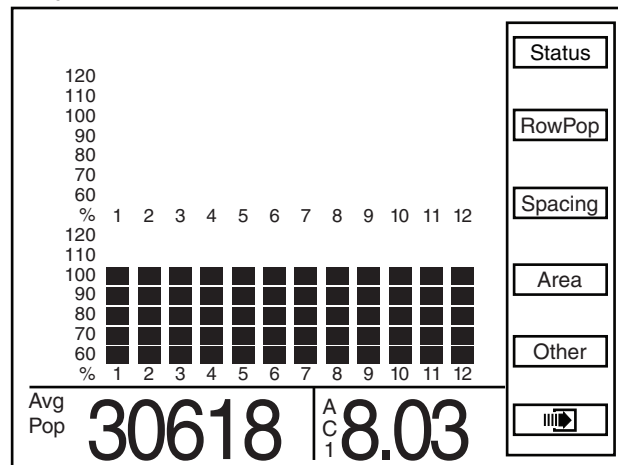
- To Clear Both Field Area And Total Area. Highlight “Clear Field Area & Total Area” and press the knob or Enter key. A note will appear to verify the decision to reset the field area and the total area to zero. Highlight “OK” and press the knob or Enter key to clear the field. Highlight “Cancel” and press the knob or Enter key to retain the current field values.

ENABLING/DISABLING INTERPLANT® ROWS

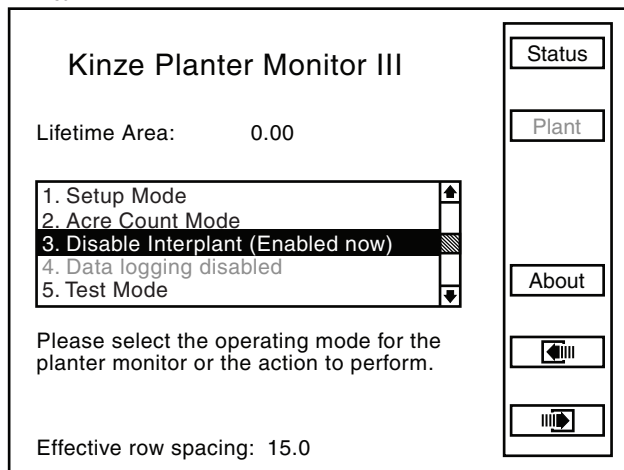
To Enable or Disable Interplant®

- STEP 1** Return to the “Planter Configuration” screen by pressing the F2 key next to “Plant”.
- STEP 2** Press the F6 key until the “Kinze Planter Monitor III” screen appears.
- STEP 3** Turn the rotary encoder knob or use the arrow keys to highlight “3. Disable Interplant (Enabled now) or Enable Interplant (Disabled now).
- STEP 4** Press the knob or Enter key to “Disable” or “Enable” Interplant®. To verify selection, the row spacing is displayed on the bottom of the screen.

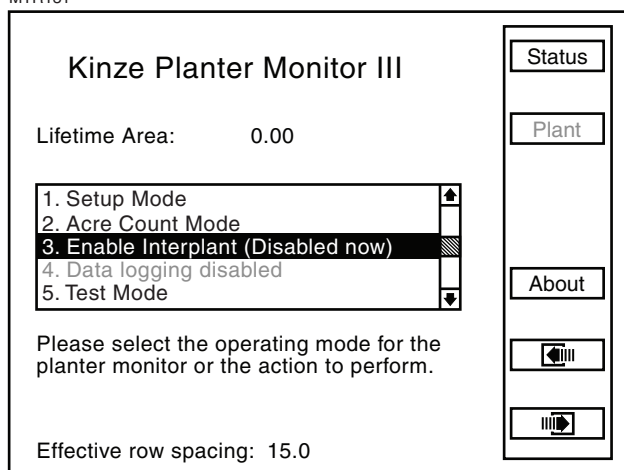
MTR132



MTR130



MTR131



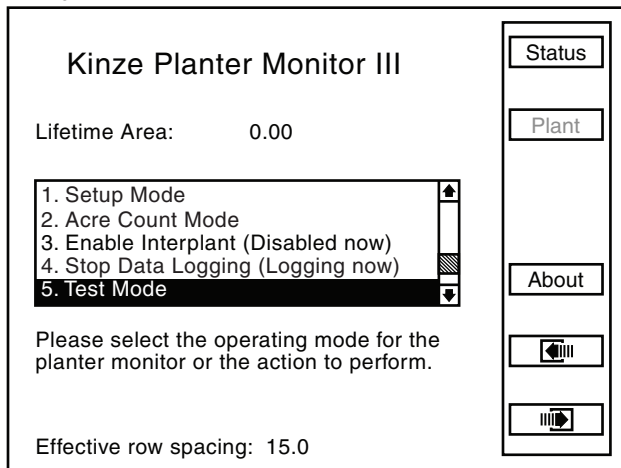
Press F6 to return to the Plant screen.

TEST MODE

STEP 1 Press the F6 key until the Mode Selection screen appears.

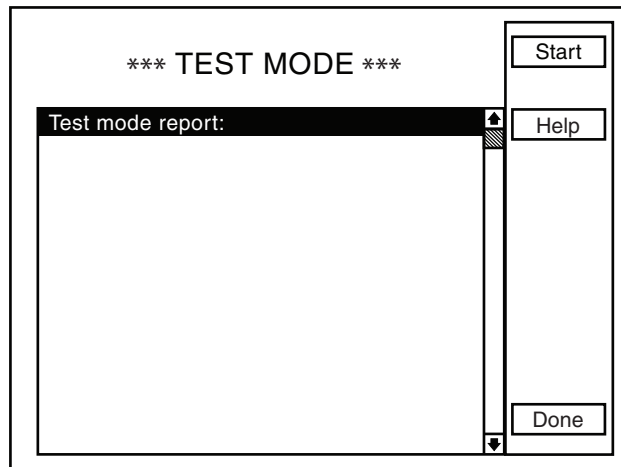
STEP 2 Select "5. Test Mode" by turning the rotary encoder knob or using the arrow keys. Press the knob or Enter key to display the highlighted item.

MTR173



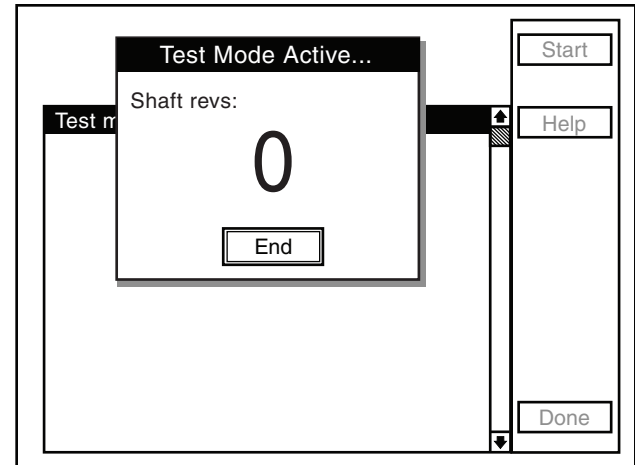
STEP 3 Press the F1 key next to Start.

MTR174



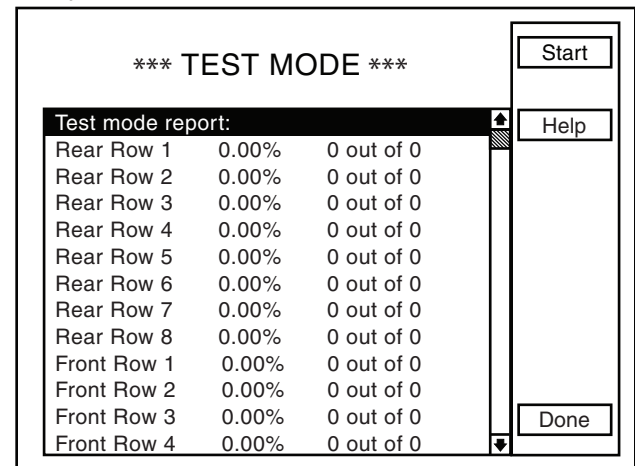
STEP 4 The "Test Mode Active" box will appear showing the number of shaft revolutions. The "End" box will be highlighted. Press the knob or Enter key. The "Test Mode Active" box will appear displaying the drill shaft revolutions.

MTR173



STEP 5 The TEST MODE screen displays test run data (seed count) for each row.

MTR176

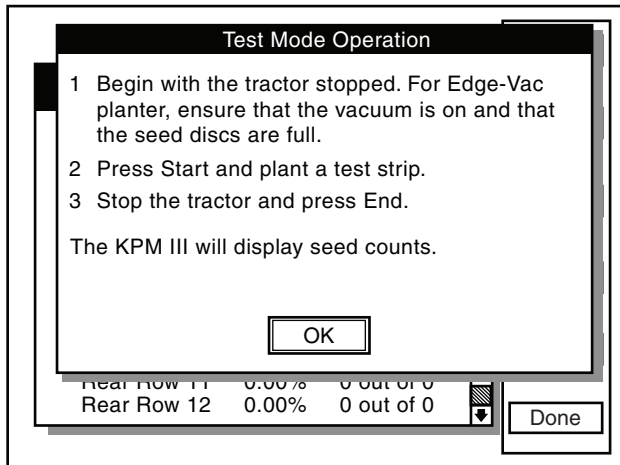


STEP 6 Begin the test with the tractor stopped. For EdgeVac planters, ensure the vacuum is on and that the seed discs are full.

STEP 7 Press the F1 key next to Start and plant a test strip.

STEP 8 Stop the tractor and press "End". The KPM III will display seed counts by row and percentage.

MTR177



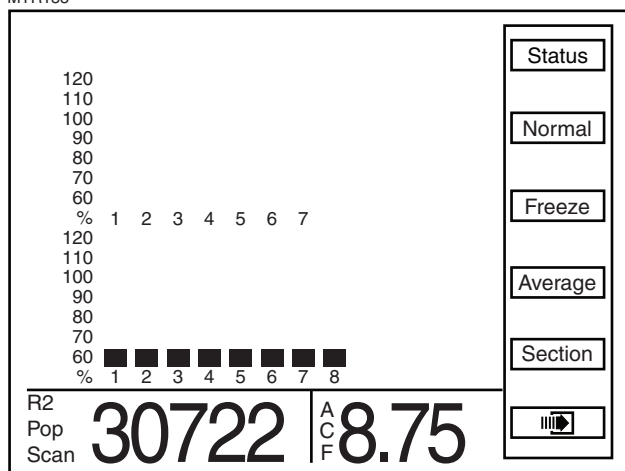
NOTE: The above instructions will display on the screen when the F2 key next to “Help” is pressed.

STEP 9 Press the F6 key next to Done. The display returns to the Mode Selection screen.

ROW POPULATION

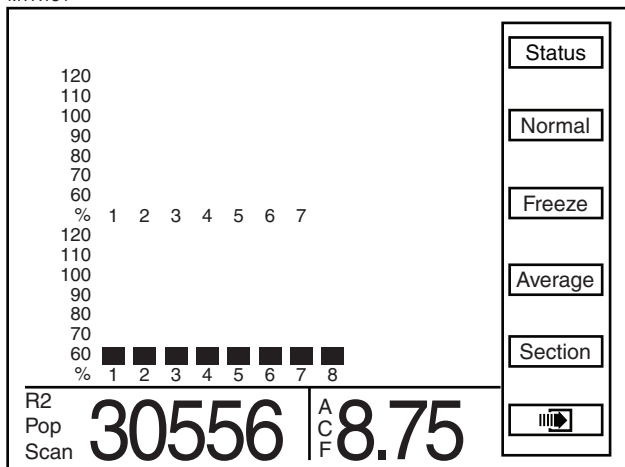
Press the F2 key next to “RowPop” to display row population. Average planter population will be shown in the lower L.H. corner of the display.

MTR133



- Press the F3 key next to Scan and the monitor will scan through each row in ascending order displaying the average seed population for each row. After all rows have been scanned the average population is displayed and scan function will continue with the first rear row.

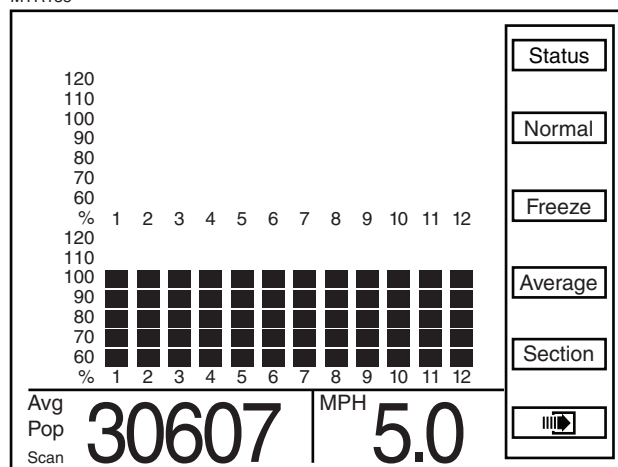
MTR134



- Press the F3 key next to Freeze to stop scanning, the left display item will be frozen on a particular row. “Frzn” appears in the lower L.H. corner to indicate the display is frozen. To resume scan press the F3 key next to Scan.

EXAMPLE: When average individual row population is shown, R3 indicates rear row 3, F2 indicates front row 2, etc.

MTR135



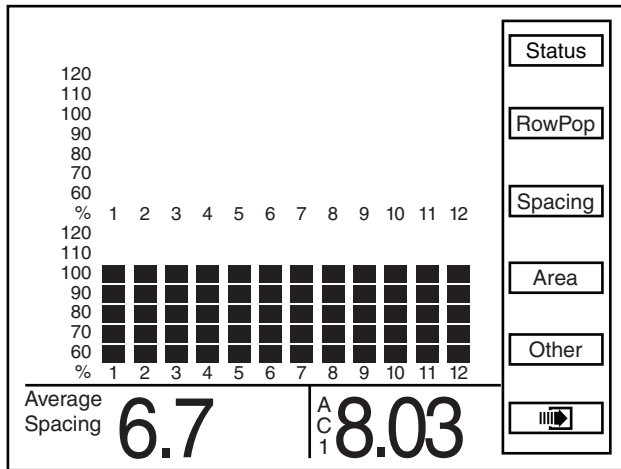
- When either “Scan” or “Frzn” is displayed in the L.H. corner, the Section and arrow keys function as follows:
 - Section, Right arrow key, or Left arrow key advances to the first rear row.
 - The Up arrow key moves forward to the next row of the planter, wrapping around to the first row when moving past the last row.
 - Down arrow key moves backward to the previous row of the planter, wrapping around to the last row of the planter when moving past the first row.
- Press the F4 key next to Average to display the average population in the bottom L.H. corner.
- Press the F2 key next to Normal to display the normal screen for the Planter Configuration screen.

NOTE: If the rows are being scanned and the F4 key next to Average is pressed the scan function will stop.

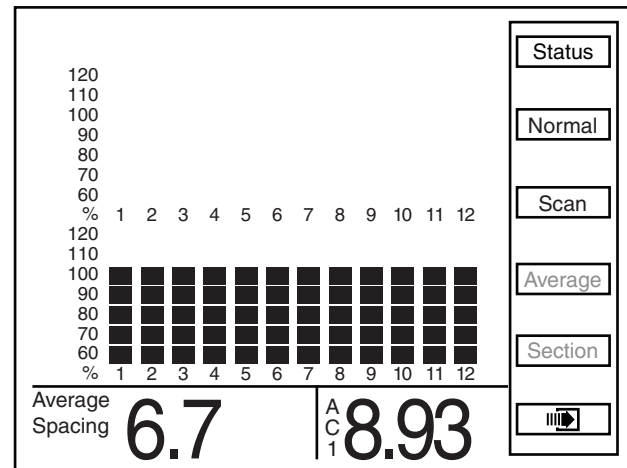
ROW SPACING

- Press the F3 key next to Spacing to display seed spacing keys. "Average Spacing" will appear in the bottom L.H. corner of the display.

MTR136



MTR137

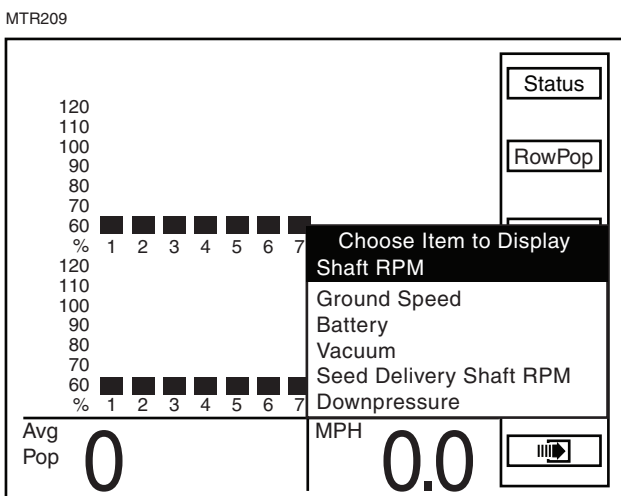
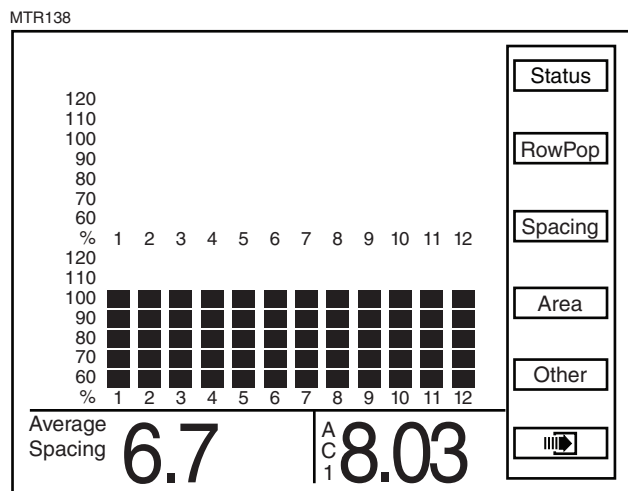


- Press the F3 key next to Scan and the monitor will scan through each row in ascending order displaying the average seed spacing for each row. Scan appears in the L.H. corner to indicate the display is scanning. After all rows have been scanned the average population is displayed and scanning will continue with the first rear row.

- Press the F3 key next to Freeze to stop scanning, the left display item will be frozen on a particular row. "Frzn" appears in the lower L.H. corner to indicate the display is frozen. To resume scan press the F3 key next to Scan.
- When either "Scan" or "Frzn" is displayed in the left display item, the Section and arrow keys function as follows:
 - Section, Right arrow key, or Left arrow key advance to the first rear row.
 - The Up arrow key moves forward to the next row of the planter, wrapping around to the first row when moving past the last row.
 - Down arrow key moves backward to the previous row of the planter, wrapping around to the last row when moving past the first row.
- Press the F4 key next to Average to display the average seed spacing in the bottom L.H. corner.
- Press the F2 key next to Normal to display the Planter Configuration screen.

NOTE: If the rows are being scanned and the F4 key next to Average is selected the scan function will stop.

SPEED/SHAFT ROTATION



- Press the F5 key next to “Other” to display items available to display in the bottom R.H. corner. Turn the knob or use the arrows keys to advance to “Battery” to view battery condition. The value will appear in the bottom R.H. corner of the display as “Bat V”.
- Press the F5 key next to “Other” to display items available to display in the bottom R.H. corner. Turn the knob or use the arrows keys to advance to “Vacuum” to view vacuum. The inches of vacuum will appear in the bottom R.H. corner of the display as “VAC”.
- Press the F5 key next to “Other” to display items available to display in the bottom R.H. corner. Turn the knob or use the arrows keys to advance to “Seed Delivery Shaft RPM” to view shaft RPM. The shaft RPM will appear in the bottom R.H. corner of the display as “RPM SDS”.
- Press the F5 key next to “Other” to display items available to display in the bottom R.H. corner. Turn the knob or use the arrows keys to advance to “Downpressure” to view lbs. of down pressure. The lbs. of down pressure will appear in the bottom R.H. corner of the display as “LBS”.

- Press the F5 key next to Other to display items available to display in the bottom R.H. corner. Turn the knob or use the arrow keys to highlight “Shaft RPM”. The value will appear in the bottom R.H. corner of the display as “RPM”.

NOTE: Applicable to planters with shaft rotation sensors installed.

- Press the F5 key next to “Other” to display items available to display in the bottom R.H. corner. Turn the knob or use the arrow keys to select “Ground Speed”. The value will appear in the bottom R.H. corner of the display as “MPH” or “Km Per Hr”.

NOTE: The selected units of measure will be displayed (English or Metric).

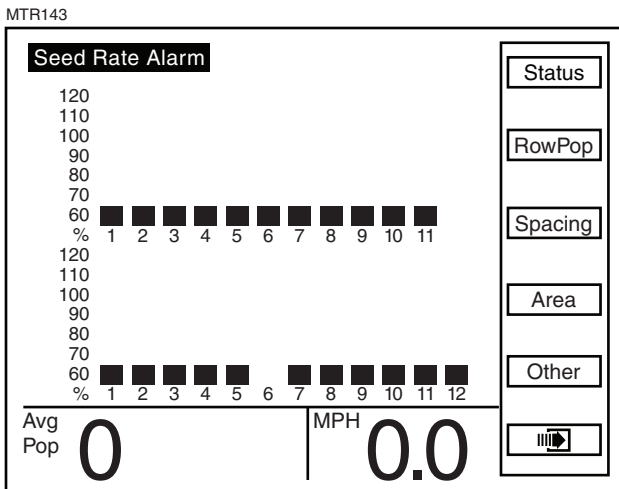
WARNINGS AND ALARMS

STEP 1 Seed Rate Alarm - A seed rate alarm is activated whenever the row average seed population drops below the threshold set for that row.

The corresponding row on the bargraph starts flashing and the monitor emits a series of beeps that persist until the alarm is cleared or the ACK button is pressed. "Seed Rate Alarm" appears in the upper left corner of the screen. The bargraph for the row drops down based on the threshold set for the alarm.

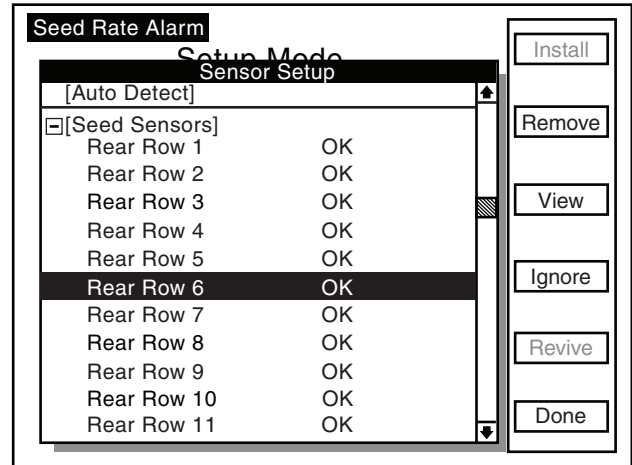
EXAMPLE: If the threshold is 70% the lower two bargraph segments are shown. If the threshold is 50% or 10% the lowest bargraph segment is shown.

The status message associated with an alarm contains more information about the alarm. To view the "Status Message" for a seed rate alarm, press the F1 key next to Status.



If the sensor is detecting no seed flow it will display which row is not functioning. The alarm may be caused by a mechanical problem reducing seed flow or an electrical problem causing an incorrect seed count.

MTR144

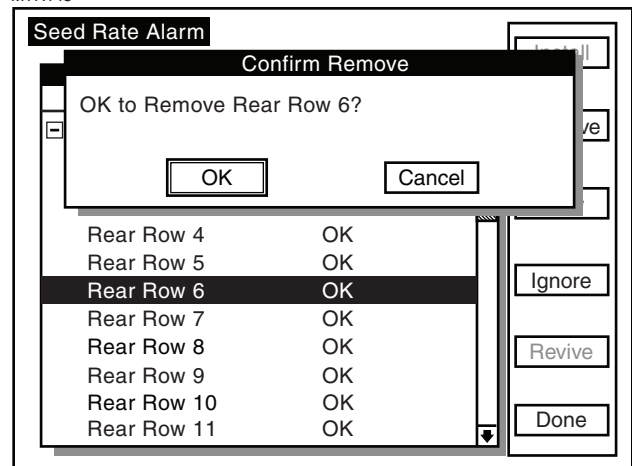


NOTE: The only way to remove an alarm is to find the problem and correct it. Alarms are not reported for rows with the seed rate alarm thresholds disabled.

NOTE: The percentage shown in the alarm message is the percentage at the time the alarm occurred.

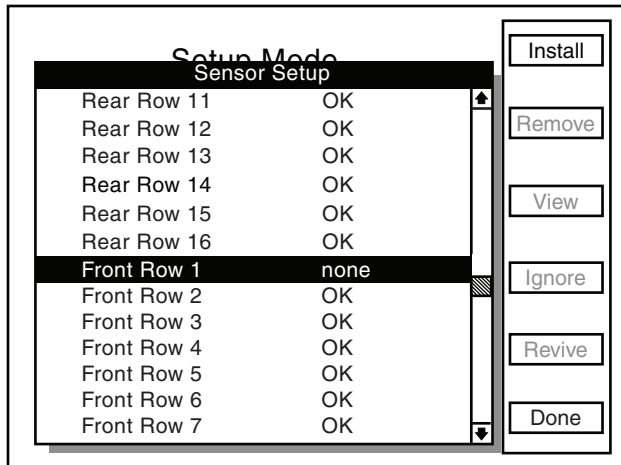
The row can be removed by pressing the F2 key next to Remove. A box will appear asking for confirmation to remove the row. The "OK" box will be highlighted in the box.

MTR145



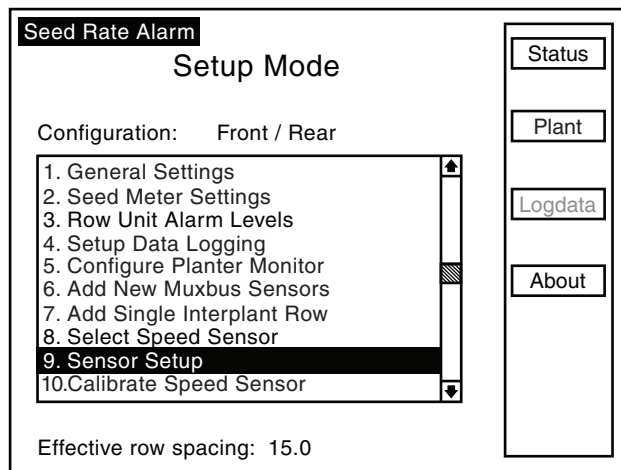
Press the knob or Enter key to confirm removal. The Sensor Setup screen will display "none" next to the row that was removed. Press the F6 key next to "Done". The setup mode screen will appear.

MTR146

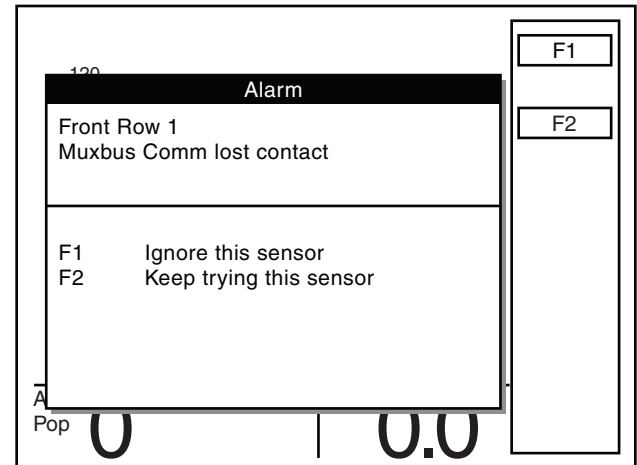


Press the F2 key next to Plant to return to the Planter Configuration screen.

MTR147

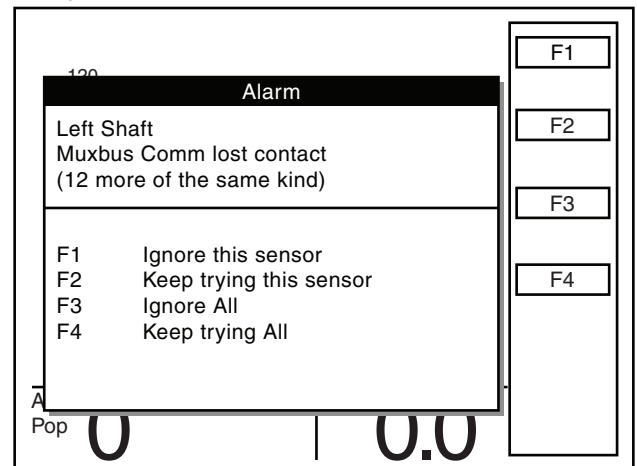


MTR148



If multiple sensors have lost contact, the message will indicate which sensors have lost contact, see below.

MTR149



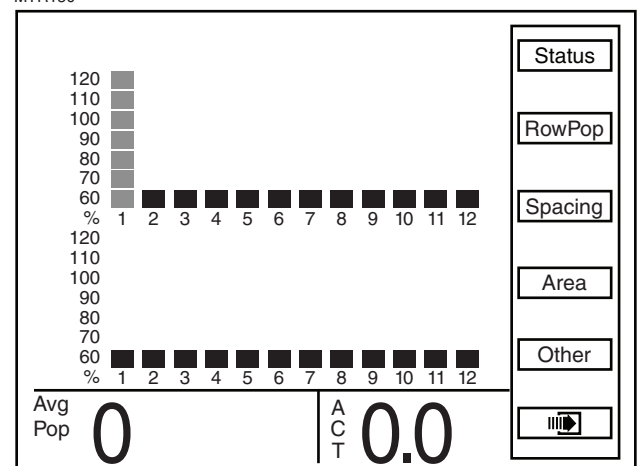
- STEP 2** Section Not Planting - When the monitor detects an entire section not planting, three beeps will sound to alert the user. The bargraph for the affected section flashes and is reduced to the lowest segment. An alarm message is added to the list of "Status Messages". Press the F1 key next to Status to view the alarm message.

- STEP 3** Seed Counting Sensors Not Communicating With Monitor - When the monitor detects a communication error between the sensor and the monitor, the monitor will beep twice to alert the user.

- Try to reestablish communication with sensor(s) by pressing F2.
- If the monitor is unable to establish communication there may be a faulty sensor, poor electrical connection, or a cut or pinched wire harness.

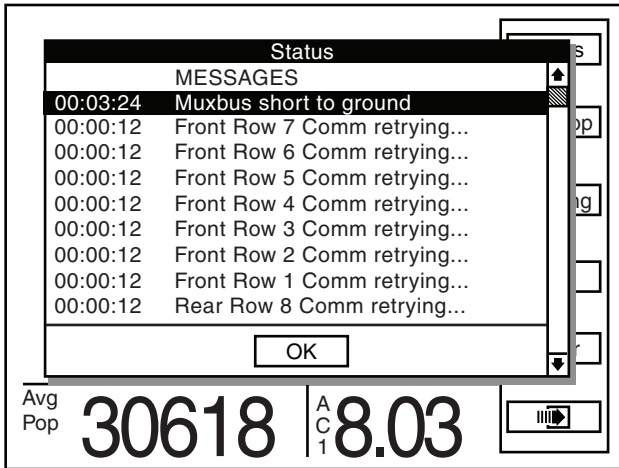
NOTE: When a known sensor or group of sensors are faulty, F1 or F3 should be pressed. The monitor will stop communication with the sensor(s) and the corresponding bargraphs will be grayed out on the main "Planter Configuration" screen as shown below.

MTR150



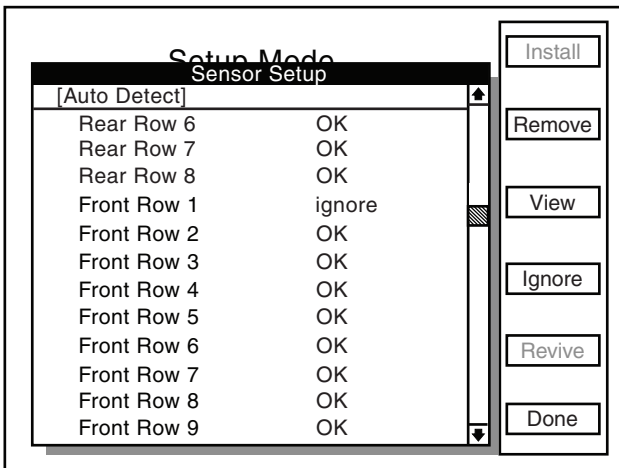
NOTE: If sensors are not faulty, F2 or F4 should be pressed. After pressing F2 or F4 a message similar to the one below will appear when the “Status” button F1 is pressed.

MTR151



NOTE: If a sensor has been ignored, the sensor configuration screen will display as shown below.

MTR152

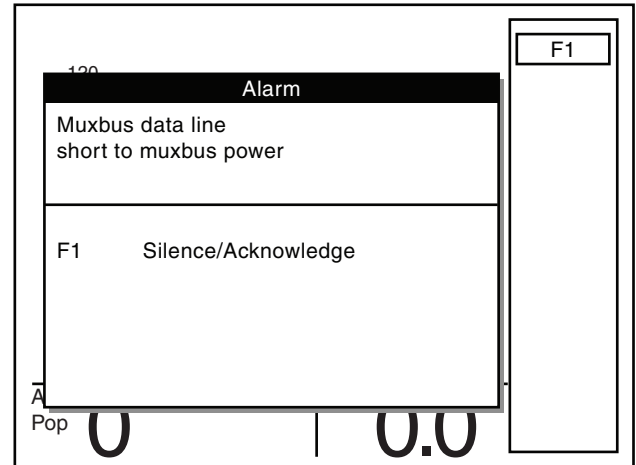


STEP 4 Seed Counting Sensors Too Dirty Warning - When powering on the KPM III, each of the seed sensors will do a self check. If a seed tube is too dirty, the message “Clean Or Replace Sensor As Necessary” will be displayed and the bargraph for that row will flash.. The sensor will not function until the problem is corrected.

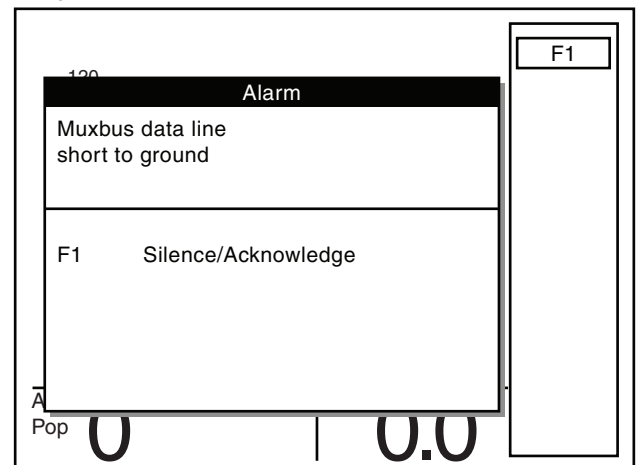
NOTE: After the alarms have been acknowledged and the alarm condition still present, the LCD screen will continue to display the alarm condition.

STEP 5 Wire Shorts - When a wire is shorted, one of the messages below will appear, indicating which wires are shorted. The short must be located and repaired to continue planting. Turn off the monitor and restart it to clear the alarm.

MTR153

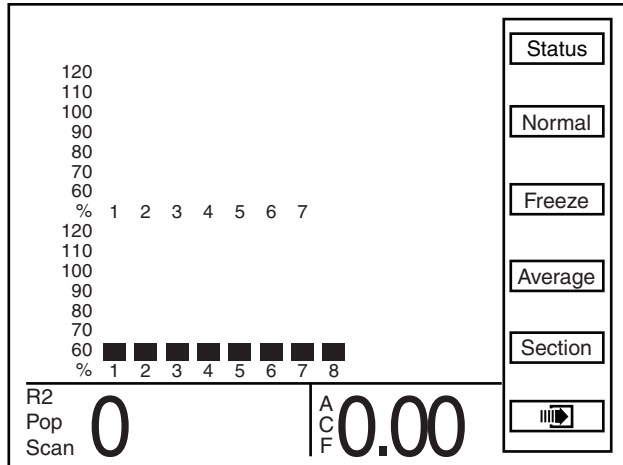


MTR154



STEP 6 Add Interplant® Row Error – The planter monitor configuration must contain an odd number of front rows before the single Interplant® row unit can be added.

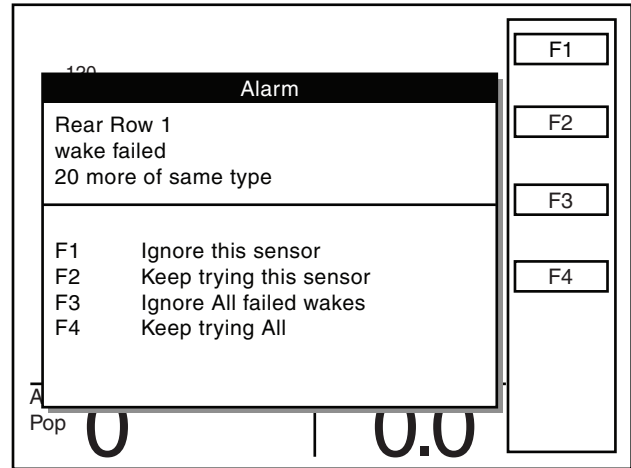
MTR155



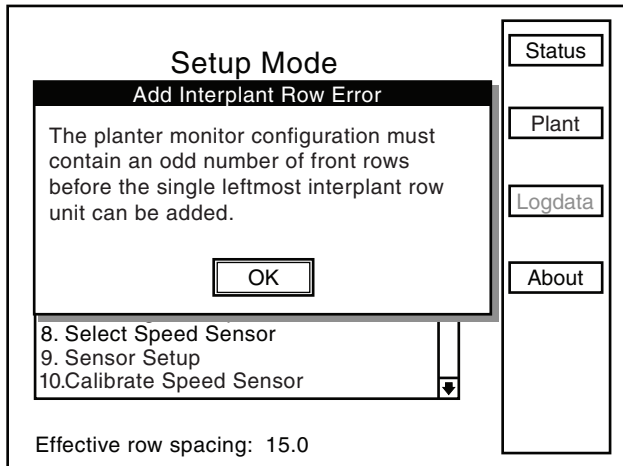
NOTE: The planter monitor configuration above has an even number of front (Interplant®) rows (8).

STEP 8 Alarm: Rear Row 1 wake failed – Select an option from the warning box and press the key next to the selection.

MTR158

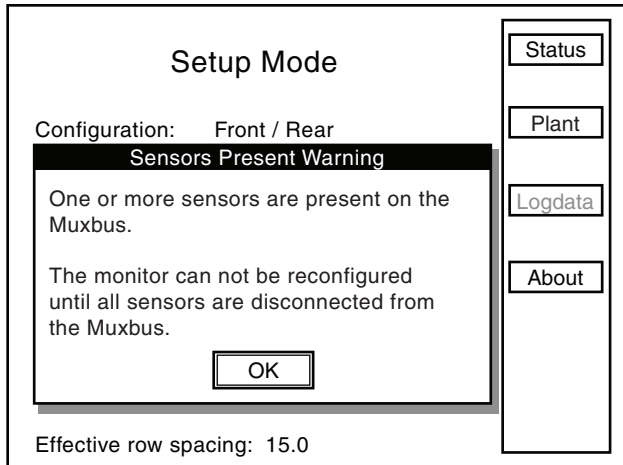


MTR156



STEP 7 Sensor Present Warning – One or more sensors are present on the Muxbus.

MTR157

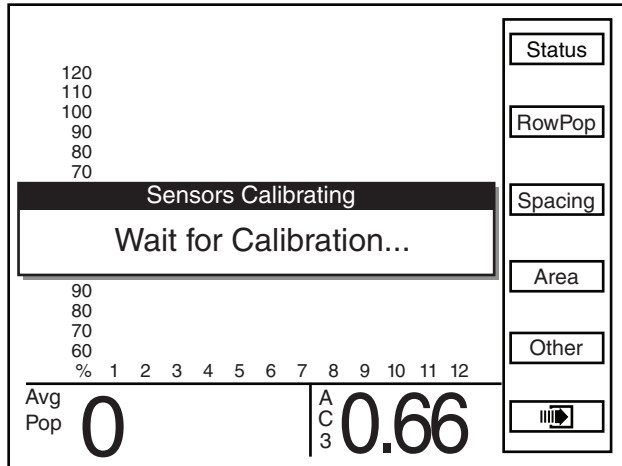


FIELD OPERATION

Press the ON/OFF key to turn the monitor ON.

If the monitor has been configured, it will show the Planter Configuration screen and attempt to communicate with the seed sensors.

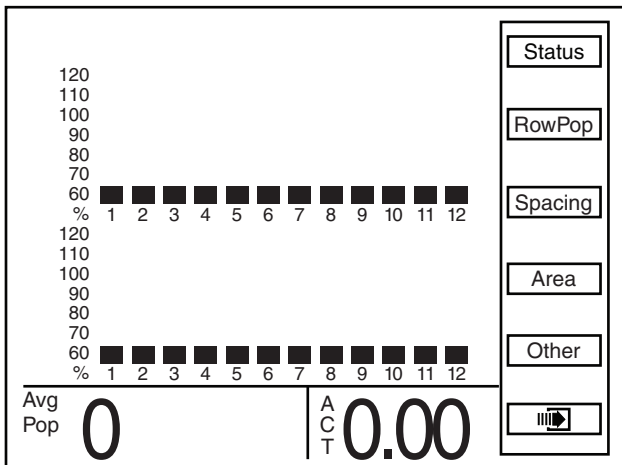
MTR179



NOTE: Do not attempt planting before the “Wait For Calibration” message disappears. If the planter is moving while sensors are calibrating alarms will be generated.

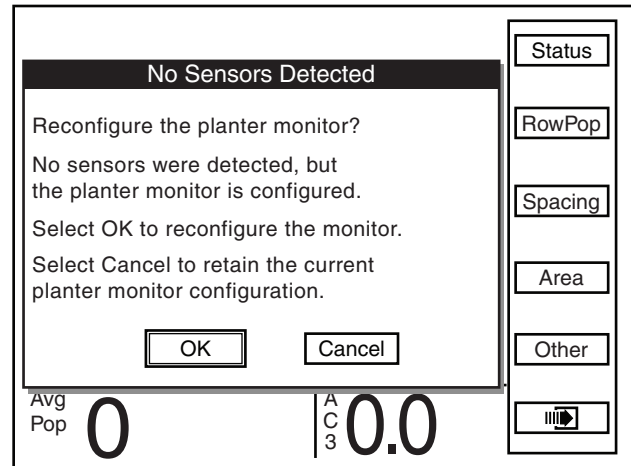
NOTE: If the monitor can communicate with the sensors the Planter Configuration screen will be displayed.

MTR180



If the monitor does not detect sensors the message below will appear.

MTR181



NOTE: Selecting OK will reconfigure the monitor requiring all sensors to be re-learned. Selecting Cancel will maintain the current configuration and the monitor will continue trying to communicate with the sensors.

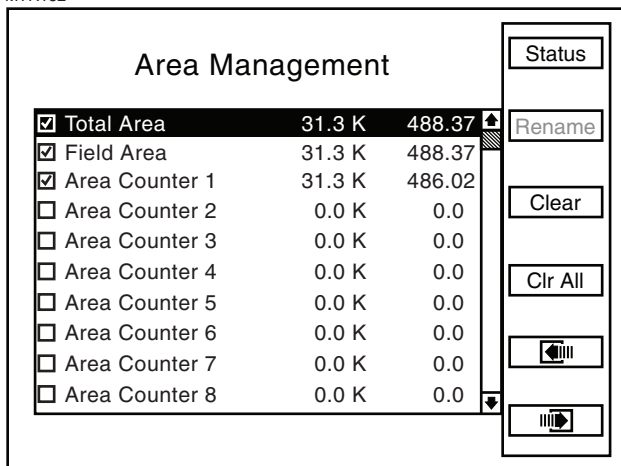
AREA MANAGEMENT

There are 42 area counters: Total Area, Field Area and Area Counters 1 through 40. The Total Area is always active but may be cleared. If it is cleared, the Field Area is also cleared. Field Area and Area Counters 1 through 40 may be cleared, started or stopped separate from each other.

In addition, there is a Lifetime Area Counter (located on the Mode Selection Screen) which can not be disabled or cleared by the user.

To display the "Area Management" screen, press the F6 key until the "Area Management" screen appears.

MTR182



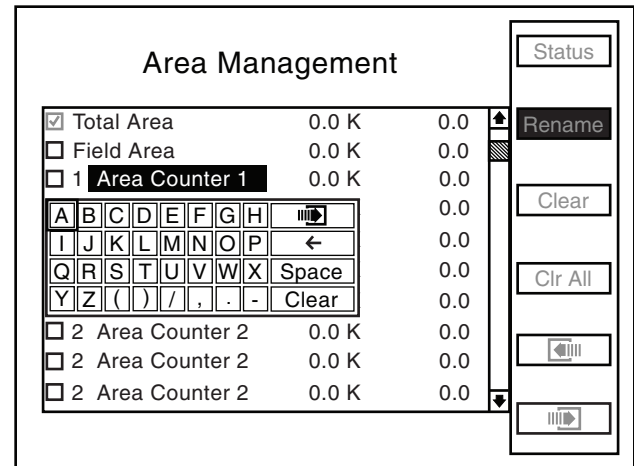
NOTE: Total Area counter can never be disabled, but can be reset to zero (cleared).

- The check mark (✓) in the box next to the name of the area counter indicates the area counter is enabled and accumulating area.

EXAMPLE: In the above illustration, 31.3K indicates average seed population per unit area (either acre or hectare). This number has been rounded off. The actual seed population ranges anywhere from 30,500 to 31,499 per unit area. The last column of numbers is the area accumulated (acre or hectare).

- Turn the knob or use the arrow keys to highlight the desired area counter.
- Press the F2 key next to Rename to name the area. A drop down keyboard will appear. Use the keyboard to enter area name, then press the knob or enter key to save information.

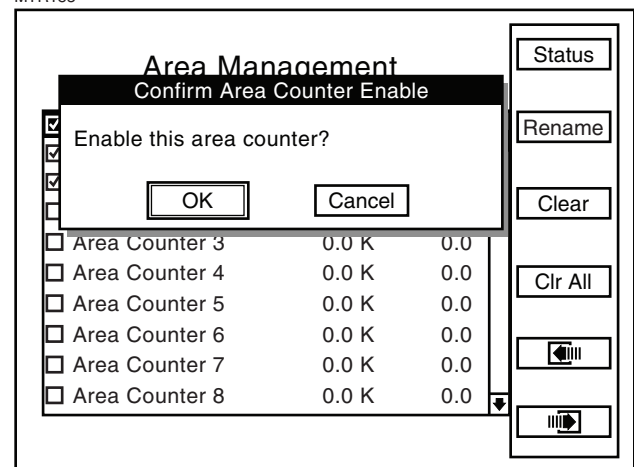
MTR202



NOTE: When a key is dimmed it does not perform any operation on the highlighted area counter.

ENABLE AREA COUNTER

MTR183



To Enable a disabled area counter:

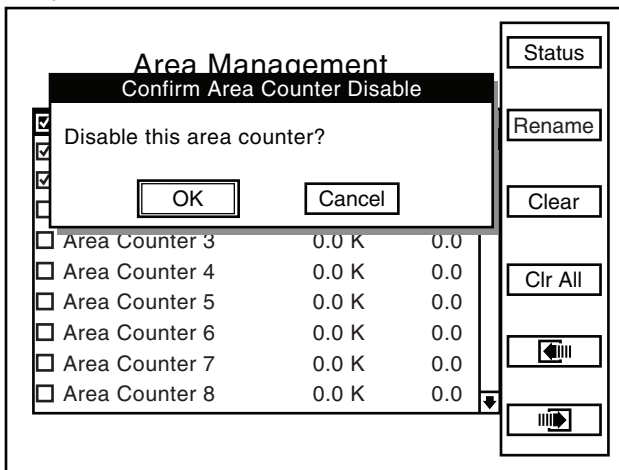
- Highlight the desired "Area Counter" by turning the rotary encoder knob or using the arrow keys.
- Press the knob or Enter key. A "Confirm Area Counter Enable" box will appear.
- Use the knob or arrow keys to highlight the "OK" button and press the knob or Enter key. The enabled "Area Counter" will then start accumulating area.

DISABLE AREA COUNTER

All area counters may be disabled, except the Total Area Counter. To disable an enabled area counter:

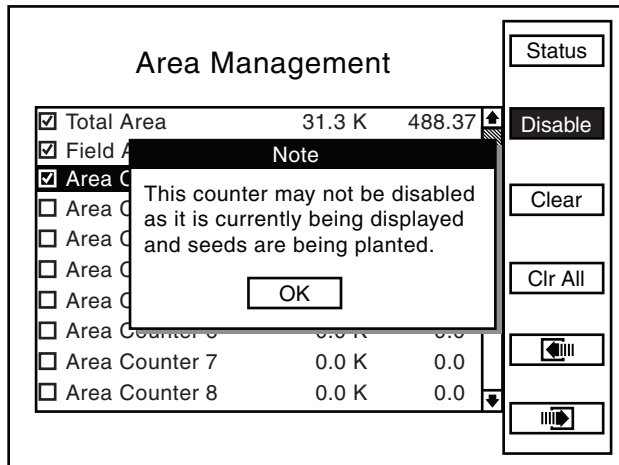
- Highlight the desired “Area Counter” by turning the rotary encoder knob or using the arrow keys.
- Press the knob or Enter key. A “Confirm Area Counter Disable” box will appear.
- Use the knob or arrow keys to highlight the “OK” button and press the knob or Enter key. The disabled “Area Counter” will no longer accumulate area.

MTR184

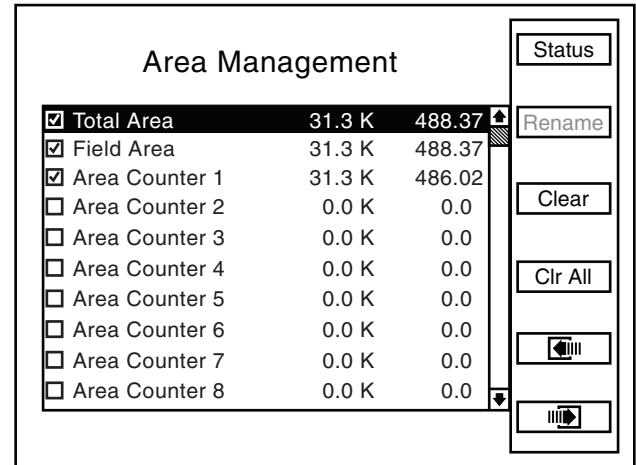


NOTE: Attempts to disable an Area Counter that is planting will cause the following alarm.

MTR185

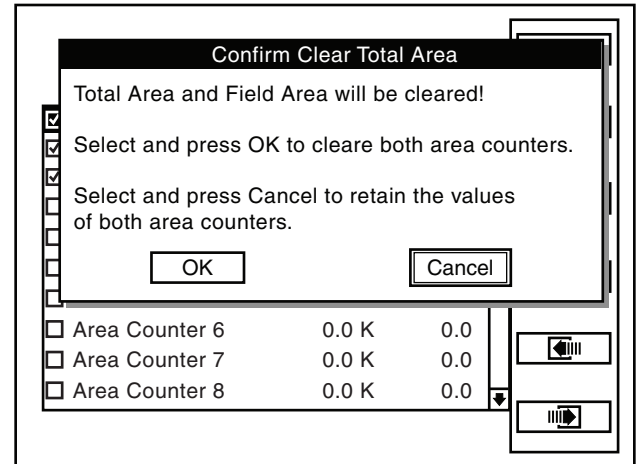


MTR186



NOTE: If “Total area” is highlighted and the F3 key next to Clear is pressed the following request for confirmation will appear.

MTR187



CLEAR AREA COUNTER

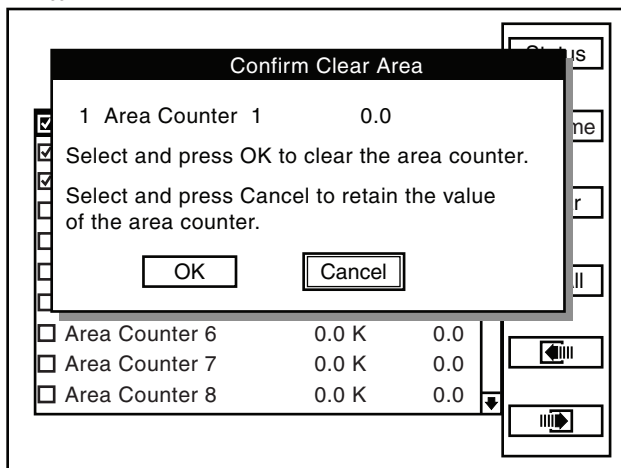
Total Area, Field Area and Area Counters 1 through 40 can be cleared, whether enabled or disabled. Clearing the “Total Area” counter forces the “Field Area” counter to be cleared. However, clearing an “Area Counter” including the “Field Area” clears only that individual counter.

NOTE: Lifetime Area Counter can never be cleared or disabled.

Clearing an Area Counter

- STEP 1** Turn the knob or use the arrow keys to highlight the desired area counter.
- STEP 2** Press the F3 key next to “Clear”. The request for confirmation shown below will appear.
- STEP 3** Turn the knob or use the arrow keys to highlight “OK” or “Cancel” and press the knob or Enter key to confirm the selection.

MTR188

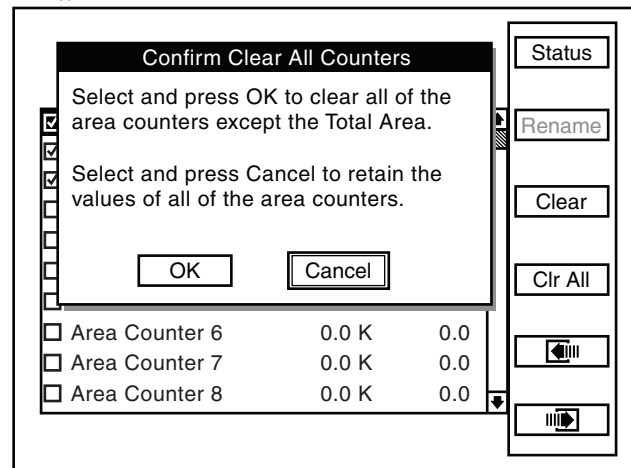


Clearing All the Area Counters

NOTE: This will clear all the area counters except the “Total Area Counter”

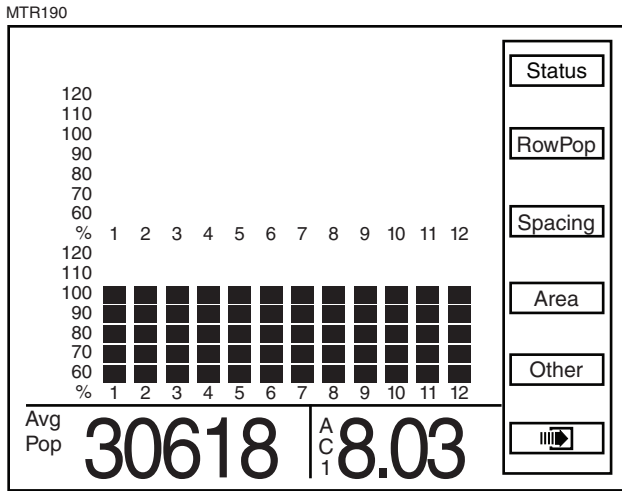
- STEP 1** Press the F4 key next to “CLR All”. A request for confirmation will appear.
- STEP 2** Turn the knob or use the arrow keys to select either “OK” or “Cancel” and press the knob or Enter key to make confirm the selection.

MTR189

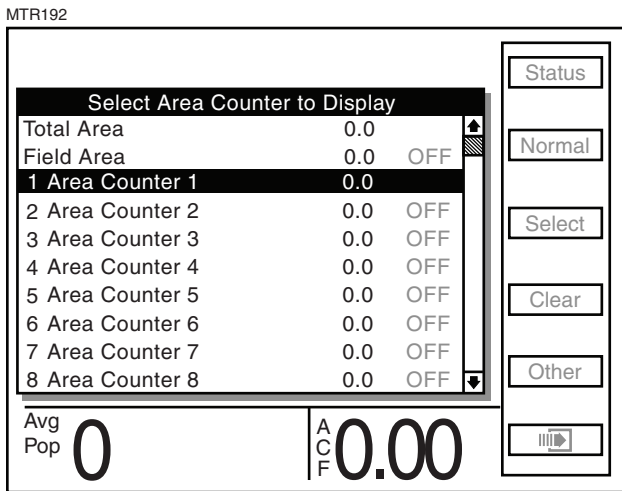


AREA COUNTERS

STEP 1 On the Planter Configuration screen press the F4 key next to “Area”.

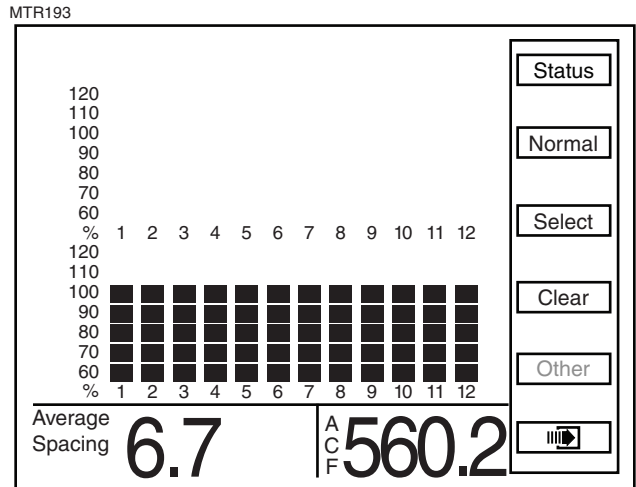


STEP 2 Press the F3 key next to “Select” to display the list of area counters.



STEP 3 Use the arrow keys to highlight the desired area counter to be displayed.

STEP 4 Press the knob or Enter key and the “Planter Configuration” screen will be displayed.



NOTE: The abbreviation for the selected area counter will appear in the bottom R.H. corner of the screen. In the above illustration “ACF” stands for Area Counter Field.

CLEARING FIELD AREA

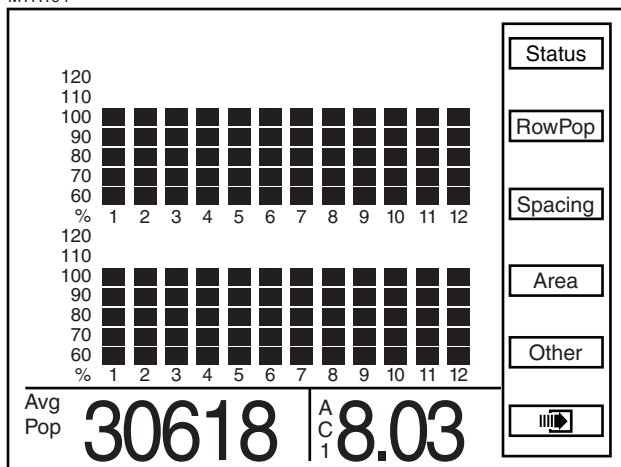
STEP 1 To reset the counter, display the Plant screen.

NOTE: If “Area” is not displayed next to F4, press F2 next to “Normal”.

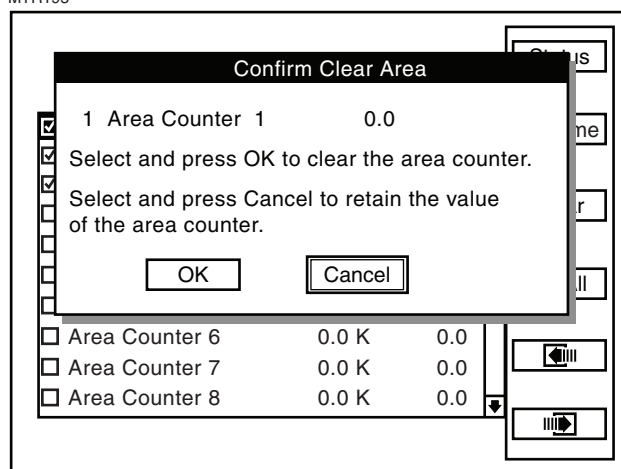
STEP 2 Press the F4 key next to Area then press the F4 key next to Clear, a dialog box will appear requesting confirmation to clear.

STEP 3 Highlight “OK” or “Cancel” by turning the knob or using the arrow keys. Press the knob or Enter key to verify the selection.

MTR194



MTR195



NOTE: Only the displayed area counter can be cleared.

REPLACING FAULTY SENSOR(S)

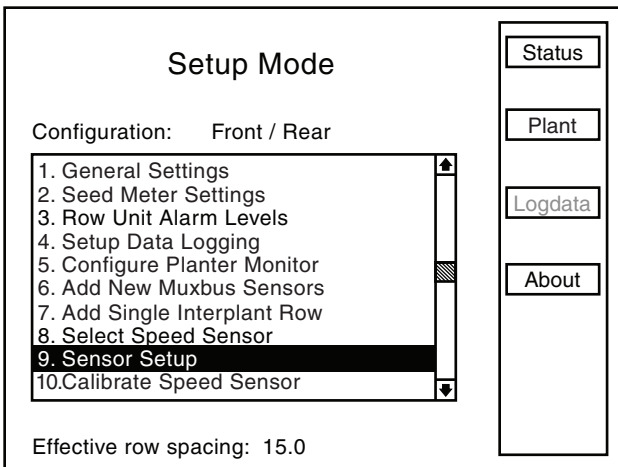
NOTE: The monitor will beep twice when the new sensor(s) is learned.

STEP 1 Press the F6 key until the Mode Selection screen appears.

STEP 2 Highlight "1. Setup Mode" by turning the knob or using the arrow keys. Press the knob or Enter key to display the highlighted item.

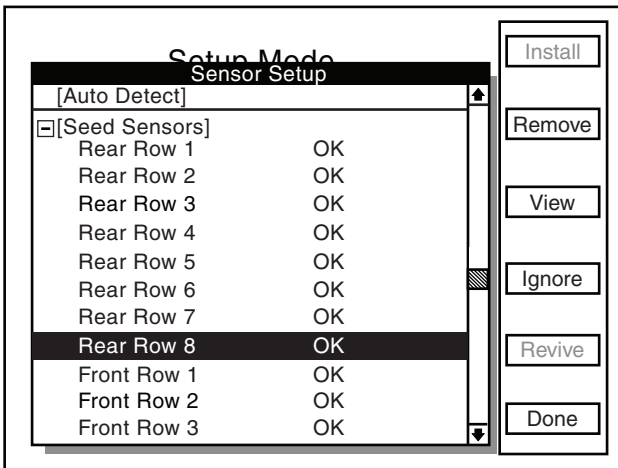
STEP 3 Highlight "9. Sensor Setup" by turning the knob or using the arrow keys. Press the knob or Enter key to display the highlighted item.

MTR200



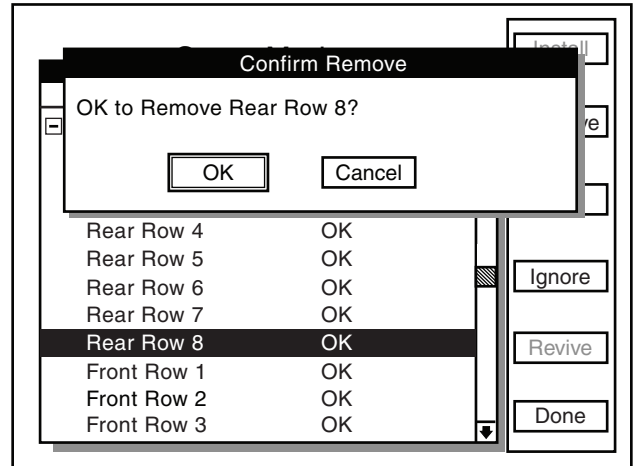
STEP 4 Turn the knob or use the arrow keys to highlight the faulty sensor and press the F2 key next to Remove.

MTR203

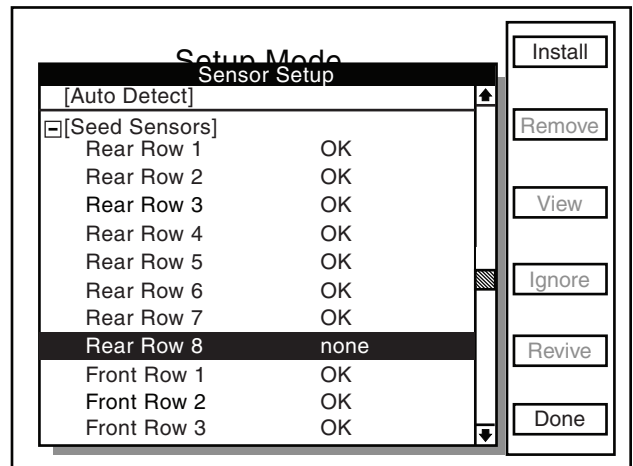


STEP 5 The following message will appear. Select OK to confirm by pressing the knob or ENTER key. Select Cancel to exit.

MTR204



MTR205



STEP 6 Unplug the sensor and plug in a new sensor. Press F1 key next to Install.

NOTE: The monitor will beep twice when the new sensor(s) is learned.

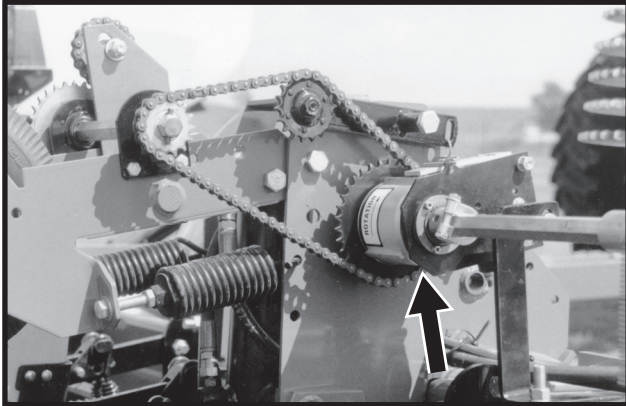
Repeat STEPS 1 through 6 for each faulty sensor being replaced.

NOTE: Highlighting a sensor and pressing the F4 key next to View displays additional information for troubleshooting a problem. If a faulty sensor has been ignored it may be highlighted in the list of sensors, press the F3 key next to Revive. The monitor will try to communicate with the sensor. If successful, "OK" will appear next to the sensor.

MACHINE OPERATION

POINT ROW CLUTCHES

07029708a



Point Row Clutch

With the use of electric-activated clutches, which disengage the drive, either half of the planter may be shut off for finishing up fields or for long point row situations.

76740-48



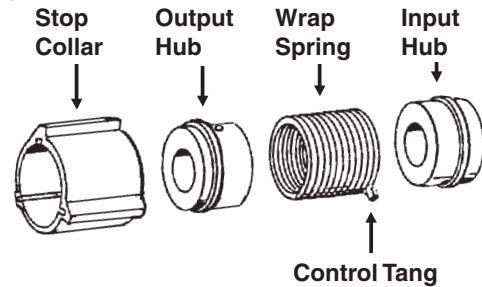
Point Row Clutch Control Box

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

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

NOTE: Since the liquid fertilizer piston pump have its own drive wheels, liquid fertilizer application will not be affected by use of the point row clutch.

(EF40c)



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

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

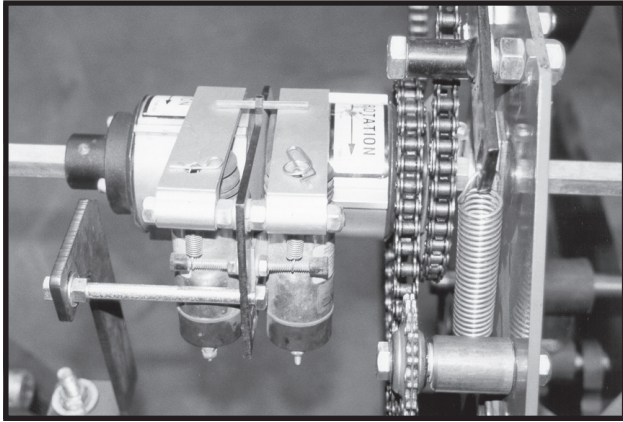
The stop collar is controlled by the use of an electric solenoid and an actuator arm. When the selector switch on the tractor control box is in the OFF position the solenoid coil is NOT ENERGIZED and the actuator arm will not contact the stop on the stop collar allowing it to rotate with the hubs and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

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

MACHINE OPERATION

TWO-SPEED POINT ROW CLUTCHES

10279714



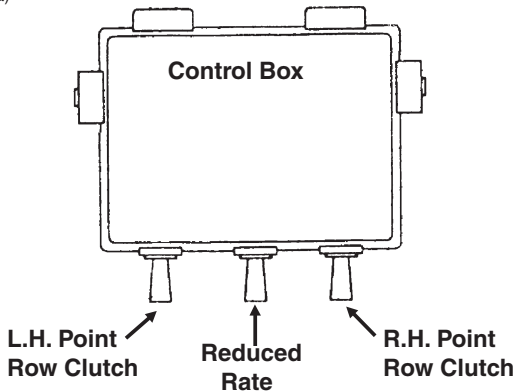
Viewed From Front Of Planter

The optional Two-Speed Point Row Clutch Package is designed to allow on-the-go population rate adjustment as well as the capability to shut off either half of the planter for finishing up fields or for long point row situations.

The point row clutches are controlled by the point row clutch switches on the control console. The point row switch is used to shut off either the left or right half of the planter. Activating the reduced rate switch engages one solenoid on each clutch assembly and reduces the planting rate for the entire planter.

NOTE: Point row switch should be left in OFF position and rate switch left in FULL RATE position when planter is not in use. If left in ON and/or REDUCED RATE positions, the tractor battery will be discharged.

(SPF46a)



Top View Of Control Box

The ratio of population reduction is determined by the sprocket ratio between the drive and driven sprockets on the wheel module. A rate reduction decal like the one shown below is located on the wheel module.

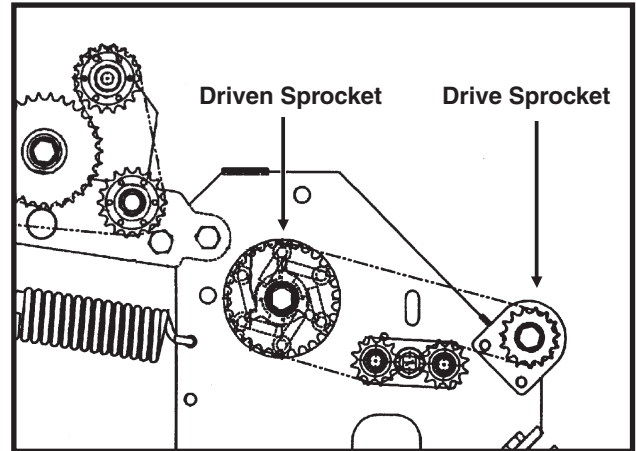
(7100-214)

TRANSMISSION RATE REDUCTION		
DRIVE	DRIVEN	% REDUCTION IN POPULATION
15	30	50
17	30	43
23*	30	23
24	30	20
25*	30	17
26*	30	13
27	30	10

* Use sprockets off seed drive transmission

7100-214

(EF48)



NOTE: Since the liquid fertilizer piston pump has its own contact drive wheel, liquid fertilizer application rates will not be affected by the two-speed point row clutches.

MACHINE OPERATION

DOUBLE DISC FERTILIZER OPENER

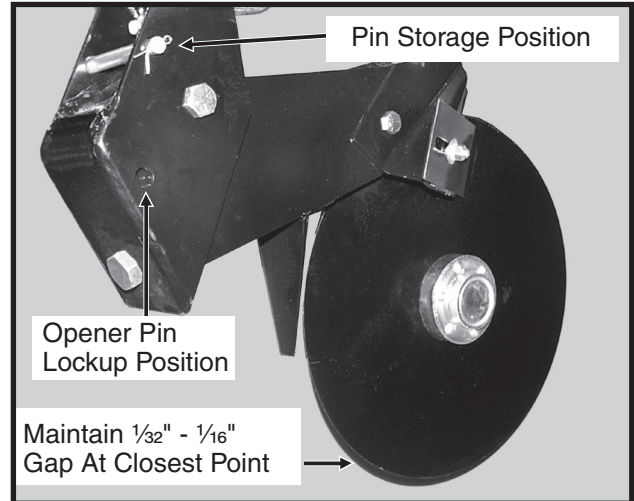
The double disc fertilizer openers should be positioned during assembly **to place fertilizer no closer than 2" to either side of the row.** If the planter frame is level and at proper 20" operating height, fertilizer depth will be approximately 4". Soil conditions can affect depth slightly.

The down pressure spring is factory preset at 250 lbs. down pressure but may be adjusted for various soil conditions. To adjust spring tension, loosen the jam nut with a $1\frac{5}{16}$ " 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.

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

A gap of $\frac{1}{32}$ " to $\frac{1}{16}$ " should be maintained between the opener blades at the closest point. Blade adjustment is 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 contacting the shank.

D06259919



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

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.



WARNING: Always install all cylinder lockup devices before working under the unit.

MACHINE OPERATION

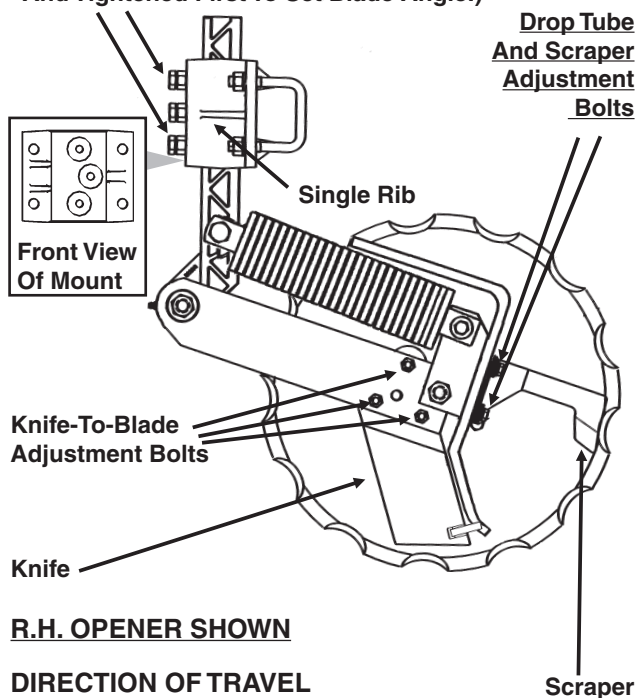
NOTCHED SINGLE DISC FERTILIZER OPENER (Style A)

The notched single disc fertilizer opener is designed for use in minimum and no till planting conditions. Placement of fertilizer with the 16 3/4" diameter notched single disc fertilizer opener is recommended at 2 1/2"- 3" from the row. The opener is designed to hold the blade at a set-angle so the knife and drop tube operate in the shadow of the blade. **Never locate the opener to place fertilizer closer than 2".**

WARNING: Spring under pressure. DO NOT disassemble.

(FRTZ210q/B0297)

Depth Adjustment Cap Screws - Recommended Maximum Operating Depth 4" (Middle Cap Screw Holds Blade Angle But Must Be Loosened To Adjust Depth And Tightened First To Set Blade Angle.)



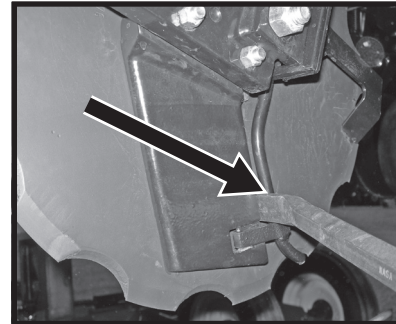
R.H. OPENER SHOWN

DIRECTION OF TRAVEL

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

Using the slotted mounting holes in the drop tube mount, **adjust fertilizer drop tube** behind the knife so it is protected from soil contact and wear. The liquid drop tube should be adjusted 1/4"- 3/8" from the opener blade while keeping it behind the knife. Insert a flat bladed pry bar between the knife and drop tube just above the drop tube tab as shown below. Bend the tube inward toward the disc blade to obtain the desired 1/4"- 3/8" adjustment.

D01040702



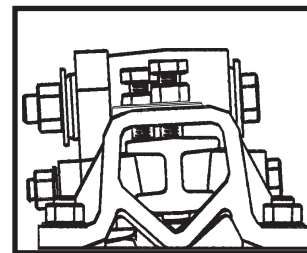
NOTE: Adjusting the liquid drop tube will ensure it is out of the path of the soil flow across the knife. Drop tube and tab will wear quickly if not adjusted correctly.

Adjust scraper to just touch the opener blade. As the mounting hardware is tightened, the scraper is drawn tighter to the blade. After adjustment, rotate opener blade to be sure blade will turn by hand with slight resistance, but will not coast or freewheel.

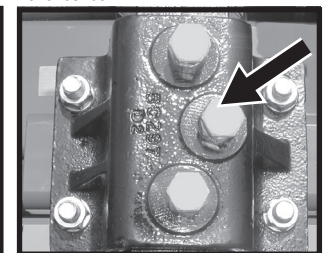
Adjust blade depth on each row using the cap screws and jam nuts located on the opener mount. The blade can be adjusted to allow a maximum 4" blade depth. Check fertilizer hose clearance (If Applicable) after adjusting opener depth. Torque cap screws and jam nuts to 57 ft. lbs.

NOTE: The blade cuts through the soil at an angle relative to the direction of travel. For this reason and to ensure proper operation, the cast mount should be oriented so the single rib is on the same side of the blade as the drop tube.

FRTZ296



D070103100



NOTE: Recommended maximum operating depth is 4". To adjust depth: (a) Loosen depth adjustment cap screws. (b) Adjust depth to desired setting. (c) Tighten upper and lower cap screws slightly to hold opener arm in place. (d) Tighten middle cap screw to set the opener arm angle. (e) Tighten upper and lower cap screws and all jam nuts.

MACHINE OPERATION

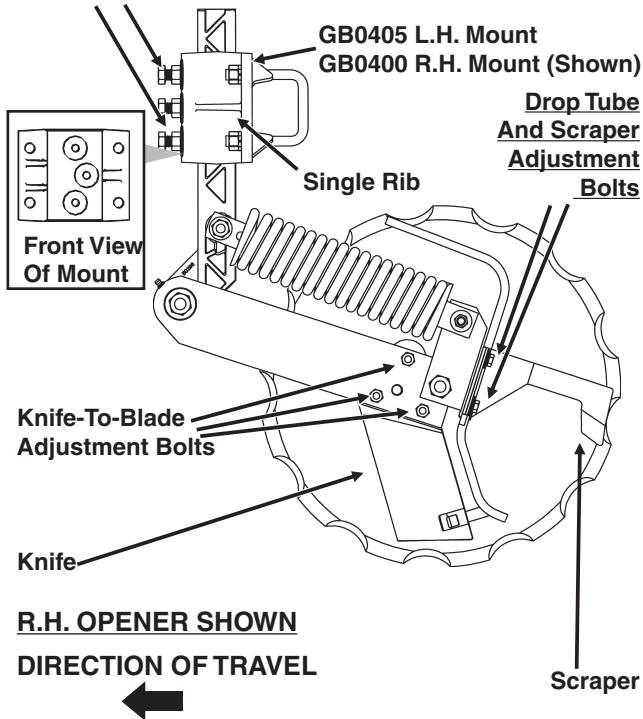
NOTCHED SINGLE DISC FERTILIZER OPENER (Style B)

The notched single disc fertilizer opener is designed for use in minimum and no till planting conditions. Placement of fertilizer with the 16 3/4" diameter notched single disc fertilizer opener is recommended at 2 1/2" - 3" from the row. The opener is designed to hold the blade at a set-angle so the knife and drop tube operate in the shadow of the blade. **Never locate the opener to place fertilizer closer than 2".**

WARNING: Spring under pressure. DO NOT disassemble.

(A12429a/B0297)

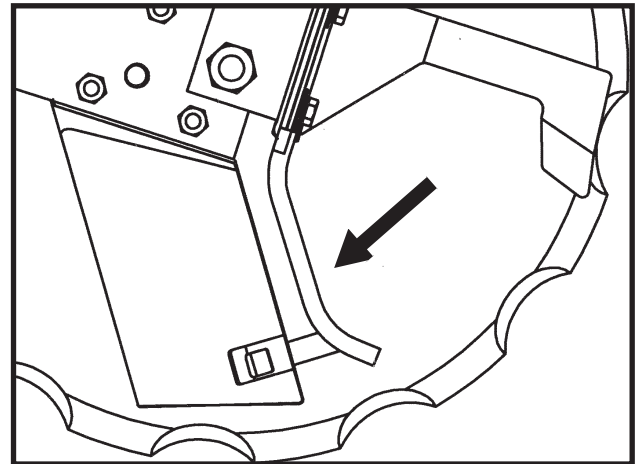
Depth Adjustment Cap Screws - Recommended Maximum Operating Depth 4" (Middle Cap Screw Holds Blade Angle But Must Be Loosened To Adjust Depth And Tightened First To Set Blade Angle.)



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

Using the slotted mounting holes in the drop tube mount, **adjust fertilizer drop tube** behind the knife so it is protected from soil contact and wear. The liquid drop tube should be adjusted 1/4"-3/8" from the opener blade while keeping it behind the knife. Insert a flat bladed pry bar between the knife and drop tube just above the drop tube tab as shown below. Bend the tube inward toward the disc blade to obtain the desired 1/4"-3/8" adjustment.

D01040702



NOTE: Adjusting the liquid drop tube will ensure it is out of the path of the soil flow across the knife. Drop tube and tab will wear quickly if not adjusted correctly.

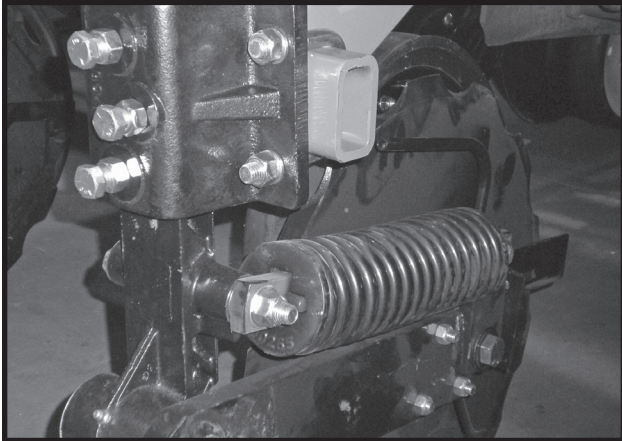
Adjust scraper to just touch the opener blade. As the mounting hardware is tightened, the scraper is drawn tighter to the blade. After adjustment, rotate opener blade to be sure blade will turn by hand with slight resistance, but will not coast or freewheel.

Adjust blade depth on each row using the cap screws and jam nuts located on the opener mount. The blade can be adjusted to allow a maximum 4" blade depth. Check fertilizer hose clearance (If Applicable) after adjusting opener depth. Torque cap screws and jam nuts to 57 ft. lbs.

MACHINE OPERATION

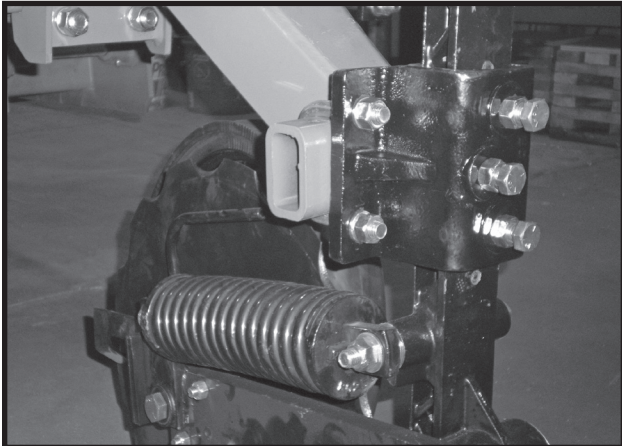
NOTE: The blade cuts through the soil at an angle relative to the direction of travel. For this reason and to ensure proper operation, the cast mount should be oriented so the front and bottom of the blade tilt towards the knife.

D01160802



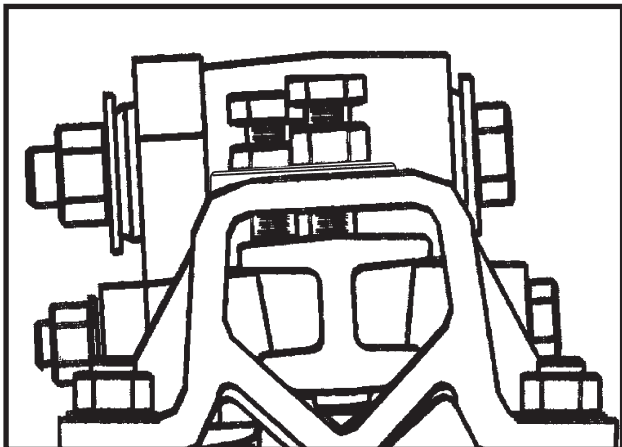
R.H. Opener (B0400)

D01160801

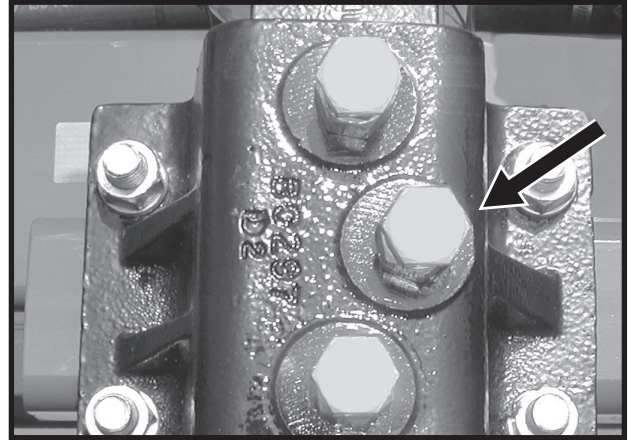


L.H. Opener (B0405)

FRTZ296



D070103100

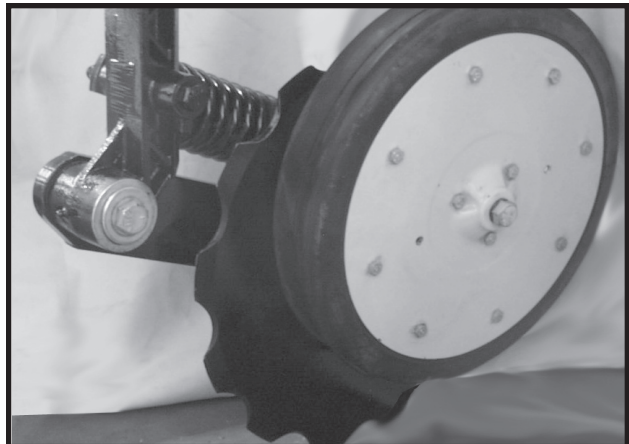


NOTE: Recommended maximum operating depth is 4". To adjust depth: (a) Loosen depth adjustment cap screws. (b) Adjust depth to desired setting. (c) Tighten upper and lower cap screws slightly to hold opener arm in place. (d) Tighten middle cap screw to set the opener arm angle. (e) Tighten upper and lower cap screws and all jam nuts.

DEPTH/GAUGE WHEEL ATTACHMENT FOR NOTCHED SINGLE DISC FERTILIZER OPENER

(For Use With Notched Single Disc Fertilizer Opener)

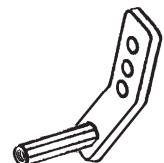
D061101202a



The depth/gauge wheel attachment for the notched single disc fertilizer opener is designed for use in situations where additional gauging is required to maintain desired fertilizer opener depth. The depth/gauge wheel is attached to the notched single disc fertilizer opener using a mounting block fastened to the pivot arm using $\frac{5}{8}$ " hardware through the disc blade hub w/bearing.

Depth adjustment is made by using the 3 adjustment holes in the depth/gauge wheel mounting block. Moving the depth/gauge wheel increases/decreases depth in approximate 1" increments in relation to the blade depth setting made at the vertical mounting post.

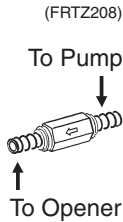
(FRTZ256a)



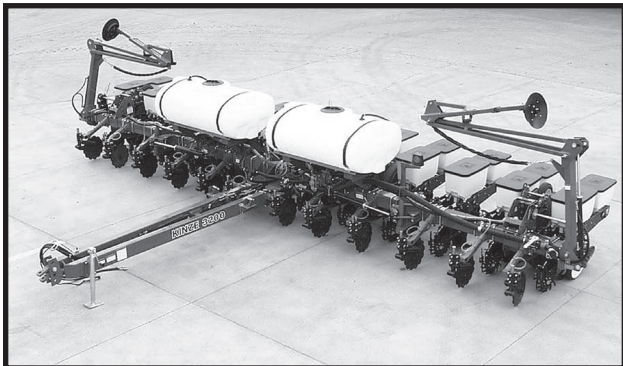
MACHINE OPERATION

LIQUID FERTILIZER ATTACHMENT

NOTE: An optional low rate check valve is available for installation in-line between the liquid fertilizer piston pump and the liquid fertilizer openers to ensure equal distribution of product at low rates. The check valves also eliminate the need for anti-siphon loops if the valves are installed as close as possible to the fertilizer opener drop tubes.



D06029915c



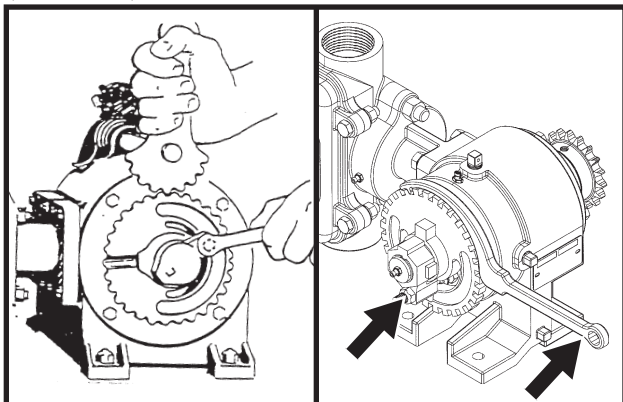
Shown With Liquid Fertilizer Package And Notched Single Disc Fertilizer Openers Installed

The rate of liquid fertilizer application is determined by the piston pump settings.

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

To adjust delivery rate, loosen the $\frac{3}{8}$ " 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 $\frac{3}{8}$ " lock nut being careful not to over tighten.

(PLTR9/A12330b)



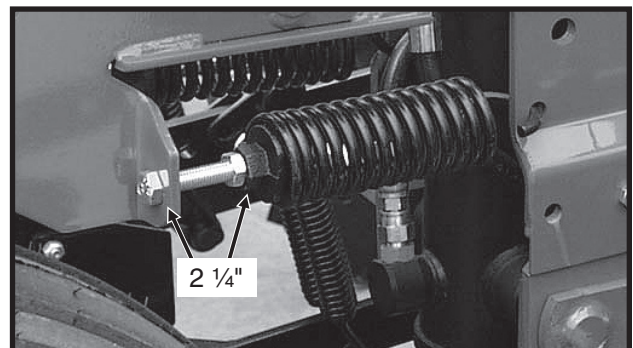
The operator and instruction manual shipped with the pump and flow divider should be kept and stored with this manual for future reference.

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

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

The spring tension is set leaving $2 \frac{1}{4}$ " between the spring plug and the bolt head.

D061199222

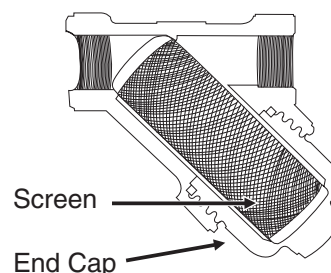


CLEANING

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.

On machines equipped with the piston pump, the strainer located between the piston pump and ball valve 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

TRANSPORTING THE PLANTER



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



WARNING: Always install safety lockup devices on lift cylinders and make sure wing safety pins are in place to secure wings at hitch before transporting the planter.

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 (Km/h)
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 (Km/h)	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.)

PLANTING SPEED

Planters are designed to operate within a speed range of 2 to 8 MPH. See “Planting And Application 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.

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 “Row Marker Length Adjustment”, “Row Marker Speed Adjustment” and “Hydraulic Row Marker Operation”.
- 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 “Fertilizer Application Rate Chart”.

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

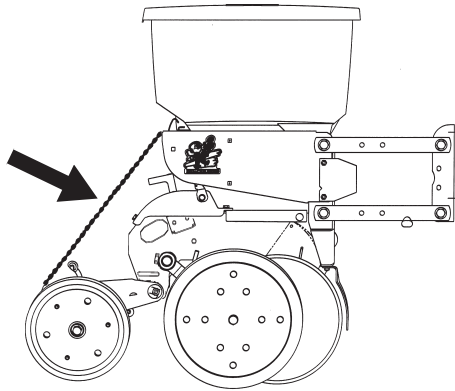
- Hoses And Fittings
- Bolts And Nuts
- Cotter Pins And Spring Pins
- Drive Chain Alignment

MACHINE OPERATION

CHECKING SEED POPULATION

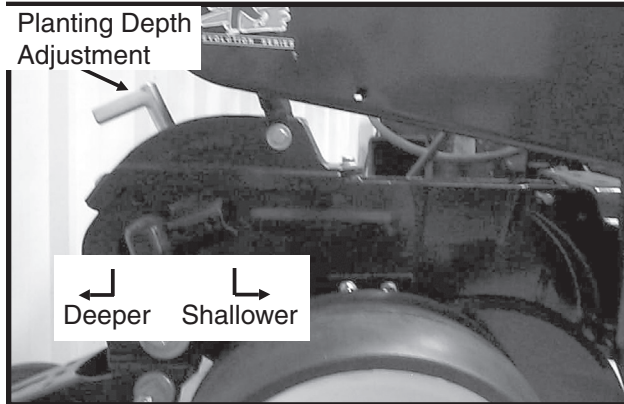
1. Tie up one or more sets of closing wheels by running a chain or rubber tarp strap between the hopper support panel and closing wheels. It may be necessary to decrease closing wheel arm spring tension.

(RU113g)



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.

D020705102



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		
	30"	36"	38"
$\frac{1}{1000}$	17' 5"	14' 6"	13' 10"

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

4. Count seeds in measured distance.
5. Multiply the number of seeds placed in $\frac{1}{1000}$ 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 driveline and check drive and driven sprockets on 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
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To determine bushels per acre:

Pounds Per Acre	÷	Unit Weight Of Seed	=	Bushels Per Acre
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The unit weight of:

- 1 Bushel Soybeans = 60 Pounds
- 1 Bushel Milo/Grain Sorghum = 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/grain sorghum
- 4,500 seeds per pound for medium size cotton

If seed population 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

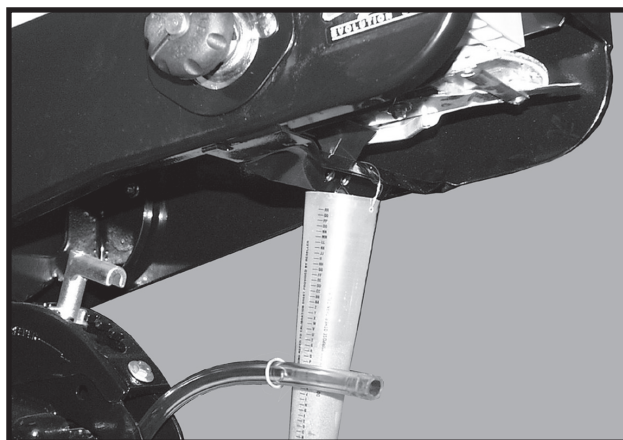
Many things can affect the rate of delivery of granular chemicals such as temperature, humidity, speed, ground conditions, flowability of different material or any obstruction in the meter.



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

A field check is important to determine correct application rates.

D05149901



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.

POUNDS PER ACRE FACTOR FOR GIVEN ROW WIDTH	
Row Width	Factor
30"	0.83
36"	0.69
38"	0.65

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

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

Metering Gate

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

MACHINE OPERATION

GENERAL PLANTING RATE INFORMATION

These planting rate charts are applicable to KINZE® Model 3200 Flex Econo-Fold® Planters. See “Tire Pressure” for recommended tire pressures.

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

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

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

Finger Pickup Corn Meter

Larger grades will generally plant more accurately at the high end of the ground speed range than 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.

Finger Pickup Oil Sunflower Meter

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. 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. No. 1 and/or No. 2 size confectionery sunflower seeds are recommended for use in the finger pickup seed meter equipped with corn fingers.

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/Grain 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” pages of this manual.

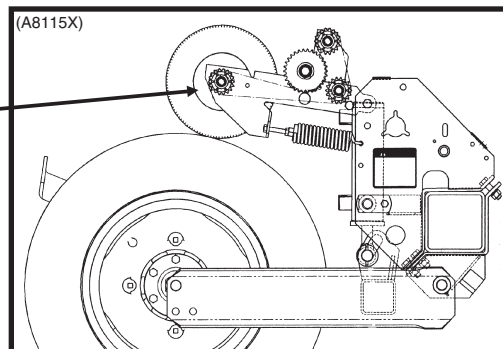
NOTE: Due to a multitude of variables, seed spacing can be adversely affected at speeds above 5.5 MPH.

In some cases a Half Rate (2 To 1) Drive Reduction Package may be required to obtain the desired population and seed spacing.

NOTE: Use of the Half Rate (2 To 1) Drive Reduction Package with brush-type seed meters 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.

EXAMPLE: 30" row spacing using 60 cell seed discs in brush-type seed meters.
 $80,928 \div 2 = 40,464$ Population (2.6" Seed Spacing x 2 = 5.2" Seed Spacing)

30 Tooth - Standard
Rate Drive
15 Tooth - Half Rate
(2 To 1) Drive



MACHINE OPERATION

Z202

PLANTING RATES FOR FINGER PICKUP SEED METERS (STANDARD DRIVE) APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
			Drive	Driven		
16,186	13,488	12,778	17	28	4 to 6	12.9
16,785	13,988	13,251	17	27	4 to 6	12.5
17,431	14,526	13,761	17	26	4 to 6	12.0
18,090	15,075	14,281	19	28	4 to 6	11.6
18,128	15,107	14,312	17	25	4 to 6	11.5
18,760	15,633	14,810	19	27	4 to 6	11.1
18,883	15,736	14,908	17	24	4 to 6	11.1
19,481	16,234	15,380	19	26	4 to 6	10.7
19,704	16,420	15,556	17	23	4 to 6	10.6
20,261	16,884	15,995	19	25	4 to 6	10.3
21,104	17,587	16,662	19	24	4 to 6	9.9
21,898	18,249	17,288	23	28	4 to 6	9.5
22,022	18,352	17,386	19	23	4 to 6	9.5
22,709	18,924	17,928	23	27	4 to 6	9.2
22,850	19,042	18,040	24	28	4 to 6	9.2
23,583	19,652	18,618	23	26	4 to 6	8.9
23,697	19,747	18,708	24	27	4 to 6	8.8
23,802	19,835	18,791	25	28	4 to 6	8.8
23,853	19,877	18,831	17	19	4 to 6	8.8
24,526	20,438	19,363	23	25	4 to 6	8.5
24,608	20,507	19,427	24	26	4 to 6	8.5
24,684	20,570	19,487	25	27	4 to 6	8.5
24,755	20,629	19,543	26	28	4 to 6	8.4
25,548	21,290	20,169	23	24	4 to 6	8.2
25,592	21,327	20,205	24	25	4 to 6	8.2
25,633	21,361	20,237	25	26	4 to 6	8.2
25,671	21,393	20,267	26	27	4 to 6	8.1
25,707	21,422	20,295	27	28	4 to 6	8.1
26,659	22,216	21,046	23	23	4 to 6	7.8
27,646	23,038	21,826	28	27	4 to 6	7.6
27,684	23,070	21,856	27	26	4 to 6	7.6
27,770	23,141	21,923	25	24	4 to 6	7.5
27,818	23,181	21,961	24	23	4 to 6	7.5
28,709	23,924	22,665	28	26	4 to 6	7.3
28,791	23,993	22,730	27	25	4 to 6	7.3
28,977	24,147	22,876	25	23	4 to 6	7.2
29,795	24,829	23,522	19	17	4 to 6	7.0
29,858	24,881	23,572	28	25	4 to 6	7.0
29,991	24,993	23,677	27	24	4 to 6	7.0
30,136	25,113	23,792	26	23	4 to 6	7.0
31,102	25,918	24,554	28	24	3 to 6	6.7
31,295	26,079	24,707	27	23	3 to 6	6.7
32,271	26,893	25,477	23	19	3 to 5.5	6.5
32,454	27,045	25,622	28	23	3 to 5.5	6.5
33,674	28,062	26,585	24	19	3 to 5.5	6.2
35,077	29,231	27,693	25	19	3 to 5	6.0
36,068	30,056	28,474	23	17	3 to 5	5.8
36,480	30,400	28,800	26	19	3 to 5	5.7
37,636	31,363	29,713	24	17	3 to 5	5.6
37,883	31,570	29,908	27	19	3 to 5	5.5
39,204	32,670	30,951	25	17	3 to 4.5	5.3
39,287	32,739	31,016	28	19	3 to 4.5	5.3
40,772	33,977	32,189	26	17	3 to 4.5	5.1
42,340	35,284	33,427	27	17	3 to 4.5	4.9
43,908	36,590	34,665	28	17	3 to 4.5	4.8

NOTE: 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 (STANDARD DRIVE)

APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

Transmission Sprockets		60 Cell Soybean Or High-Rate Milo/ Grain Sorghum			Average Seed Spacing In Inches	48 Cell Specialty Soybean Or High-Rate Acid-Delinted Cotton			Average Seed Spacing In Inches	Speed Range (MPH)
Drive	Driven	30" Rows	36" Rows	38" Rows		30" Rows	36" Rows	38" Rows		
17	28	80,928	67,440	63,891	2.6	64,742	53,952	51,113	3.2	2 to 8
17	27	83,926	69,938	66,257	2.5	67,141	55,950	53,006	3.1	2 to 8
17	26	87,154	72,628	68,805	2.4	69,723	58,102	55,044	3.0	2 to 8
19	28	90,449	75,374	71,407	2.3	72,359	60,299	57,126	2.9	2 to 8
19	27	93,799	78,166	74,052	2.2	75,039	62,533	59,242	2.8	2 to 8
17	24	94,416	78,680	74,539	2.2	75,533	62,944	59,631	2.8	2 to 8
17	23	98,521	82,101	77,780	2.1	78,817	65,681	62,224	2.7	2 to 8
19	25	101,303	84,419	79,976	2.1	81,042	67,535	63,981	2.6	2 to 8
19	24	105,524	87,937	83,309	2.0	84,419	70,350	66,647	2.5	2 to 8
23	28	109,491	91,243	86,440	1.9	87,593	72,994	69,152	2.4	2 to 8
19	23	110,112	91,760	86,931	1.9	88,090	73,408	69,545	2.4	2 to 8
24	28	114,252	95,210	90,199	1.8	91,402	76,168	72,159	2.3	2 to 8
24	27	118,483	98,736	93,539	1.8	94,786	78,989	74,831	2.2	2 to 8
17	19	119,263	99,386	94,155	1.8	95,410	79,509	75,324	2.2	2 to 8
24	26	123,040	102,534	97,137	1.7	98,432	82,027	77,710	2.1	2 to 8
26	28	123,773	103,144	97,715	1.7	99,018	82,515	78,172	2.1	2 to 8
24	25	127,962	106,635	101,023	1.6	102,370	85,308	80,818	2.0	2 to 8
26	27	128,357	106,964	101,334	1.6	102,686	85,571	81,067	2.0	2 to 8
23	23	133,294	111,078	105,232	1.6	106,635	88,862	84,186	2.0	2 to 8
27	26	138,420	115,350	109,279	1.5	110,736	92,280	87,423	1.9	2 to 8
24	23	139,089	115,907	109,807	1.5	111,271	92,726	87,846	1.9	2 to 8
25	23	144,884	120,737	114,382	1.4	115,907	96,590	91,506	1.8	2 to 8
19	17	148,975	124,146	117,612	1.4	119,180	99,317	94,090	1.8	2 to 8
27	24	149,955	124,963	118,386	1.4	119,964	99,970	94,709	1.7	2 to 8
28	24	155,509	129,591	122,770	1.3	124,407	103,673	98,216	1.7	2 to 8
23	19	161,355	134,463	127,386	1.3	129,084	107,570	101,909	1.6	2 to 8
28	23	162,270	135,225	128,108	1.3	129,816	108,180	102,486	1.6	2 to 8
24	19	168,371	140,309	132,924	1.2	134,696	112,247	106,339	1.6	2 to 8
25	19	175,386	146,155	138,463	1.2	140,309	116,924	110,770	1.5	2 to 8
23	17	180,338	150,282	142,372	1.2	144,270	120,226	113,898	1.5	2 to 8
26	19	182,402	152,001	144,001	1.1	145,922	121,601	115,201	1.4	2 to 7
27	19	189,417	157,848	148,540	1.1	151,534	126,278	118,832	1.4	2 to 7
28	19	196,433	163,694	155,078	1.1	157,146	130,955	124,062	1.3	2 to 7
26	17	203,861	169,884	160,943	1.0	163,089	135,907	128,754	1.3	2 to 7
27	17	211,702	176,418	167,133	0.9	169,362	141,134	133,706	1.2	2 to 7
28	17	219,542	182,952	173,323	0.9	175,634	146,362	138,658	1.2	2 to 7

NOTE: 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.

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

MACHINE OPERATION

RH/Z215

PLANTING RATES FOR BRUSH-TYPE SEED METERS (STANDARD DRIVE)

APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

Transmission Sprockets		36 Cell Acid-Delinted Large Cotton			Average Seed Spacing In Inches	30 Cell Milo/Grain Sorghum Or Acid-Delinted Cotton			Average Seed Spacing In Inches	Speed Range (MPH)
Drive	Drive	30" Rows	36" Rows	38" Rows		30" Rows	36" Rows	38" Rows		
17	28	48,557	40,464	38,335	4.3	40,464	33,720	31,945	5.2	2 to 8
17	27	50,356	41,963	39,754	4.2	41,963	34,969	33,129	5.0	2 to 8
17	26	52,292	43,577	41,283	4.0	43,577	36,314	34,403	4.8	2 to 8
19	28	54,269	45,224	42,844	3.9	45,225	37,687	35,704	4.6	2 to 8
19	27	56,279	46,900	44,431	3.7	46,900	39,083	37,026	4.5	2 to 8
17	24	56,650	47,208	44,723	3.7	47,208	39,340	37,270	4.4	2 to 8
17	23	59,113	49,261	46,668	3.5	49,261	41,051	38,890	4.2	2 to 8
19	25	60,782	50,651	47,986	3.4	50,652	42,210	39,988	4.1	2 to 8
19	24	63,314	52,762	49,985	3.3	52,762	43,968	41,654	4.0	2 to 8
23	28	65,695	54,746	51,864	3.2	54,746	45,621	43,220	3.8	2 to 8
19	23	66,067	55,056	52,159	3.2	55,056	45,880	43,465	3.8	2 to 8
24	28	68,551	57,126	54,119	3.0	57,126	47,605	45,099	3.7	2 to 8
24	27	71,090	59,242	56,123	2.9	59,242	49,368	46,770	3.5	2 to 8
17	19	71,558	59,632	56,493	2.9	59,631	49,693	47,077	3.5	2 to 8
24	26	73,824	61,520	58,282	2.8	61,520	51,267	48,569	3.4	2 to 8
26	28	74,264	61,886	58,629	2.8	61,886	51,572	48,858	3.4	2 to 8
24	25	76,772	63,981	60,614	2.7	63,981	53,317	50,511	3.3	2 to 8
26	27	77,014	64,178	60,800	2.7	64,178	53,482	50,667	3.3	2 to 8
23	23	79,976	66,647	63,139	2.6	66,647	55,539	52,616	3.1	2 to 8
27	26	83,052	69,210	65,567	2.5	69,210	57,675	54,640	3.0	2 to 8
24	23	83,453	69,544	65,884	2.5	69,544	57,954	54,904	3.0	2 to 8
25	23	86,930	72,442	68,629	2.4	72,442	60,368	57,191	2.9	2 to 8
19	17	89,385	74,488	70,567	2.3	74,488	62,073	58,806	2.8	2 to 8
27	24	89,973	74,978	71,032	2.3	74,978	62,481	59,193	2.8	2 to 8
28	24	93,305	77,755	73,662	2.2	77,755	64,796	61,385	2.7	2 to 8
23	19	96,813	80,678	76,432	2.2	80,678	67,231	63,693	2.6	2 to 8
28	23	97,362	81,135	76,864	2.1	81,135	67,613	64,054	2.6	2 to 8
24	19	101,023	84,185	79,754	2.1	84,185	70,155	66,462	2.5	2 to 8
25	19	105,232	87,693	83,078	2.0	87,693	73,078	69,231	2.4	2 to 8
23	17	108,233	90,169	85,423	1.9	90,169	75,141	71,186	2.3	2 to 8
26	19	109,441	91,201	86,401	1.9	91,201	76,001	72,001	2.3	2 to 7
27	19	113,650	94,709	89,124	1.8	94,709	78,924	74,770	2.2	2 to 7
28	19	117,860	98,216	93,047	1.8	98,216	81,847	77,539	2.1	2 to 7
26	17	122,317	101,930	96,566	1.7	101,930	84,942	80,471	2.1	2 to 7
27	17	127,021	105,851	100,280	1.6	105,851	88,209	83,566	2.0	2 to 7
28	17	131,725	109,771	103,994	1.6	109,771	91,476	86,661	1.9	2 to 7

NOTE: 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.

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

MACHINE OPERATION

Z202

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

Due to variations in cotton seed size, meters equipped with the 12 cell acid-delinted hill-drop cotton 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 widths, 14' 6" for 36" row widths and 13' 10" for 38" row widths). Multiply average seeds per hill by hills per acre. EXAMPLE: 4 seeds per hill x (13 hills x 1000) = 52,000.

Transmission Sprockets		NUMBER OF HILLS PER ACRE			Average Hill Spacing In Inches	Speed Range (MPH)
		12 Cell Hill-Drop Cotton, Acid-Delinted				
Drive	Driven	30" Rows	36" Rows	38" Rows		
17	28	16,186	13,488	12,778	12.9	2 to 8
17	27	16,785	13,988	13,251	12.5	2 to 8
17	26	17,431	14,526	13,761	12.0	2 to 8
19	28	18,090	15,075	14,281	11.6	2 to 8
19	27	18,760	15,633	14,810	11.1	2 to 8
17	24	18,883	15,736	14,908	11.1	2 to 8
17	23	19,704	16,420	15,556	10.6	2 to 8
19	25	20,261	16,884	15,995	10.3	2 to 8
19	24	21,105	17,587	16,662	9.9	2 to 8
23	28	21,898	18,249	17,288	9.5	2 to 8
19	23	22,022	18,352	17,386	9.5	2 to 8
24	28	22,850	19,042	18,040	9.2	2 to 8
24	27	23,697	19,747	18,708	8.8	2 to 8
17	19	23,853	19,877	18,831	8.8	2 to 8
24	26	24,608	20,507	19,427	8.5	2 to 8
26	28	24,755	20,629	19,543	8.4	2 to 8
24	25	25,592	21,327	20,205	8.2	2 to 8
26	27	25,671	21,393	20,267	8.1	2 to 8
23	23	26,659	22,216	21,046	7.8	2 to 8
27	26	27,684	23,070	21,856	7.6	2 to 8
24	23	27,818	23,181	21,961	7.5	2 to 8
25	23	28,977	24,147	22,876	7.2	2 to 8
19	17	29,795	24,829	23,522	7.0	2 to 8
27	24	29,991	24,993	23,677	7.0	2 to 8
28	24	31,102	25,918	24,554	6.7	2 to 8
23	19	32,271	26,893	25,477	6.5	2 to 8
28	23	32,454	27,045	25,622	6.5	2 to 8
24	19	33,674	28,062	26,585	6.2	2 to 8
25	19	35,077	29,231	27,693	6.0	2 to 8
23	17	36,068	30,056	28,474	5.8	2 to 8
26	19	36,480	30,400	28,800	5.7	2 to 7
27	19	37,883	31,570	29,908	5.5	2 to 7
28	19	39,287	32,739	31,016	5.3	2 to 7
26	17	40,772	33,977	32,189	5.1	2 to 7
27	17	42,340	35,284	33,427	4.9	2 to 7
28	17	43,908	36,590	34,665	4.8	2 to 7

NOTE: 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.

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

MACHINE OPERATION

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

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

NOTE: The chart above 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. See "Checking Granular Chemical Application Rate" page for additional information.



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

DRY HERBICIDE APPLICATION RATES

APPROXIMATE POUNDS/ACRE AT 5 MPH FOR VARIOUS ROW WIDTHS

CLAY GRANULES

Meter Setting	30" Rows	36" Rows	38" Rows
10	4.7	3.9	3.7
11	5.2	4.4	4.1
12	5.8	4.9	4.6
13	6.5	5.4	5.1
14	7.3	6.1	5.7
15	8.2	6.9	6.5
16	9.0	7.5	7.1
17	9.9	8.2	7.8
18	10.7	8.9	8.4
19	11.6	9.7	9.2
20	12.6	10.5	10.0
21	13.6	11.3	10.7
22	14.6	12.1	11.5
23	15.7	13.1	12.4
24	17.0	14.1	13.4
25	18.1	15.1	14.3
26	19.4	16.2	15.3
27	20.9	17.4	16.5
28	22.6	18.8	17.8
29	24.3	20.2	19.1
30	26.7	22.2	21.1

NOTE: 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. See "Checking Granular Chemical Application Rate" page for additional information.



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

LIQUID FERTILIZER PISTON PUMP APPLICATION RATES GALLONS PER ACRE

Applies To Model LM-2455-R And Model NGP-6055 Piston Pumps
With 18 Tooth Sprockets

Pump Setting	1	2	3	4	5	6	7	8	9	10
8 Row 36"	6.5	13.0	19.5	25.9	32.3	38.8	45.2	51.7	58.1	64.6
8 Row 38"	6.1	12.3	18.3	24.5	30.6	36.7	42.8	48.9	55.1	61.2
12 Row 30"	5.1	10.4	15.5	20.6	25.8	31.0	36.2	41.3	46.5	51.7

The chart above is for planters equipped with contact drive. See "Tire Pressure" for recommended tire pressures. This chart is based on average wheel slippage and liquid viscosities.

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

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

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

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. To convert this delivery rate for wider rows, multiply by the following conversion factors:

36" multiply by 0.83

38" multiply by 0.79

MACHINE OPERATION

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ROW UNIT OPERATION

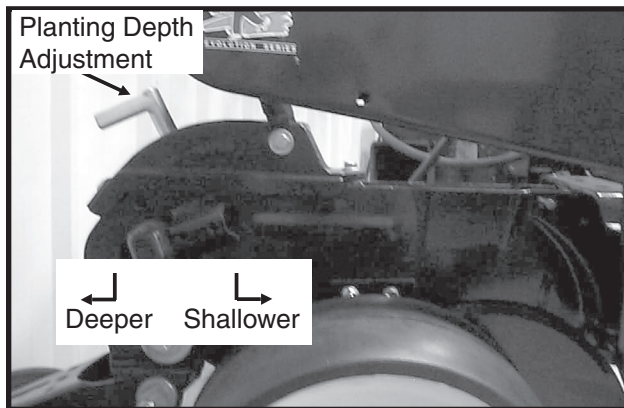
PLANTING DEPTH

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 push down on 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. Available depth adjustment range is approximately 1/2" to 3 1/2".



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

D020705102



"V" CLOSING WHEEL ADJUSTMENT (Rubber And Cast Iron)

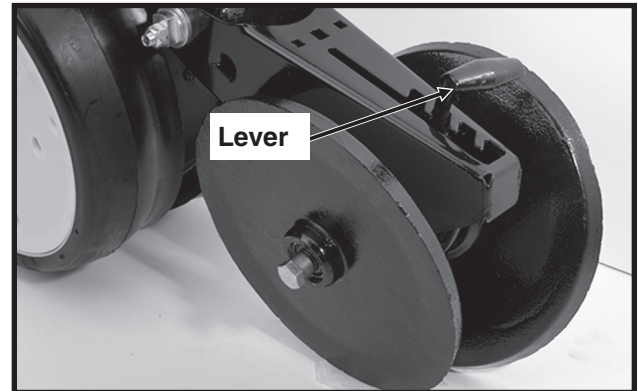


WARNING: Raise planter and install safety lockup devices before making closing wheel adjustments.

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.

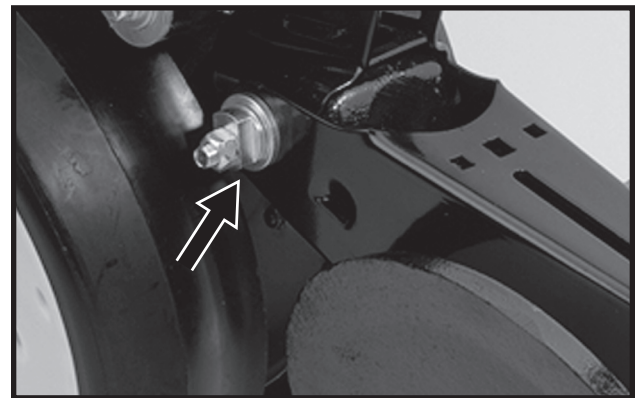
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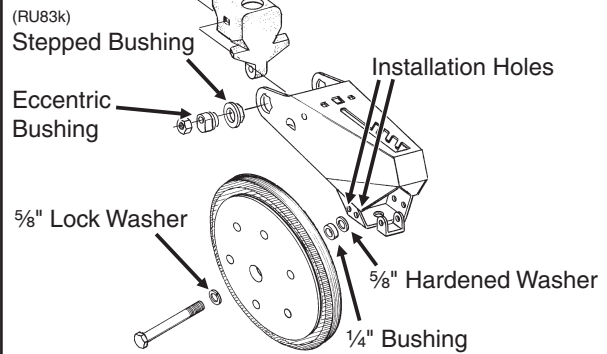
Light soil usually requires less down force at average depth (approximately 2") while heavy soil requires increased down force.

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

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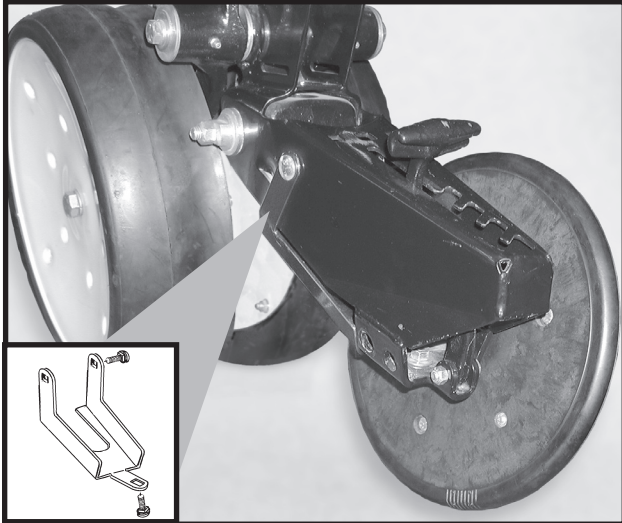
The closing wheels can be installed in two locations either "offset" (to improve residue flow) or "directly" opposite. If set "directly" opposite, the forward installation holes should be used.



ROW UNIT OPERATION

CLOSING WHEEL SHIELD (Rubber And Cast Iron "V" Closing Wheels)

D11090208a



Shown With Closing Wheel Removed For Visual Clarity

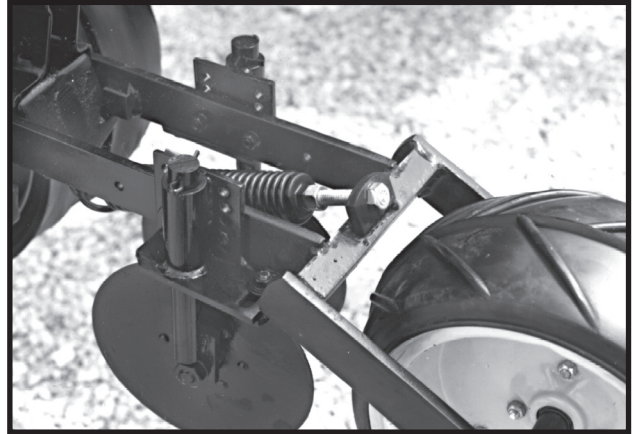
The optional closing wheel shield is designed to be installed onto the underside of the closing wheel arm to help prevent root balls and stalks from plugging the closing wheels.

COVERING DISCS/SINGLE PRESS WHEEL ADJUSTMENT



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

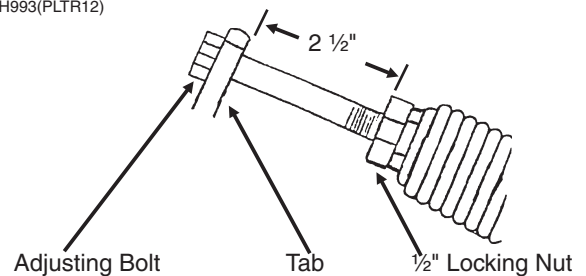
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After adjusting planting depth, check the operation of the covering discs/single press wheels.

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 or out to decrease down force. Tighten locking nut against spring plug. Adjust all row units to a similar setting.

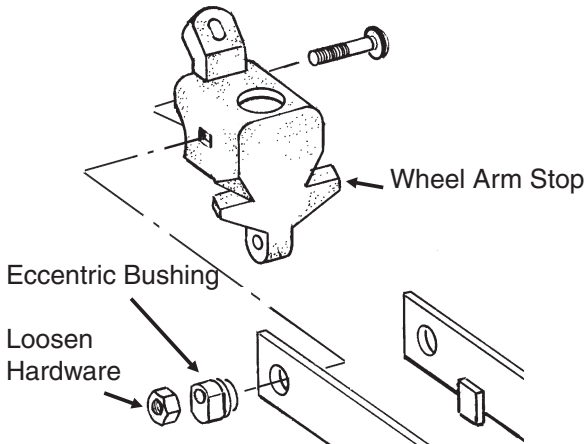
RH993(PLTR12)



ROW UNIT OPERATION

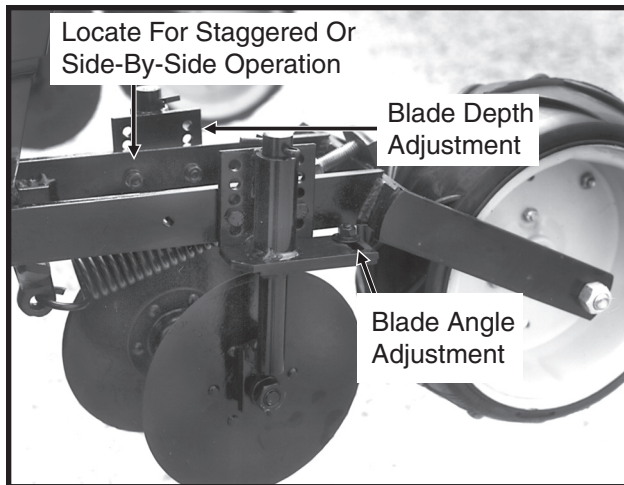
Eccentric bushings in the wheel arm stop allow for lateral adjustment of the covering discs/single press wheel assembly. Using a 3/4" wrench, loosen the hardware which attaches the assembly to the wheel arm stop. Using another 3/4" wrench, turn the eccentric bushings until the press wheel is aligned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

(RU94b)



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



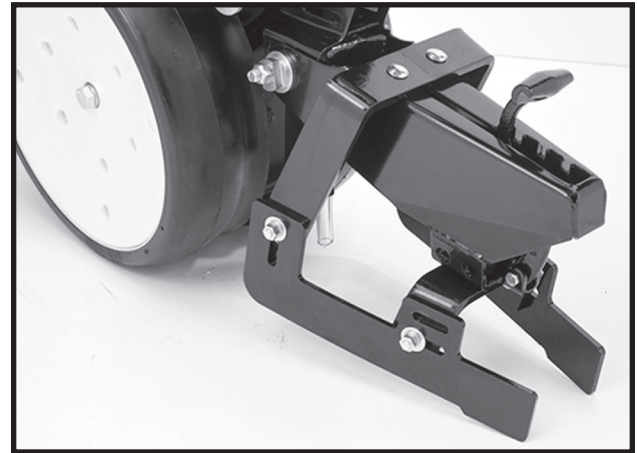
Five sets of holes in each disc bracket allow for 1/2" incremental blade depth adjustment.

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.

DRAG CLOSING ATTACHMENT

LF212299-18



The drag closing attachment is designed to pull loose soil over the seed trench.

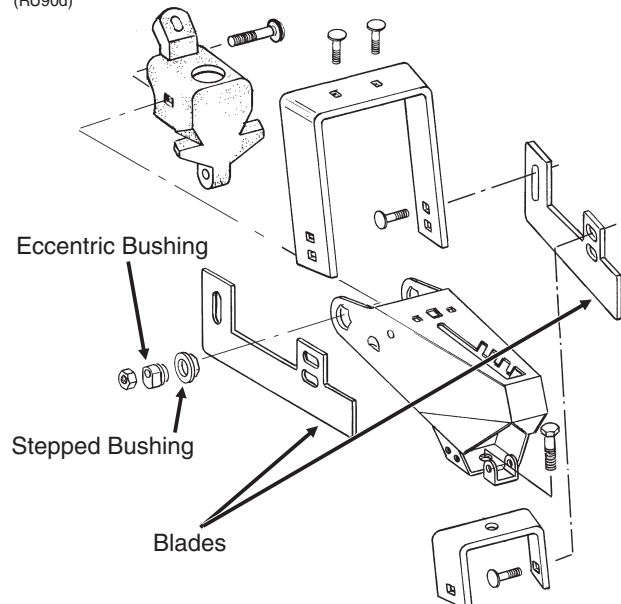
Front and rear adjustment is made using the slotted holes in the blades. Adjust all rows the same.

NOTE: Use of a seed firming wheel or other seed firming device is recommended with the drag closing attachment.



WARNING: Raise planter and install safety lockup devices before making drag closing attachment adjustments.

(RU90d)



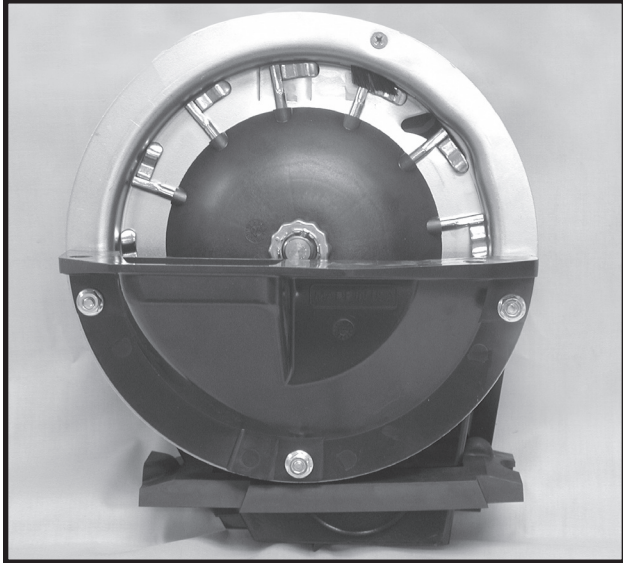
Eccentric bushings allow for lateral adjustment of the drag closing attachment. Using a 3/4" wrench, loosen the hardware which attaches the assembly to the wheel arm stop. Using another 3/4" wrench, turn the eccentric bushings until the drag closing attachment is aligned with the seed trench.

ROW UNIT OPERATION

FINGER PICKUP SEED METER

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

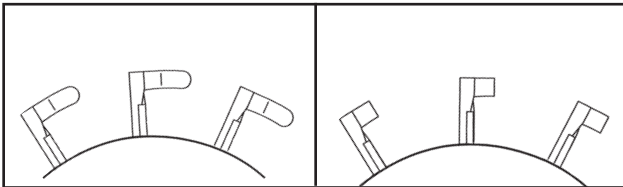
D12220401



Shown With Corn Fingers Installed

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

(PLTR91/PLTR92/PLTR91a)

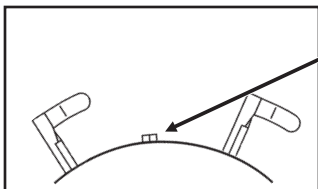


Corn Fingers

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.

No. 1 and/or No. 2 size confectionery sunflower seeds are recommended for use in the finger pickup seed meter equipped with corn fingers.



Half Rate Blank Finger

Blank fingers are used to replace alternate fingers in the finger wheel to reduce the planting rate by half while allowing the finger wheel to maintain a minimum of 40 RPM when planting low rates.

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

NOTE: Powdered graphite is recommended for finger pickup seed meter lubrication to ensure efficient operation of the mechanism and to extend the life of its components. Mix one teaspoon of powdered graphite with the seed twice daily. Apply graphite on top of seed around the outer perimeter of the hopper as shown below. Graphite application frequency and volume may need to be increased if using additional seed treatments.

NOTE: Do NOT apply graphite only in the center of the hopper. It will filter too quickly through the seed and not distribute as evenly as desired.

D05230121b



NOTE: Follow manufacturer's recommendations when applying and mixing other seed treatments. If the additive is to be applied on top of the seed, apply around the outer perimeter of the hopper as with graphite.

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

CLEANOUT

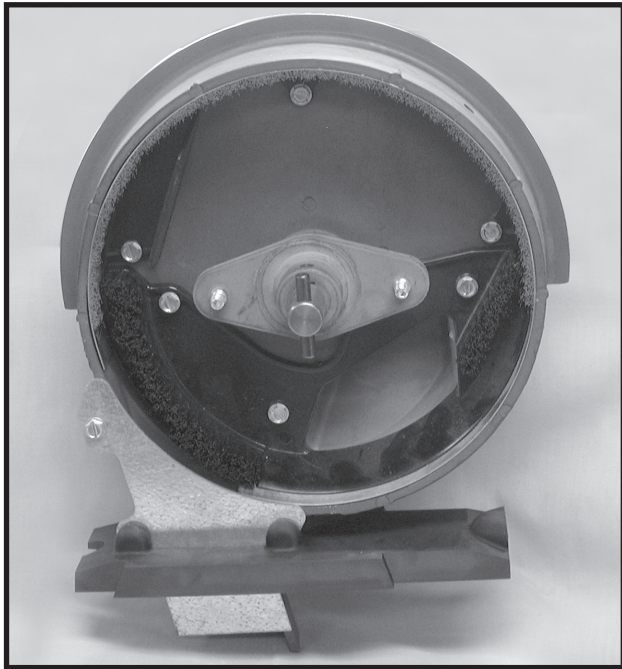
To maintain genetic purity, thorough seed meter cleanout is important.

To clean the seed meter, disengage the seed drive and remove the seed hopper and meter. Dump the seed from the right rear corner of the hopper into a container. Turn the seed drive several times. Invert hopper to dump seed again. Shake the hopper and listen for any remaining seed. Turn seed drive and shake and dump hopper until all seed is removed.

ROW UNIT OPERATION

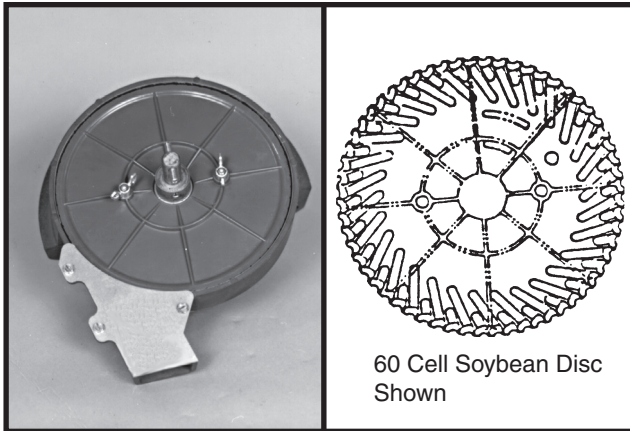
BRUSH-TYPE SEED METER

D12220403



Shown Without Seed Disc Installed

60607-40a(PLTR13)

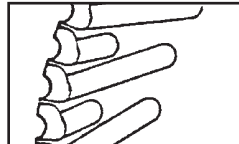


60 Cell Soybean Disc Shown

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

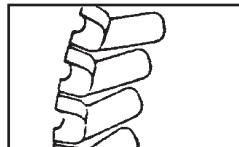
Soybean: 60 cells to meter seed sizes from 2200 to 4000 seeds per pound (Black color-coded).

(PLTR14)



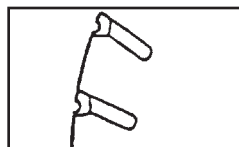
Specialty soybean: 48 cells to meter seed sizes from 1400 to 2200 seeds per pound (Dark blue color-coded).

(PLTR15)



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

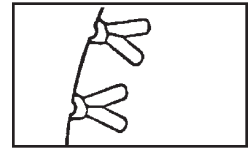
(PLTR16)



Large milo/grain sorghum:

30 cells to meter seed sizes from 10,000 to 16,000 seeds per pound (Light blue color-coded).

(PLTR17)



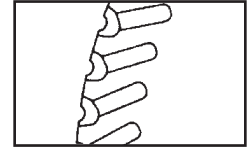
High-rate small milo/grain sorghum:

60 cells to meter seed sizes from 12,000 to 18,000 seeds per pound (Red color-coded). (PLTR18)



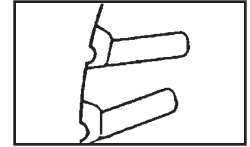
High-rate large milo/grain sorghum:

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).

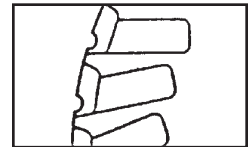
(PLTR20)



Large cotton, acid-delinted:

36 cells to meter seed sizes from 3800 to 4400 seeds per pound (Tan color-coded).

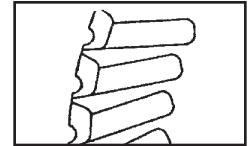
(PLTR21)



High-rate cotton, acid-delinted:

48 cells to meter seed sizes from 4200 to 5200 seeds per pound (Light green color-coded).

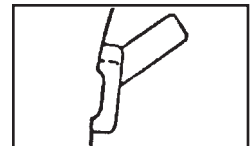
(PLTR22)



Hill-drop cotton, acid-delinted:

12 cells, 3 to 6 seeds/cell, to meter seed sizes from 4000 to 5200 seeds per pound

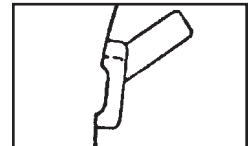
(Brown color-coded). (PLTR23)



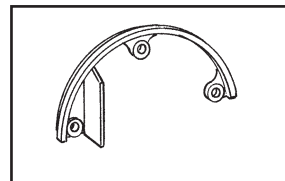
Small hill-drop cotton, acid-delinted:

12 cells, 3 to 6 seeds/cell, to meter seed sizes from 5000 to 6200 seeds per pound (Dark green color-coded).

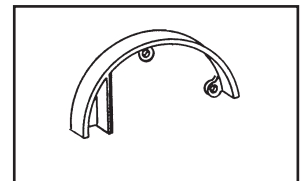
(PLTR23)



(RU14c)



Use GD1112 upper brush retainer when using soybean and cotton discs.



Use GD8237 upper brush retainer when using milo/grain sorghum discs.

ROW UNIT OPERATION

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 $\frac{5}{16}$ " thumbscrews. Tighten thumbscrews slightly with pliers. **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.

One tablespoon of **powdered graphite** should be mixed with the seed each time the hoppers are filled. Regular graphite use will prolong the life of the brush-type seed meter components, improve seed spacing, and may reduce buildup of seed treatments. Apply graphite around the outer perimeter of the hopper as shown below.

D05300104b



NOTE: Do NOT apply graphite only in the center of the hopper. It will filter too quickly through the seed and not distribute as evenly as desired.

NOTE: 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.

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. 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.

NOTE: 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 may cause bridging of the seed in the meter, reducing population or stopping the meter from planting.

NOTE: 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.

CLEANOUT

To maintain genetic purity, thorough seed meter cleanout is important.

To clean the seed meter, disengage the seed drive and remove the seed hopper and meter. Dump the seed from the right rear corner of the hopper into a container. Disassemble seed disc by removing wing nuts. Empty the meter. Thoroughly inspect brushes in meter to ensure all seed is removed. Replace seed disc and install wing nuts.

ROW UNIT OPERATION

SEED HOPPER

LF212199-7a



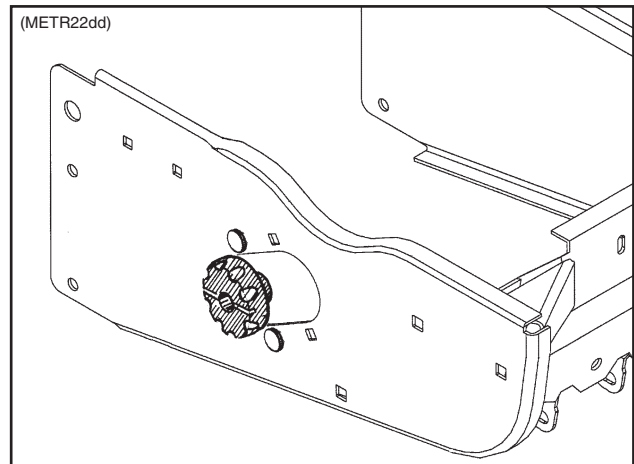
The seed hopper capacity is 1.9 bushels.

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” and/or “Brush-Type Seed Meter”.

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

SEED METER DRIVE RELEASE

The seed meter drive is equipped with a clutch release mechanism that allows the drive to be disengaged from the seed metering unit for removal of the 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.



To disengage the drive, turn the knob $\frac{1}{4}$ turn counterclockwise. To engage the drive, turn the knob $\frac{1}{4}$ turn clockwise.

ROW UNIT OPERATION

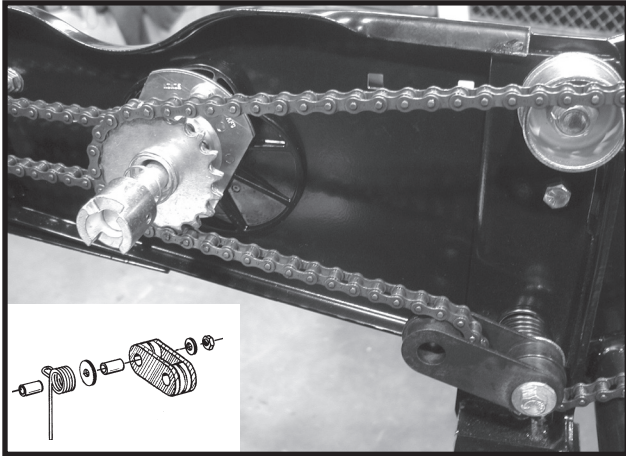
ROW UNIT CHAIN ROUTING

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

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

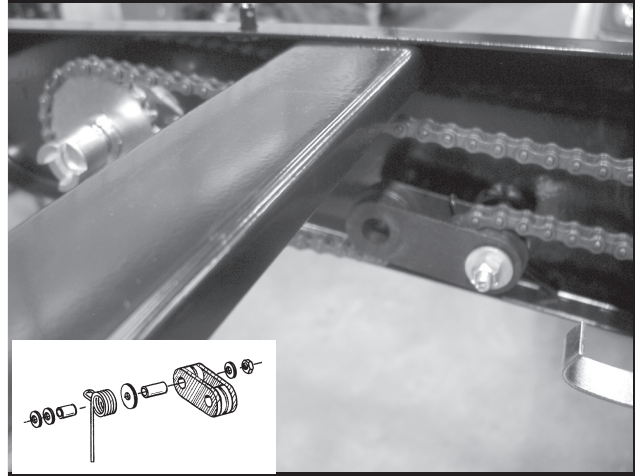
NOTE: When idler shows signs of wear, it can be reversed for prolonged use.

D051705103



Pull Row Unit Meter Drive

D051705102



Row Unit Granular Chemical Drive

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

(PLTR24)



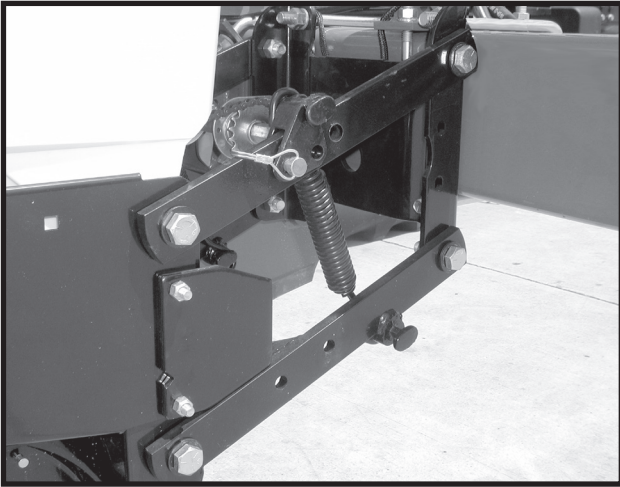
ROW UNIT OPERATION

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.

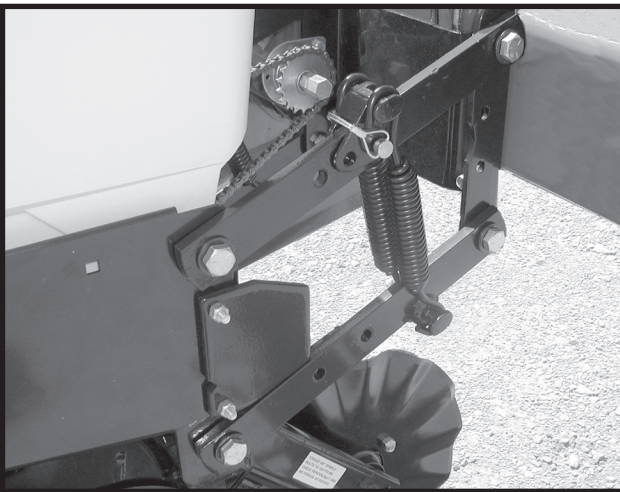
Two springs per row, one on the L.H. parallel arms and one on the R.H. parallel arms, are used unless equipped with row unit mounted no till coulters. Four springs per row are used with row unit mounted no till coulters.

D06300305



Two Springs Per Row (Dual)

D07010301

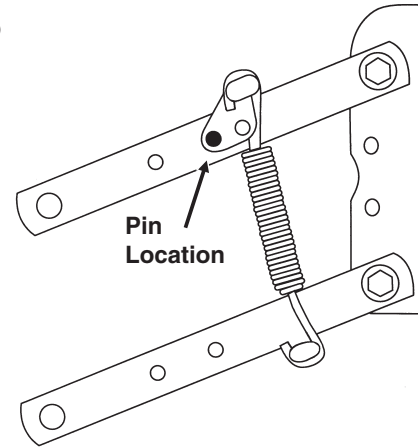


**Four Springs Per Row (Quad)
(Used Only In Conjunction With Row Unit Mounted
No Till Coulters)**

NOTE: Four springs per row are to be used with row unit mounted no till coulters only.

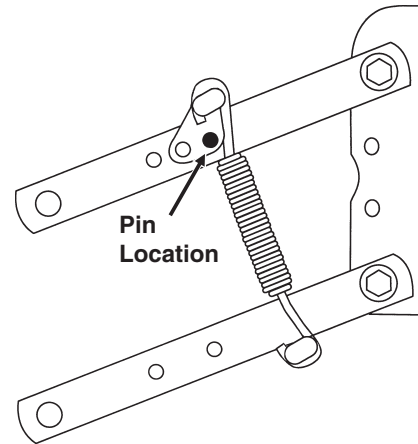
There are four positions for spring tension adjustment. Position 1 allows for minimum down pressure and position 4 for maximum down pressure.

L0096(PLTR27e)



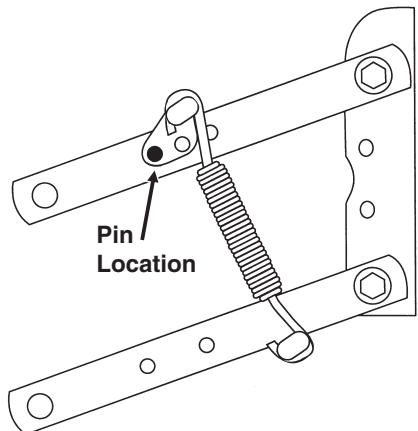
Position 1 (Minimum)

(PLTR28e)



Position 2

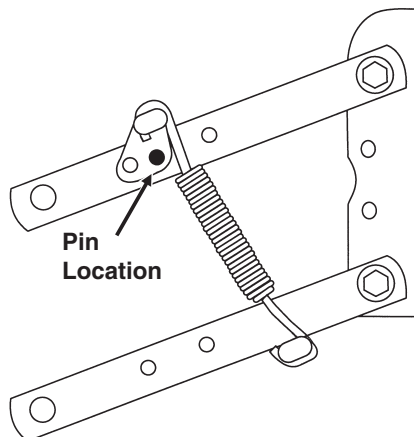
(PLTR29e)



Position 3

ROW UNIT OPERATION

(PLTR30e)



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.



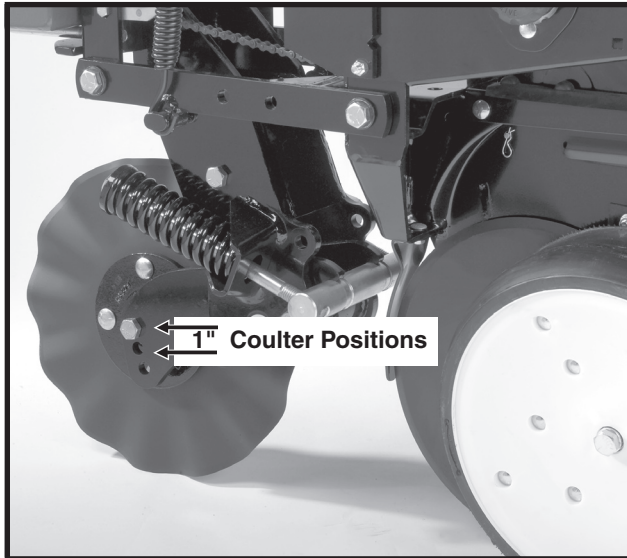
WARNING: Always install safety lockup devices or lower machine to the ground before working under or around the machine.

IMPORTANT: Springs must always be installed with open side of spring hooks toward seed hoppers to prevent binding on spring mount adjustment pins.

ROW UNIT OPERATION

FRAME MOUNTED COULTER

LF083002101

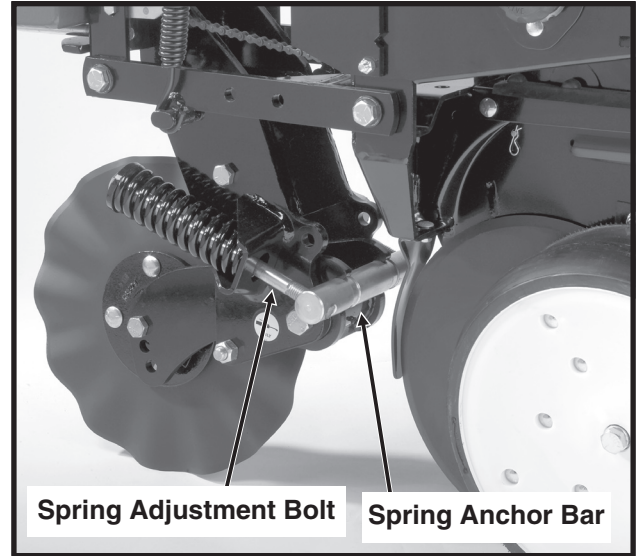


Frame mounted coulters with 1" bubbled, 1" fluted (8 flutes) or 3/4" fluted (13 flutes) blades may be used on pull row units only. (Not compatible with push row units.)

The frame mounted coulters is designed to apply necessary spring down pressure on the coulters for maximum penetration while exerting less shock load on the row unit.

The initial location of the coulters blade is in the top hole. The blade can be relocated to one of the lower two holes (1" increments) as wear occurs or if deeper operation of the blade is desired.

LF083002101



DOWN PRESSURE ADJUSTMENT

Down force adjustment is made by tightening or loosening the two spring adjustment bolts. With the planter in raised position, turn the bolts clockwise to increase down pressure or counterclockwise to decrease down force. Set both springs the same.

Down force on the blade is shown below in lbs.

End Of Spring Adjustment Bolt Flush With Spring Anchor Bar (Shown Above)	End Of Spring Adjustment Bolt Extended 1/2" Through Spring Anchor Bar	All Threads Used (Maximum)
275 lbs.	400 lbs.	500 lbs.

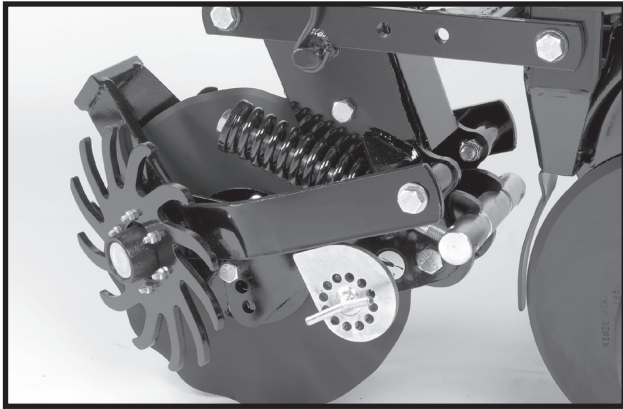
NOTE: Avoid setting down pressure higher than is required for consistent soil penetration. Excessive pressure will increase the chances of damage to coulters components when the coulters strikes an obstacle.

ROW UNIT OPERATION

RESIDUE WHEELS (For Use With Frame Mounted Coulter)

The residue wheels for use with the frame mounted coulter may be used on pull row units only.

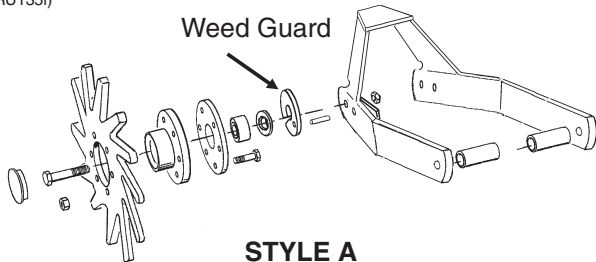
LF083002102



STYLE A Shown

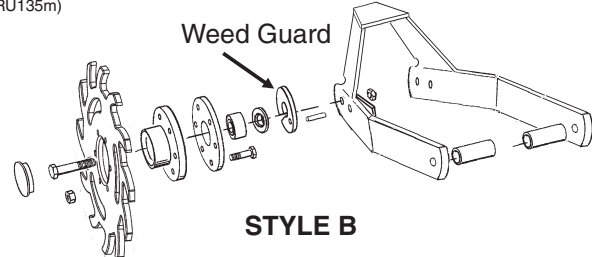
The residue wheels are attached to the frame mounted coulter with two cap screws and sleeves allowing the unit to free-float. A 2-position spindle bolt mounting allows the tined wheels to be mounted interlocked or staggered. Depth adjustment is made using a spring-loaded cam and pin with 11 positions in 1/4" increments. A high point on the cam allows the wheels to be locked up so they do not contact the ground. A weed guard, located on the inboard side of each wheel, aids in the prevention of weed wrap which can cause premature bearing failure.

(RU135i)



STYLE A

(RU135m)



STYLE B

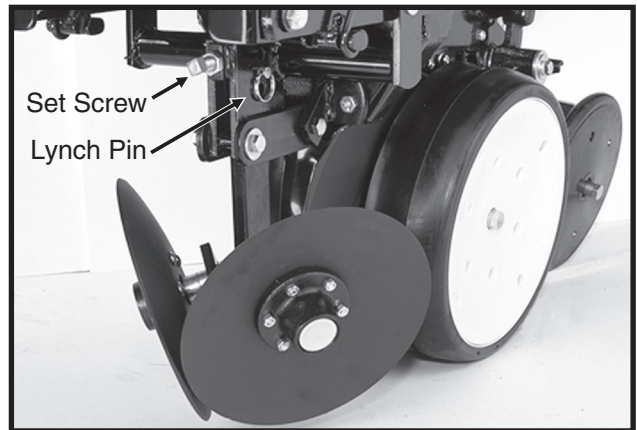
NOTE: Opening in weed guard must point down.

ROW UNIT MOUNTED DISC FURROWER

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

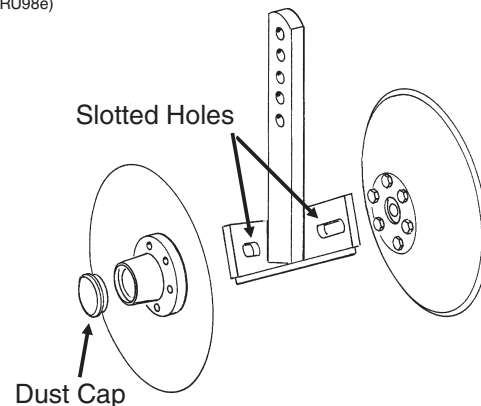
Disc furrowers are used to clear crop residue, dirt clods and dry soil from in front of the row units for a clean and smooth seed bed. Notched blades are used for heavier residue conditions. The notched blades cut crop residue and move it aside to prevent plugging or pushing.

LF212299-22



Vertical adjustment in 1/8" increments is possible by removing the lynch pin which secures the vertical support arm and moving the support arm up or down as required. Reinstall 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.

(RU98e)

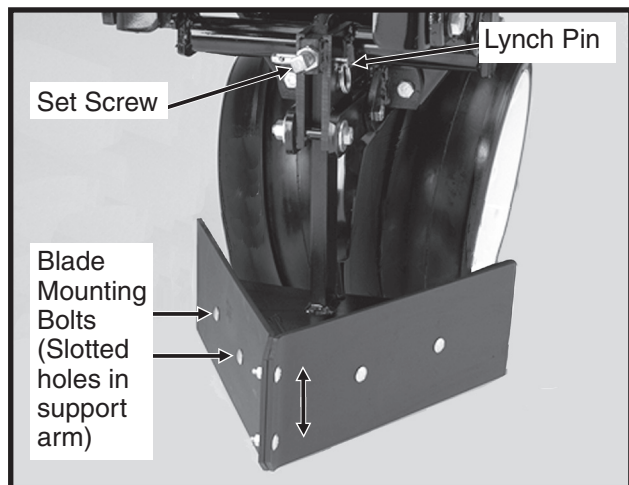


Slotted holes in the support arm where the blades are mounted allow fore and aft adjustment of the disc blades. Blades can be adjusted so the front edges meet or one blade can be moved to the rear and the other to the front of the slot so the cutting edge of one blade overlaps the edge of the other blade.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

ROW UNIT OPERATION

ROW UNIT MOUNTED BED LEVELER

LF212299-25a



Row unit mounted bed levelers may be used on pull row units only. They are not compatible with push row units.

Vertical adjustment in $\frac{1}{3}$ " 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 $\frac{5}{8}$ " x $2 \frac{1}{4}$ " set screw to clamp the support arm in the required position.

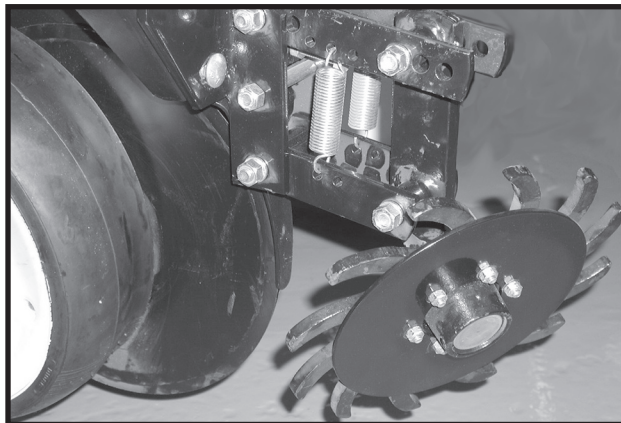
Slotted holes in the support arm where the blades are mounted allow tilting of the blades. The blades can be tilted up or down at the front for desired adjustment.

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

ROW UNIT MOUNTED RESIDUE WHEEL

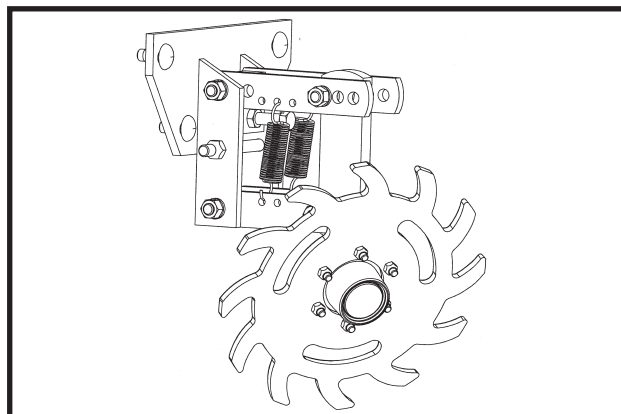
The row unit mounted residue wheel may be used on pull row units and push row units.

D101701113



STYLE A

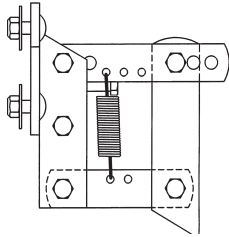
(A12685)



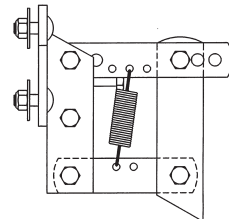
STYLE B

ROW UNIT OPERATION

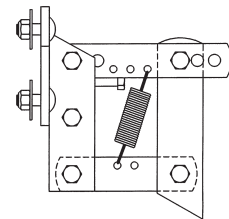
Two adjustable springs on the parallel links on each residue wheel allow for down force adjustment. Position 1 as shown below provides minimum down pressure and position 3 maximum down pressure.



Position 1 (Minimum)(PLTR31a)



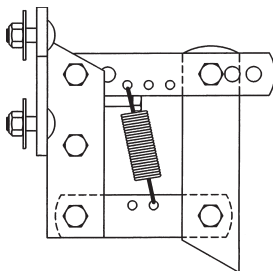
Position 2 (PLTR32a)



Position 3 (Maximum)(PLTR33a)

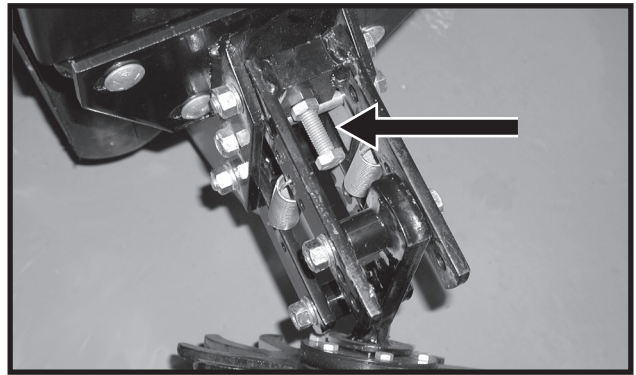
For additional uplift or float, position springs as shown below.

(PLTR34a)



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

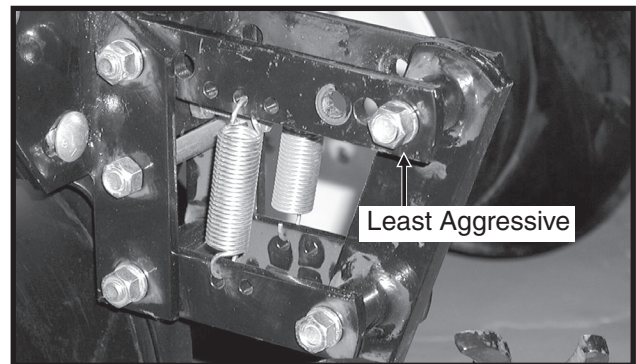
D10170112



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.

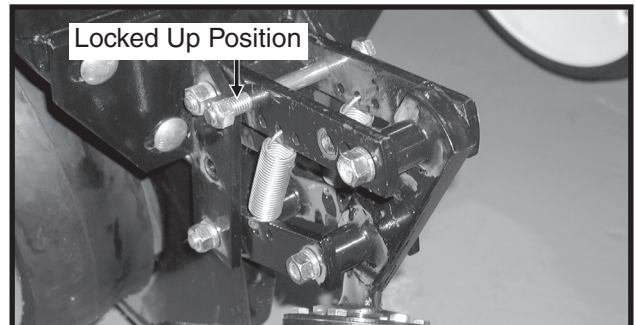
Three holes in the upper link allow for wheel angle adjustment. With the wheel mount in the most vertical position, using the rear hole in the upper link, the residue wheel is most aggressive. Moving the wheel mount to one of the forward holes reduces the aggressiveness of the wheel for use in mulch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

D101701202



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.

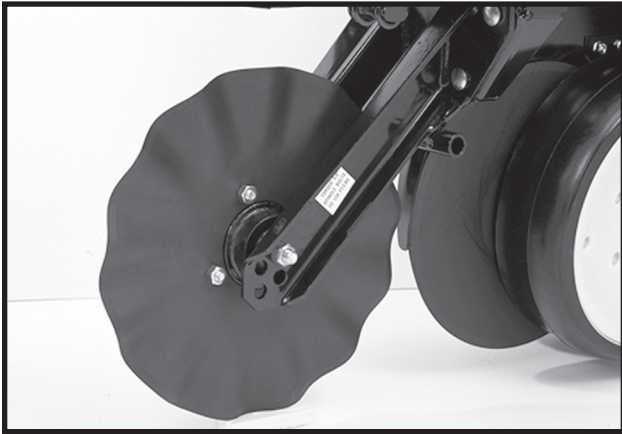
D011701203



ROW UNIT OPERATION

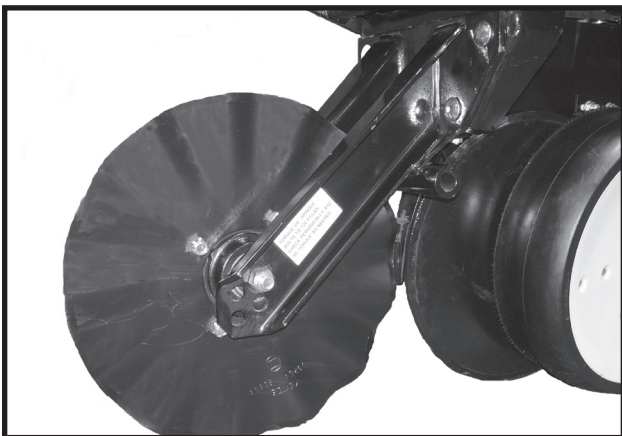
ROW UNIT MOUNTED NO TILL COULTER

LF212299-19a



STYLE A (Two Sleeves For Installing Coulters Mounted Residue Wheels)

D05170706a



STYLE B (One Sleeve For Installing Coulters Mounted Residue Wheels)

Row unit mounted no till coulters with 1" bubbled, 1" fluted (8 flutes) or 3/4" fluted (13 flutes) blades may be used on pull row units and push row units. (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 blade 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 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, 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.

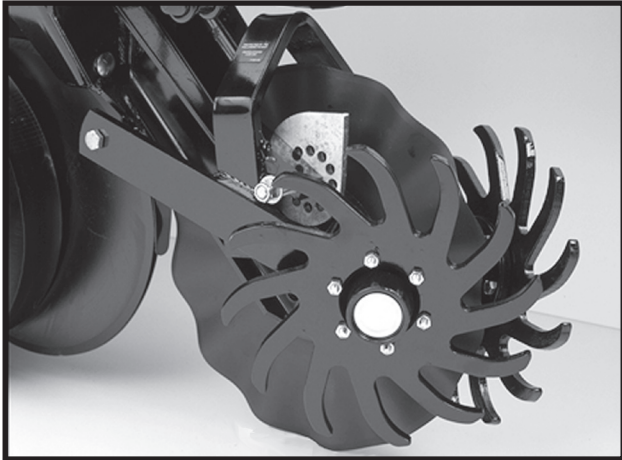
Operating depth can be checked by setting the planter down on a level concrete floor and checking the relationship between the coulters blade and row unit opener blade. Make sure the planter is level and coulters is square with the planter frame and aligned with the row unit disc opener.

NOTE: Torque 5/8" spindle hardware to 120 ft. lbs.

ROW UNIT OPERATION

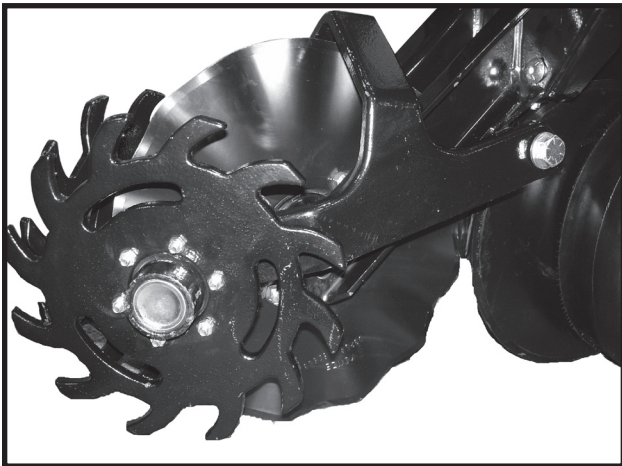
COULTER MOUNTED RESIDUE WHEELS

LF212299-23



STYLE A - Used With Style A Row Unit Mounted No Till Coulters

D05170708a

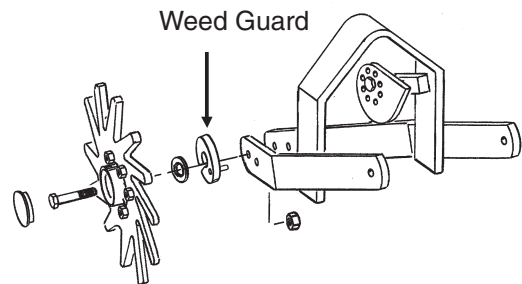


STYLE B - Used With Style B Row Unit Mounted No Till Coulters

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

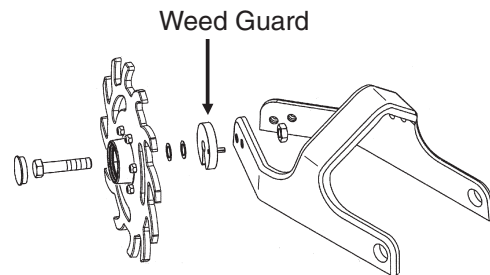
The coulters mounted residue wheels are attached to the row unit mounted no till coulters with one cap screw and sleeve allowing the unit to free-float. A 2-position spindle bolt mounting allows the tined wheels to be mounted interlocked or staggered. A lock nut on the inside of the mount locks the spindle cap screw. Depth adjustment is made using a spring-loaded cam and pin with 11 positions in 1/4" increments. A high point on the cam allows the wheels to be locked up so they do not contact the ground. A weed guard, located on the inboard side of each wheel, aids in the prevention of weed wrap which can cause premature bearing failure.

(RU104tt)



STYLE A

(RU153a)



STYLE B

NOTE: Opening in weed guard must point down.

ROW UNIT OPERATION

GRANULAR CHEMICAL HOPPER AND DRIVE

LF212299-6



The granular chemical hopper has a 1.4 cubic feet capacity.

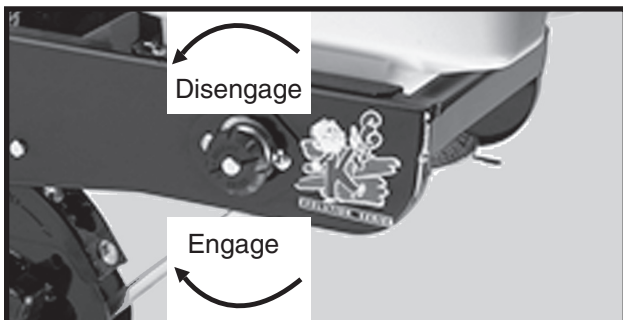
Be sure no foreign objects get into the hopper when it is being filled. Replace the hopper lids after filling the hoppers to prevent the accumulation of dirt and moisture.

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.

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

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 ¼ turn clockwise. To disengage the drive, turn the knob ¼ turn counterclockwise. Slotted holes in the hopper support panel and clutch housing allow for alignment adjustment between the clutch drive coupler and meter shaft.

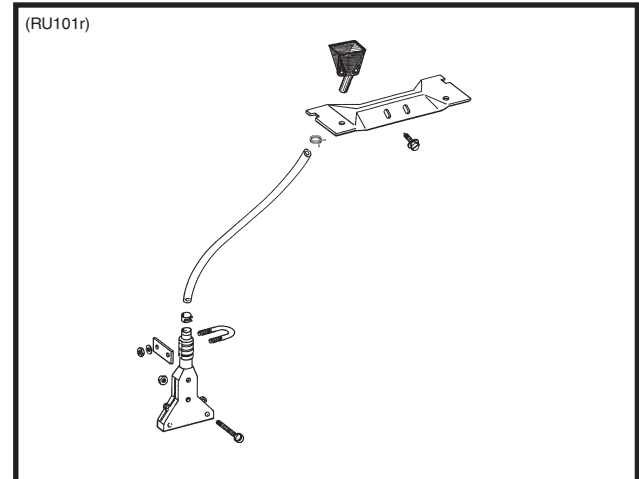
LF212299-4



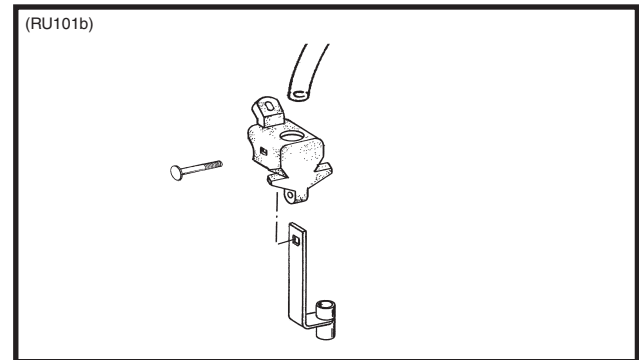
GRANULAR CHEMICAL BANDING OPTIONS

Granular chemical banding options allow 4 ½" slope-compensating banding, straight drop in-furrow placement or 14" rear banding.

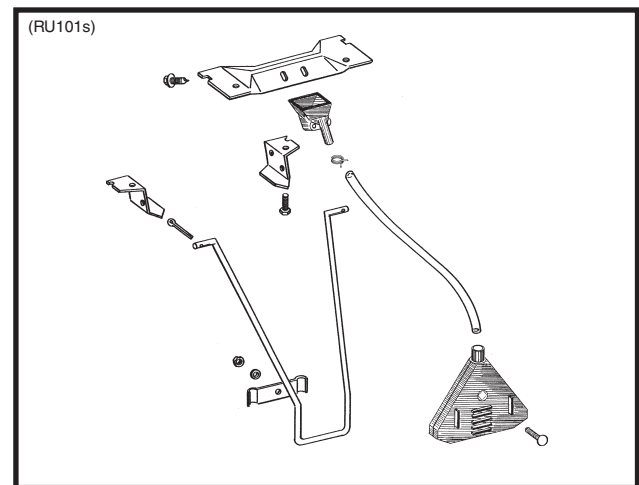
NOTE: The granular chemical rear bander is not compatible with the covering discs/single press wheel option.



4 ½" Slope-Compensating Bander



Straight Drop In-Furrow Placement



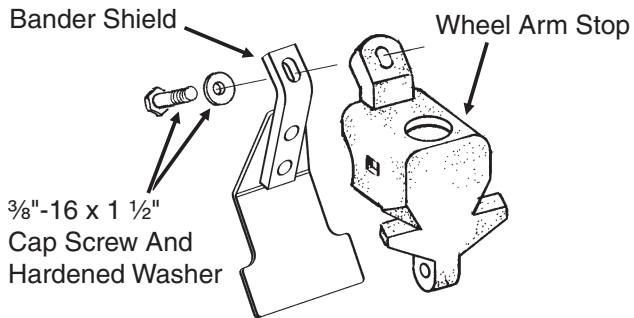
14" Rear Banding

ROW UNIT OPERATION

GRANULAR CHEMICAL BANDER SHIELD

The optional granular chemical banded shield is designed to be installed onto the underside of the wheel arm stop to shield crop residue from lodging in the granular chemical bander.

(RU83m)

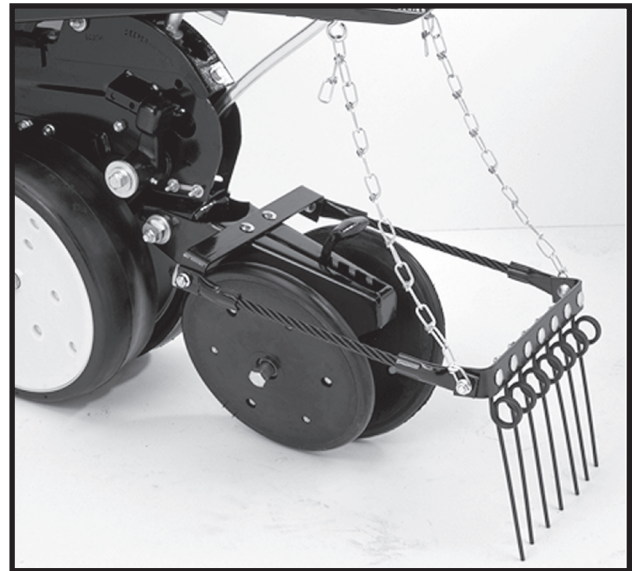


SPRING TOOTH INCORPORATOR

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.

LF212299-26



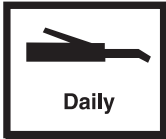
LUBRICATION

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.



WARNING: Always install safety lockup devices or lower to the ground before working under or around the machine.

LUBRICATION SYMBOLS



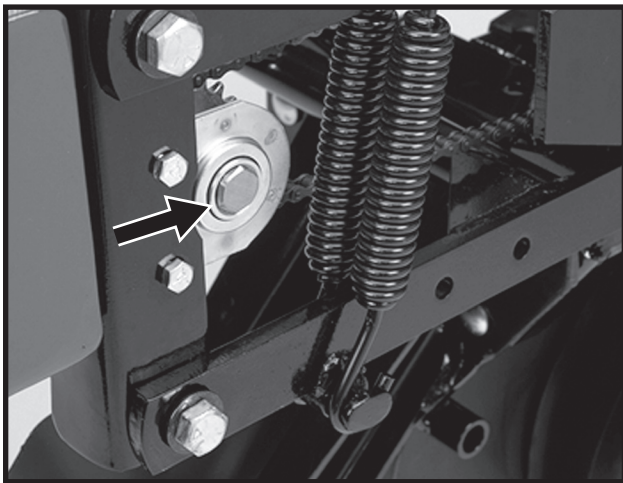
Lubricate at frequency indicated with an SAE multipurpose grease.



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

SEALED BEARINGS

LF212199-3



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. Due to the seals, relubrication is not practical.

WRAP SPRING WRENCH ASSEMBLY

The chain idler is equipped with a wrap spring wrench. The wrench components may require occasional lubrication to operate correctly. Disassembly is required to lubricate. (a) Remove the 1/4"-20 x 1/2" cap screw that secures the idler with sprockets to the wrench tightener shaft. (b) Remove the wrap spring wrench from the planter. (c) Tip the wrap spring wrench on its side and lubricate using a high quality spray lubricant. Lubricant must be absorbed into the wrap spring area. (d) Reinstall wrench on planter.

D101303102

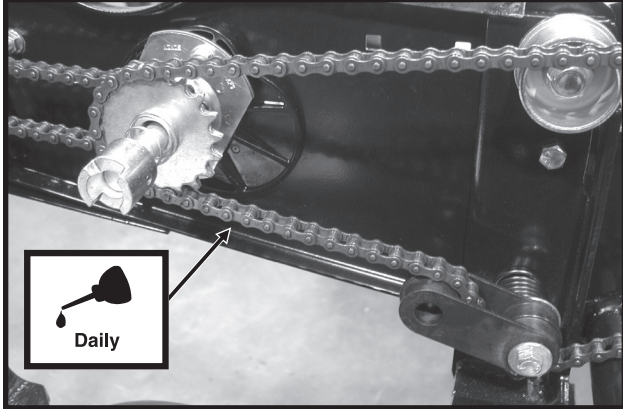


LUBRICATION

DRIVE CHAINS

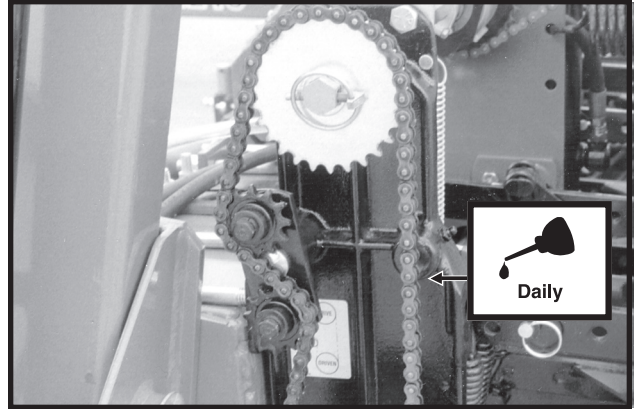
All transmission and drive chains should be lubricated daily with a high quality chain lubricant. Extreme operating conditions such as dirt, temperature or speed may require more frequent lubrication. If a chain becomes stiff, it should be removed, soaked and washed in solvent to loosen and remove dirt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

D051705103



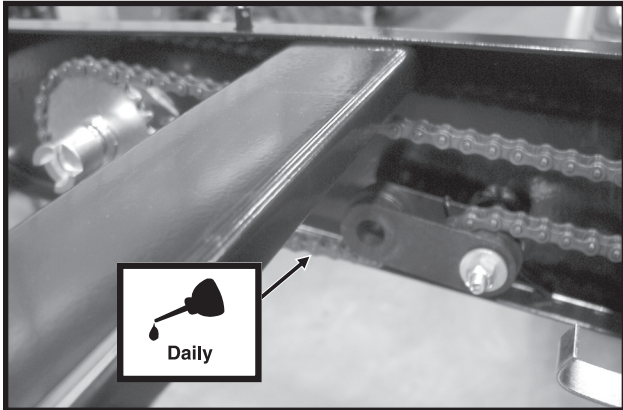
Row Unit Drive Chains

08049714



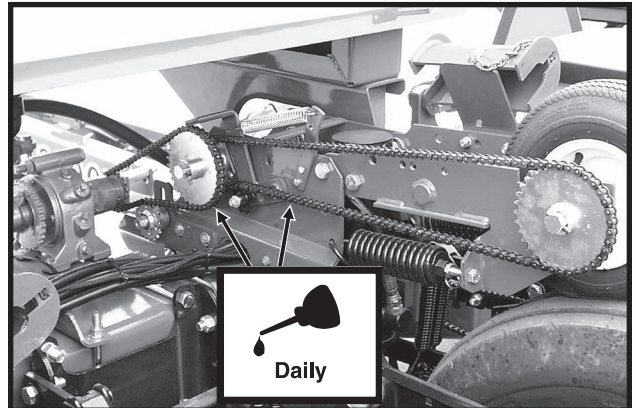
Seed Rate Transmission Chains

D051705102



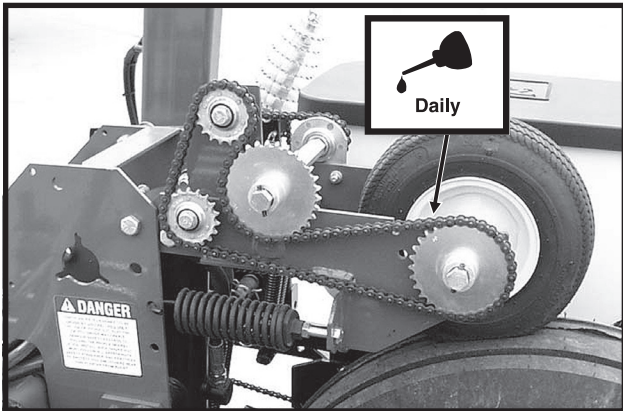
Row Unit Granular Chemical Drive Chains

D06029921



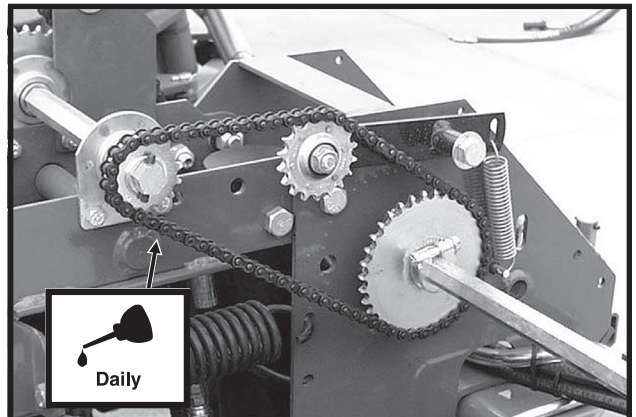
Liquid Fertilizer Piston Pump Drive Chains

D06029925



Contact Wheel Drive Chains

D06029926



Jack Shaft (Reverser) Chains

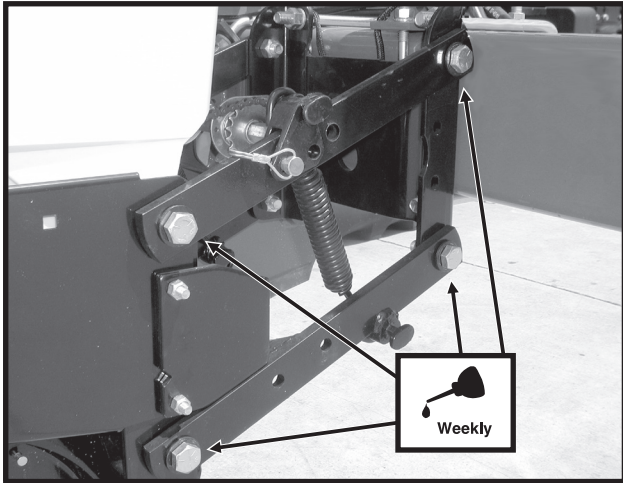
LUBRICATION

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 hardware to 130 ft. lbs.**

D06300305



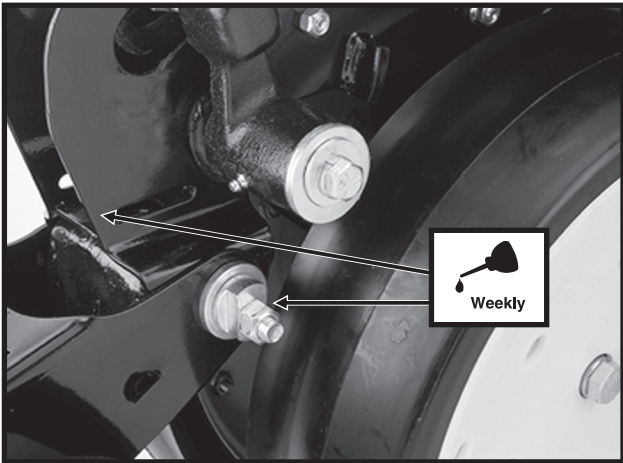
Pull Row Unit And/Or Push Row Unit Parallel Linkages (8 Per Row)

LF212299-22



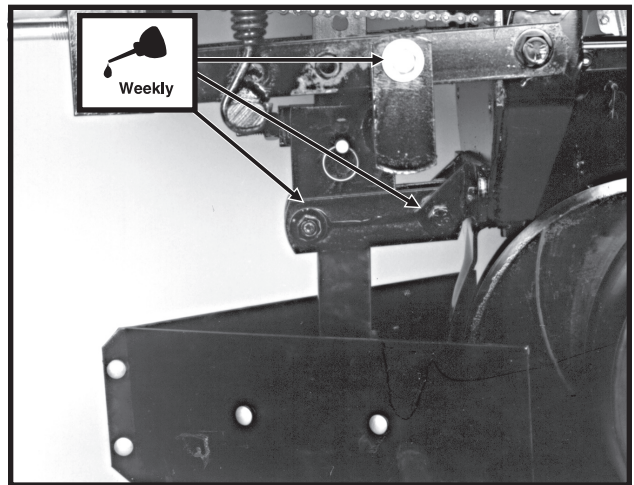
Row Unit Mounted Disc Furrower Parallel Linkages (6 Per Row)

LF212199-2



Row Unit "V" Closing Wheel, Covering Discs/ Single Press Wheel And/Or Drag Closing Wheel Eccentric Bushings (2 Per Row)

59386-26



Row Unit Mounted Bed Leveler Parallel Linkages (6 Per Row)

LUBRICATION

WHEEL BEARINGS

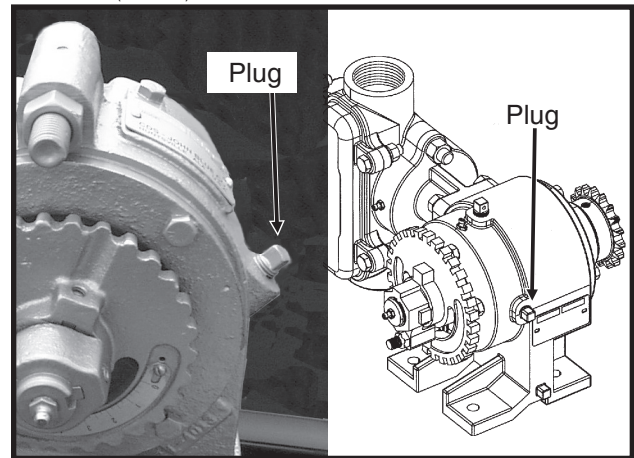
All wheel bearings should be replaced annually and checked for wear. This applies to all drive wheels, transport wheels and marker hubs.

To check for wear, lift the wheel off the ground. Check for endplay in the bearings by moving the tire side to side. Rotate the tire to check for roughness in the bearings. If bearings sound rough, the hub should be removed and the bearings inspected and replaced if necessary. See "Maintenance section".

To repack wheel hubs, follow the procedure outlined for wheel bearing replacement with the exception that bearings and bearing cups are reused.

LIQUID FERTILIZER PISTON PUMP CRANKCASE OIL LEVEL

D071504102a/(A12330a)



Check crankcase oil daily and maintain at plug level. Fill as needed with EP 90 weight gear oil. Total oil capacity is approximately $\frac{3}{4}$ pint.

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

LUBRICATION

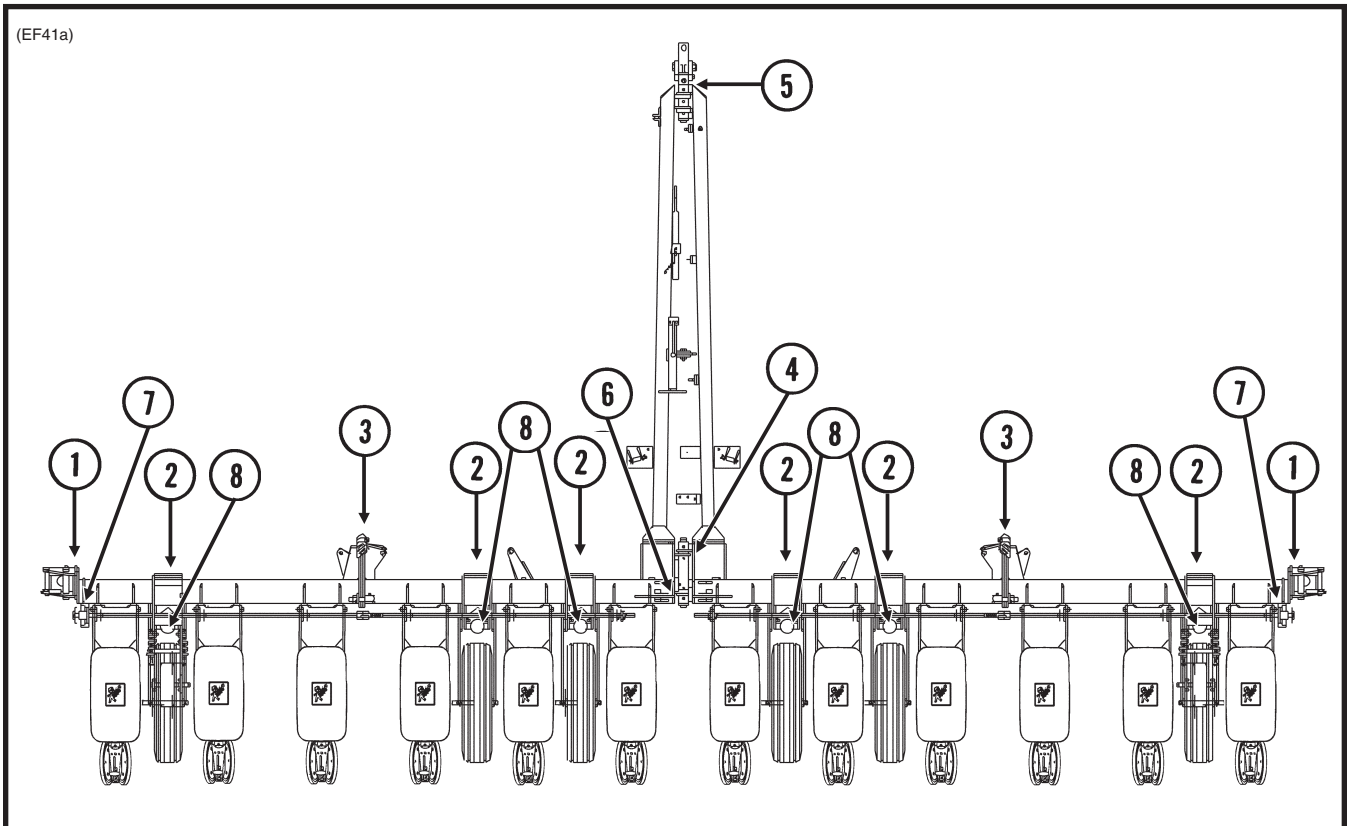
GREASE FITTINGS

Those parts equipped with grease fittings should be lubricated at the frequency indicated with an SAE multipurpose 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.



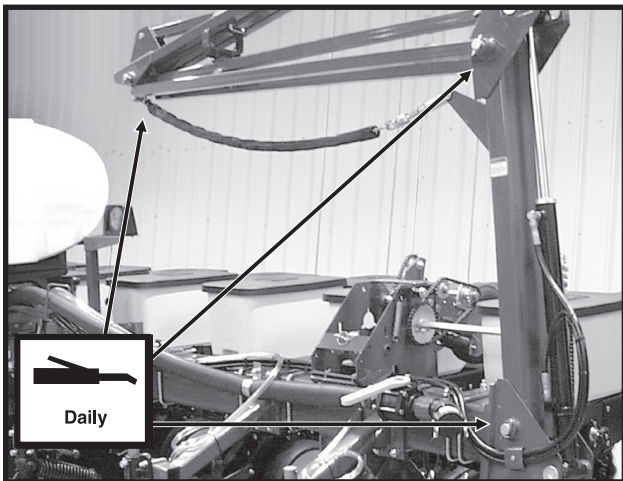
WARNING: Always install safety lockup devices or lower the planter to the ground before working under or around the machine.

NOTE: Numbers on illustration below correspond to photos on following pages showing lubrication frequencies.



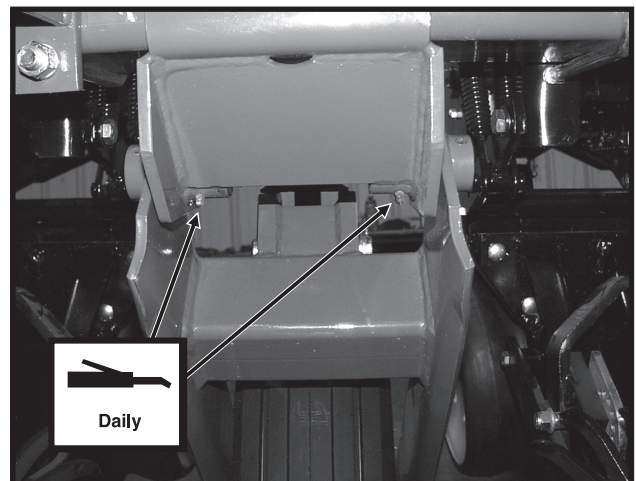
Model 3200 12 Row 30" Planter Shown

D05149906b



1. Row Marker Assemblies - 3 Zerks Per Assembly

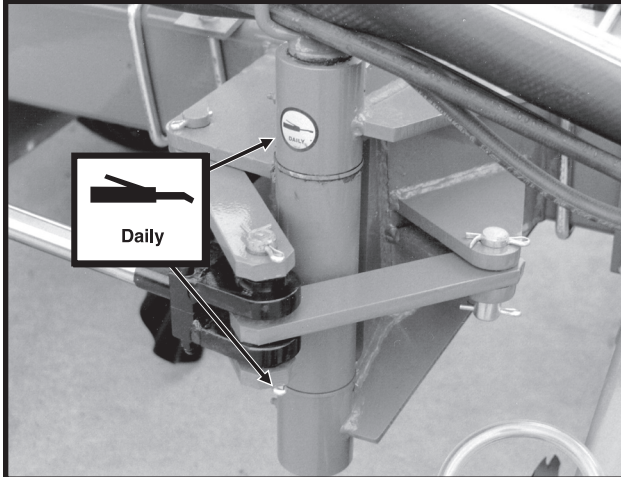
D05149905



2. Wheel Pivots - 2 Zerks Per Wheel Module

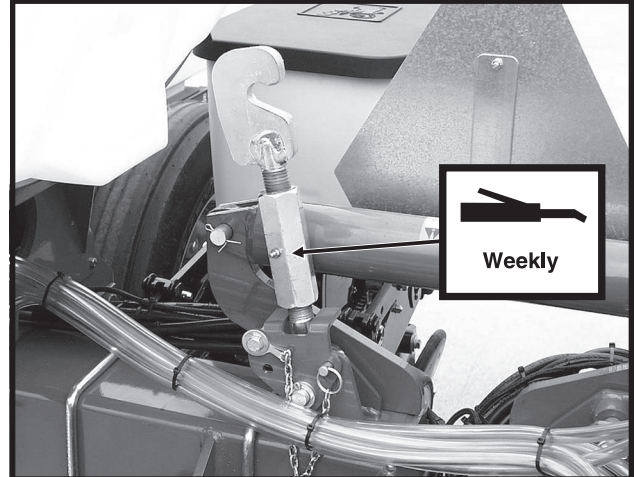
LUBRICATION

08069719



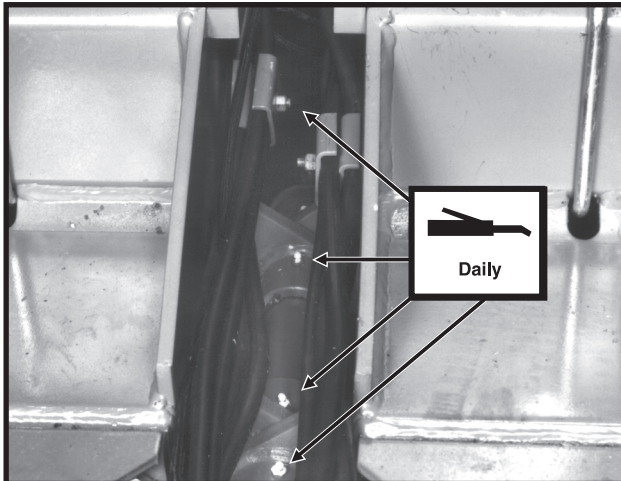
3. Wing Hinges - 2 Zerks Per Wing

D06029909



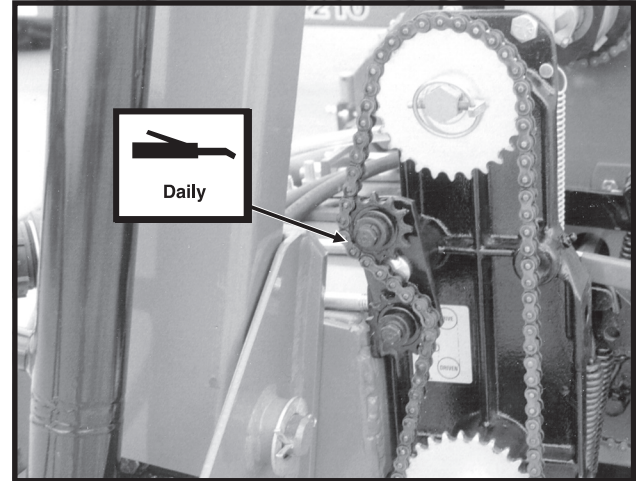
6. Turnbuckle - 1 Zerk

60982-10



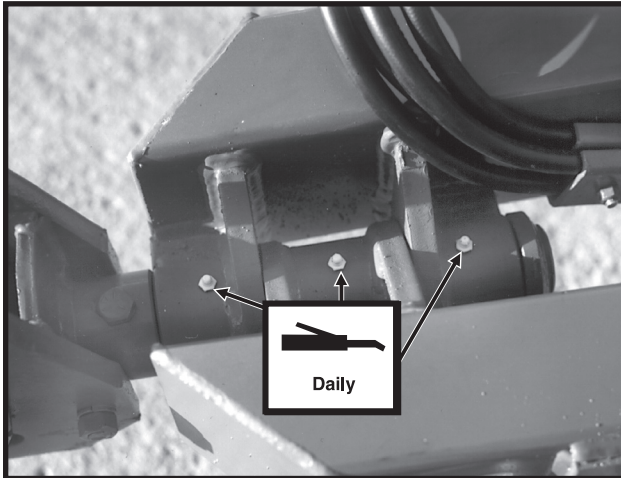
4. Center Frame Flex Pin - 4 Zerks

08049714



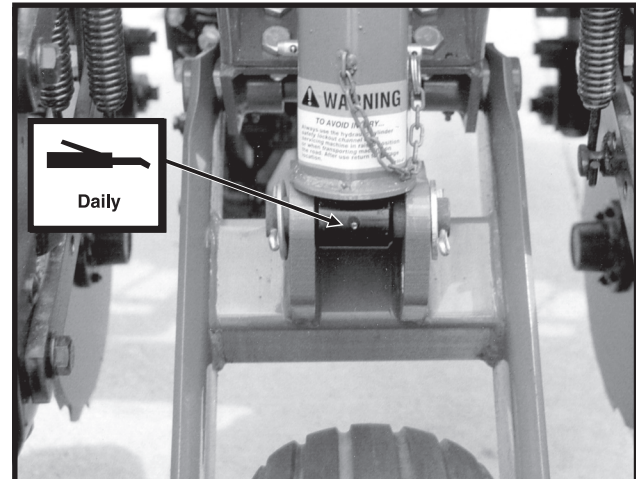
7. Seed Rate Transmission Idler - 1 Zerk Per Transmission

60887-15



5. Hitch Flex Pin - 3 Zerks

08059723

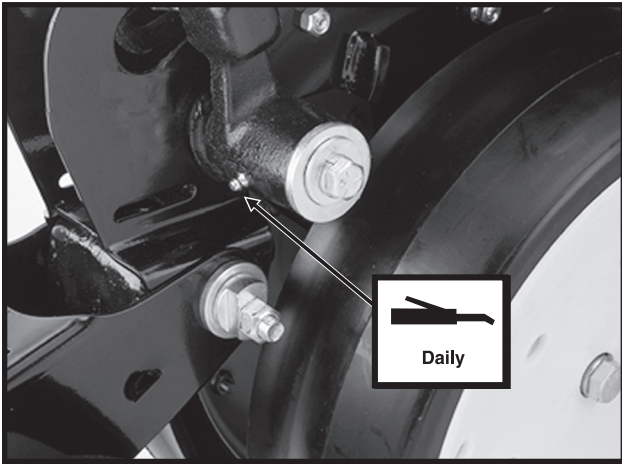


8. Planter Lift Cylinders (Master, Slave And Assist) - 1 Zerk Per Cylinder

LUBRICATION

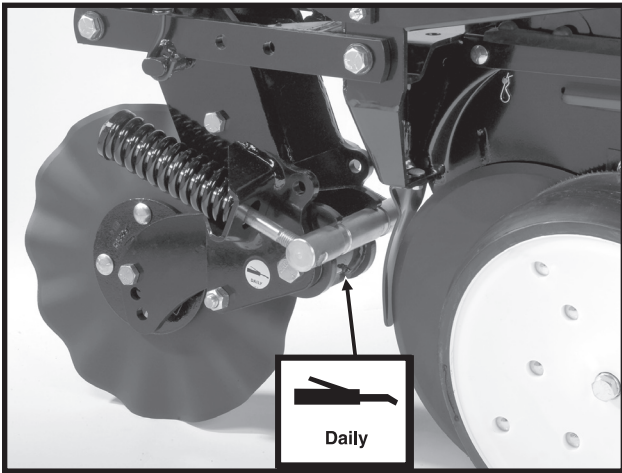
Row Unit

LF212199-2



Gauge Wheel Arms - 1 Zerk Per Arm
(Seals in gauge wheel arm are installed with lip facing out to allow grease to purge dirt away from seal. Pump grease into arm until fresh grease appears between washers and arm.)

LF083002101

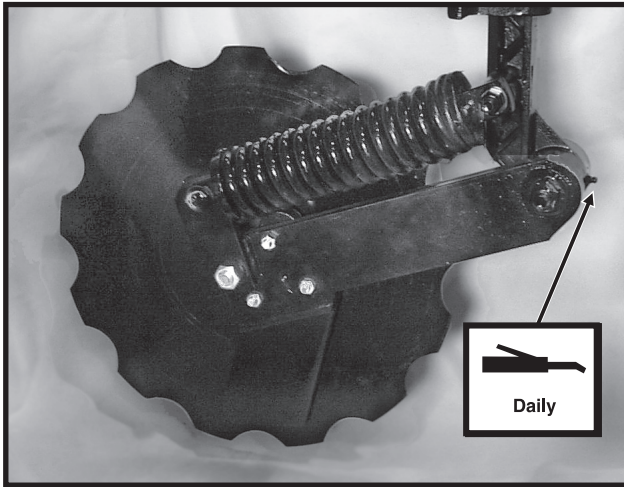


Frame Mounted Coulter - 1 Zerk Per Arm

LUBRICATION

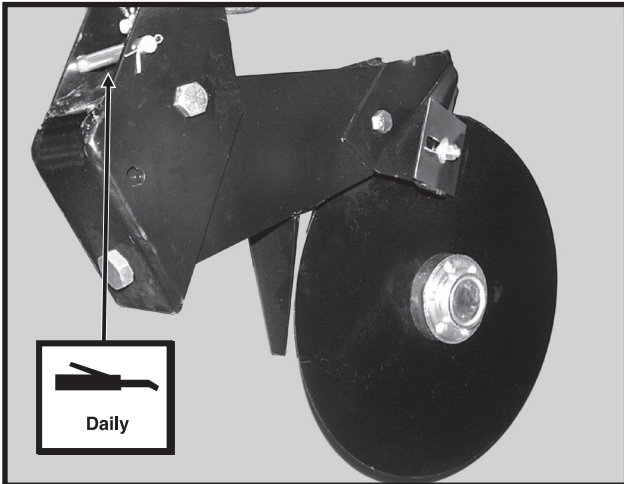
Fertilizer Openers

D06060128a



Notched Single Disc Fertilizer Opener - 1 Zerk

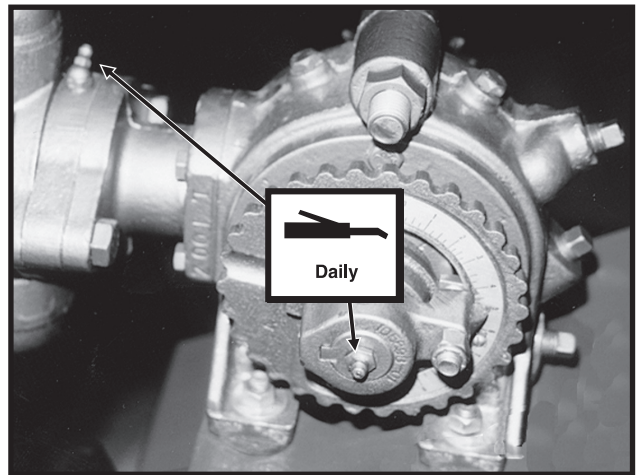
D06259919



Double Disc Fertilizer Opener - 1 Zerk

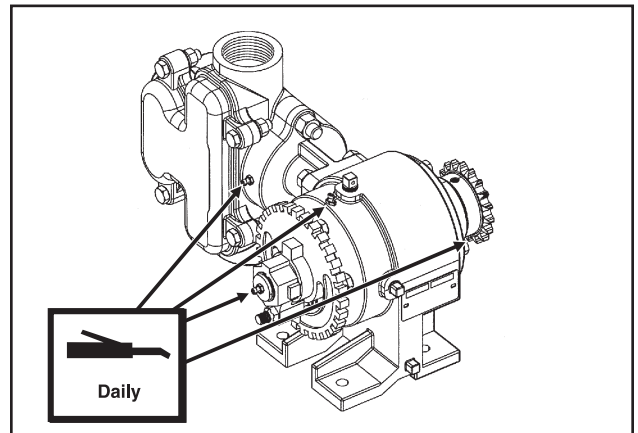
Liquid Fertilizer

12229799



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

(A12330a)



Liquid Fertilizer Piston Pump - 4 Zerks (Fill zerk on outboard stuffing box until lubricant seeps out of drain hole in bottom.)

MAINTENANCE

MOUNTING BOLTS AND HARDWARE

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

All hardware used on the KINZE® planter is Grade 5 (high strength), unless otherwise noted. Grade 5 cap screws are marked with three radial lines on the head. If hardware must be replaced, be sure to replace it with hardware of equal size, strength and thread type. Refer to the torque values chart when tightening hardware.

IMPORTANT: Over tightening hardware can cause as much damage as under tightening. Tightening hardware 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 bolts on the transport wheels are tight. This is especially important if the planter is to be transported for a long distance.

Row Unit Parallel Linkage Bushing Hardware - 130 Ft. Lbs. (See "Bushings" in the Lubrication section of this manual.)

5/8" No Till Coulter Spindle Hardware – 120 Ft. Lbs. Transport/Ground Drive Tire Lug Bolts – 90 Ft. Lbs.

TORQUE VALUES CHART - PLATED HARDWARE

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

NOTE: Unplated 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



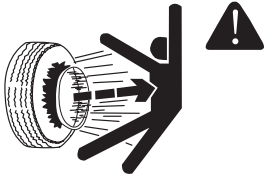
GRADE 5
3 Marks



GRADE 8
6 Marks

MAINTENANCE

TIRE PRESSURE



WARNING: Rim and tire servicing, improper use of rims and tires, or worn or improperly maintained tires could result in a tire explosion. The explosive separation of rim and tire parts could result in death or serious personal injury.

To prevent tire explosion, do the following:

- Maintain proper tire pressure. Inflating a tire above or below the recommended pressure can cause tire damage.
- Mount tires only by properly trained personnel using proper equipment.
- Replace any tire with cuts or bubbles. Replace any damaged rims. Replace any missing lug bolts and nuts.
- Do not weld or heat wheel assembly. Heating increases tire pressure.

TRANSPORT TIRES



WARNING: Different rims are designed for different tire pressures. Over-inflation of tires on thinner rims could result in explosive separation of rim and tire that could result in death or serious personal injury.

To prevent tire explosion, do not exceed the following maximum pressures:

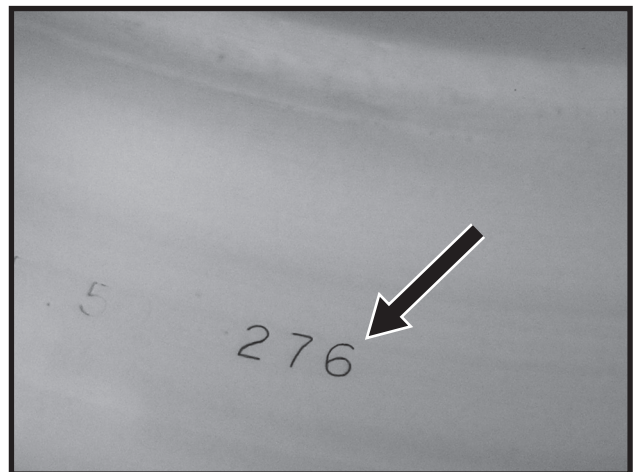
- Rims stamped with “224”: 75 psi (517.1 kPa) maximum pressure.
- Rims stamped with “276”: 100 psi (689.4 kPa) maximum pressure.

D03231013



Maximum Tire Pressure is 75 psi (517.1 kPa)

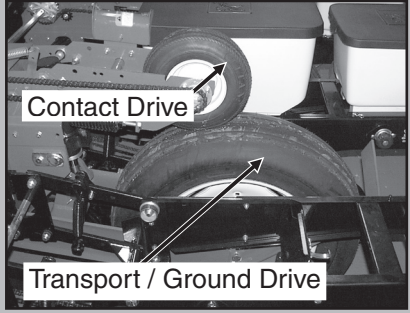
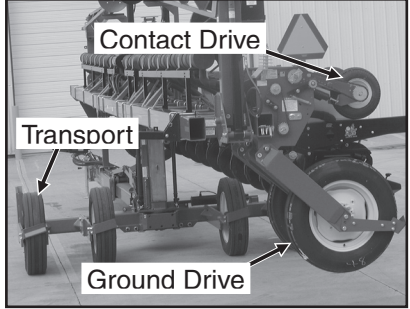
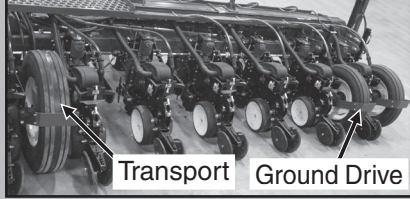
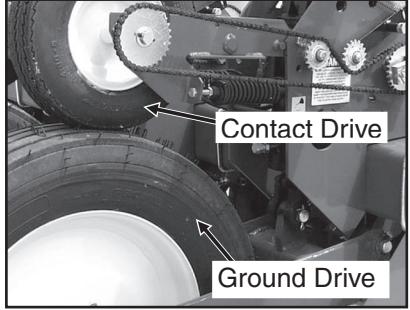
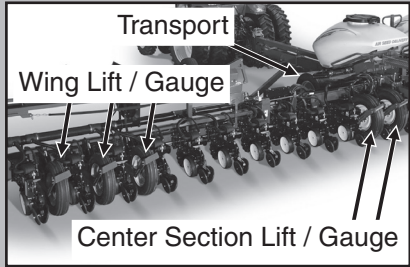
D03301009



Maximum Tire Pressure is 100 psi (689.4 kPa)

MAINTENANCE

Tire pressure should be checked regularly and maintained as follows:

Model / Tire Size / Tire Pressure	Tire Identification
<p>3000 / 3200 / 3500 Transport / ground drive - 7.50" x 20 40 psi (275.7 kPa) Contact drive - 4.10" x 6" 50 psi (344.7 kPa)</p>	
<p>3600 Transport (center section) 255-70R 22.5 ("224" rim)75 psi (517.1 kPa) recommended / 75 psi (517.1 kPa) max. Transport (center section) 255-70R 22.5" ("276" rim)75 psi (517.1 kPa) recommended / 100 psi (689.4 kPa) max. Ground drive (wings) 7.50" x 20"..... 40 psi (275.7 kPa) Contact drive - 4.80" x 8"..... 50 psi (344.7 kPa) Liquid fertilizer piston pump 7.60" x 15" 40 psi (275.7 kPa)</p>	
<p>3660 Transport (center section) 255-70R 22.5 ("224" rim)75 psi (517.1 kPa) recommended / 75 psi (517.1 kPa) max. Transport (center section) 255-70R 22.5" ("276" rim)75 psi (517.1 kPa) recommended / 100 psi (689.4 kPa) max. Ground drive (wings) 7.50" x 20"..... 40 psi (275.7 kPa) Liquid fertilizer piston pump 7.60" x 15" 40 psi (275.7 kPa)</p>	
<p>3700 Ground drive (wings) 255-70R 22.5 75 psi (517.1 kPa) Transport - 36" x 16" x 17.5" 75 psi (517.1 kPa) Contact drive - 4.80" x 8"..... 50 psi (344.7 kPa) Row marker - 16" x 6.5" x 8" 14 psi (96.5 kPa) Liquid fertilizer piston pump 4.10" x 6" 50 psi (344.7 kPa)</p>	
<p>3800 Center section lift / gauge - 41 x 11R22.5" radial load range H ("224" rim)75 psi (517.1 kPa) recommended / 75 psi (517.1 kPa) max. Center section lift / gauge - 41 x 11R22.5" radial load range H ("276" rim)75 psi (517.1 kPa) recommended / 100 psi (689.4 kPa) max. Wing lift / gauge - 7.50" x 20" 8 ply custom rib implement. . . 40 psi (275.7 kPa) Transport - 445-50R22.5R radial load range H 120 psi (827.3 kPa) Row marker - 20.5 x 8.0-10. 35 psi (241.3 kPa) Liquid fertilizer piston pump - 7.60" x 15" rib implement . . . 40 psi (275.7 kPa)</p>	

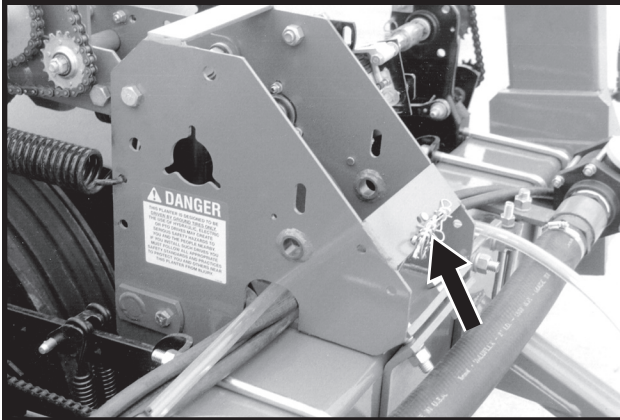
MAINTENANCE

CHAIN TENSION ADJUSTMENT

The drive chains have spring loaded idlers 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. See “Wrap Spring Wrench Assembly” (on applicable idler assemblies) in Lubrication Section for additional information.

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

08049721

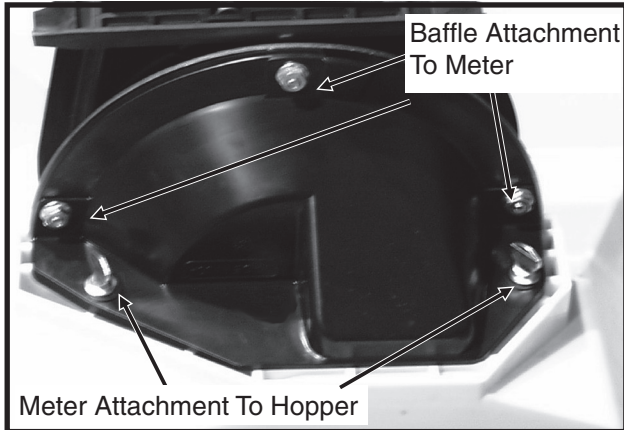


MAINTENANCE

FINGER PICKUP SEED METER INSPECTION/ADJUSTMENT

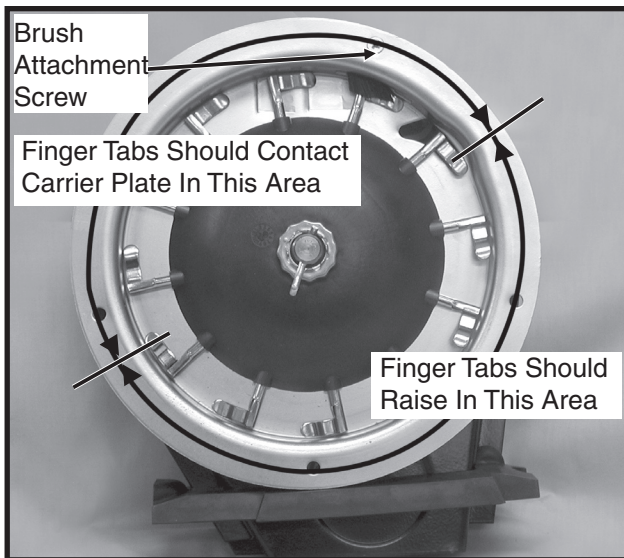
To inspect or service the finger pickup seed meter, remove the meter from the seed hopper by removing the two thumbscrews which secure the mechanism to the hopper. Remove the baffle from the meter assembly by removing three cap screws. This will permit access to the finger pickup.

D04229901



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.

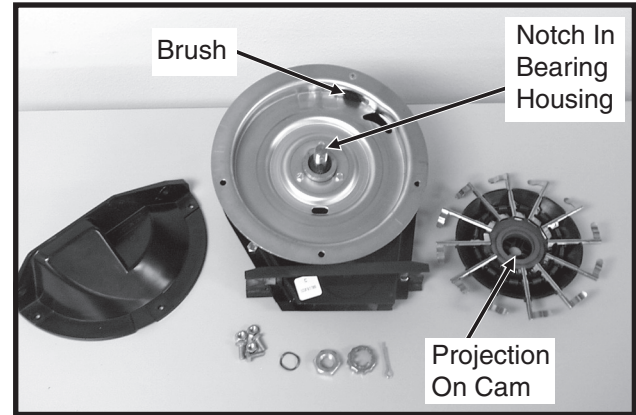
D12220402a



A buildup of debris or chaff may prevent proper finger operation and will require disassembly and cleaning of the finger pickup meter as follows:

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

D092004102



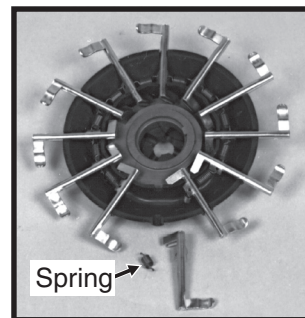
3. Check brush for wear and replace if necessary or following every 100 acres per row of operation.

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

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

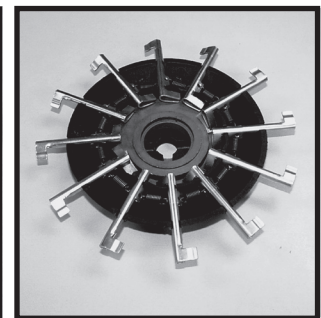
4. To replace fingers or springs, remove springs from fingers and remove finger from holder by lifting it out of the friction fit slot. Under average conditions, life expectancy of these parts should be 600-900 acres per row of operation.
5. After cleaning and/or replacing defective parts, reassemble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



Corn Finger Assembly
(Position Spring Opening Toward Holder)

D07299902



Oil Sunflower Finger Assembly

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

D021506100

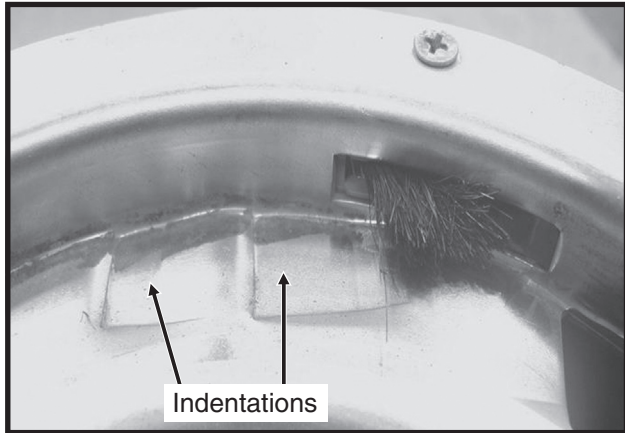


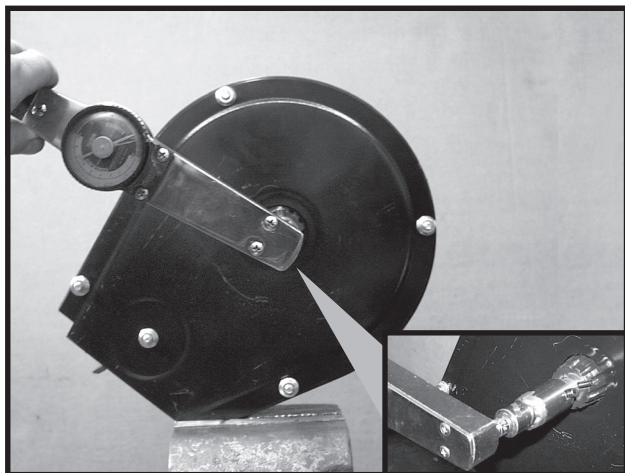
Photo Shows Worn Carrier Plate

- 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.

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

- 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 22 to 25 inch pounds.

D07299903/D07309912

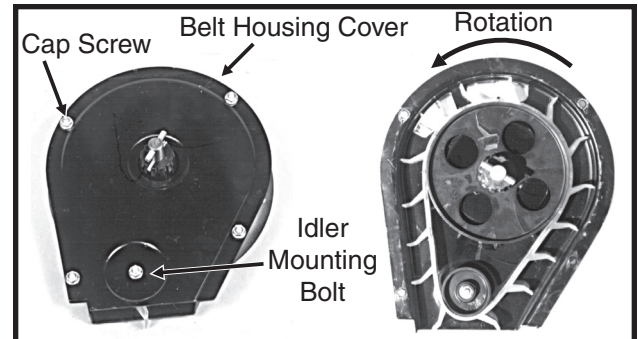


- Turn finger holder by hand to make sure it is positioned firmly against the carrier plate, but is not over tightened and can be rotated with moderate force.
- Install cover nut and cotter pin and reinstall baffle.

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.

60620-13a/60887-97

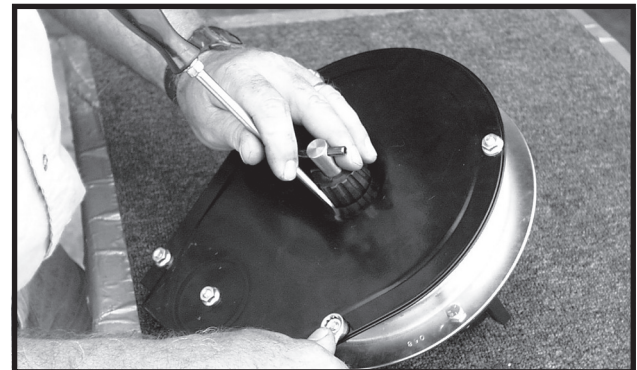


If the belt is being replaced, make sure it is installed to correctly orient the paddles as shown. A diagram molded into the drive sprocket also illustrates the correct orientation.

Reinstall the housing cover. **DO NOT TIGHTEN** hardware at this time. Wedge a screwdriver between the sprocket hub and housing cover as shown below. Pry cover down until it is centered on the belt housing and tighten hardware. Check idler alignment by rotating meter drive shaft. The seed belt should "run" centered on the idler or with only slight contact with the belt housing or cover.

IMPORTANT: Do not over tighten hardware.

D06200030



FINGER PICKUP SEED METER CLEANING

- Disassemble meter.
- Blow out any foreign material present in the meter mechanism.
- Wash in mild soap and water. **DO NOT USE GASOLINE, KEROSENE OR ANY OTHER PETROLEUM BASED PRODUCT.**
- Dry thoroughly.
- Coat lightly with a rust inhibitor.
- Rotate finger assembly so finger does not touch brush.
- Reassemble and store in a dry rodent-free place.

MAINTENANCE

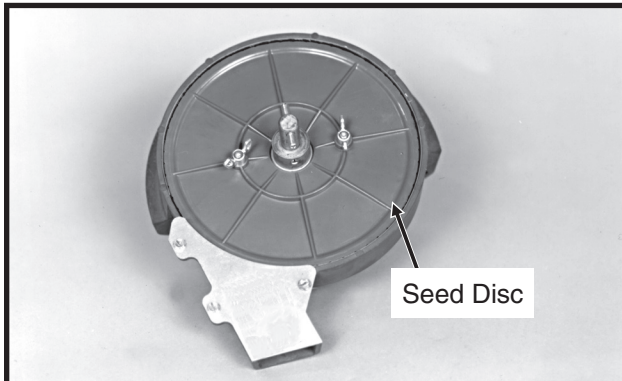
FINGER PICKUP SEED METER TROUBLESHOOTING

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.
	Row unit drive chain off of sprocket or broken.	Check drive chain.
Unit is skipping.	Foreign material or obstruction in meter.	Clean and inspect.
	Finger holder improperly adjusted.	Adjust to specifications. (22 to 25 in. lbs. rolling torque)
	Broken fingers.	Replace fingers and/or springs as required.
	Planting too slowly.	Increase planting speed to within recommended range.
Planting too many doubles.	Planting too fast.	Stay within recommended speed range.
	Loose finger holder.	Adjust to specifications. (22 to 25 in. lbs. rolling torque)
	Worn brush in carrier plate.	Inspect and replace if necessary.
Overplanting.	Worn carrier plate.	Inspect and replace if necessary.
	Seed hopper additive being used.	Reduce or eliminate additive or increase graphite.
Underplanting.	Seed 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.	Perform 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.

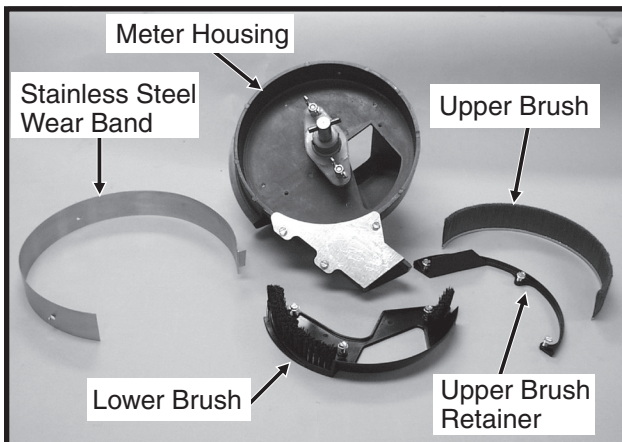
MAINTENANCE

BRUSH-TYPE SEED METER MAINTENANCE

60607-10a

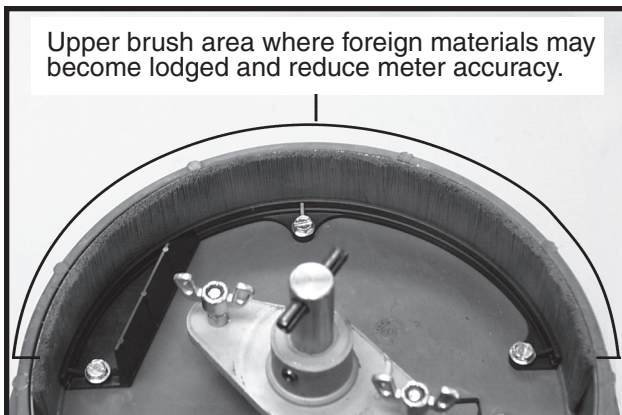


D04239911



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 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 retainer and stainless steel wear band which can greatly reduce the accuracy of the meter because the upper brush will not be able to retain the seed in the seed disc pocket. Clean the brush areas of the meter housing thoroughly.

D04239912a



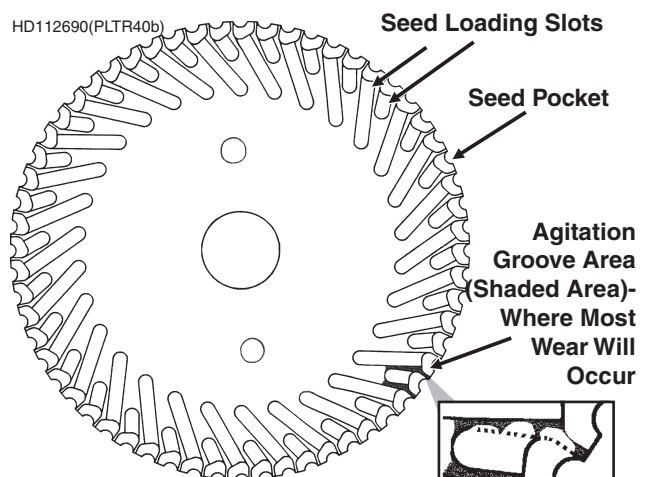
IMPORTANT: Replace hopper lids after hoppers are filled to prevent accumulation of dust or dirt in the seed meter which will cause premature wear.

Cleaning brush-type seed meter for storage:

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

HD112690(PLTR40b)



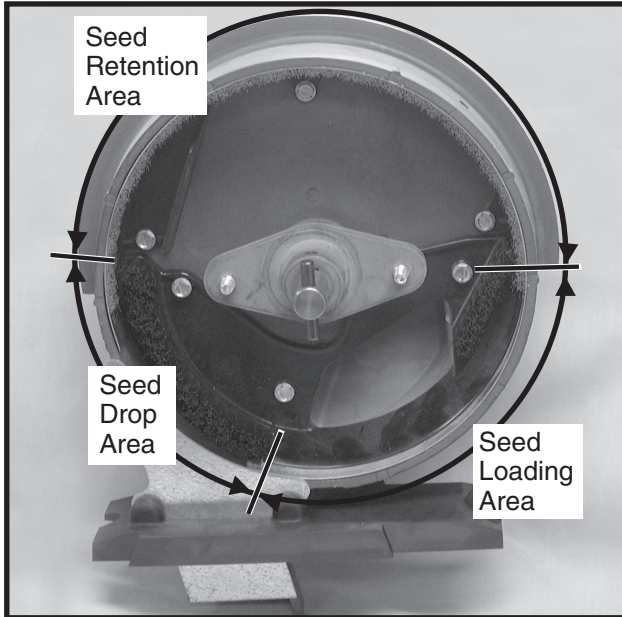
Most wear on the seed disc will be found in the agitation groove area (area between the seed loading slots). Wear will affect planting accuracy at high RPM. To measure for wear, lay a straight edge across the surface of the disc and measure the gap between the disc (at the agitation groove area) and 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 to under 100 acres per row.

MAINTENANCE

Upper Brush

D12220403



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

The 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.

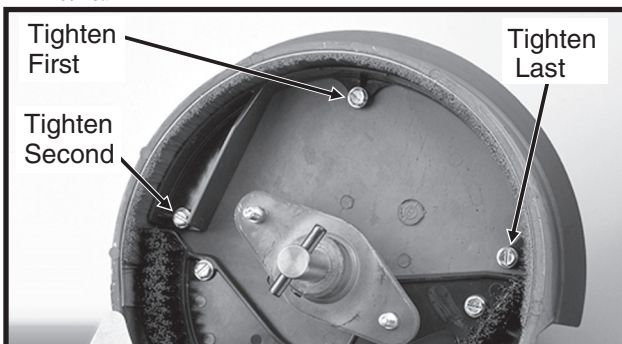
The upper brush should be replaced at approximately 120-400 acres per row of use or sooner if damage or excessive wear is found.

Installation Of Upper Brush

Position upper 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 retainer and three hex head screws. Tighten center screw first, left screw second and right screw last.

NOTE: Use GD11122 upper brush retainer when using soybean and cotton discs. Use GD8237 upper brush retainer when using milo/grain sorghum discs. GD11122 brush retainer shown.

LF212299-13a



Stainless Steel Wear Band

D04239917a

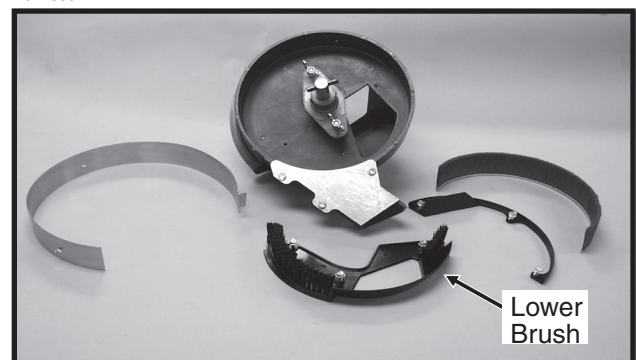


The purpose of the stainless steel wear band is to protect the meter housing from wear. The band is .030" thick and should be replaced when approximately .020" of wear is found in the primary area of wear. If the wear band is allowed to wear through or if the meter is used without the wear band in place,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

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

Lower Brush

D04239911



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 retainer.

MAINTENANCE

BRUSH-TYPE SEED METER TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Low count.	Meter RPM too high.	Reduce planting speed.
	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. Add talc.
Low count at low RPM and higher count at higher RPM.	Foreign material lodged in upper brush.	Remove seed disc and remove foreign material from between brush retainer and bristles. Clean thoroughly.
	Worn upper 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.
High count. (Milo/Grain Sorghum)	Incorrect brush retainer being used.	Make sure GD8237 brush retainer is installed to keep upper brush from fanning out.
Upper 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 retainer and brush. Clean thoroughly. Reinstall.

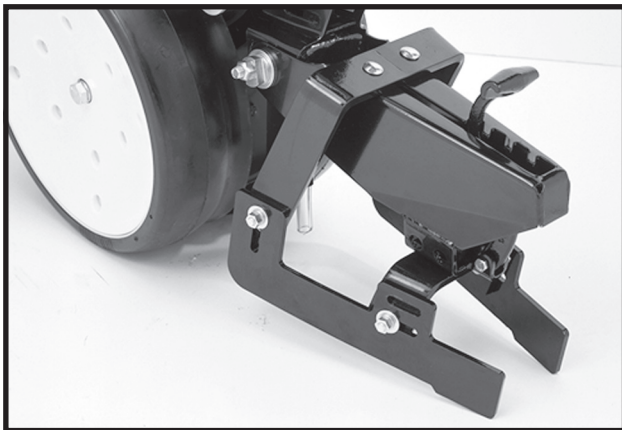
MAINTENANCE

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”.

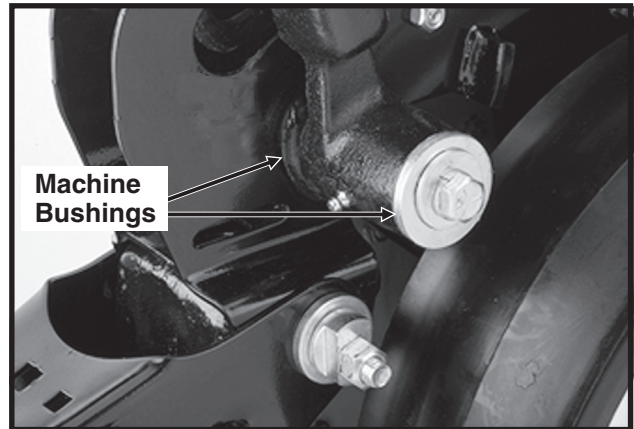
DRAG CLOSING ATTACHMENT

LF212299-18



Prior to storage of the planter, inspect each drag closing attachment and replace any worn or broken parts. Check for loose hardware and tighten as needed.

LF212199-2



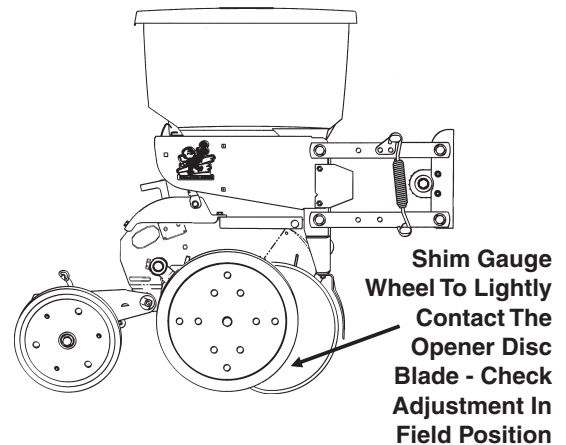
(RU113g)

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.

To adjust clearance between gauge wheels and opener blades, add or remove machine bushings between the shank and gauge wheel arm. Store remaining machine bushings 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.

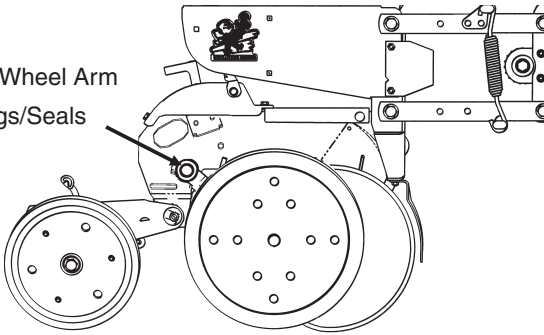


MAINTENANCE

GAUGE WHEEL ARM BUSHING AND/OR SEAL REPLACEMENT

(RU113g)

Gauge Wheel Arm Bushings/Seals

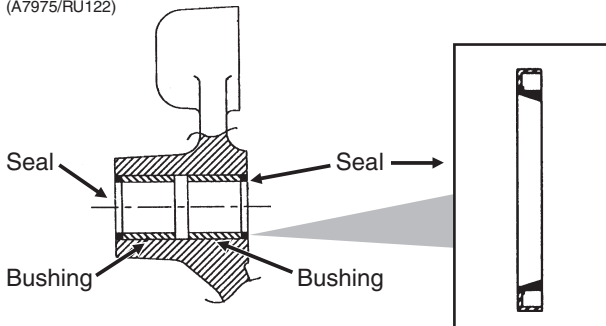


NOTE: A Gauge Wheel Arm Bushing And Seal Driver Kit (G1K296), for use in bushing and seal replacement, is available through your KINZE® Dealer.

To replace gauge wheel arm assembly bushing(s) and/or seal(s):

1. Remove gauge wheel from arm.
2. Remove the gauge wheel arm assembly from the shank assembly.
3. Remove seal and bushing and discard. Clean and dry inner bore.

(A7975/RU122)



4. Drive/press replacement bushing inside bore of arm to a depth of .125" below flush.
5. Coat wiping edge of seal with grease.
6. Drive/press seal into place with lip to the outside as shown above.

NOTE: Use extra care to protect the sealing lip during installation. Apply uniform pressure to assemble the seal into the bore of the arm. Never apply a direct hammer blow to the seal surface.

7. Inspect gauge wheel pivot spindle.
8. Reinstall gauge wheel arm assembly and gauge wheel.

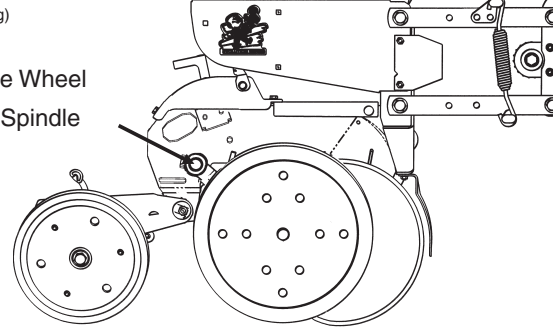
NOTE: Special machine bushing between gauge wheel arm and gauge wheel.

9. Shim for proper gauge wheel tire/disc blade clearance.
10. Lubricate with an SAE multipurpose grease.

GAUGE WHEEL ARM PIVOT SPINDLE REPLACEMENT

(RU113g)

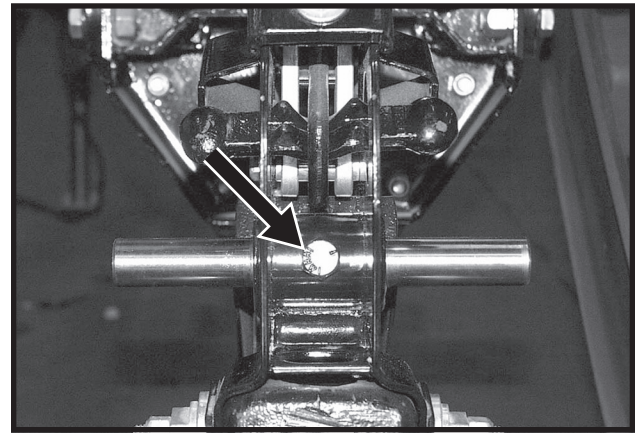
Gauge Wheel Pivot Spindle



To replace gauge wheel pivot spindle:

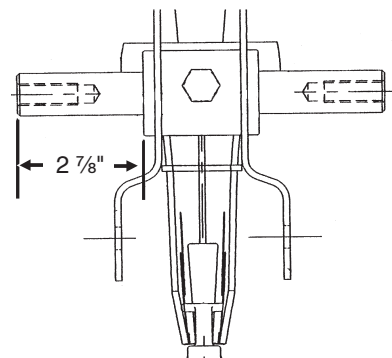
1. Remove the gauge wheel and arm assemblies from the shank assembly.
2. Remove 1/2" x 3/4" cap screw that locks the pivot spindle in place and remove the spindle.

D06189902



3. Install the replacement spindle and position as shown below. Exact centering is critical.

(A7966)



4. Install 1/2" x 3/4" cap screw and torque to lock pivot spindle in place.
5. Install gauge wheel and arm assemblies. Shim for proper gauge wheel tire/disc blade clearance.

MAINTENANCE

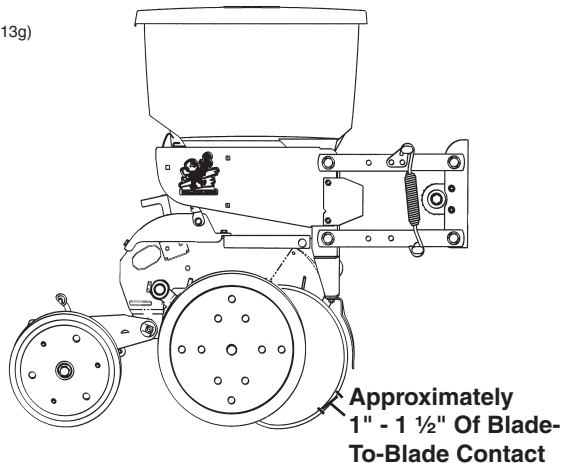
15" SEED OPENER DISC BLADE/ BEARING ASSEMBLY

Approximately 1" - 1 ½" 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 relocate machine bushings from inside to outside to maintain approximately 1" - 1 ½" of contact.

NOTE: If proper blade-to-blade contact cannot be maintained after relocating machine bushings or if blade diameter wears below 14 ½", the blades should be replaced.

IMPORTANT: Excessive blade contact may result in premature disc opener bearing/hub failures and excessive wear on seed tube guard/inner scraper. When properly adjusted, if one blade is held in fixed position, the opposite blade should be able to be rotated with minimal force (Less than 5 pounds force at outer edge of blade).

(RU113g)



To replace disc blade/bearing assembly:

1. Remove gauge wheel.
2. Remove scraper.
3. Remove bearing dust cap.
4. Remove cap screw, washer and disc blade/bearing assembly. The machine bushings between the shank and disc blade are used to maintain the approximate 1" - 1 ½" of blade-to-blade contact.

IMPORTANT: Left hand side of opener uses a left hand threaded cap screw. DO NOT OVERTIGHTEN. Damage to shank threads will require replacement of row unit shank assembly.

5. Install machine bushing(s), new disc blade/bearing assembly, washer and cap screw. Torque ⅝"-11 Grade 5 cap screw to value shown in "Torque Values Chart".

NOTE: Replace disc blades only with blades of equal thickness.

6. Replace bearing dust cap.
7. Install scraper.
8. Install gauge wheel.

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

To replace bearing:

1. Remove gauge wheel, scraper, bearing cap, cap screw, washer and disc blade/bearing assembly.
2. Remove ¼" rivets from bearing housing to expose bearing.
3. After installing new bearing, install three evenly spaced ¼" cap screws 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 ¼" cap screws and install rivets in those three holes.
4. Reinstall disc blade/bearing assembly, washer and cap screw. Torque ⅝"-11 cap screw to value shown in "Torque Values Chart" at the beginning of this section.
5. Replace bearing dust cap.
6. Install scraper and gauge wheel.

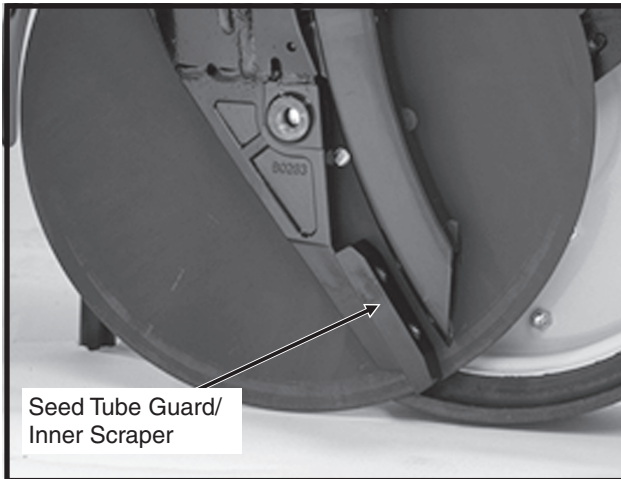
MAINTENANCE

SEED TUBE GUARD/INNER SCRAPER

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

Remove the seed tube and check for wear. Excessive wear on the seed tube indicates a worn seed tube guard. Replace the seed tube guard if it measures $\frac{5}{8}$ " or less at the lower end. A new seed tube guard measures approximately $\frac{7}{8}$ ".

LF212199-12



Shown With Gauge Wheel And Seed Opener Disc Blade Removed For Visual Clarity

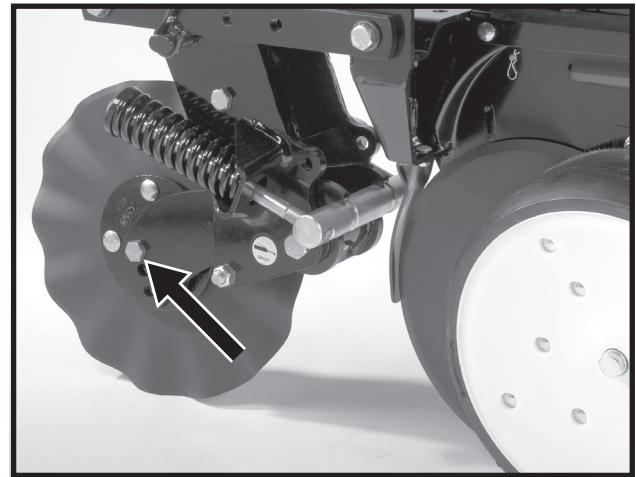
IMPORTANT: No till planting or planting in hard ground conditions, especially when the planter is not equipped with no till coulters, and/or excessive blade-to-blade contact will increase seed tube guard wear and necessitate more frequent inspection and/or replacement.

To replace the seed tube guard, remove the seed tube and the two hex socket head cap screws which attach the seed tube guard. Hold the replacement seed tube guard centered between the seed opener disc blades. Install, but DO NOT tighten, the hex socket head cap screws. Using a clamp or vise-grip, squeeze the opener blades together in front of the seed tube guard. Tighten the seed tube guard retaining screws. Remove the clamps. The distance between the seed tube guard and opener blades should be equal on both sides. Reinstall seed tube.

IMPORTANT: Over tightening the hex socket head cap screws may damage the threads in the shank and require replacement of the shank. A seed tube guard that is worn excessively may allow the blades to wear into the row unit shank, also requiring replacement of the shank.

FRAME MOUNTED COULTER

LF083002101



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

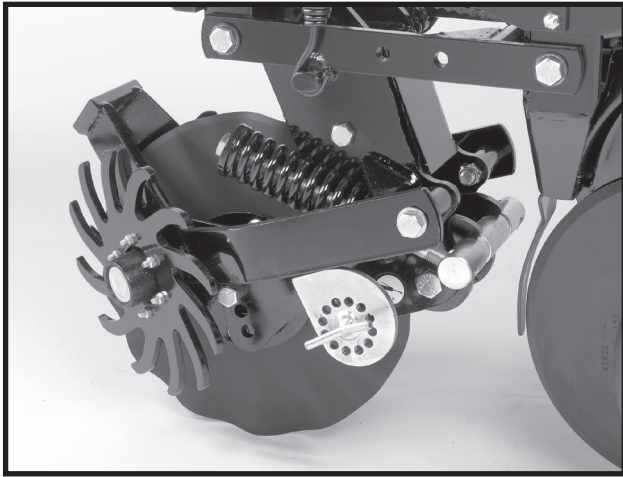
See "Frame Mounted Coulter" in Row Unit Operation section of this manual for depth and spring adjustment.

When the 16" diameter coulter blade (1" fluted, 1" bubbled or $\frac{3}{4}$ " fluted) is worn to 14 $\frac{1}{2}$ " (maximum allowable wear), it should be replaced.

MAINTENANCE

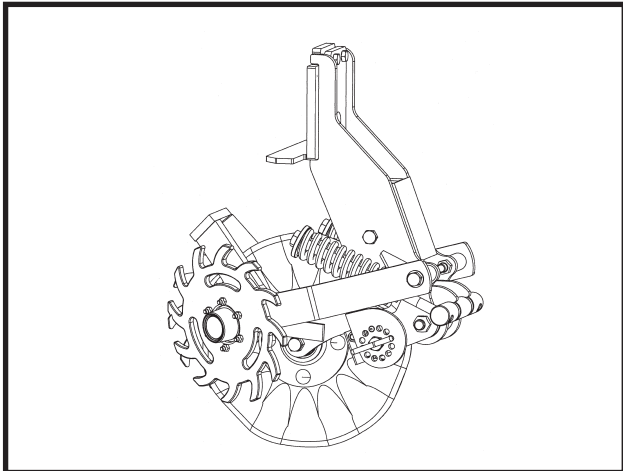
RESIDUE WHEELS (For Use With Frame Mounted Coulter)

LF083002102



STYLE A

(RU154)

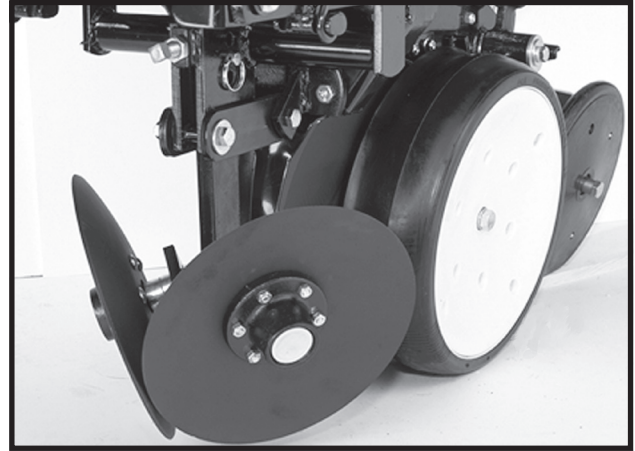


STYLE B

The wheel hub is equipped with sealed bearings. If a bearing sounds or feels rough when the wheel is rotated, replace the bearings.

ROW UNIT MOUNTED DISC FURROWER

LF212299-22



Lubricate the bushings in the support arm and mounting bracket at the frequency indicated in the Lubrication Section of this manual. Using a torque wrench, check each bolt for proper torque. If the bolt is loose, it should be removed and the bushing inspected for cracks and wear. Replace bushings as necessary. **Only hardened flat washers should be used. Replace damaged flat washers with proper part. Torque cap screws to 57 ft. lbs.**

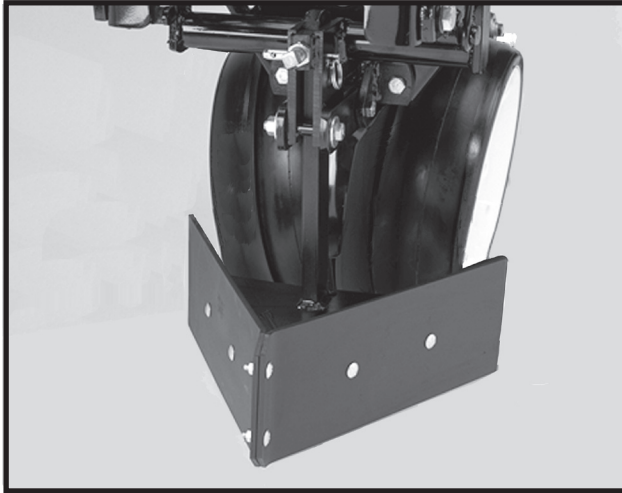
The blade hubs are equipped with sealed bearings. If bearings sound or feel rough when the blade is rotated, replace the bearings.

When the 12" diameter blades (solid or notched) are worn to 11", they should be replaced.

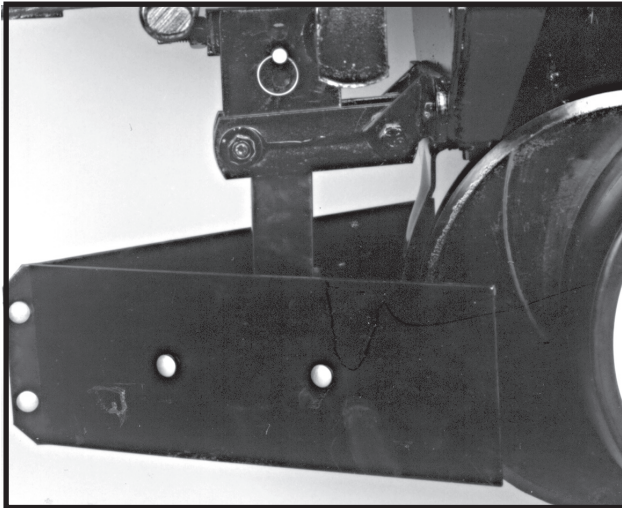
MAINTENANCE

ROW UNIT MOUNTED BED LEVELER

LF212299-25a



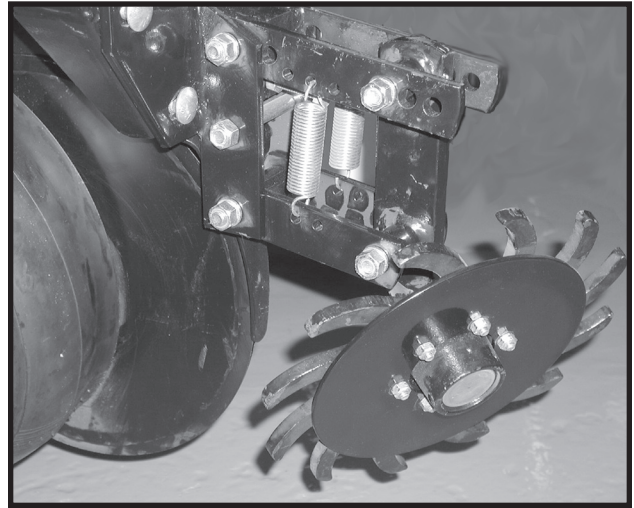
59386-26



Lubricate the bushings in the mounting bracket and links at the frequency indicated in the Lubrication Section of this manual. Using a torque wrench, check each bolt for proper torque. If the 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 57 ft. lbs.**

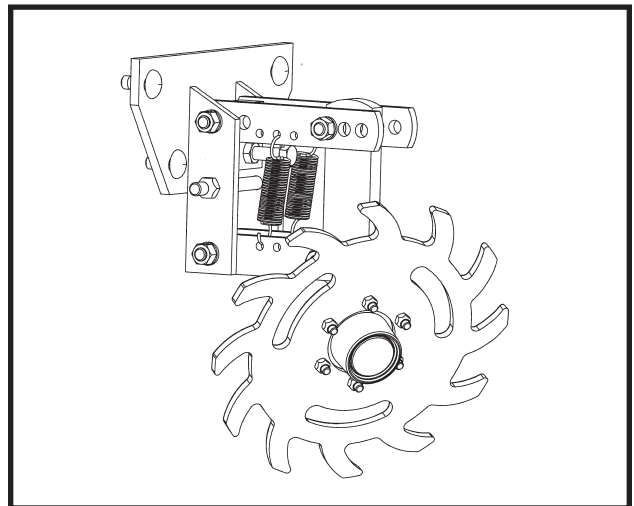
ROW UNIT MOUNTED RESIDUE WHEEL

D101701113



STYLE A

(A12685)



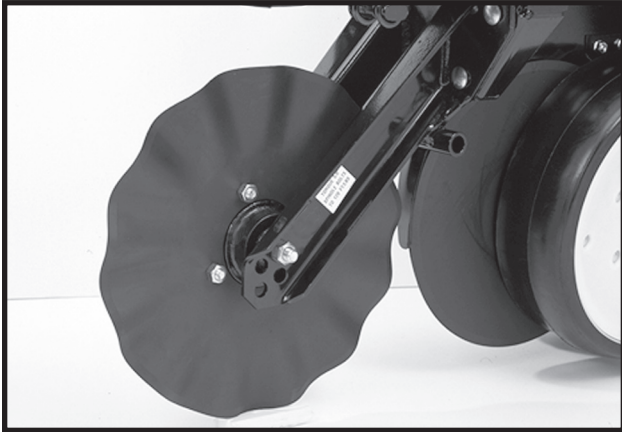
STYLE B

The wheel hub is equipped with sealed bearings. If a bearing sounds or feels rough when the wheel is rotated, replace the bearings.

MAINTENANCE

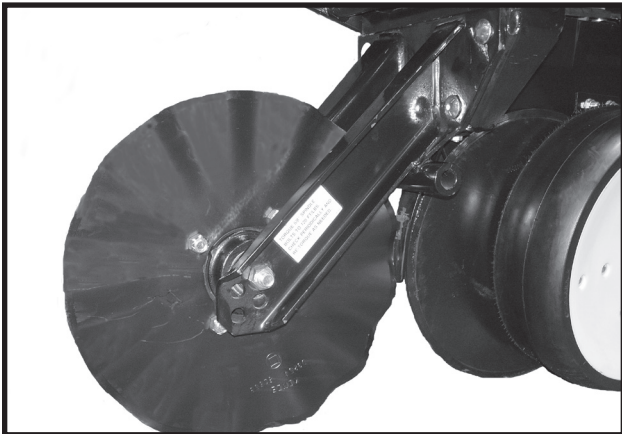
ROW UNIT MOUNTED NO TILL COULTER

LF212299-19a



STYLE A (Two Sleeves For Installing Coulters Mounted Residue Wheels)

D05170706



STYLE B (One Sleeve For Installing Coulters Mounted Residue Wheels)

Check periodically to be sure nuts and hardware are tightened to proper torque specification.

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

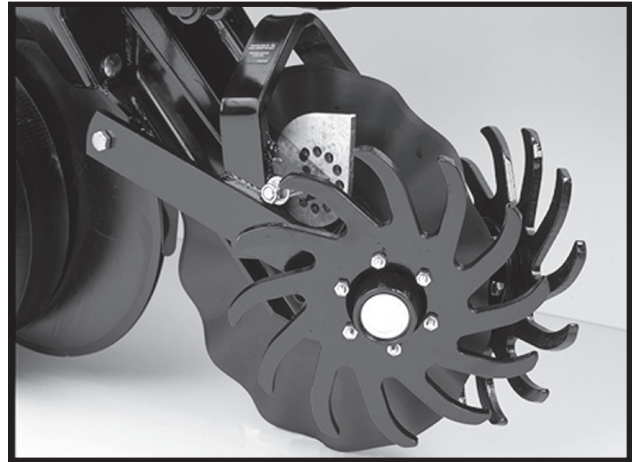
Be sure the coulters are positioned square with the row unit and aligned in front of row unit disc opener.

The coulters 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 Coulters" in Row Unit Operation section of this manual.

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

COULTERS MOUNTED RESIDUE WHEELS

LF212299-23



STYLE A - Used With Style A Row Unit Mounted No Till Coulters

D05170708



STYLE B - Used With Style B Row Unit Mounted No Till Coulters

The wheel hubs are equipped with sealed bearings. If bearings sound or feel rough when the wheel is rotated, replace the bearings.

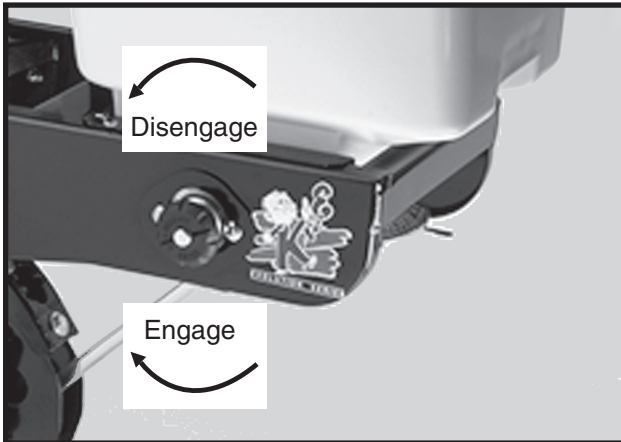
MAINTENANCE

GRANULAR CHEMICAL ATTACHMENT

Prior to storage of the planter, disengage the granular chemical drive by rotating the throwout knob $\frac{1}{4}$ turn counterclockwise. Remove the drive chain and empty and clean all granular chemical hoppers. Clean the drive chains and coat them with a rust preventive spray or submerge chains in oil. Inspect and replace any worn or broken parts.

Install hoppers and chains. Check chain alignment.

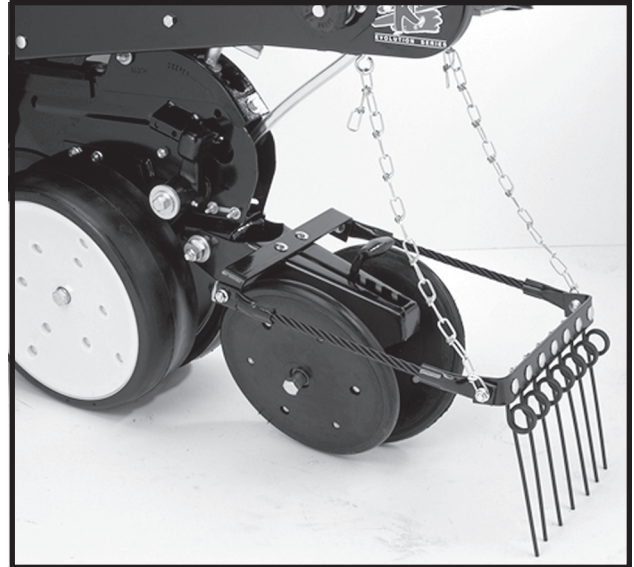
LF212299-4



SPRING TOOTH INCORPORATOR

Prior to storage of the planter, inspect each spring tooth incorporator and replace any worn or broken parts. Check for loose hardware and tighten as needed.

LF212299-26



MAINTENANCE

KPM I/KPM II STACK-MODE ELECTRONIC SEED MONITORS TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Single sensor communication alarm comes on (alarm on with no bargraph and a flashing row number on a single row).	Faulty seed tube sensor.	Replace sensor.
	Break in the harness just before the seed tube sensor.	Inspect for break in harness and repair. If break can't be found, replace harness section.
	Dirty or corroded connector.	Clean connector.
Sensor communication alarms come on for all sensors (alarm on with no bargraphs and flashing row numbers on all rows).	Faulty monitor.	Repair/replace monitor.
	Break in the harness just after the monitor.	Inspect for break in harness and repair. If break can't be found, replace harness section.
	Dirty or corroded connector.	Clean connector.
Sensor communication alarms come on for some sensors (alarm on with no bargraphs and flashing row numbers on all rows).	Break in the harness.	Inspect for break in harness and repair. If break can't be found, replace harness section corresponding with the alarming sensors.
	Dirty or corroded connector.	Clean connector.
Faulty monitor values (such as speed, area, etc.) being displayed. (KPM II Only)	Incorrect monitor settings.	Change settings to properly correspond to the system.
	Faulty radar/magnetic distance sensor.	Replace sensor.
	Improperly mounted radar sensor.	Properly mount sensor.
Underplanting or no planting alarm on a single sensor when planting (alarm on with a single bargraph segment on and a flashing row number on a single row).	Seed tube sensor is blocked.	Clean sensor.
	Faulty seed tube sensor.	Replace sensor.
	Meter not planting or underplanting.	Repair/replace meter.
	Chain broken or off sprocket.	Repair as necessary.
Seed tube sensor dirty or blocked warning comes on (after calibration, bargraph keeps flashing for a single row).	Seed tube sensor is dirty.	Clean sensor.
	Faulty seed tube sensor.	Replace sensor.
LED on the seed tube sensor will not come on.	Faulty seed tube sensor.	Replace sensor.
	Dirty or corroded connector.	Clean connector.
	Break in the harness just before the sensor.	Repair harness.
Erroneous MPH readings at idle. (Radar Distance Sensor Only)	Radar sensor not located in a stable location.	Relocate to a more stable location.

MAINTENANCE

KPM III ELECTRONIC SEED MONITOR TROUBLESHOOTING

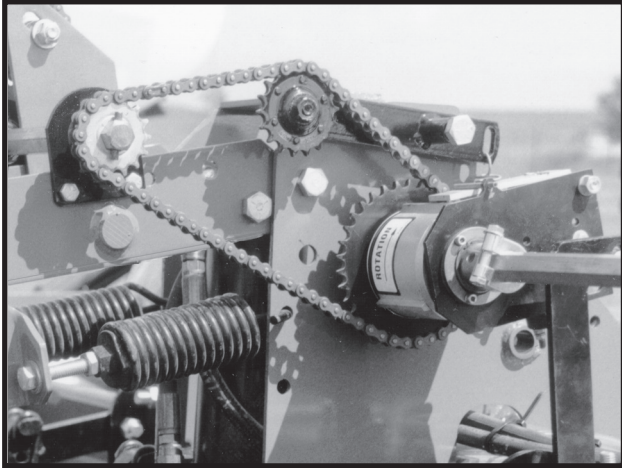
PROBLEM	POSSIBLE CAUSE	SOLUTION
Single sensor communication alarm comes on.	Faulty seed tube sensor.	Replace sensor.
	Break in the harness just before the seed tube sensor.	Inspect for break in harness and repair. If break can't be found, replace harness section.
	Dirty or corroded connector.	Clean connector.
Sensor communication alarms come on for all sensors.	Faulty monitor.	Repair/replace monitor.
	Break in the harness just after the monitor.	Inspect for break in harness and repair. If break can't be found, replace harness section.
	Dirty or corroded connector.	Clean connector.
Sensor communication alarms come on for some sensors.	Break in the harness.	Inspect for break in harness and repair. If break can't be found, replace harness section corresponding with the alarming sensors.
	Dirty or corroded connector.	Clean connector.
Faulty monitor values (such as speed, area, etc.) being displayed.	Incorrect monitor settings.	Change settings to properly correspond to the system.
	Faulty radar/magnetic distance sensor.	Replace sensor.
	Improperly mounted radar sensor.	Properly mount sensor.
Underplanting or no planting alarm on a single sensor when planting (alarm on with a single bargraph segment on and a flashing row number on a single row).	Seed tube sensor is blocked.	Clean sensor.
	Faulty seed tube sensor.	Replace sensor.
	Meter not planting or underplanting.	Repair/replace meter.
	Chain broken or off sprocket.	Repair as necessary.
Seed tube sensor dirty or blocked warning comes on.	Seed tube sensor is dirty.	Clean sensor.
	Faulty seed tube sensor.	Replace sensor.
LED on the seed tube sensor will not come on.	Faulty seed tube sensor.	Replace sensor.
	Dirty or corroded connector.	Clean connector.
	Break in the harness just before the sensor.	Repair harness.
Erroneous MPH readings at idle. (Radar Distance Sensor Only)	Radar sensor not located in a stable location.	Relocate to a more stable location.

MAINTENANCE

POINT ROW CLUTCH INSPECTION

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

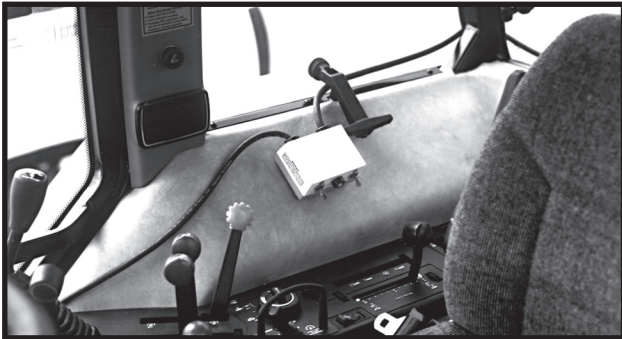
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The right hand clutch operates clockwise and the left hand clutch operates counterclockwise. Therefore, some of the parts of the clutch such as the wrap spring differ from one side of the planter to the other. Be sure to use the correct repair part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

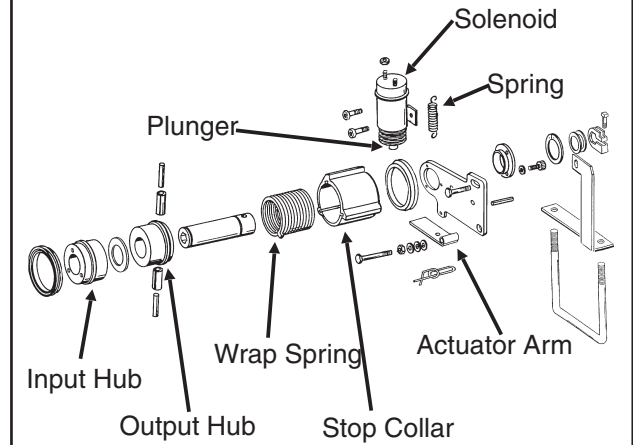
The control box is equipped with a resettable circuit breaker. To reset the circuit breaker, press the red button on the circuit breaker until it snaps into place. If the circuit breaker continues to trip, check to see what is causing it to trip. See "Point Row Clutch Troubleshooting".

76740-48



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

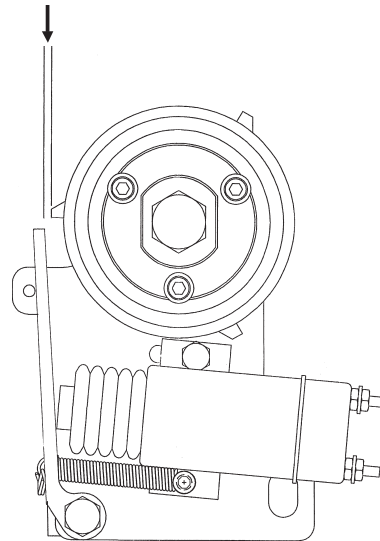
(TWL70e)



(A7110)

ACTUATOR ARM ADJUSTMENT

NOTE: Gap between actuator arm and stop on stop collar should be $\frac{1}{8}$ " ($\pm\frac{1}{32}$ ") when the solenoid is NOT engaged.



NOTE: To adjust gap between actuator arm and stop, loosen nut on mounting pin and move pin in slot until there is $\frac{1}{8}$ " ($\pm\frac{1}{32}$ ") gap between arm and stop on stop collar. Retighten nut.

MAINTENANCE

POINT ROW CLUTCH TROUBLESHOOTING

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

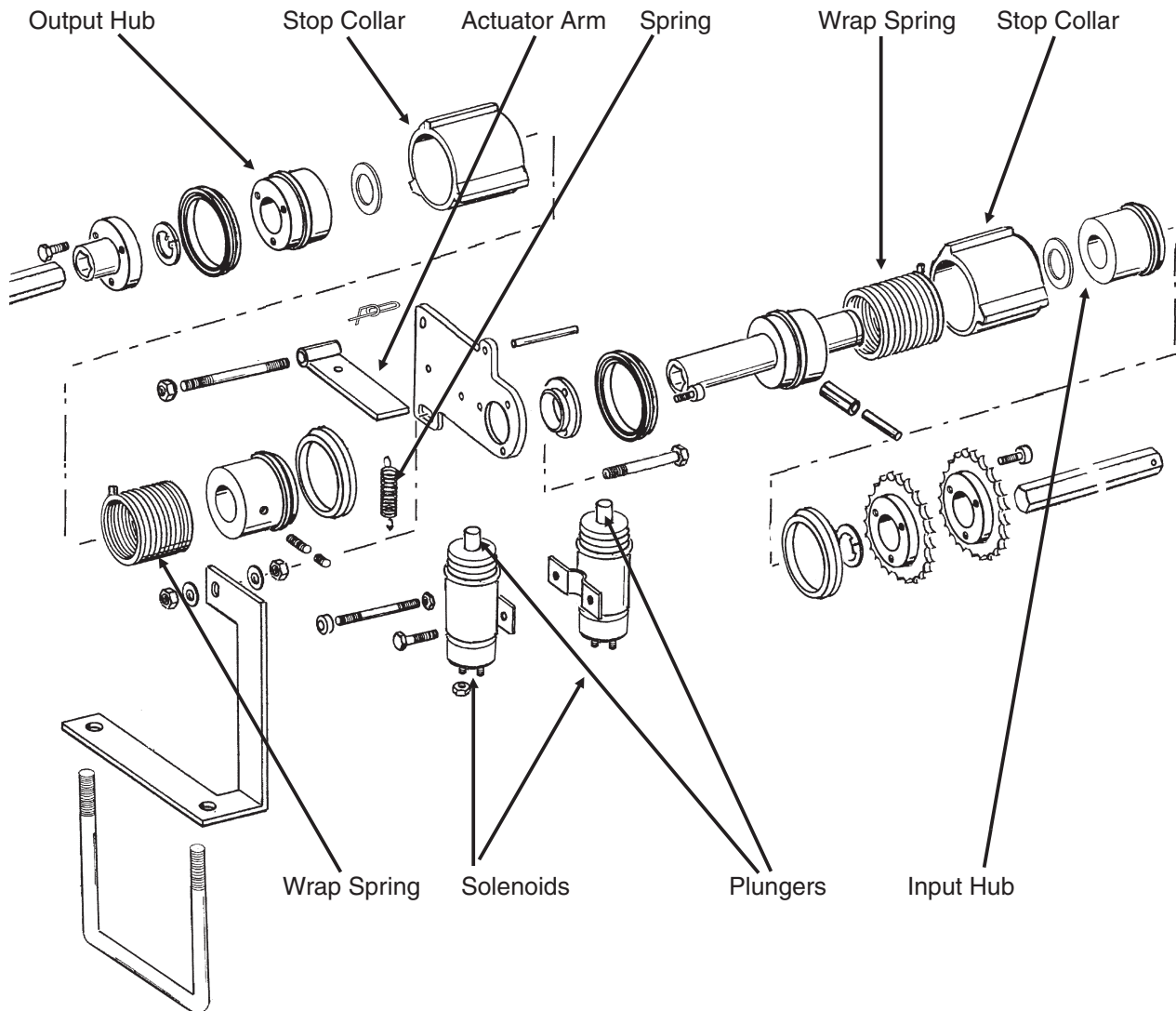
MAINTENANCE

TWO-SPEED POINT ROW CLUTCH

The two-speed point row clutch is similar in design and operation to the standard point row clutch except for the two-speed function. If a two-speed clutch or clutches fail to operate properly, refer to "Point Row Clutch Inspection" and "Point Row Clutch Troubleshooting" for additional information.

NOTE: If the "Reduced Rate/Full Rate" functions fail to engage or disengage, see troubleshooting chart for possible cause.

(EF50d)



MAINTENANCE

ROW MARKER SEQUENCING/FLOW CONTROL VALVE INSPECTION

The valve block assembly consists of the row 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.

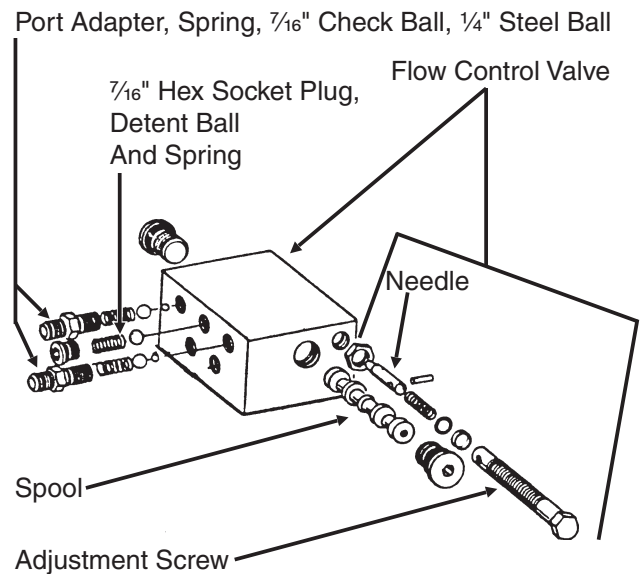
3. Remove plug from both sides of valve block and remove spool.
4. Inspect all parts for pitting, contamination or foreign material. Also check seating surfaces inside the valve. Replace any parts found to be defective.
5. Lubricate spool with a light oil and reinstall. Check to be sure spool moves freely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

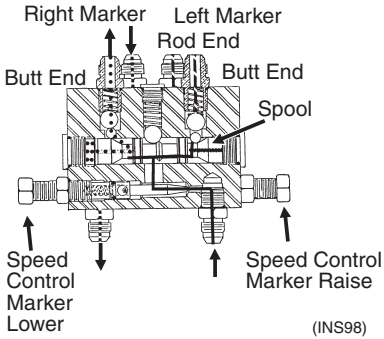
NOTE: When oil is cold, hydraulics operate slowly. Make sure all adjustments are made with warm oil.

VVB025(PLTR43)



MAINTENANCE

ROW MARKER OPERATION TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
<p>Same marker always operating.</p>  <p>(INS98)</p>	<p>Spool in sequencing valve not shifting.</p>	<p>Remove spool. Inspect for foreign material, making sure all ports in spool are open. Clean and reinstall.</p>
<p>Both markers lowering and only one raising at a time.</p>	<p>Hoses from cylinders to valve connected backwards.</p>	<p>Check hosing diagram in manual and correct.</p>
<p>Both markers lower and raise at same time</p>	<p>Foreign material under check ball in sequencing valve.</p>	<p>Remove hose fitting, spring and balls. Clean. May be desirable to remove spool and clean as well.</p>
	<p>Check ball missing or installed incorrectly in sequencing valve.</p>	<p>Disassemble and correct. See above illustration.</p>
<p>Marker (in raised position) settling down.</p>	<p>Damaged o-ring in marker cylinder or cracked piston.</p>	<p>Disassemble cylinder and inspect for damage and repair.</p>
	<p>Spool in sequencing valve not shifting completely because detent ball or spring is missing.</p>	<p>Check valve assembly and install parts as needed.</p>
	<p>Spool in sequencing valve shifting back toward center position.</p>	<p>Restrict flow of hydraulic oil from tractor to sequencing valve.</p>
<p>Neither marker will move.</p>	<p>Flow control closed too far.</p>	<p>Loosen locking nut and turn flow control adjustment bolt out or counterclockwise until desired speed is set.</p>
<p>Markers moving too fast.</p>	<p>Flow control open too far.</p>	<p>Loosen locking nut and turn flow control adjustment bolt in or clockwise until desired speed is set.</p>
<p>Sporadic marker operation speed.</p>	<p>Needle sticking open in flow control valve.</p>	<p>Remove flow control, inspect and repair or replace.</p>

MAINTENANCE

LIFT CIRCUIT OPERATION TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	TROUBLESHOOTING*	SOLUTION
Planter raising uneven.	Master cylinder is leaking.	With turnbuckle off, raise planter slowly until master cylinder reaches end of stroke. If master cylinder is leaking it will lag behind the slave cylinder, causing the tire to squat less. If planter settles when hydraulic lever is released, check assist cylinders.	Check for contamination in rephasing valve in piston. Prior to removing rephasing valve, measure the set screw setting by turning the set screw clockwise and counting the revolutions until it bottoms out. After cleaning rephasing valve, bottom the screw out and back it out the same number of revolutions as the original setting. Replace rephasing valve and adjust as stated above or replace piston. Install seal kit. Consult your KINZE® Dealer for leak testing and rephasing valve adjustment if necessary.
	Slave cylinder is leaking.	With turnbuckle off, raise and lower planter. As planter lowers, the side with leaking slave cylinder will drop rapidly. With turnbuckle on, install wheel lockups on master and assist cylinders. Retract slave cylinder and observe which tire settles. If planter settles when hydraulic lever is released, check assist cylinders.	Check for contamination in rephasing valve in piston. Prior to removing rephasing valve, measure the set screw setting by turning the set screw clockwise and counting the revolutions until it bottoms out. After cleaning rephasing valve, bottom the screw out and back it out the same number of revolutions as the original setting. Replace rephasing valve and adjust as stated above or replace piston. Install seal kit. Consult your KINZE® Dealer for leak testing and rephasing valve adjustment if necessary.
Planter raising even; however, planter settles when hydraulic lever is released.	Assist cylinder is leaking.	With turnbuckle on, install lockups on the master cylinder and slave cylinders. Retract assist cylinder and observe which tire settles.	Seal on piston is leaking. Install seal kit.

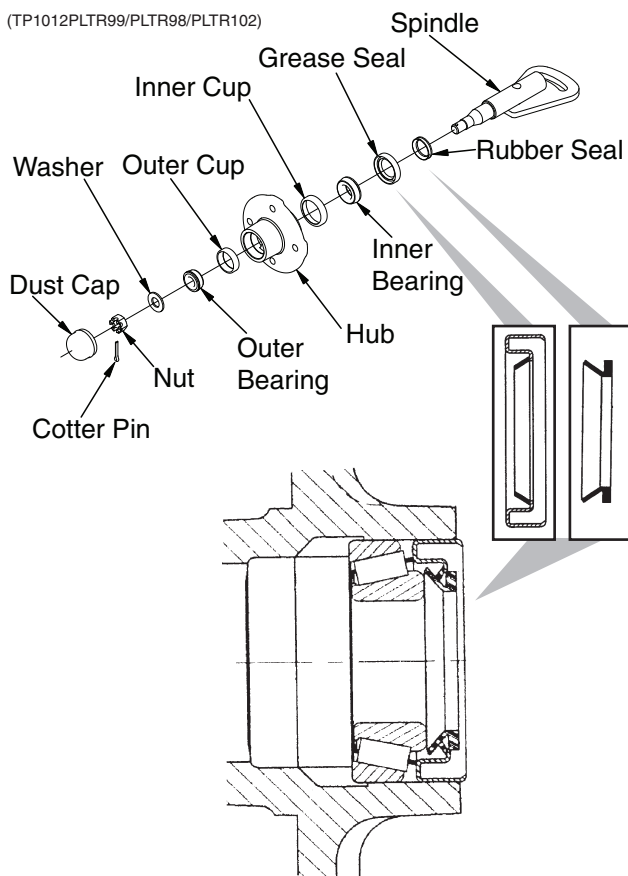
* Operate hydraulics slowly to accentuate the problem. Rephase after each lowering cycle.

MAINTENANCE

ROW 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 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.

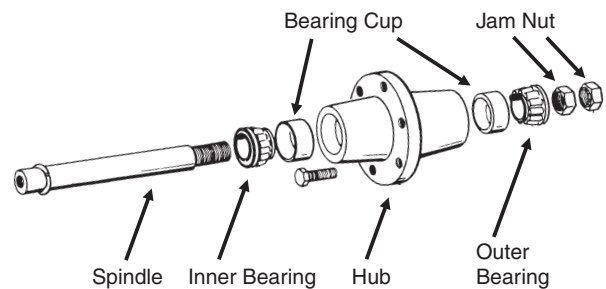
(TP1012PLTR99/PLTR98/PLTR102)



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. Also fill the space between the bearing cups in the hub with grease.
6. Place inner bearing in place.
7. Clean spindle and install hub.
8. Install outer bearing and jam nut. Tighten jam nut while rotating hub until there is some drag. This assures that all bearing surfaces are in contact. Back off jam nut $\frac{1}{4}$ 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.

(EF35e)



MAINTENANCE

PISTON PUMP STORAGE

IMPORTANT: 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.

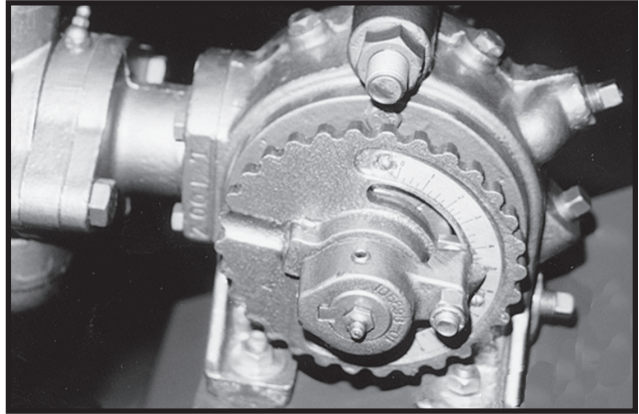
Overnight Storage

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

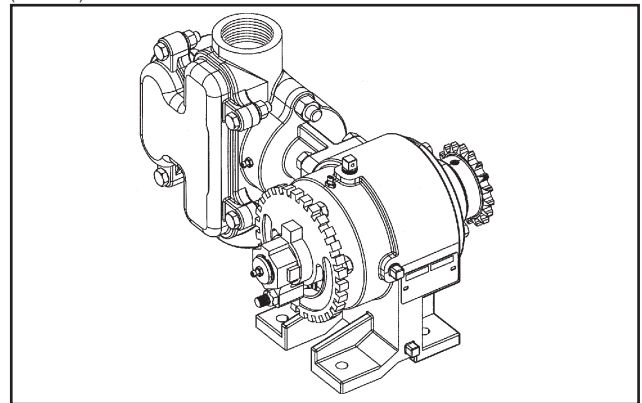
Winter Storage

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.

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(A12330a)



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 metering.	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.

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

Make sure all seed and granular chemical hoppers are empty and clean.

Clean seed meters and store in a rodent-free, dry area.

Remove seed discs from brush-type seed meters, clean and store meters with discs removed.

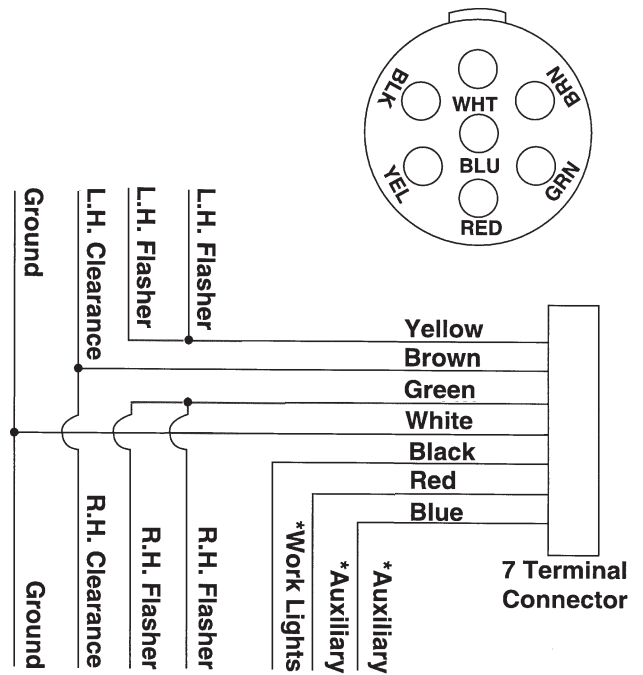
Grease or paint disc openers/blades and row marker disc blades to prevent rust.

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.

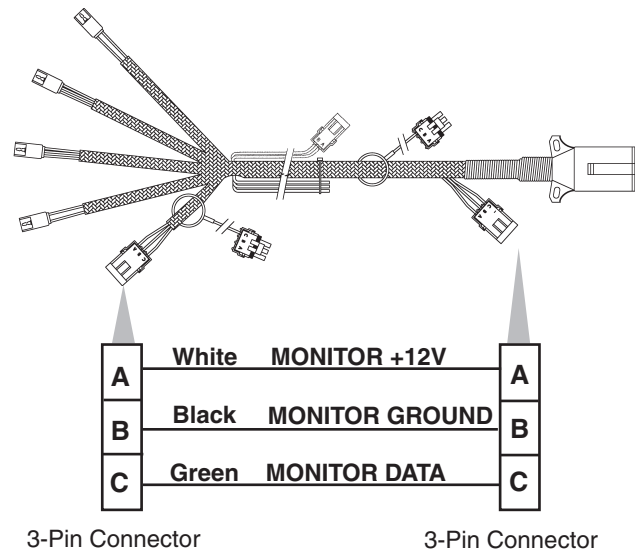
ELECTRICAL WIRING DIAGRAM FOR LIGHT PACKAGE

(WGN66b)



* Optional customer-supplied auxiliary lights and wires may be wired into existing plug terminals.

(A9206a)

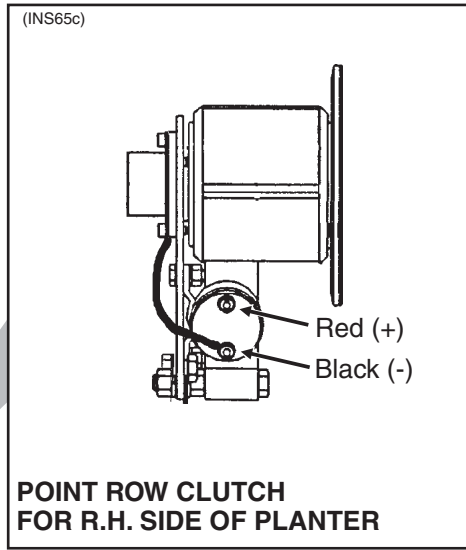
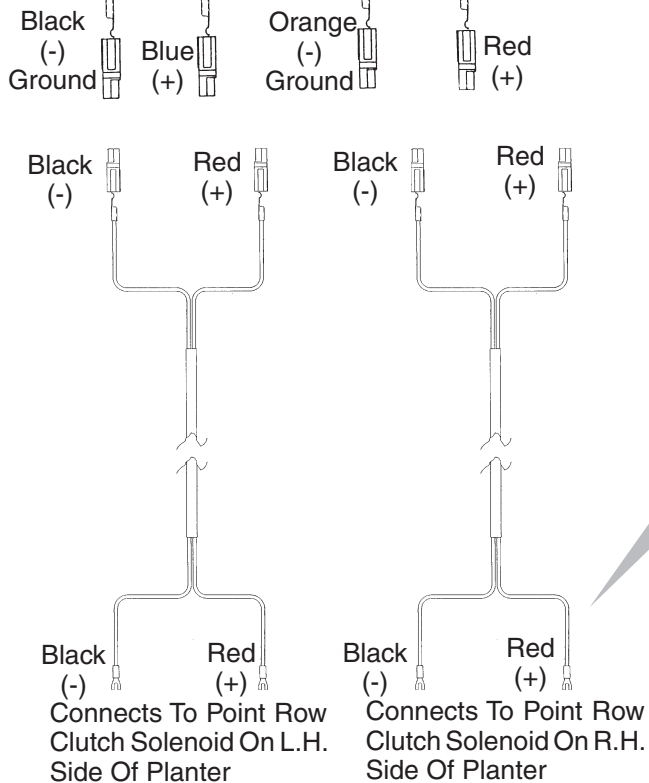
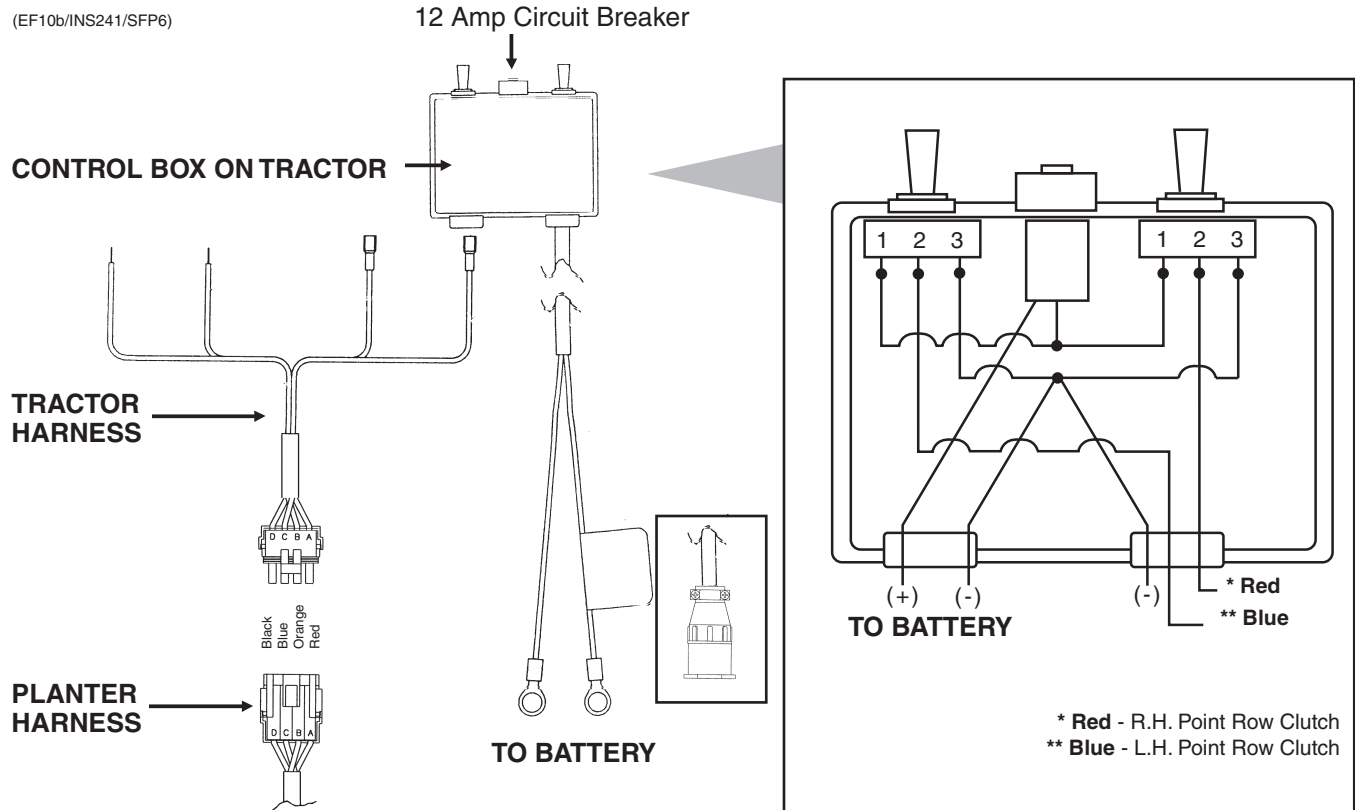


The light package supplied on the Model 3200 planter meets ASAE Standards. For the correct wiring harness to be wired into the lights on your tractor, check with the tractor manufacturer.

MAINTENANCE

ELECTRICAL WIRING DIAGRAMS FOR POINT ROW CLUTCHES

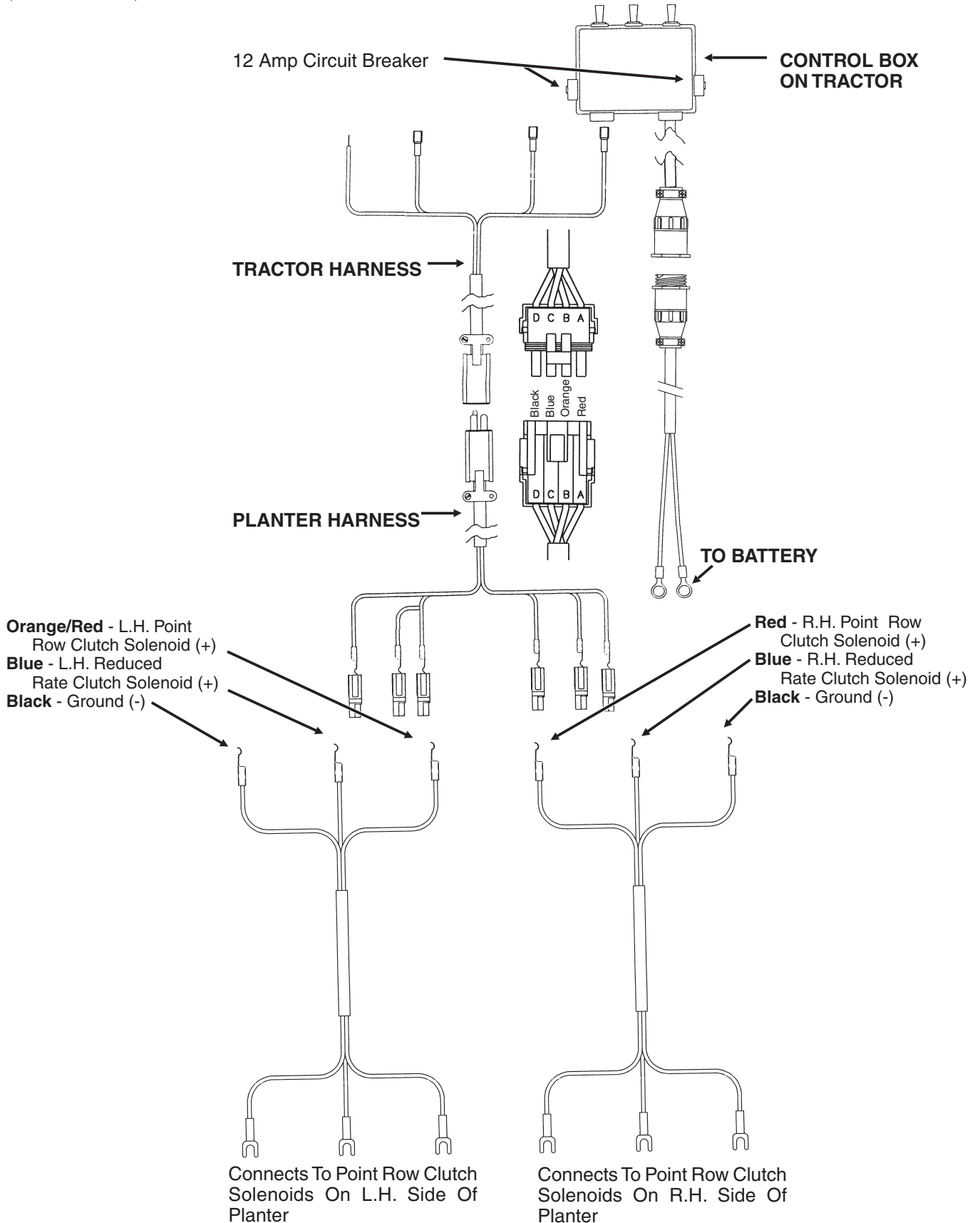
(EF10b/INS241/SFP6)



MAINTENANCE

ELECTRICAL WIRING DIAGRAMS FOR TWO-SPEED POINT ROW CLUTCHES

(SFP461/TWL71a/ELC27)

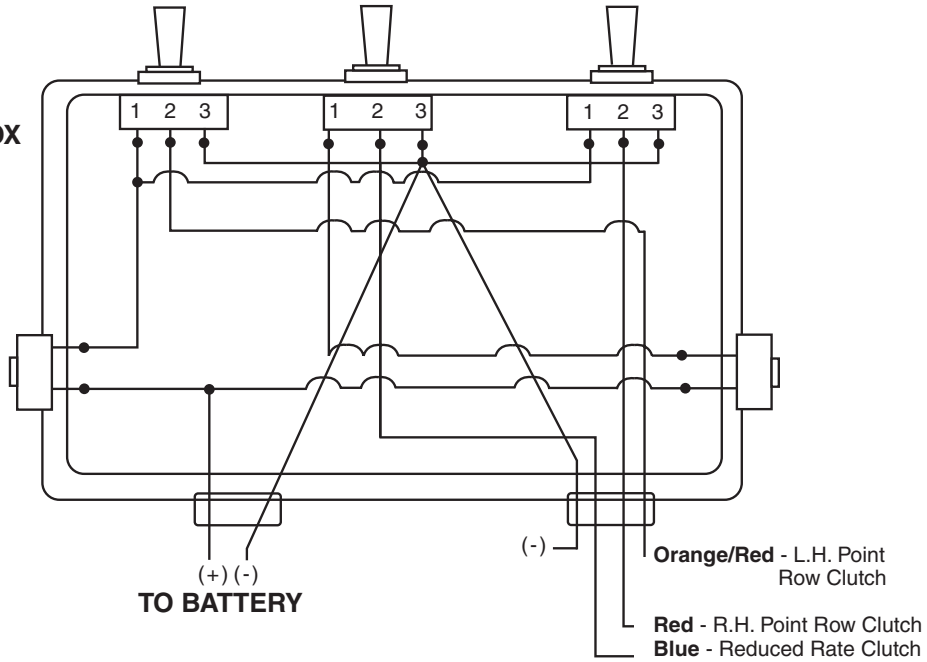


MAINTENANCE

ELECTRICAL WIRING DIAGRAMS FOR TWO-SPEED POINT ROW CLUTCHES

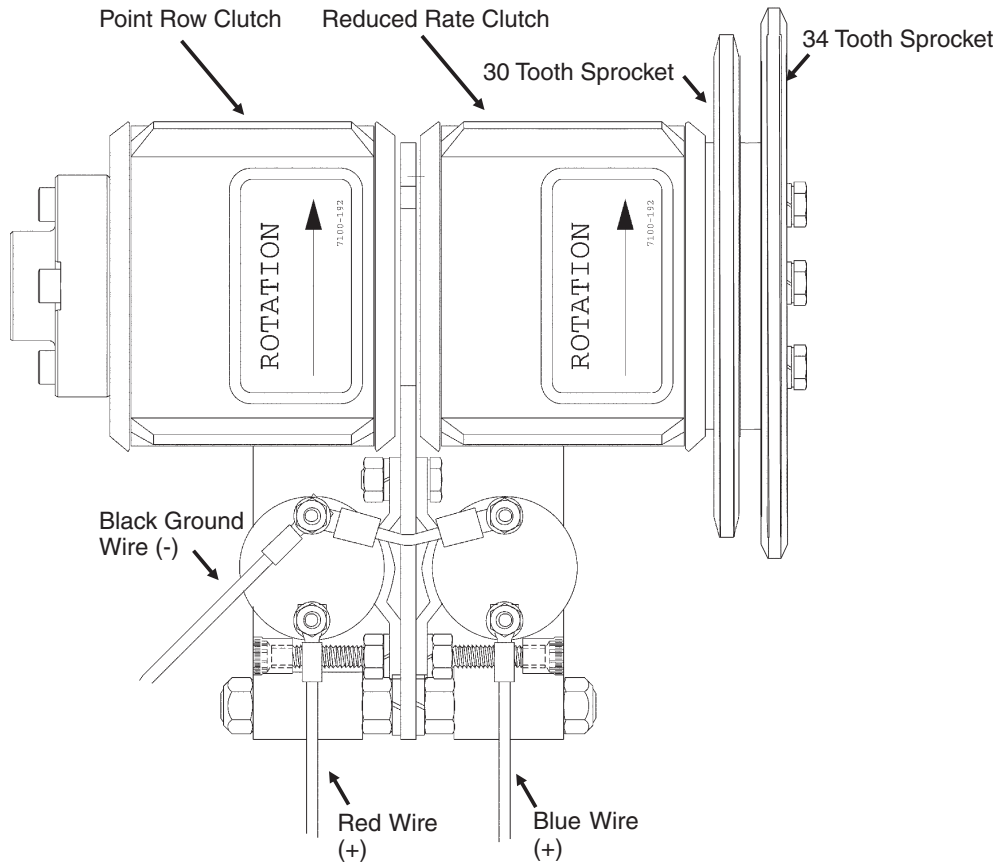
(INS242)

CONTROL BOX
ON TRACTOR



TWO-SPEED POINT ROW CLUTCH FOR L.H. SIDE OF PLANTER SHOWN

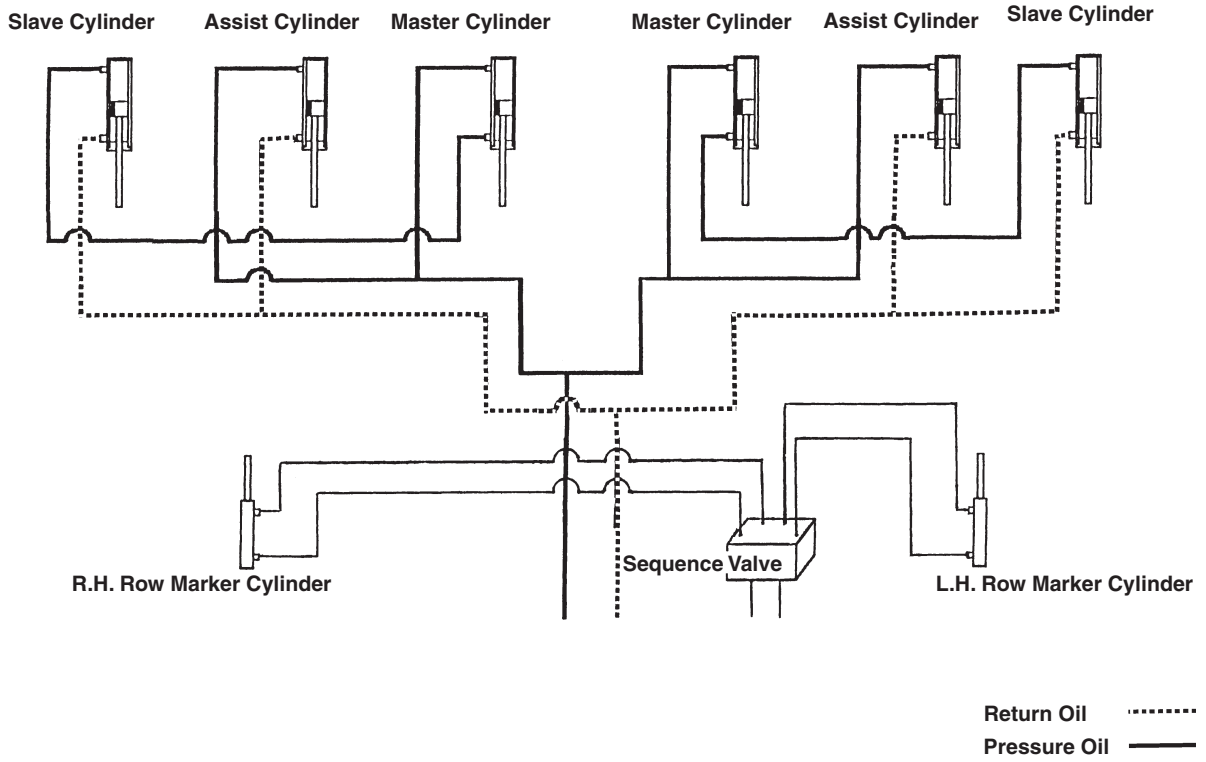
(INS126b)



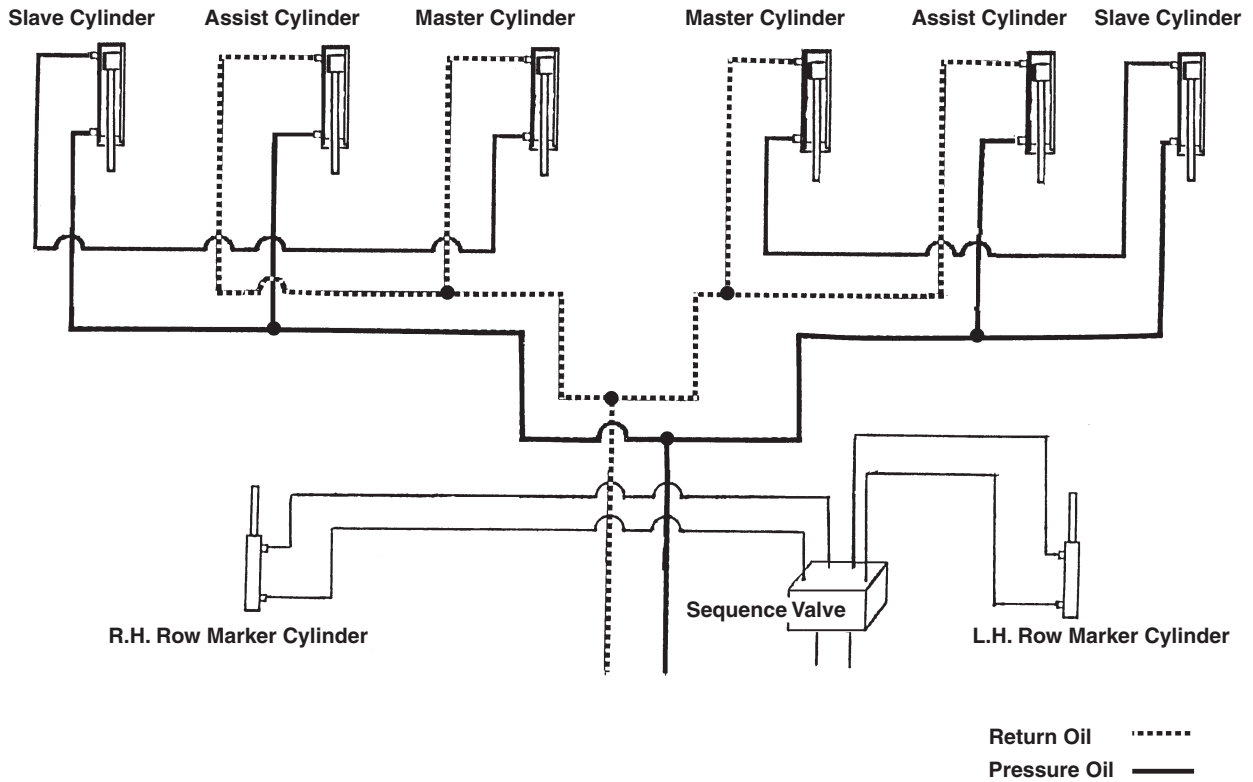
MAINTENANCE

HYDRAULIC SYSTEM SCHEMATIC - Planter Raising

(INS103d/INS104e)



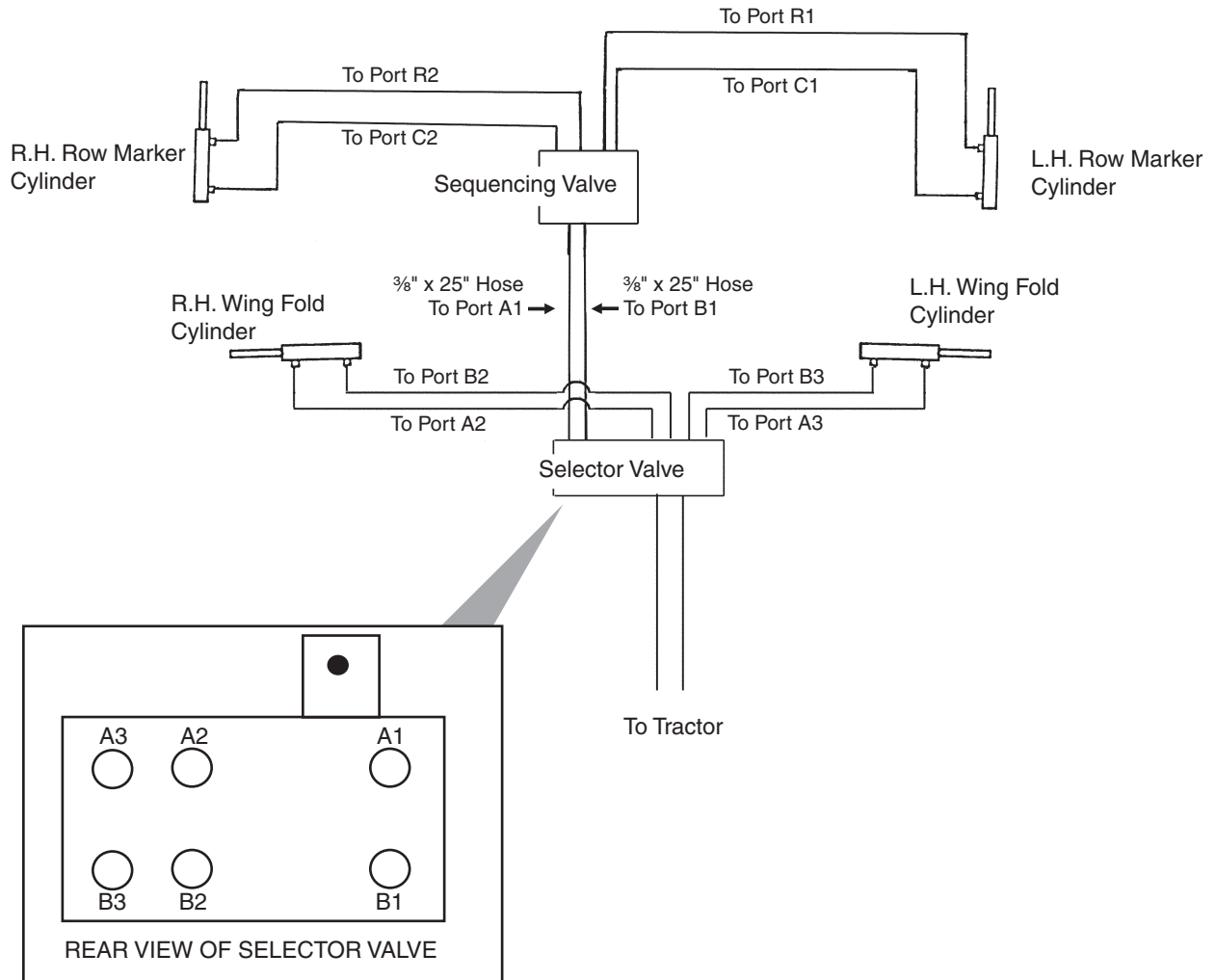
HYDRAULIC SYSTEM SCHEMATIC - Planter Lowering



MAINTENANCE

(INS104d)

OPTIONAL HYDRAULIC WING FOLD SYSTEM SCHEMATIC



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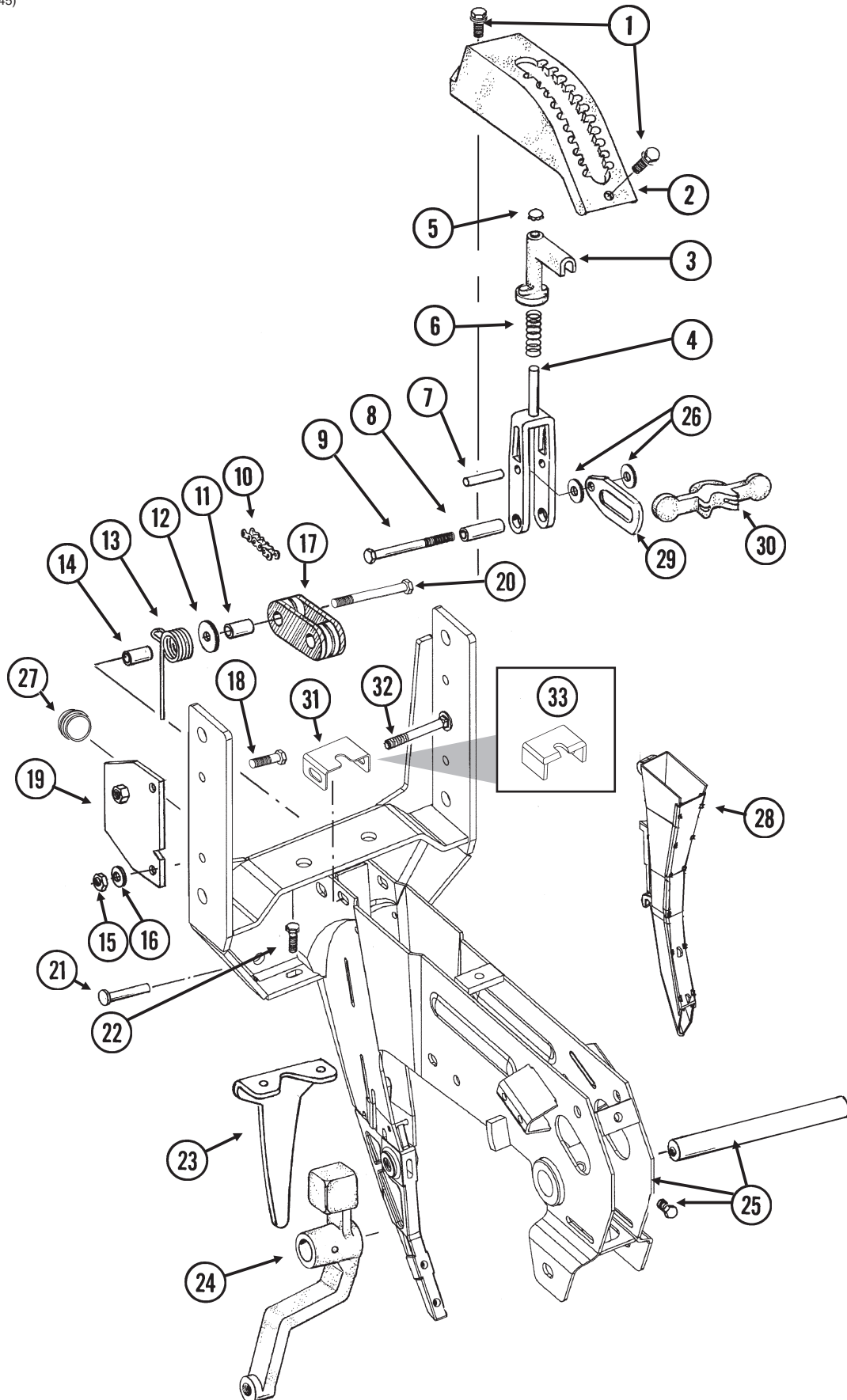
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SHANK ASSEMBLY, SEED TUBE AND DEPTH ADJUSTMENT

(METR29cc/D16245)

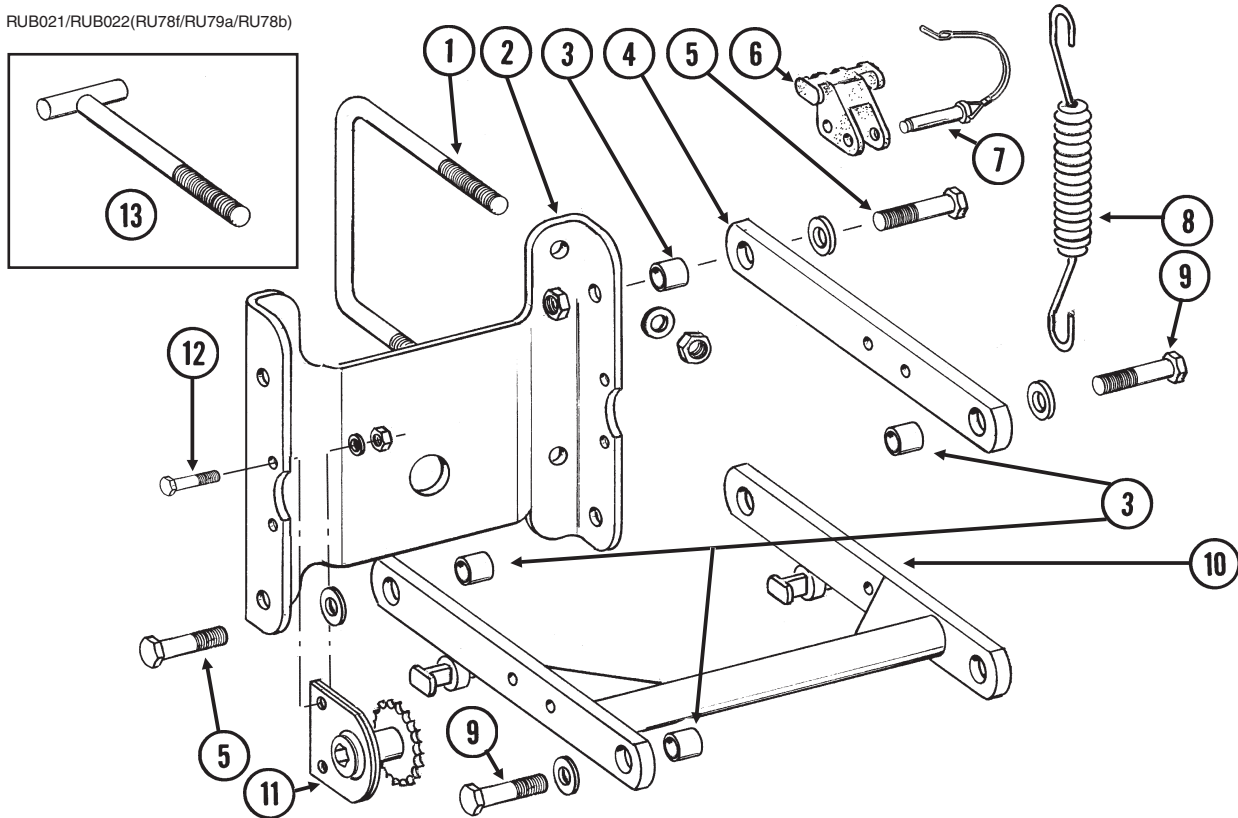


SHANK ASSEMBLY, SEED TUBE AND DEPTH ADJUSTMENT

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G11015	2	Hex Washer Head Cap Screw, 3/8"-16 x 1 1/4"
2.	GB0274	1	Cover, Depth Adjustment
3.	GB0266	1	Handle, Depth Adjustment
4.	GB0267	1	Lever, Depth Adjustment
5.	GD3612	1	Cap Plug
6.	GD10993	1	Spring
7.	GD13361	1	Pin, 3/8" x 1 2/3"
8.	GD11259	1	Sleeve, 3/8" I.D. x 5/8" O.D. x 1 25/32" Long
9.	G11008	1	Hex Head Cap Screw, 3/8"-24 x 2 1/2", Grade 8
	G11007	1	Lock Nut, 3/8"-24, Grade C
10.	G3303-98	1	Chain, No. 41, 98 Pitch Including Connector Link
	G3303-16	1	Chain, No. 41, 16 Pitch Including Connector Link (Used w/Row Unit Extension Brackets)
	GR0196	1	Connector Link, No. 41
11.	GD1026	1	Sleeve, 1 3/16" Long
12.	G10201	1	Special Washer, 3/8" x 1 1/2" O.D.
13.	GD1065	1	Idler Spring
14.	GD7318	1	Sleeve, 1" Long
15.	G10108	1	Lock Nut, 3/8"-16
16.	G11387	1	Flat Washer, 3/8" SAE
17.	GD11962	1	Idler
18.	G10003	3	Hex Head Cap Screw, 3/8"-16 x 1 1/2"
	G10108	3	Lock Nut, 3/8"-16
19.	GD10867	2	Stop
20.	G10326	1	Hex Head Cap Screw, 3/8"-16 x 3 3/4"
21.	G10551	1	Clevis Pin, 1/4" x 2 1/2"
	G10669	1	Hair Pin Clip, No. 22
22.	G10312	2	Carriage Bolt, 5/16"-18 x 3/4"
	G10620	2	Serrated Flange Nut, 5/16"-18
23.	GD1033	1	Shield
24.		-	See "Gauge Wheels", Pages P6 And P7
25.	GA10157	1	Shank W/Gauge Wheel Pivot Spindle And Set Screw
	GD11001	-	Spindle
	G10438	-	Hex Head Cap Screw, 1/2"-13 x 3/4"
26.	G10207	2	Washer, 7/8" O.D. x 1 3/32" I.D. x .134" (If Applicable)
27.	GD11845	1	Dust Cap
28.			See "KPM I Electronic Seed Monitor", "KPM II Stack-Mode Electronic Seed Monitor And KPM III Electronic Seed Monitor", Pages P66-P71
29.	GB0285	1	Collar, Depth Adjustment
30.	GB0265	1	Pivot Link, Depth Adjustment
31.	GD15970	1	Sun Shade
32.	G10304	1	Carriage Bolt, 3/8"-16 x 3"
	G10108	1	Lock Nut, 3/8"-16
33.	GD16245	-	Sun Shade (Rubber)

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

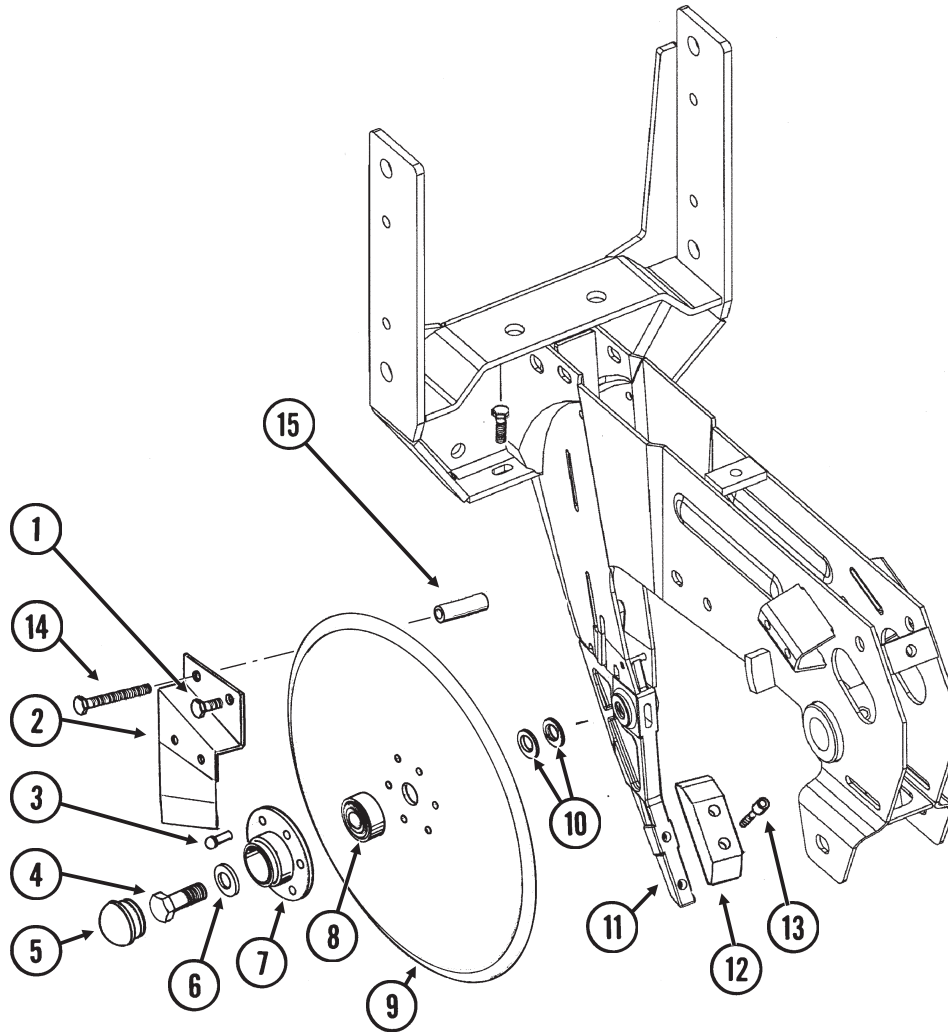
RUB021/RUB022(RU78f/RU79a/RU78b)



ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	GD1114	2	U-Bolt, 7" x 7" x 5/8"-11
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
2.	GD10036	1	Mounting Support Plate
3.	GB0218	4	Bushing, 2 1/32" I.D. x 7/8" O.D. x 19/32" Long
4.	GD11422	2	Upper Parallel Arm
5.	G10732	4	Hex Head Cap Screw, 5/8"-18 x 2"
	G11391	4	Flat Washer, 5/8" SAE
	G10412	4	Lock Nut, 5/8"-18
6.	GB0186	2	Spring Anchor
7.	GD14217	2	Tab Lock Pin, 7/16" x 1 1/2"
8.	GD8249	2-4	Spring
9.		-	See "Hopper Support And Meter Drive", Page P12
10.	GA5651	1	Lower Parallel Arm
11.	GA1720	1	Bearing/Sprocket, 7/8" Hex Bore
12.	G10001	2	Hex Head Cap Screw, 3/8"-16 x 1"
	G10229	2	Lock Washer, 3/8"
	G10101	2	Hex Nut, 3/8"-16
13.	GA8140	-	T-Bolt, 5/8"-11 x 7"
	G10230	-	Lock Washer, 5/8"
	G10104	-	Hex Nut, 5/8"-11
A.	G6326X	-	U-Bolt Package For 7" x 7" Toolbar, Includes: (2) GD1114, (4) G10230, (4) G10104

15" SEED OPENER DISC BLADE/BEARING ASSEMBLY AND SCRAPERS

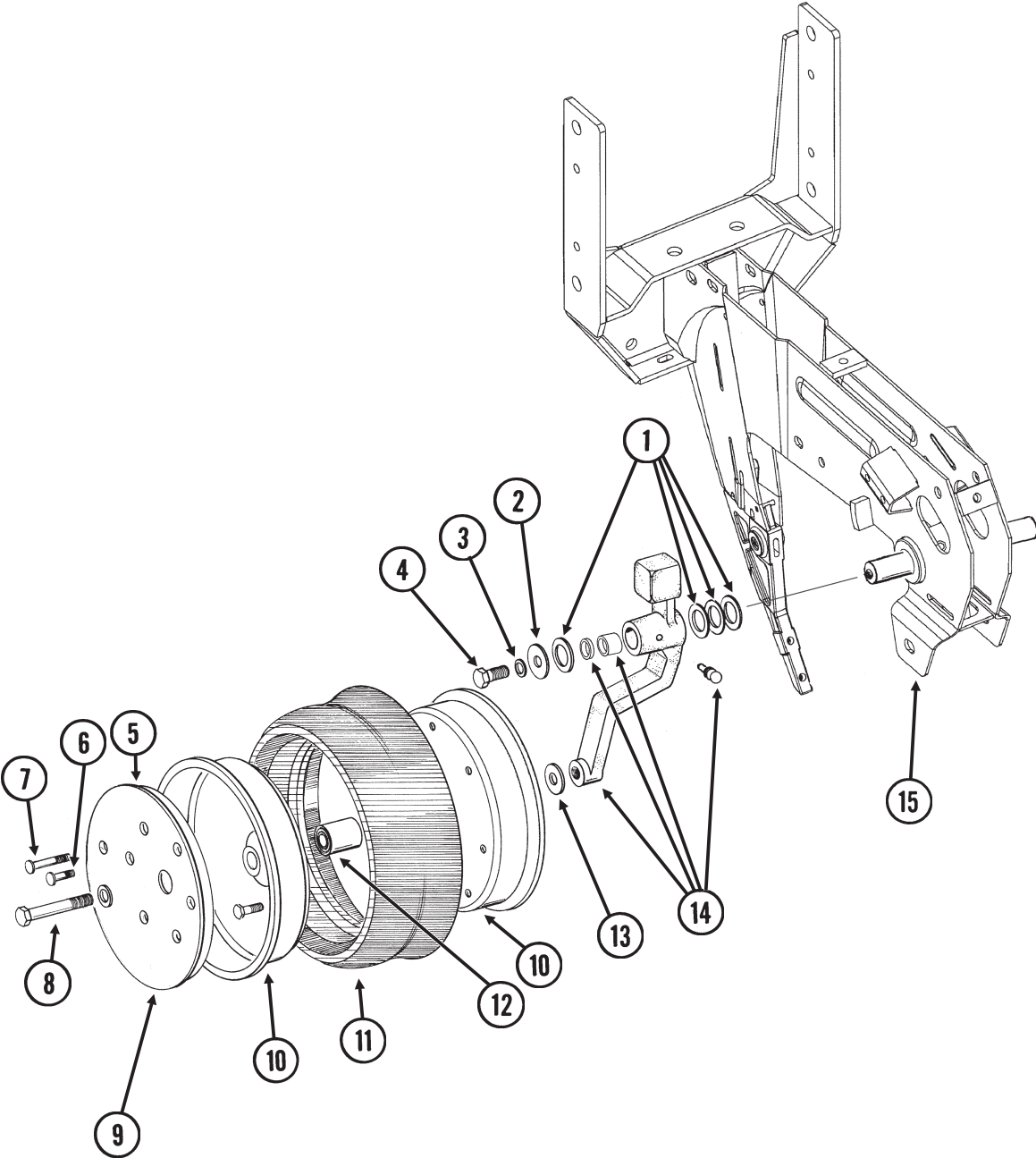
(RU139)



ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G10328	2	Hex Head Cap Screw, 3/8"-16 x 5/8"
	G10622	2	Serrated Flange Nut, 3/8"-16
2.	GA2012R	1	Disc Scraper, R.H.
	GA2012L	-	Disc Scraper, L.H. (Shown)
3.	G10427	12	Rivet, 1/4" x 1/2"
4.	GD11017	1	Special Hex Head Cap Screw, 5/8"-11 x 1 1/2", L.H. Threads
	G10007	1	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
5.	GD11845	2	Dust Cap
6.	G10204	2	Special Machine Bushing, 5/8" x 1" O.D.
7.	GD10473	2	Bearing Housing
8.	GA2014	2	Bearing
9.	GD11306	2	Disc Blade, 3.5 mm x 15"
10.	G10213	-	Machine Bushing, 5/8" (.030" Thick)(As Required)
11.		-	See "Shank Assembly", Pages P2 And P3
12.	GB0301	1	Seed Tube Guard/Inner Scraper
13.	G10912	2	Hex Socket Head Cap Screw, 5/16"-18 x 1", Grade 8
14.	G10325	1	Hex Head Cap Screw, 3/8"-16 x 2 3/4"
	G10622	1	Serrated Flange Nut, 3/8"-16
15.	GD11259	1	Sleeve, 3/8" I.D. x 5/8" O.D. x 1 25/32" Long
A.	GA8324	-	Disc Blade/Bearing Assembly, Less Dust Cap (Items 3 And 7-9)

GAUGE WHEELS

(RU140)

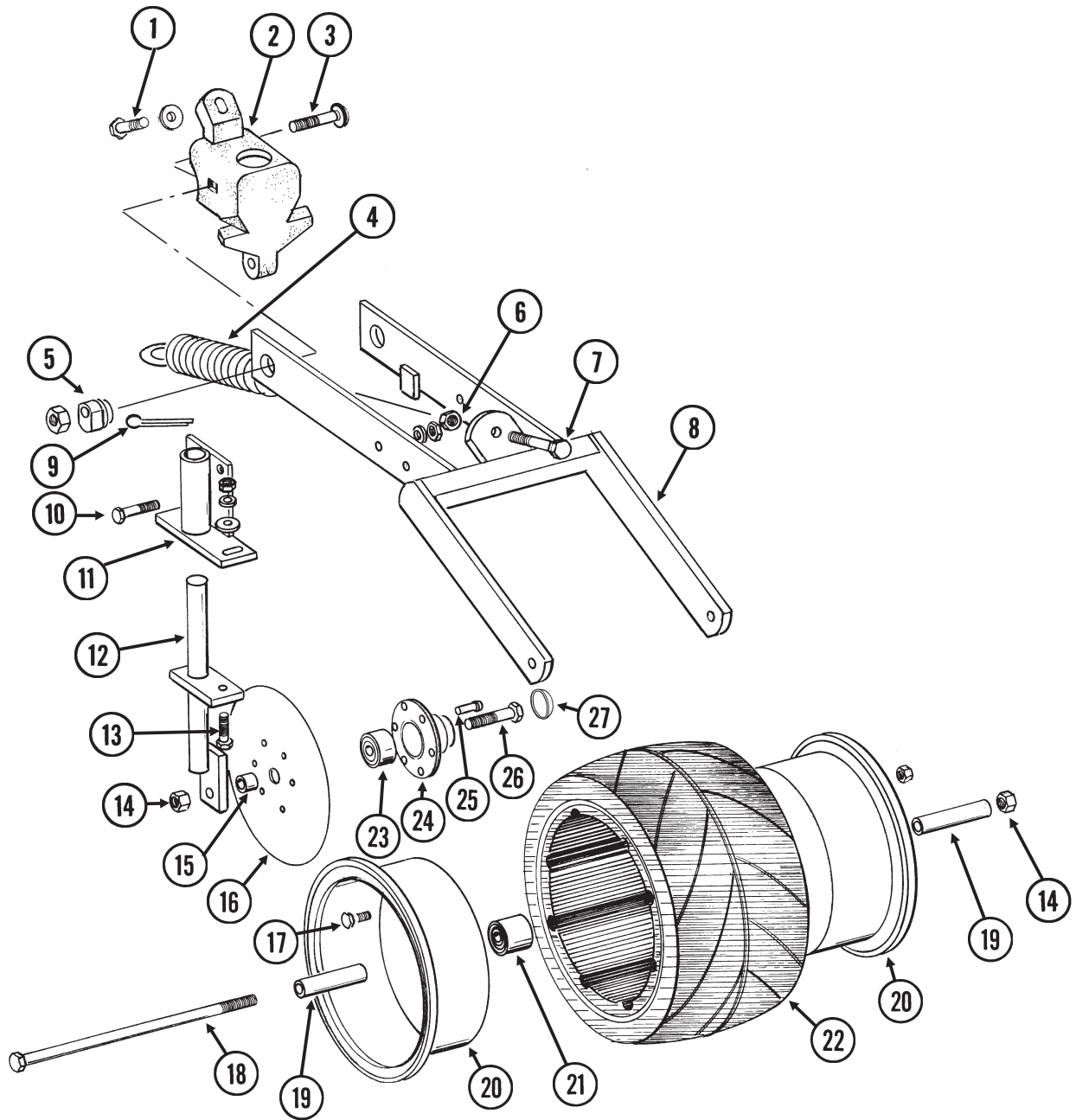


GAUGE WHEELS

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G10940	-	Machine Bushing, 1" (.048" Thick)
2.	G10216	2	Washer, 1/2" USS
3.	G10228	2	Lock Washer, 1/2"
4.	G10014	1	Hex Head Cap Screw, 1/2"-13 x 1"
5.	GD11453	2	Cover
6.	G10338	12	Carriage Bolt, 5/16"-18 x 1 1/4"
	G10620	12	Serrated Flange Nut, 5/16"-18
7.	G10924	8	Carriage Bolt, 5/16"-18 x 1 3/4"
	G10620	8	Serrated Flange Nut, 5/16"-18
8.	G10010	2	Hex Head Cap Screw, 5/8"-11 x 3"
	G10230	2	Lock Washer, 5/8"
9.	G10018	14	Hex Head Cap Screw, 5/16"-18 x 5/8"
	G10109	14	Lock Nut, 5/16"-18, Grade 8
10.	GD11423	4	Half Wheel
11.	GD1086	2	Tire
12.	GA6171	2	Bearing
13.	G10204	2	Special Machine Bushing, 5/8" x 1" O.D.
14.	GA7975	1	Wheel Arm W/Grease Fitting, Bushings And Seals, L.H. (Shown)
	GA7976	1	Wheel Arm W/Grease Fitting, Bushings And Seals, R.H.
	G10640	1	Grease Fitting, 1/4"-28 (Per Arm)
	GB0276	2	Bushing, 1" I.D. x 1 1/4" O.D. x 1" Long (Per Arm)
	GD10991	2	Seal (Per Arm)
15.		-	See "Shank Assembly", Pages P2 And P3
A.	GA7949	-	Gauge Wheel Complete (Items 5-7 And 9-12)
B.	G1K296	-	Gauge Wheel Arm Bushing And Seal Driver Kit, Includes: (1) Seal Driver, (1) Bushing Driver, (1) Instruction

COVERING DISCS/SINGLE PRESS WHEEL

RUA054/RUB026(RU94d)

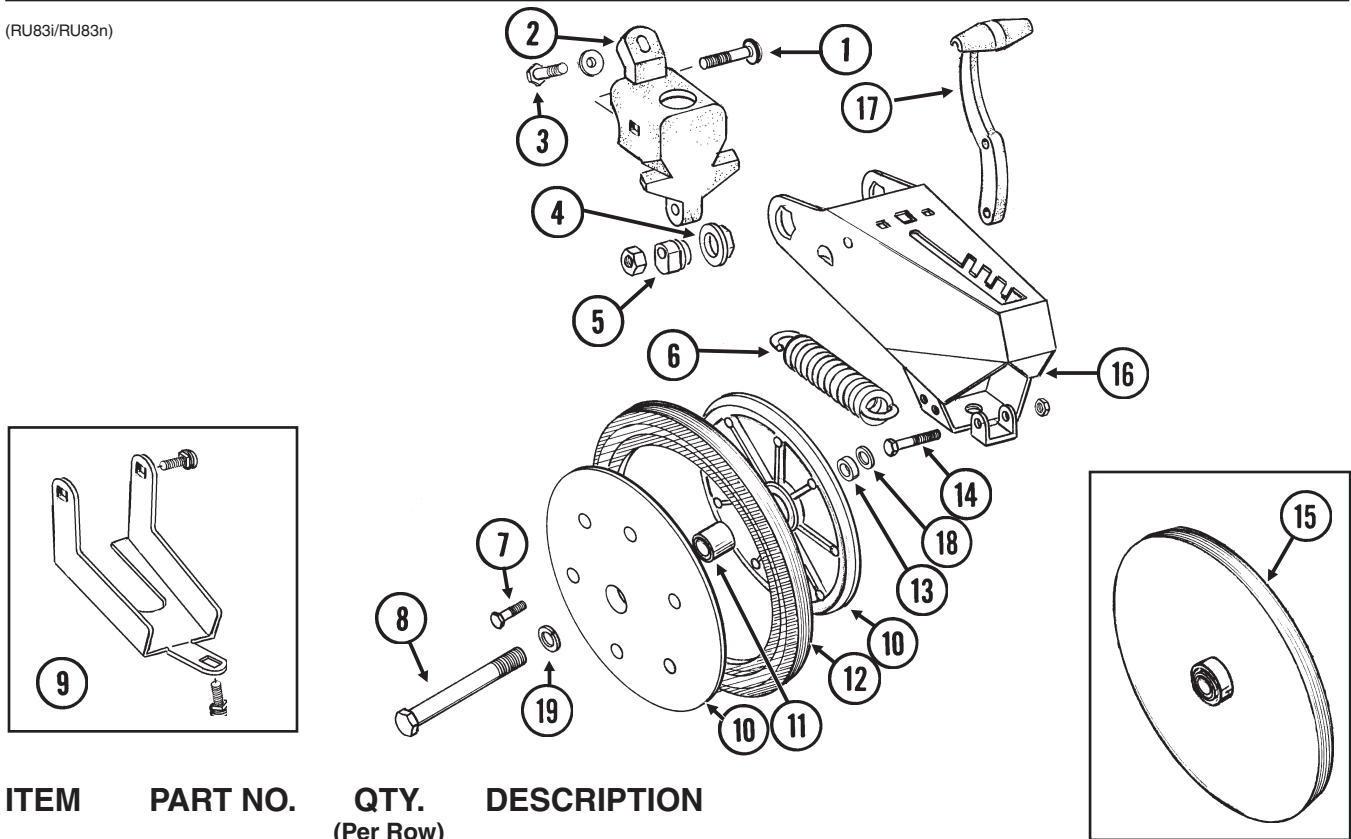


COVERING DISCS/SINGLE PRESS WHEEL

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Row)	
1.	G10001	1	Hex Head Cap Screw, 3/8"-16 x 1"
	G11387	1	Flat Washer, 3/8" SAE
2.	GB0268	1	Wheel Arm Stop
3.	G10801	2	Carriage Bolt, 1/2"-13 x 2 1/4"
	G10315	-	Carriage Bolt, 1/2"-13 x 2 1/2" (Used W/Straight Drop In-Furrow Granular Chemical Bracket)
	G10102	2	Hex Nut, 1/2"-13
4.	GA2054	1	Spring
5.	GB0239	2	Eccentric Bushing
6.	G10102	1	Hex Nut, 1/2"-13
7.	G10015	1	Adjusting Bolt, 1/2"-13 x 5"
8.	GA6619	1	Mounting Arm
9.	G10463	2	Cotter Pin, 1/4" x 1 1/2"
10.	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
11.	GA6620	2	Bracket
12.	GA6618	2	Mount
13.	G10303	2	Carriage Bolt, 5/16"-18 x 1"
	G11386	2	Flat Washer 5/16" SAE
	G10232	2	Lock Washer, 5/16"
	G10106	2	Hex Nut, 5/16"-18
14.	G10107	3	Lock Nut, 5/8"-11
15.	GD1109	2	Bushing, 4 1/64" I.D. x 7/8" O.D. x 1/4" Long
16.	GD9290	2	Disc Blade, 8"
17.	G10018	7	Hex Head Cap Screw, 5/16"-18 x 5/8"
	G10109	7	Lock Nut, 5/16"-18, Grade 8
18.	G10152	1	Hex Head Cap Screw, 5/8"-11 x 9"
19.	GD3180-12	2	Sleeve, 5/8" I.D. x 7/8" O.D. x 2 7/8" Long
20.	GD9562	2	Half Wheel
21.	GA6171	1	Bearing
22.	GD9305	1	Tire
23.	GA2014	2	Bearing
24.	GD10473	2	Bearing Housing
25.	G10427	12	Rivet, 1/4" x 1/2"
26.	G10006	2	Hex Head Cap Screw, 5/8"-11 x 2 1/4"
27.	GD11845	2	Dust Cap
A.	GA6733	-	Single Press Wheel Complete W/Bearing (Items 17 And 20-22)
B.	GA6801	-	Covering Disc Blade Complete W/Bearing (Items 16 And 23-25)

"V" CLOSING WHEELS

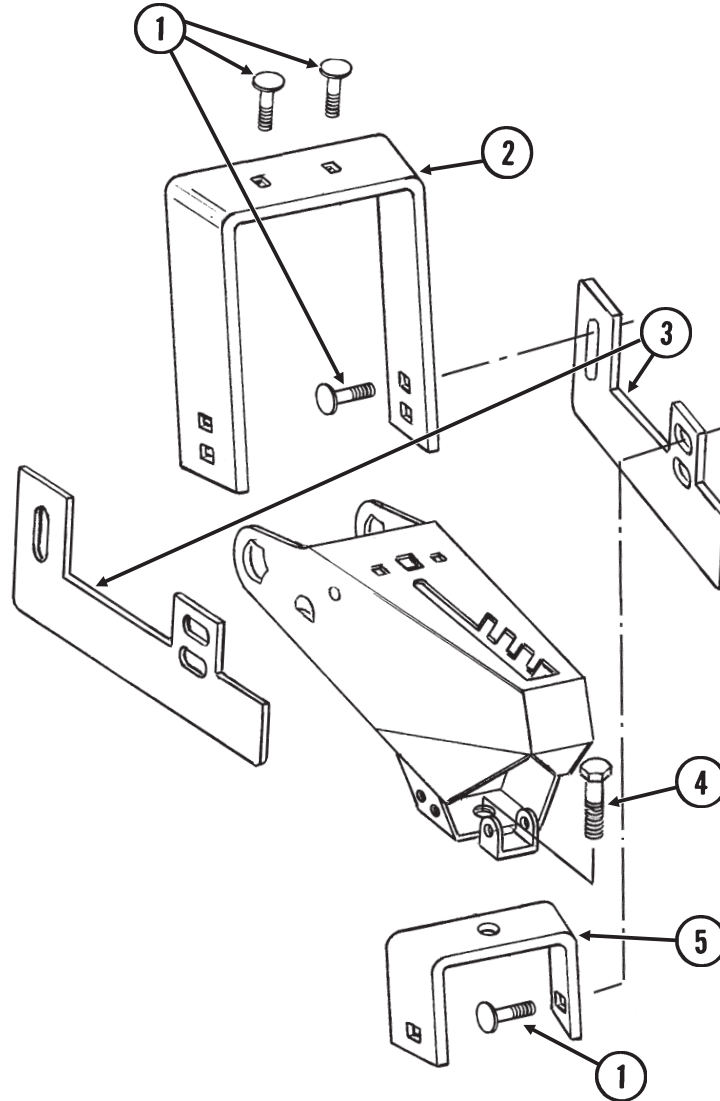
(RU83i/RU83n)



ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G10801	2	Carriage Bolt, 1/2"-13 x 2 1/4"
	G10315	-	Carriage Bolt, 1/2"-13 x 2 1/2" (Used W/Straight Drop In-Furrow Granular Chemical Bracket)
	G10111	2	Lock Nut, 1/2"-13
2.	GB0268	1	Wheel Arm Stop
3.	G10001	1	Hex Head Cap Screw, 3/8"-16 x 1"
	G11387	1	Flat Washer, 3/8" SAE
4.	GB0282	2	Stepped Bushing
5.	GB0239	2	Eccentric Bushing
6.	GD8460	1	Spring
7.	G10064	6	Hex Head Cap Screw, 1/4"-20 x 1"
8.	G10013	2	Hex Head Cap Screw, 5/8"-11 x 3 1/2"
	G10107	2	Lock Nut, 5/8"-11
9.	G1K345	-	Closing Wheel Shield Kit W/Hardware And Instruction
	G10308	2	Carriage Bolt, 3/8"-16 x 3/4"
	G10599	1	Carriage Bolt, 3/8"-16 x 1 1/4"
	G11387	1	Flat Washer, 3/8" SAE
	G10229	3	Lock Washer, 3/8"
	G10101	3	Hex Nut, 3/8"-16
10.	GD9120	4	Nylon Half Wheel
11.	GA6171	2	Bearing
12.	GD1085	2	Rubber Tire, 1" x 12"
13.	GD1109	2	Bushing, 4 1/64" I.D. x 7/8" O.D. x 1/4" Long
14.	G10133	1	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	G10109	1	Lock Nut, 5/16"-18, Grade 8
15.	GA6597	-	Cast Iron Closing Wheel W/Bearing
	GA6171	-	Bearing
16.	GA8322	1	Arm
17.	GB0254	1	Lever
18.	G11391	2	Flat Washer, 5/8" SAE
19.	G10230	2	Lock Washer, 5/8"
A.	GA6434	-	Rubber Closing Wheel Complete W/Bearing (Items 7 And 10-12)

DRAG CLOSING ATTACHMENT

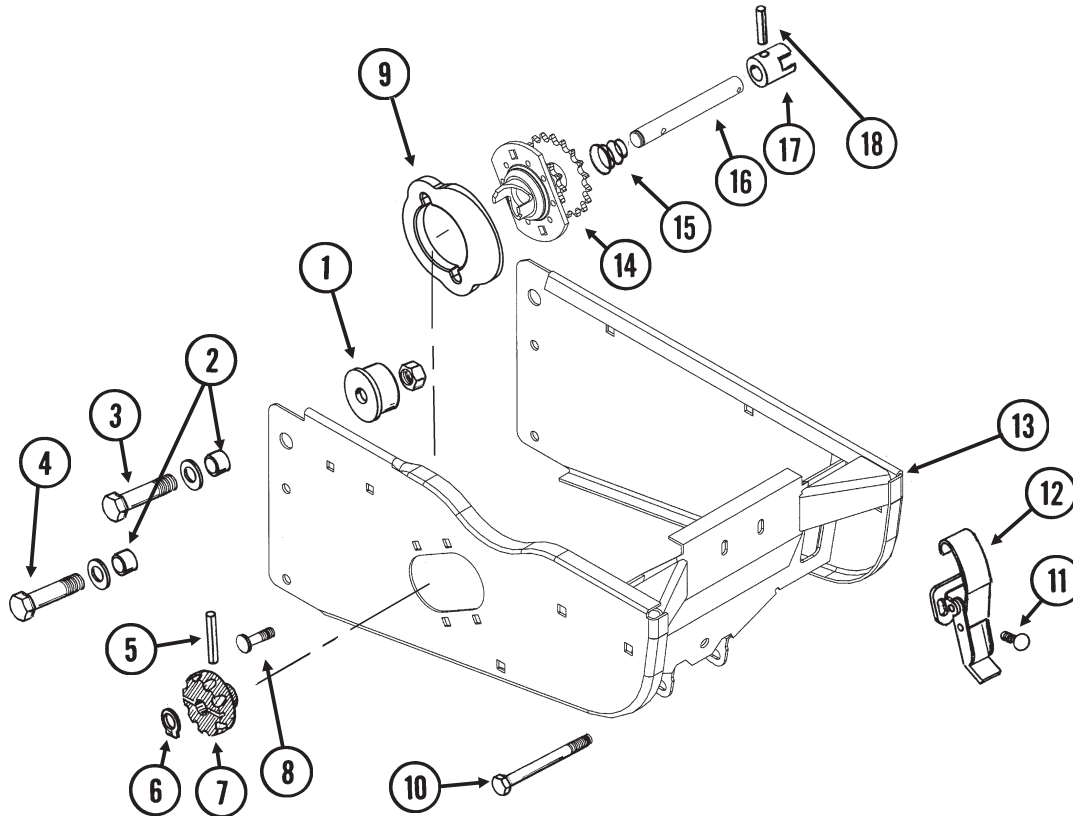
RUB050(RU90c)



ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Row)	
1.	G10599	6	Carriage Bolt, 3/8"-16 x 1 1/4"
	G11387	6	Flat Washer, 3/8" SAE
	G10229	6	Lock Washer, 3/8"
	G10101	6	Hex Nut, 3/8"-16
2.	GD11508	1	Front Bracket
3.	GD11313	2	Blade
4.	G10007	1	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	G10230	1	Lock Washer, 5/8"
	G10104	1	Hex Nut, 5/8"-11
5.	GD11509	1	Rear Bracket
A.	G7566X	-	Drag Closing Attachment Complete (Items 1-5)

HOPPER SUPPORT AND METER DRIVE

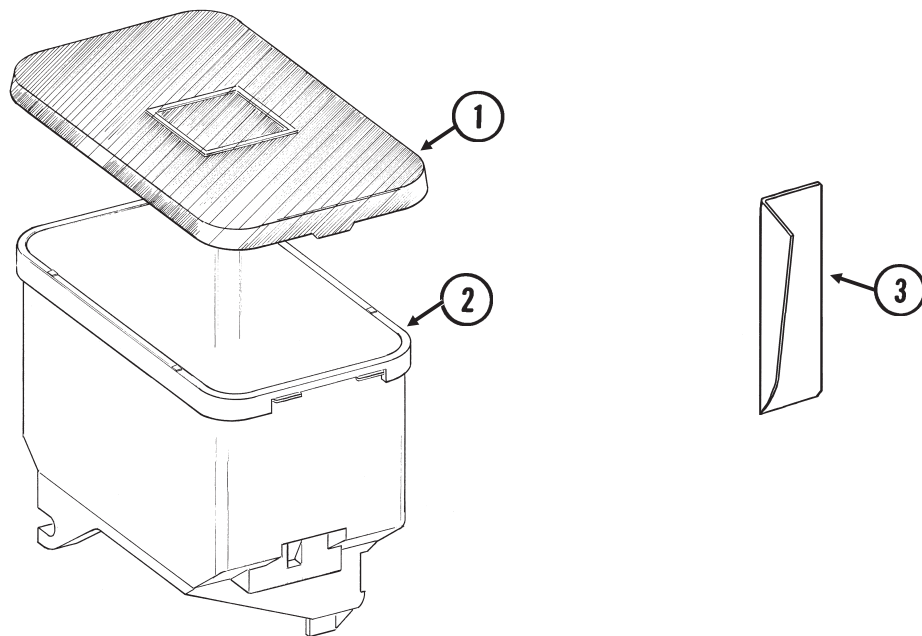
(METR22d)



ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	GB0314	2	Hopper Mount
2.	GB0218	4	Bushing, 2 ¹ / ₃₂ " I.D. x 7/8" O.D. x 1 ⁹ / ₃₂ " Long
3.	G10752	2	Hex Head Cap Screw, 5/8"-18 x 2 1/4"
	G11391	2	Flat Washer, 5/8" SAE
	G10412	2	Lock Nut, 5/8"-18
4.	G10751	2	Hex Head Cap Screw, 5/8"-18 x 1 3/4"
	G11391	2	Flat Washer, 5/8" SAE
	G10412	2	Lock Nut, 5/8"-18
5.	G10602	1	Spring Pin, 1/4" x 1 1/2"
6.	G10567	1	External Retaining Ring, 5/8"
7.	GD11239	1	Knob
8.	G10338	2	Carriage Bolt, 5/16"-18 x 1 1/4"
	G10620	2	Serrated Flange Nut, 5/16"-18
9.	GB0331	1	Clutch Adapter Plate
10.	G10061	1	Hex Head Cap Screw, 3/8"-16 x 3 1/2"
	G11387	2	Flat Washer, 3/8" SAE
	G10108	1	Lock Nut, 3/8"-16
11.	G10309	2	Carriage Bolt, 1/4"-20 x 5/8", Grade 2
	G10621	2	Serrated Flange Nut, 1/4"-20
12.	GA2007	1	Hopper Hold Down Latch
13.	GA10155	1	Hopper Support
14.	GA10137	1	Double Sprocket And Bearing, Drive Clutch, 11/19 Tooth
15.	GD11413	1	Spring
16.	GD15747	1	Shaft
17.	GB0278	1	Coupler
18.	G10546	1	Spring Pin, 3/16" x 1 1/4"
A.	GA10151	-	Meter Drive Assembly Complete, 11/19 Tooth (Items 5-7 And 14-18)

SEED HOPPER AND LID

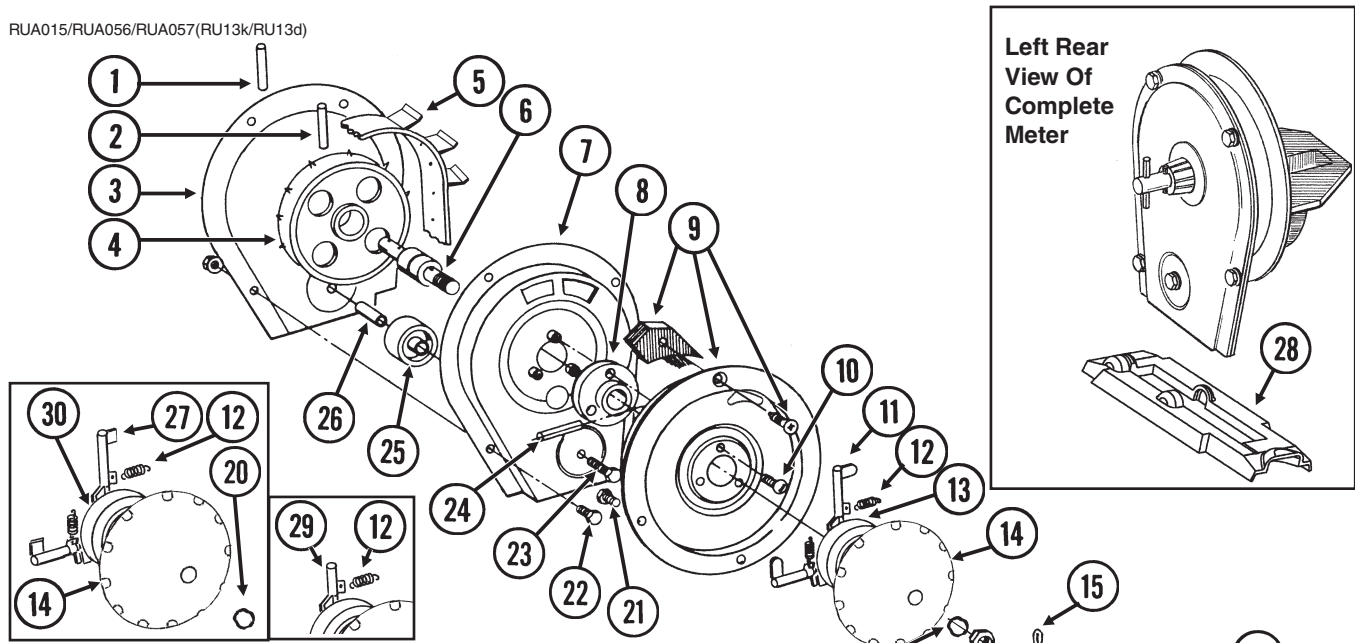
(RU87e/RU87a)



ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	GD11279	1	Lid
2.	GA9714	1	Seed Hopper, Reinforced
3.	GD11747	1	Seed Reserve Baffle

FINGER PICKUP SEED METER

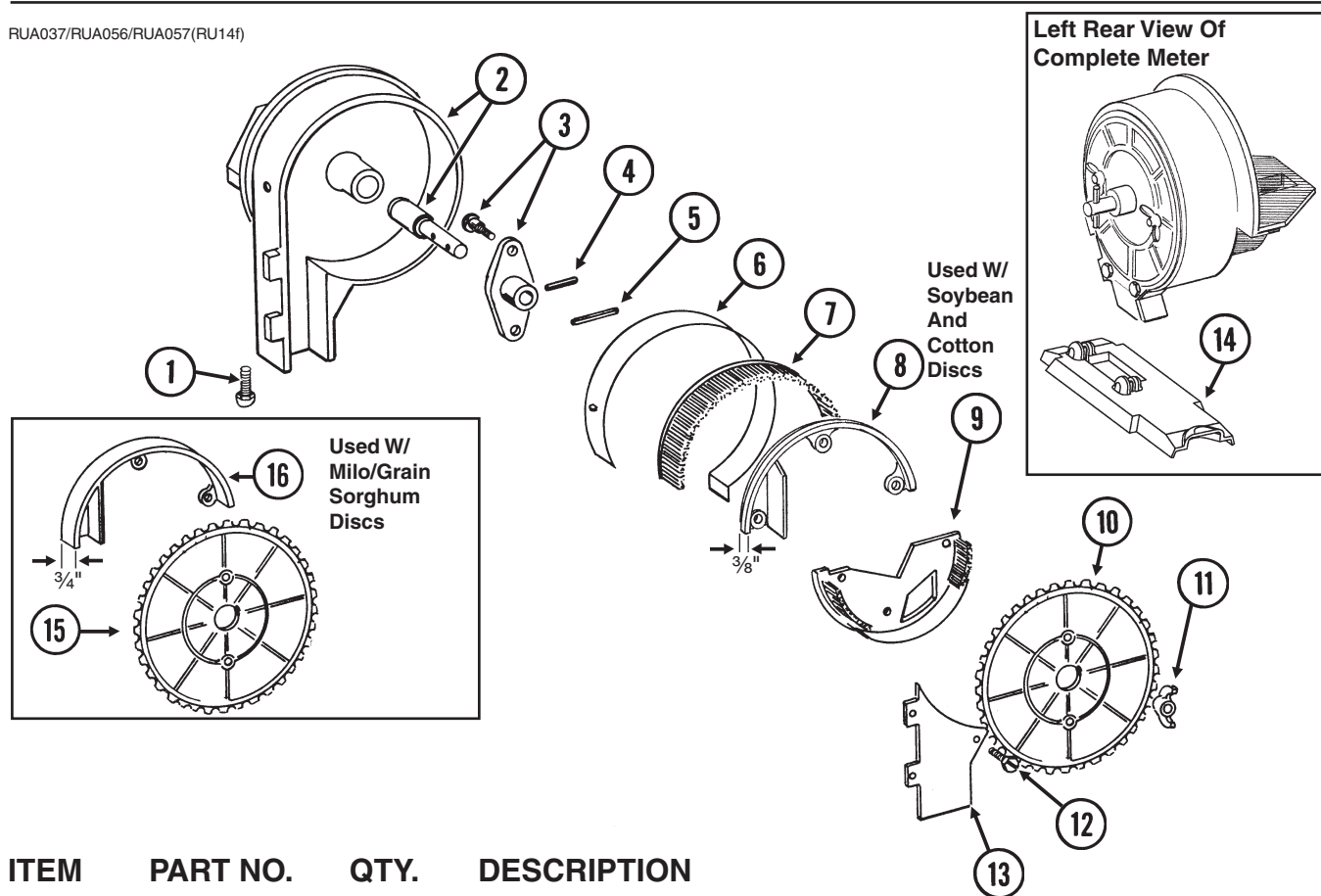
RUA015/RUA056/RUA057(RU13k/RU13d)



ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G10602	1	Spring Pin, 1/4" x 1 1/2"
2.	G10604	1	Spring Pin, 3/16" x 1 1/2"
3.	GD1039	1	Housing Cover
4.	GD1041	1	Belt Drive Sprocket
5.	GD11286	1	Seed Belt
6.	GA2019	1	Bearing
7.	GA2018	1	Conveyor Housing
8.	GB0110	1	Bearing Housing
9.	GR1569	1	Carrier Plate W/Brush And Screw (Corn)
	GR0664	-	Carrier Plate W/Brush And Screw (Sunflower)
	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.	GD18704	12	Finger, Corn
12.	GD19790	12	Spring
13.	GB0410	1	Cam (Corn)
14.	GD11528	1	Finger Holder
15.	G10470	1	Cotter Pin, 5/32" x 1"
16.	G11009	2	Locking Thumbscrew, 5/16"-18 x 3/4"
17.	GD11311	1	Seed Baffle
18.	GD1083	1	Cover Nut
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, No Serrations
22.	G10022	4	Hex Head Cap Screw, 1/4"-20 x 1/2"
	G10621	4	Serrated Flange Nut, 1/4"-20
23.	G10021	1	Hex Head Cap Screw, 1/4"-20 x 1 1/2"
	G10621	1	Serrated Flange Nut, 1/4"-20
24.	G10603	1	Spring Pin, 1/4" x 1 1/4"
25.	GD1042	1	Idler
26.	GB0120	1	Bushing, 17/64" I.D. x 1 1/32" Long
27.	GD19333	12	Finger, Oil Sunflower
28.	GD15698	1	Shank Cover, Finger Pickup Seed Meter
29.	GD11787	-	Half Rate Blank Finger
30.	GB0111	1	Cam (Sunflower)
A.	GR1848	-	Finger Assembly, Corn (Items 11-14 And 20)
B.	GR1897	-	Finger Assembly, Oil Sunflower (Items 12, 14, 22, And 30)

BRUSH-TYPE SEED METER

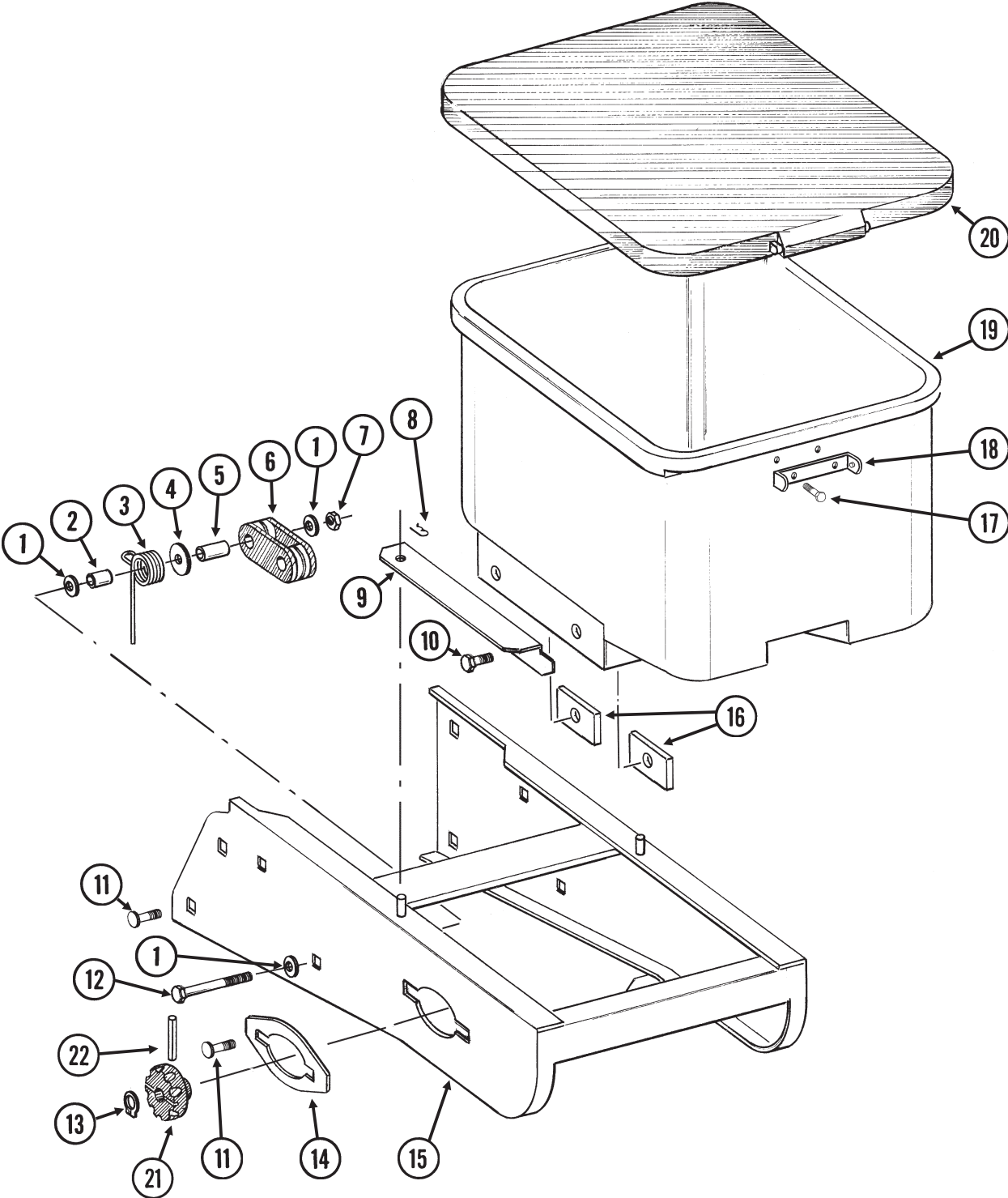
RUA037/RUA056/RUA057(RU14f)



ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Row)	
1.	G11009	2	Locking Thumbscrew, $\frac{5}{16}$ "-18 x $\frac{3}{4}$ "
2.	GA6027	1	Housing W/Bearing
	GA5698	-	Bearing
3.	GA6038	1	Hub W/Shoulder Bolts
	GD1755	-	Shoulder Bolt, $\frac{1}{4}$ "-20 (2 Used)
4.	G10603	1	Spring Pin, $\frac{1}{4}$ " x $1 \frac{1}{4}$ "
5.	G10602	1	Spring Pin, $\frac{1}{4}$ " x $1 \frac{1}{2}$ "
6.	GD8778	1	Wear Strip
7.	GA5699	1	Upper Brush
8.	GD11122	1	Upper Brush Retainer (Used W/Soybean And Cotton Discs)
9.	GA5834	1	Lower Brush
10.	GA5794	-	Seed Disc, Soybean, 60 Cell, Black Color-Coded
	GA6184	-	Seed Disc, Specialty Soybean, 48 Cell, Dark Blue 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
11.	G10531	2	Wing Nut W/Nylon Insert, $\frac{1}{4}$ "-20
12.	G11151	9	Hex Washer Head Screw, No. 10-24 x $\frac{1}{2}$ "
	G10634	-	Slotted Tap Screw, No. 10-24 x $\frac{5}{8}$ " (Use As Required)
13.	GD7878	1	Cover
14.	GD15699	1	Shank Cover, Brush-Type Seed Meter
15.	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
16.	GD8237	-	Upper Brush Retainer (Used W/Milo/Grain Sorghum Discs)

GRANULAR CHEMICAL HOPPER AND HOPPER PANEL EXTENSION

(METR14d)

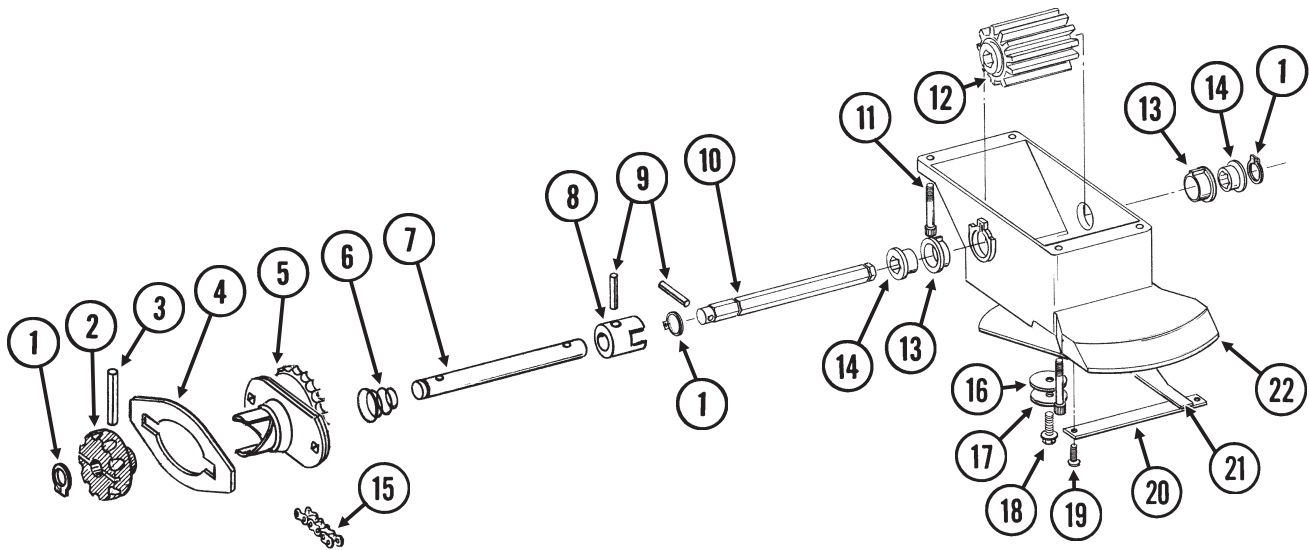


GRANULAR CHEMICAL HOPPER AND HOPPER PANEL EXTENSION

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G11387	3	Flat Washer, 3/8" SAE
2.	GD2971-10	1	Sleeve, 9/16" Long
3.	GD11219	1	Spring
4.	G10201	1	Special Washer, 3/8" x 1 1/2" O.D.
5.	GD1026	1	Sleeve, 1 3/16" Long
6.	GD11962	1	Idler
7.	G10108	1	Lock Nut, 3/8"-16
8.	G10670	2	Hair Pin Clip, No. 3
9.	GD1059L	1	Support, L.H. (Shown)
	GD1059R	1	Support, R.H.
10.	G10002	4	Hex Head Cap Screw, 3/8"-16 x 3/4"
	G10229	4	Lock Washer, 3/8"
11.	G10312	8	Carriage Bolt, 5/16"-18 x 3/4"
	G10620	8	Serrated Flange Nut, 5/16"-18
12.	G10325	1	Hex Head Cap Screw, 3/8"-16 x 2 3/4"
13.	G10567	3	External Retaining Ring, 5/8"
14.	GD11305	1	Plate
15.	A10759	1	Hopper Panel Extension (Non-Stock Item) (Sub Wholegoods Order Code 700-01099)
16.	GD11424	4	Block
17.	G10023	2	Hex Head Cap Screw, 1/4"-20 x 3/4"
	G10621	2	Serrated Flange Nut, 1/4"-20
18.	GD1060	1	Hinge
19.	GA8371	1	Hopper
20.	GA4444	1	Lid
21.	GD11239	1	Knob
22.	G10602	1	Spring Pin, 1/4" x 1 1/2"

GRANULAR CHEMICAL METER AND METER DRIVE

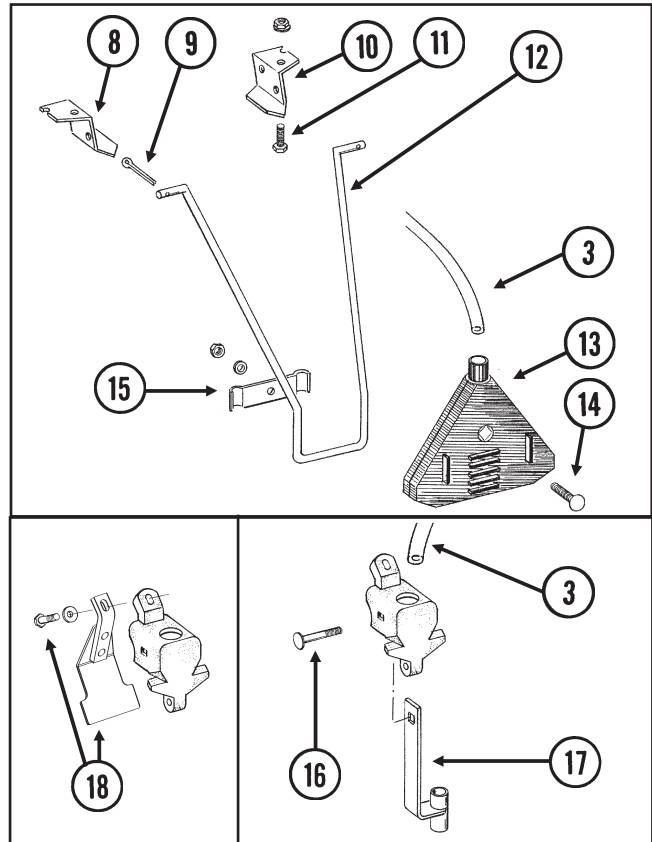
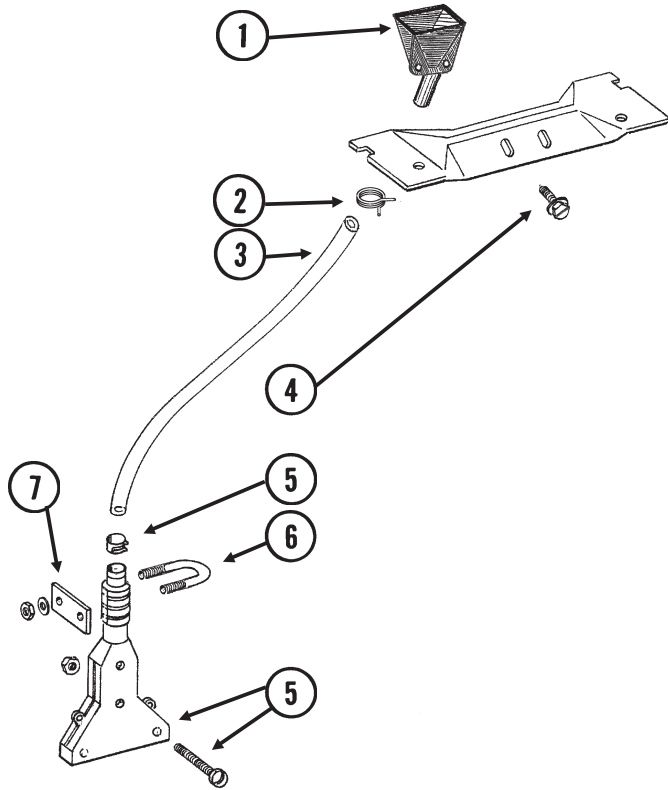
RUA051/RUB028(RU91a)



ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G10567	3	External Retaining Ring, 5/8"
2.	GD11239	1	Knob
3.	G10602	1	Spring Pin, 1/4" x 1 1/2"
4.		-	See "Granular Chemical Hopper And Hopper Panel Extension", Pages P16 And P17
5.	GA8364	1	Sprocket And Bearing, Drive Clutch, 24 Tooth
6.	GD11413	1	Spring
7.	GD11240	1	Shaft
8.	GB0278	1	Coupler
9.	G10546	2	Spring Pin, 3/16" x 1 1/4"
10.	GD11297	1	Shaft
11.	G10921	4	Hex Socket Head Cap Screw, No. 10-24 x 7/8"
	G10257	4	Lock Washer, No. 10
12.	GD7148	1	Feed Roller, Hex Bore
13.	GB0115	2	Bearing
14.	GD7258	2	Hex Bushing
15.	G3303-114	1	Chain, No. 41, 114 Pitch Including Connector Link
	GR0196	1	Connector Link, No. 41
16.	G10660	1	Wave Washer, 1/2"
17.	G11385	1	Flat Washer, 1/4" SAE
18.	G10570	1	Slotted Hex Self-Tapping Screw, 1/4"-20 x 3/4"
19.	G11073	2	Slotted Hex Self-Tapping Screw, No. 10 x 3/8"
20.	GD1061	1	Support Strap
21.	GD1063	1	Metering Gate
22.	GB0116	1	Granular Housing
A.	GA8326	-	Granular Chemical Meter Complete (Items 1, 9, 10, 12-14 And 16-22)

GRANULAR CHEMICAL BANDING OPTIONS

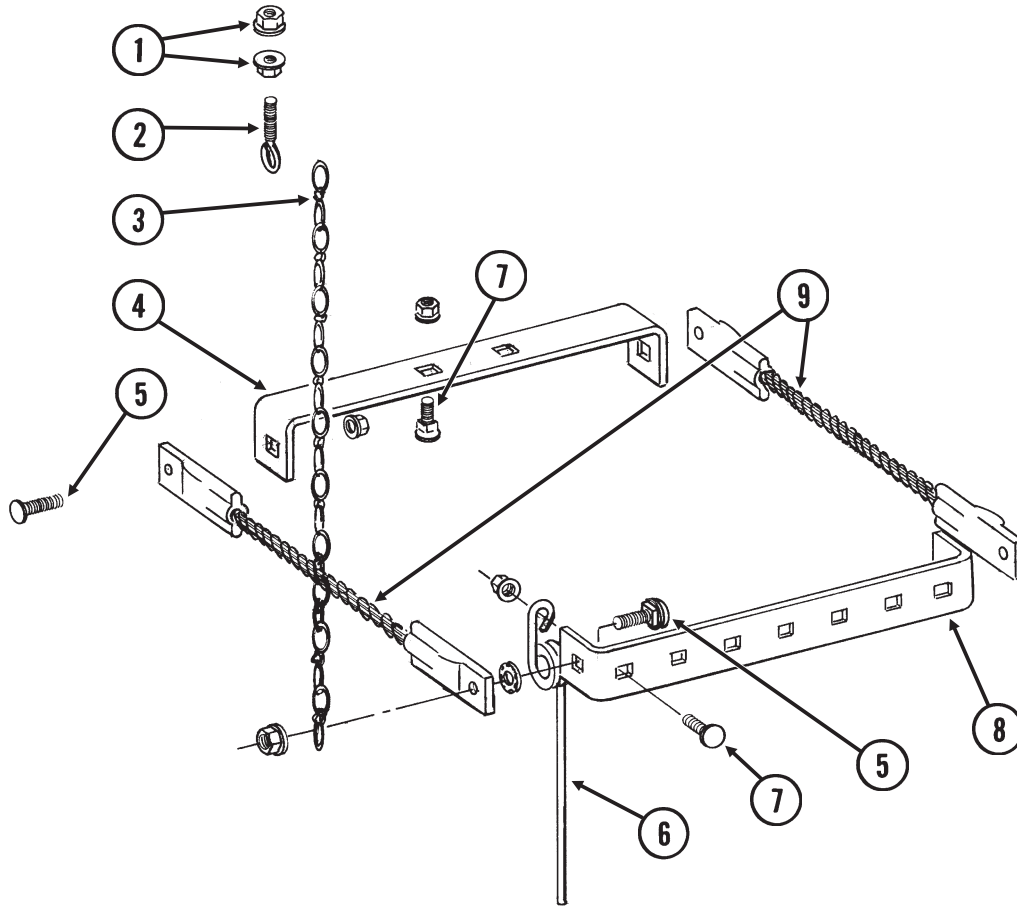
RUA061/RUA073(RU101mm/RU83m)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GD2423	1	Funnel
2.	G11209	1	Wire Hose Clamp, 3/4"
3.	GD2947	1	Hose, 7/16" x 28"
4.	G10523	2	Slotted Pan Head Self-Tapping Screw, No. 10 x 1/2"
5.	GA6907	1	Slope-Compensating Bander W/Hardware (4 1/2" Band Width)
	G10864	1	Uni-Clamp
	G10757	2	Pan Head Screw, No. 10-32 x 1 1/4"
	G10758	2	Hex Nut, No. 10-32
6.	GD10963	1	U-Bolt, 1 1/2" x 1 5/16" x 1/4"-20
	G11385	2	Flat Washer, 1/4" SAE
	G10110	2	Lock Nut, 1/4"-20, Grade B
7.	GD10984	1	Spacer
8.	GD1115L	-	Hanger Bracket, L.H.
9.	G10452	-	Cotter Pin, 1/8" x 1/2"
10.	GD1115R	-	Hanger Bracket, R.H.
11.	G10310	-	Carriage Bolt, 1/4"-20 x 3/4", Grade 2
	G10227	-	Lock Washer, 1/4"
	G10103	-	Hex Nut, 1/4"-20
12.	GD1116	-	Hanger
13.	GA2075	-	Diffuser, 14" Band
14.	G10306	-	Carriage Bolt, 3/8"-16 x 2"
	G10229	-	Lock Washer, 3/8"
	G10101	-	Hex Nut, 3/8"-16
15.	GD1118	-	Clamp
16.	G10315	1	Carriage Bolt, 1/2"-13 x 2 1/2" (Replaces Existing 1/2" x 2 1/4" Hardware)
17.	GA6741	1	Bracket (Straight Drop In-Furrow)
18.	G1K385	-	Bander Shield Kit W/Hardware And Instruction
	G10003	1	Hex Head Cap Screw, 3/8"-16 x 1 1/2"
	G11387	1	Flat Washer, 3/8" SAE

SPRING TOOTH INCORPORATOR

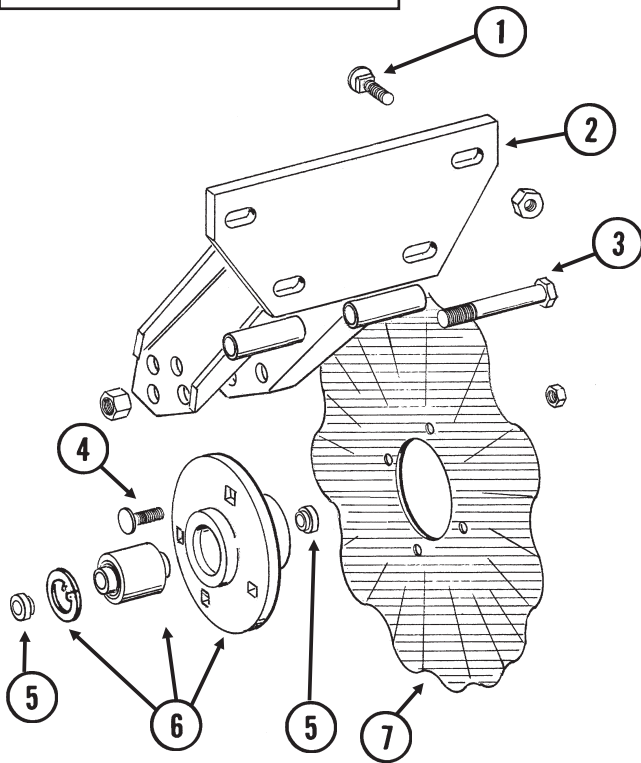
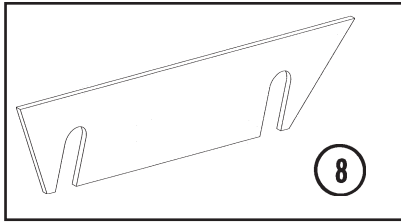
RUA055(RU95)



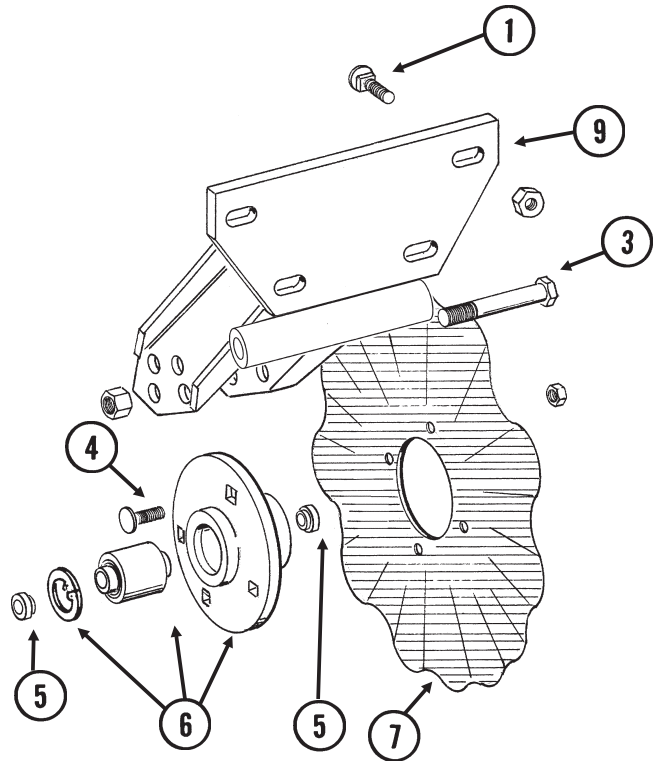
ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G10621	4	Serrated Flange Nut, 1/4"-20
2.	GD2460	2	Eyebolt, 1/4"-20
3.	G3305-01	2	Twin Loop Chain, 9 Links
4.	GD1143	1	Front Bracket
5.	G10305	4	Carriage Bolt, 3/8"-16 x 1"
	G10529	4	External Tooth Lock Washer, 3/8"
	G10622	4	Serrated Flange Nut, 3/8"-16
6.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

ROW UNIT MOUNTED NO TILL COULTER

(D14398/RU102c/RU152)



STYLE A

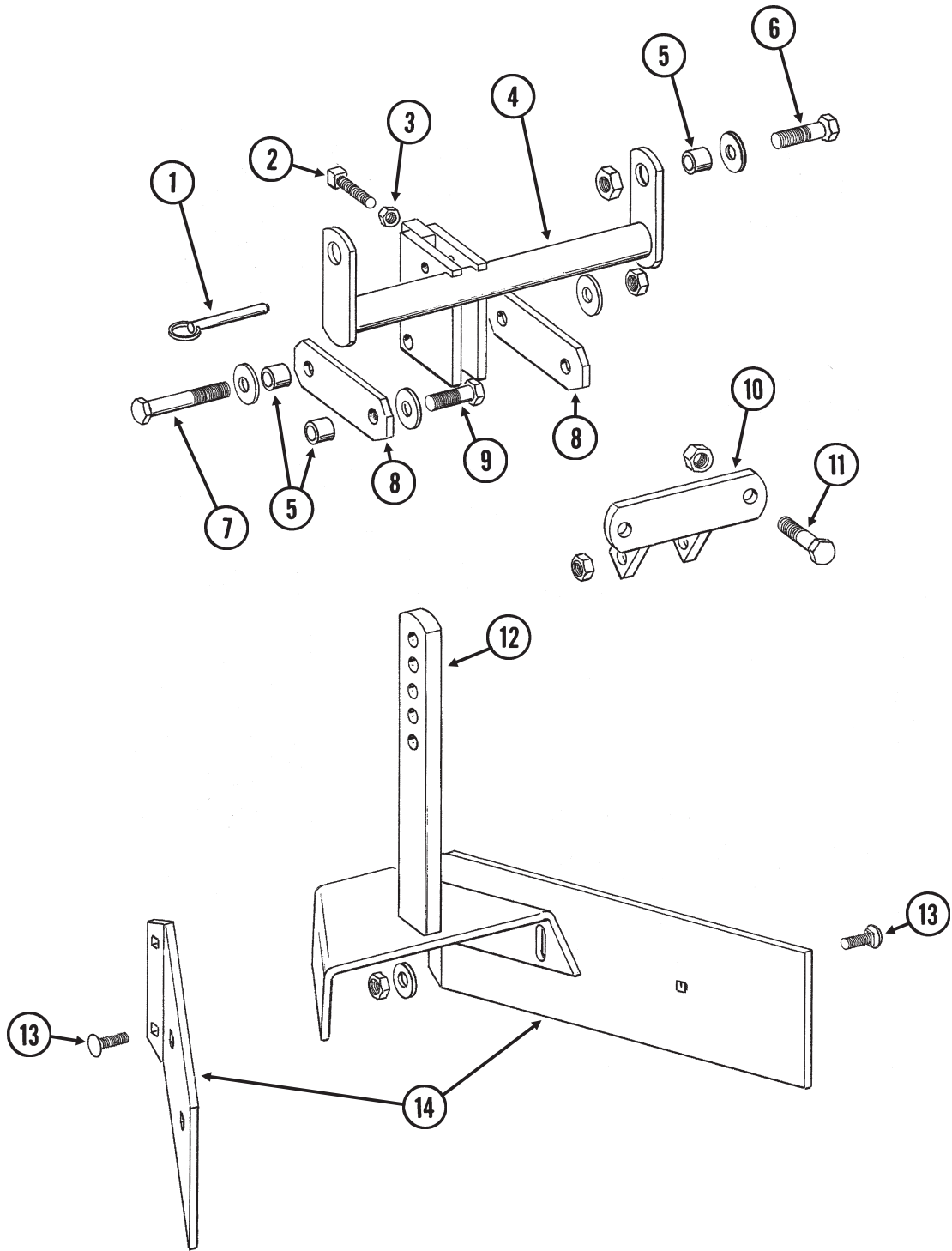


STYLE B

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Row)	
1.	G10574	4	Carriage Bolt, 1/2"-13 x 1 1/4"
	G10111	4	Lock Nut, 1/2"-13
2.	GA5625	1	Arm (Style A)
3.	G10036	1	Hex Head Cap Screw, 5/8"-11 x 4"
	G10107	1	Lock Nut, 5/8"-11
4.	G10574	4	Carriage Bolt, 1/2"-13 x 1 1/4"
	G10111	4	Lock Nut, 1/2"-13
5.	GD11677	2	Adapter
6.	GA8641	1	Hub W/Bearing And Retaining Ring
	GA8603	-	Bearing, Double Row
	GD11652	-	Retaining Ring, 2 7/16"
7.	GD7803	-	Disc Blade, Fluted, 1", 8 Flutes (Shown)
	GD7804	-	Disc Blade, Bubbled, 1"
	GD9254	-	Disc Blade, Fluted, 3/4", 13 Flutes
8.	GD14398	-	Spacer
9.	GA11520	1	Arm (Style B)

ROW UNIT MOUNTED BED LEVELER

RUA059/RUA060(RU99/RU100)

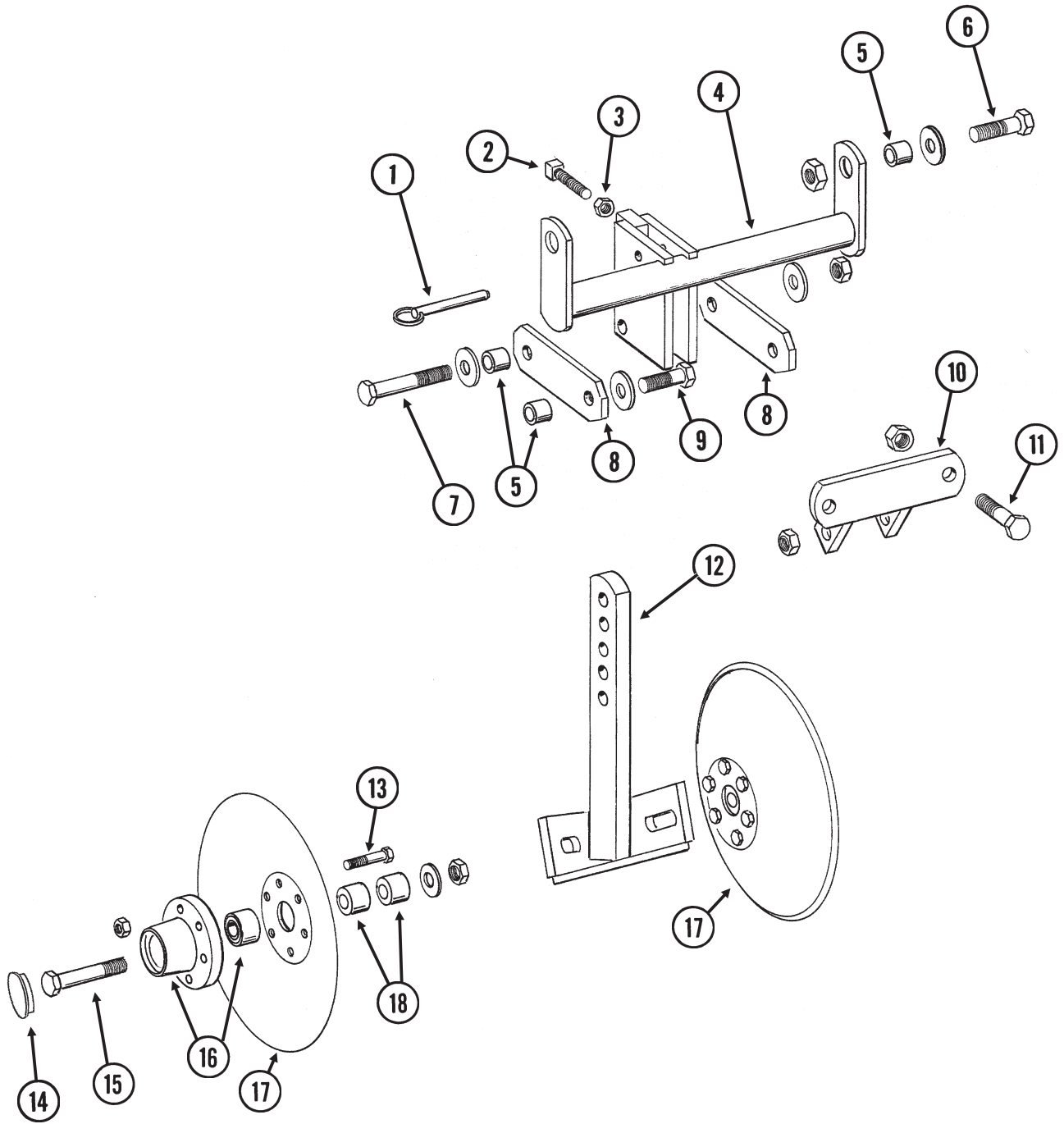


ROW UNIT MOUNTED BED LEVELER

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Row)	
1.	G10536	1	Detent Pin, 1/2" x 2 1/2" Grip
2.	G10597	1	Square Head Set Screw, 5/8"-11 x 2 1/4"
3.	G10503	1	Hex Jam Nut, 5/8"-11, Grade 2
4.	GA5719	1	Mounting Bracket
5.	GD7889	6	Bushing, 1" O.D. x 9/16" I.D. x 7/16" Long
6.	G10039	2	Hex Head Cap Screw, 1/2"-13 x 1 3/4"
	G11389	2	Flat Washer, 1/2" SAE
	G10111	2	Lock Nut, 1/2"-13
7.	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
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.	GA5715	1	Anchor
11.	G10017	2	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	G10111	2	Lock Nut, 1/2"-13
12.	GA5892	1	Leveler
13.	G10303	6	Carriage Bolt, 5/16"-18 x 1"
	G11386	4	Flat Washer 5/16" SAE
	G10109	6	Lock Nut, 5/16"-18, Grade 8
14.	GD8266	2	Blade

ROW UNIT MOUNTED DISC FURROWER

RUA059/RUA058(RU99/RU98g)

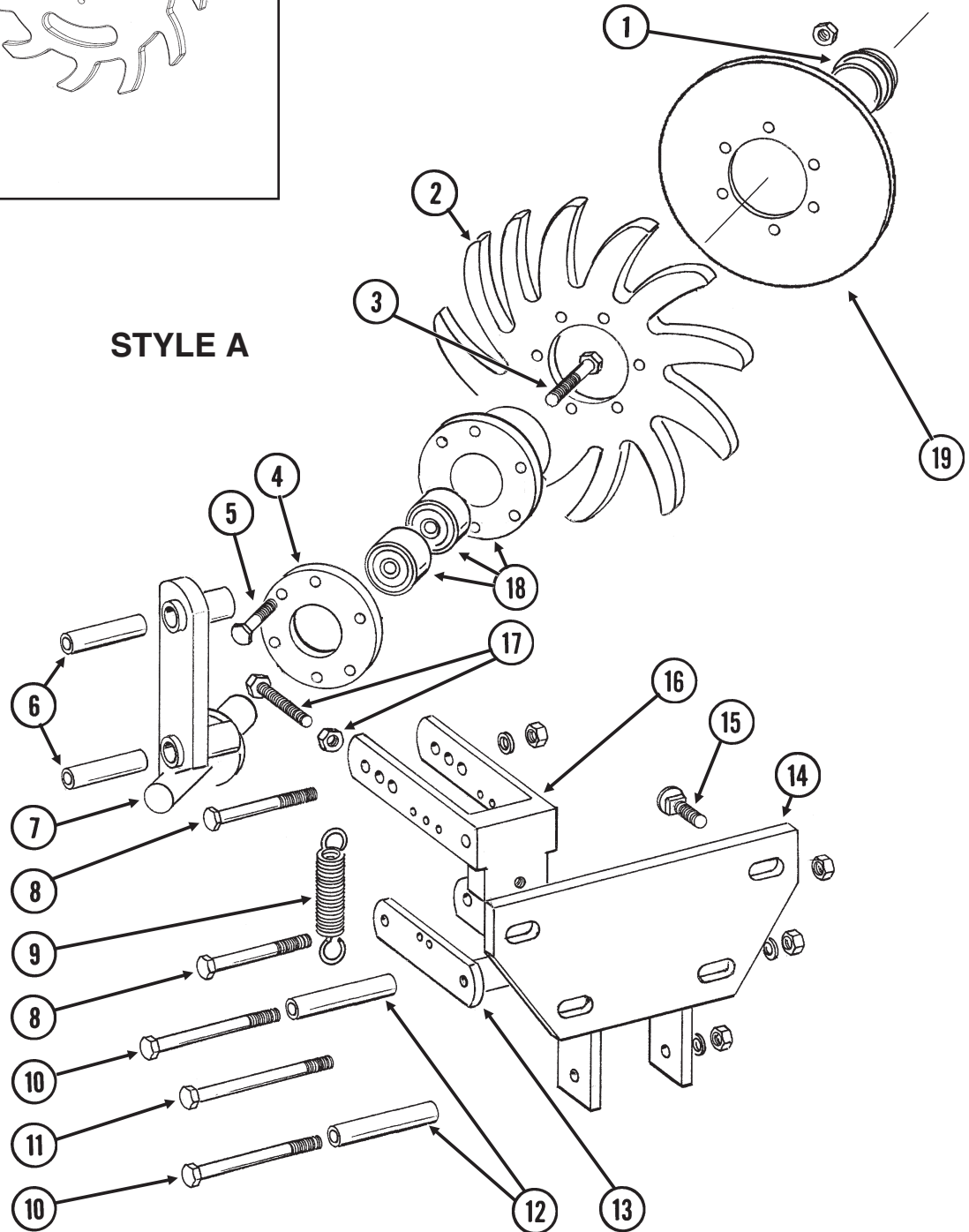
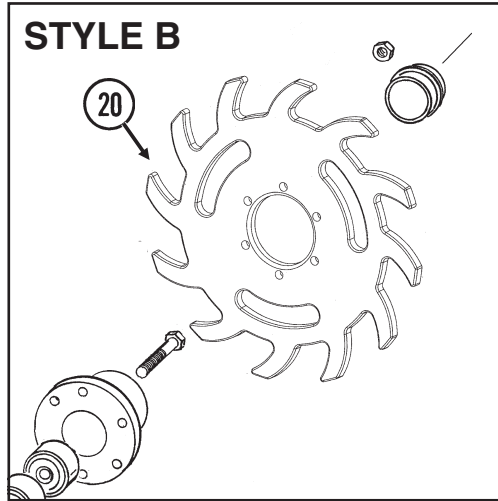


ROW UNIT MOUNTED DISC FURROWER

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Row)	
1.	G10536	1	Detent Pin, 1/2" x 2 1/2" Grip
2.	G10597	1	Square Head Set Screw, 5/8"-11 x 2 1/4"
3.	G10503	1	Hex Jam Nut, 5/8"-11, Grade 2
4.	GA5719	1	Mounting Bracket
5.	GD7889	6	Bushing, 1" O.D. x 9/16" I.D. x 7/16" Long
6.	G10039	2	Hex Head Cap Screw, 1/2"-13 x 1 3/4"
	G11389	2	Flat Washer, 1/2" SAE
	G10111	2	Lock Nut, 1/2"-13
7.	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
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.	GA5715	1	Anchor
11.	G10017	2	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	G10111	2	Lock Nut, 1/2"-13
12.	GA5718	1	Support Arm
13.	G10572	6	Truss Head Slotted Machine Screw, 5/16"-18 x 7/8"
	G10106	6	Hex Nut, 5/16"-18
14.	GD1132	2	Dust Cap
15.	G10318	2	Hex Head Cap Screw, 5/8"-11 x 4 1/2"
	G11391	2	Flat Washer, 5/8" SAE
	G10107	2	Lock Nut, 5/8"-11
16.	GA5654	2	Hub W/Bearings
	GA2014	-	Bearing
17.	GD7823	-	Disc Blade, Solid, 12" (Shown)
	GD8307	-	Disc Blade, Notched, 12"
18.	GD7817-01	2	Spacer, 1 1/16" I.D. x 3/4" Long
	GD7817-04	2	Spacer, 1 1/16" I.D. x 1/2" Long

ROW UNIT MOUNTED RESIDUE WHEEL

(RU103d/RU103dd)



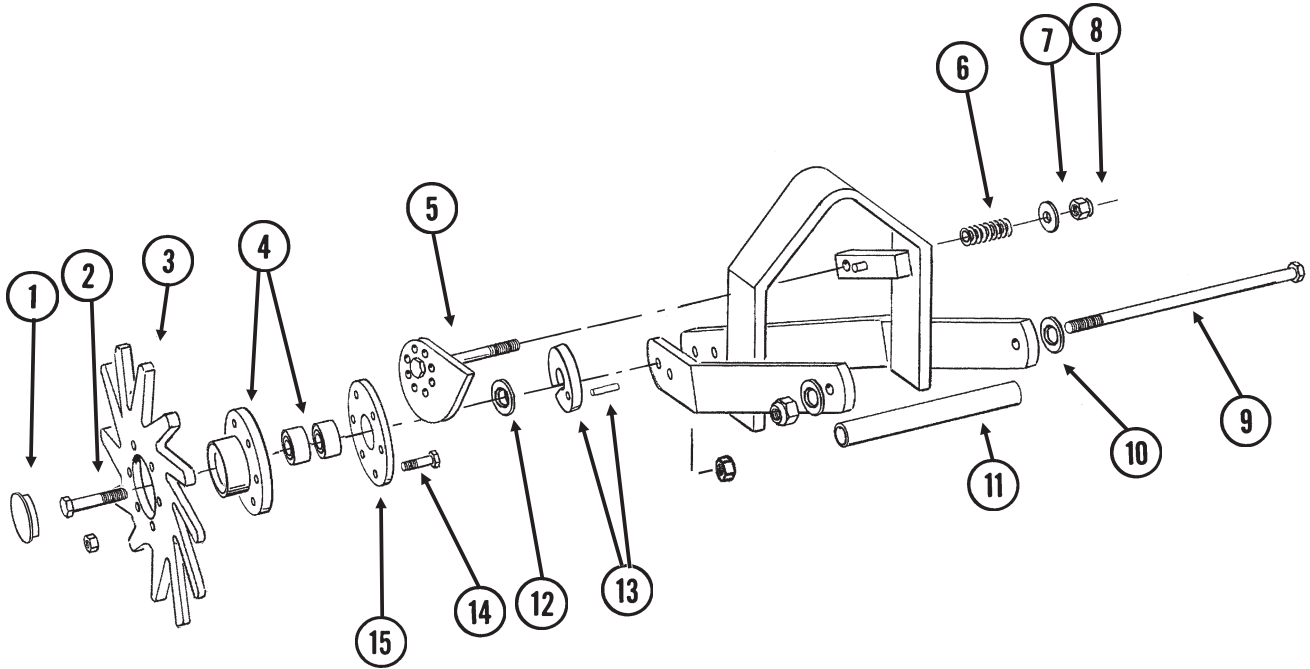
ROW UNIT MOUNTED RESIDUE WHEEL

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Row)	
1.	GD1132	1	Dust Cap
2.	GD10552	1	Wheel, 12 Tine, 3/8" x 12"
3.	G10006	1	Hex Head Cap Screw, 5/8"-11 x 2 1/4"
4.	GD9724	1	Backing Plate
5.	G10133	6	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	G10109	6	Lock Nut, 5/16"-18, Grade 8
6.	GD9720	2	Spacer, 1/2" x 2 3/16" Long
7.	GA6838	1	Wheel Mount
8.	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
9.	GD5857	2	Spring
10.	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
11.	G10348	1	Hex Head Cap Screw, 1/2"-13 x 5" (Lockup Bolt)
	G10111	1	Lock Nut, 1/2"-13
12.	GD9715	2	Spacer, 1/2" x 3" Long
13.	GA6834	1	Lower Link
14.	GA6832	1	Mount
15.	G10574	4	Carriage Bolt, 1/2"-13 x 1 1/4"
	G10111	4	Lock Nut, 1/2"-13
16.	GA6833	1	Upper Link
17.	G10371	1	Hex Head Cap Screw, 1/2"-13 x 3", Full Thread
	G10501	1	Hex Jam Nut, 1/2"-13, Grade 2
18.	GA5654	1	Hub W/Bearings
	GA2014	-	Bearing
19.	GD12534	-	Cover
20.	GB0387	1	Wheel, 12 Tine, 3/8" x 12"
A.	GA7446	-	Wheel Assembly, 12 Tine, R.H. (Items 2, 4, 5 And 18)
B.	GA12236	-	Wheel Assembly, 12 Tine, R.H. (Items 4, 5, 18 And 20)

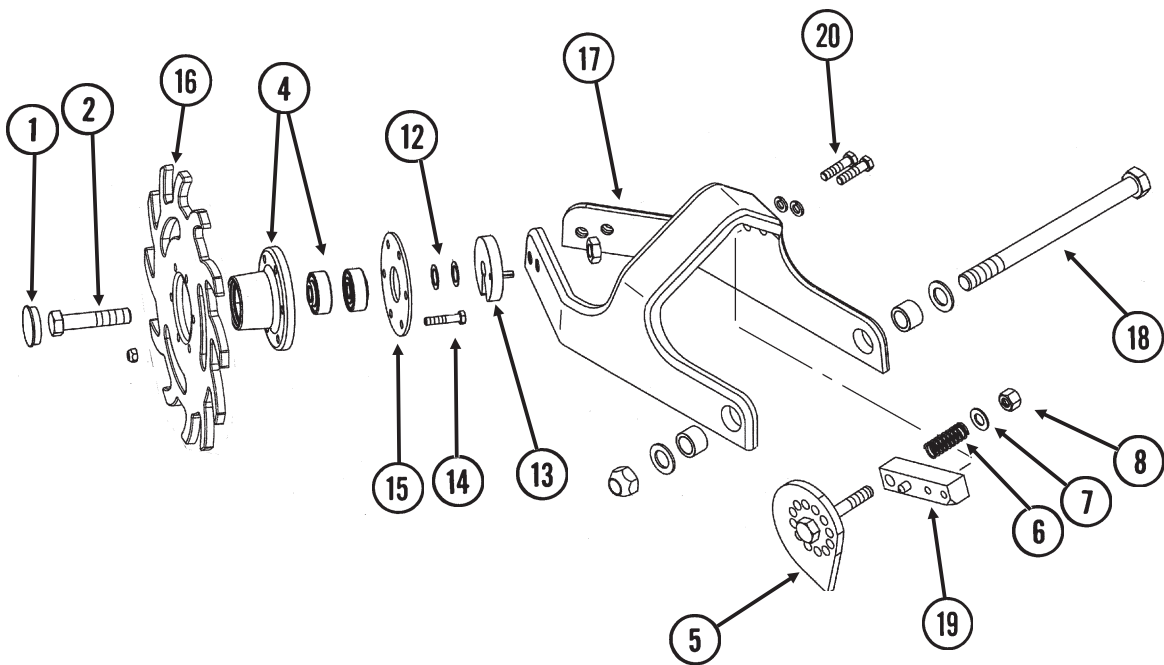
COULTER MOUNTED RESIDUE WHEELS

(RU104uuu/RU153)

STYLE A - Used With Style A Row Unit Mounted No Till Coulter



STYLE B - Used With Style B Row Unit Mounted No Till Coulter

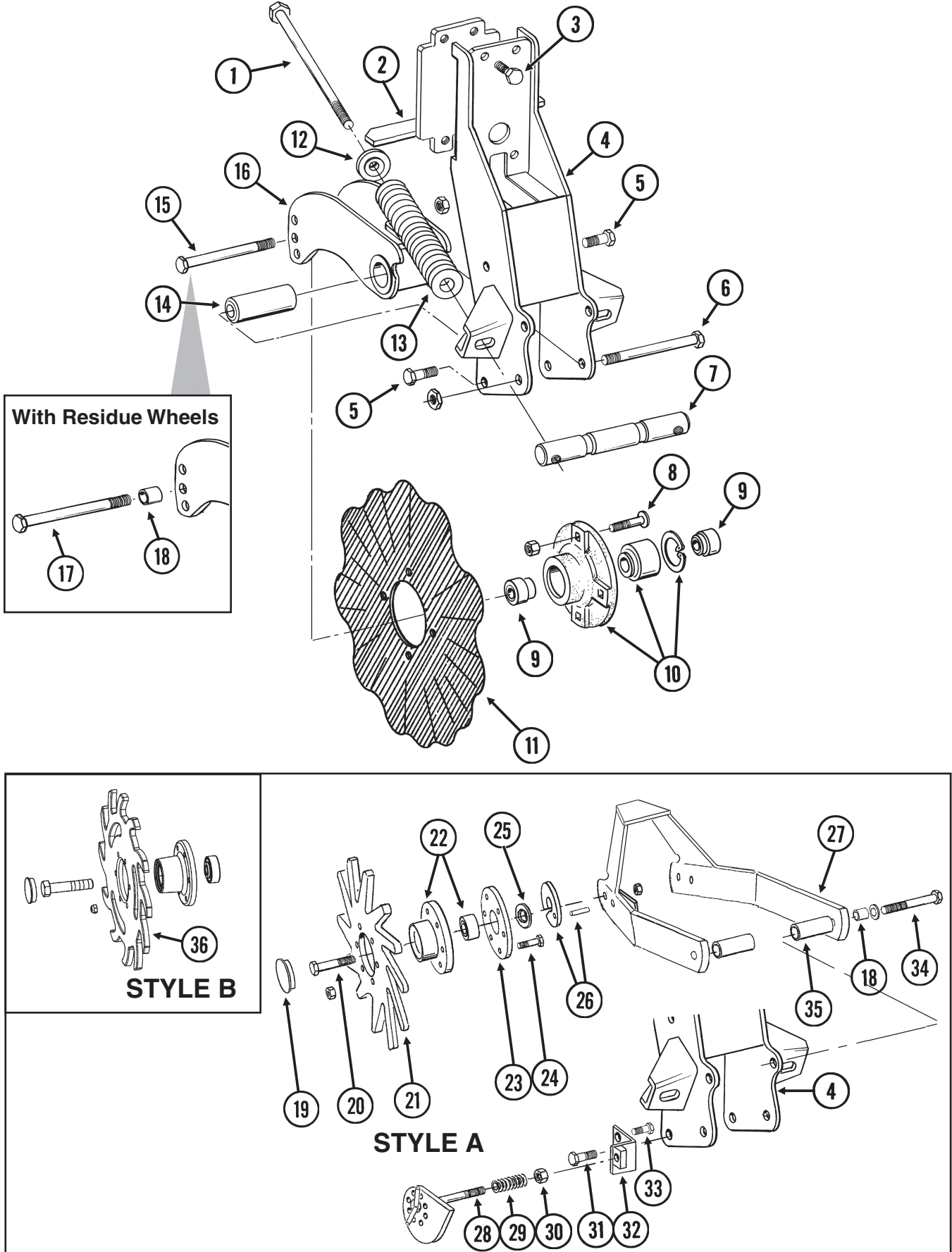


COULTER MOUNTED RESIDUE WHEELS

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Row)	
1.	GD1132	2	Dust Cap
2.	G10010	2	Hex Head Cap Screw, 5/8"-11 x 3"
	G10503	2	Hex Jam Nut, 5/8"-11, Grade 2
3.	GD10552	2	Wheel, 12 Tine, 3/8" x 12"
4.	GA5654	2	Hub W/Bearings
	GA2014	-	Bearing
5.	GA14251	1	Cam
6.	GD10519	1	Spring
7.	G11389	1	Washer, 1/2" SAE
8.	G10974	1	Lock Nut W/Nylon Insert, 1/2"-13
9.	G11098	1	Hex Head Cap Screw, 1/2"-13 x 9 1/2", Grade 8
	G11389	2	Flat Washer, 1/2" SAE
	G10974	1	Lock Nut W/Nylon Insert, 1/2"-13
10.	GA7271	1	Mount
11.	GD10526	1	Sleeve, 7 1/2"
12.	G10213	2-4	Machine Bushing, 5/8" (.030" Thick)
13.	GA8760	2	Weed Guard W/Spring Pin
	G10765	-	Spring Pin, 1/4" x 1"
14.	G10133	12	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	G10109	12	Lock Nut, 5/16"-18, Grade 8
15.	GD9724	2	Backing Plate
16.	GB0387	2	Wheel, 12 Tine, 3/8" x 12"
17.	GB0401	1	Mount
18.	G11236	1	Hex Head Cap Screw, 3/4"-10 x 10 1/2"
	GB0383	2	Bushing, 1 1/8" O.D. x 25/32" I.D. x 3/4" Long
	G11392	2	Flat Washer, 3/4" SAE
	G11228	1	Lock Nut, 3/4"-10
19.	GA14250	1	Locking Pin
20.	G10003	2	Hex Head Cap Screw, 3/8"-16 x 1 1/2"
	G10229	2	Lock Washer, 3/8"
A.	GA7446	-	Wheel Assembly, 12 Tine, R.H. (Items 3, 4, 14 And 15) (Shown)
	GA7445	-	Wheel Assembly, 12 Tine, L.H. (Items 3, 4, 14 And 15)
B.	GA12236	-	Wheel Assembly, 12 Tine, R.H. (Items 4, 14, 15 And 16) (Shown)
	GA12235	-	Wheel Assembly, 12 Tine, L.H. (Items 4, 14, 15 And 16)
C.	G1K467	-	Residue Wheel Mount Kit (Items 17-20)

FRAME MOUNTED COULTER W/RESIDUE WHEELS

(RU135c/RU135g/RU153b/RU135hh)

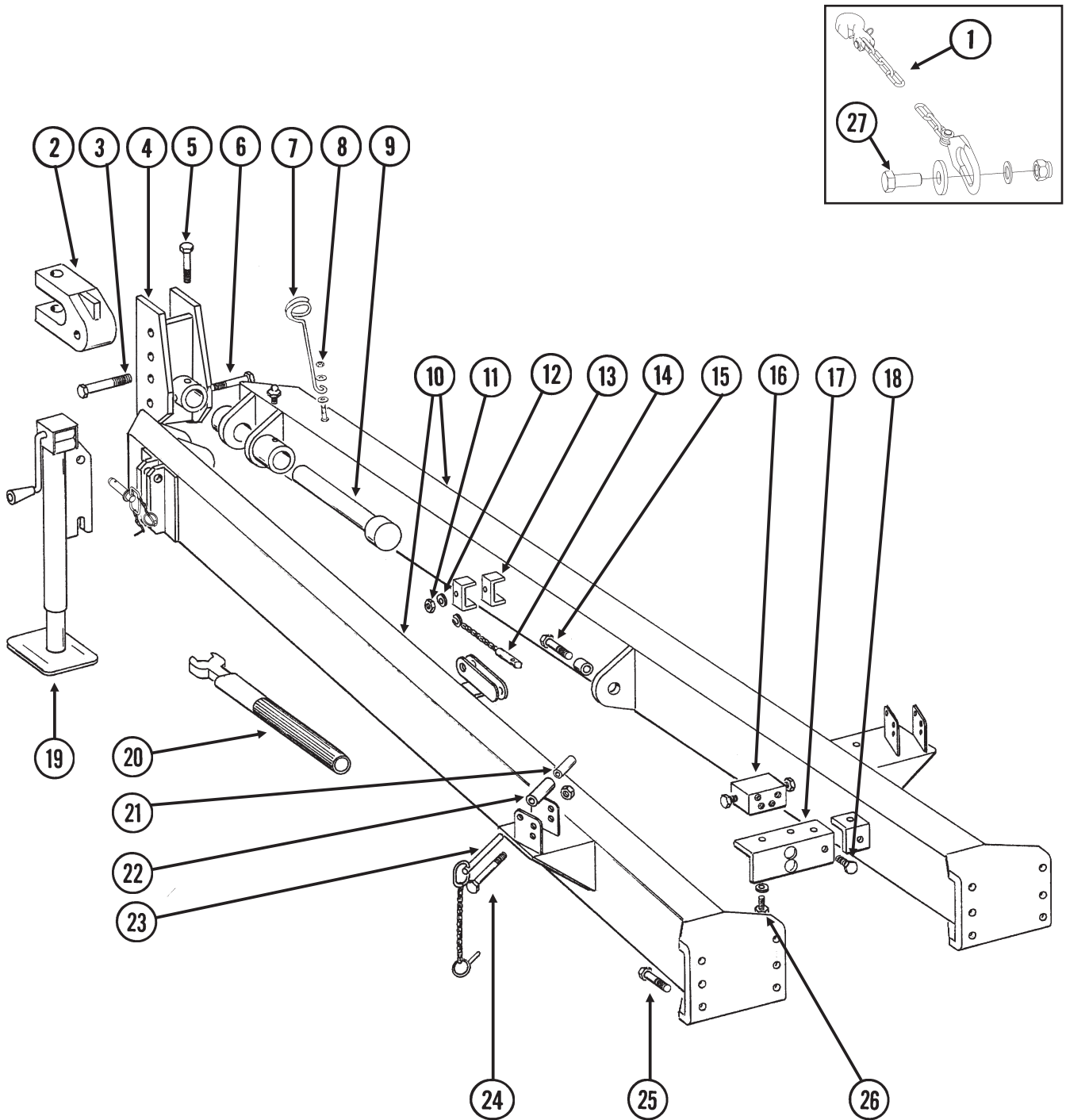


FRAME MOUNTED COULTER W/RESIDUE WHEELS

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G11010	2	Hex Head Cap Screw, 3/4"-10 x 12"
2.	GA9844	1	Plate W/Angle
3.	G10039	4	Hex Head Cap Screw, 1/2"-13 x 1 3/4"
4.	GA9131	1	Coulter Frame
5.	G10007	4	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	G10107	4	Lock Nut, 5/8"-11
6.	G10400	1	Hex Head Cap Screw, 3/4"-10 x 6 1/2"
	G10112	1	Lock Nut, 3/4"-10
7.	GD12826	1	Spring Anchor Bar
8.	G10574	4	Carriage Bolt, 1/2"-13 x 1 1/4"
	G10111	4	Lock Nut, 1/2"-13
9.	GD12827	2	Adapter
10.	GA8641	1	Hub W/Bearing And Retaining Ring
	GA8603	1	Bearing, Double Row
	GD11652	1	Retaining Ring (Beveled), 2 7/16"
	GD19292	-	Retaining Ring (Square), 2 7/16"
11.	GD7803	1	Disc Blade, Fluted, 1", 8 Flutes (Shown)
	GD7804	-	Disc Blade, Bubbled, 1"
	GD9254	-	Disc Blade, Fluted, 3/4", 13 Flutes
12.	GB0213	2	Spring Seat
13.	GD12817	2	Compression Spring
14.	GD12829	1	Sleeve
15.	G10046	1	Hex Head Cap Screw, 5/8"-11 x 5"
	G10107	1	Lock Nut, 5/8"-11
16.	GA9845	1	Coulter Arm W/Grease Fitting
	G10643	-	Grease Fitting, 45°, 1/4"-28
17.	G10011	1	Hex Head Cap Screw, 5/8"-11 x 5 1/2"
	G10107	1	Lock Nut, 5/8"-11
18.	GB0218	3	Bushing, 2 1/32" I.D. x 7/8" O.D. x 1 9/32" Long
19.	GD1132	2	Dust Cap
20.	G10010	2	Hex Head Cap Screw, 5/8"-11 x 3"
	G10503	2	Hex Jam Nut, 5/8"-11, Grade 2
21.	GD10552	2	Wheel, 12 Tine, 3/8" x 12"
22.	GA5654	2	Hub W/Bearings
	GA2014	-	Bearing
23.	GD9724	2	Backing Plate
24.	G10133	12	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	G10109	12	Lock Nut, 5/16"-18, Grade 8
25.	G10213	2	Machine Bushing, 5/8" (.030" Thick)
26.	GA9862	2	Weed Guard W/Spring Pin
	G10765	-	Spring Pin, 1/4" x 1"
27.	GA9865	1	Mount
28.	GA9861	1	Cam
29.	GD10519	1	Spring
30.	G10974	1	Lock Nut W/Nylon Insert, 1/2"-13
31.	G10005	1	Hex Head Cap Screw, 5/8"-11 x 1 3/4"
	G10107	4	Lock Nut, 5/8"-11
32.	GA9864	1	Support
33.	G10014	1	Hex Head Cap Screw, 1/2"-13 x 1"
	G10102	1	Hex Nut, 1/2"-13
34.	G10011	2	Hex Head Cap Screw, 5/8"-11 x 5 1/2"
	G10205	2	Washer, 5/8" SAE
	G10730	2	Lock Nut W/Nylon Insert, 5/8"-11
35.	GD14170	2	Sleeve, 3"
36.	GB0387	2	Wheel, 12 Tine, 3/8" x 12"
A.	GA7446	-	Wheel Assembly, 12 Tine, R.H. (Items 21-24) (Shown)
	GA7445	-	Wheel Assembly, 12 Tine, L.H. (Items 21-24)
B.	GA12236	-	Wheel Assembly, 12 Tine, R.H. (Items 22, 23, 24 And 36) (Shown)
	GA12235	-	Wheel Assembly, 12 Tine, L.H. (Items 22, 23, 24 And 36)

HITCH AND SAFETY CHAIN

PHA041(WGN47a/EF32c)

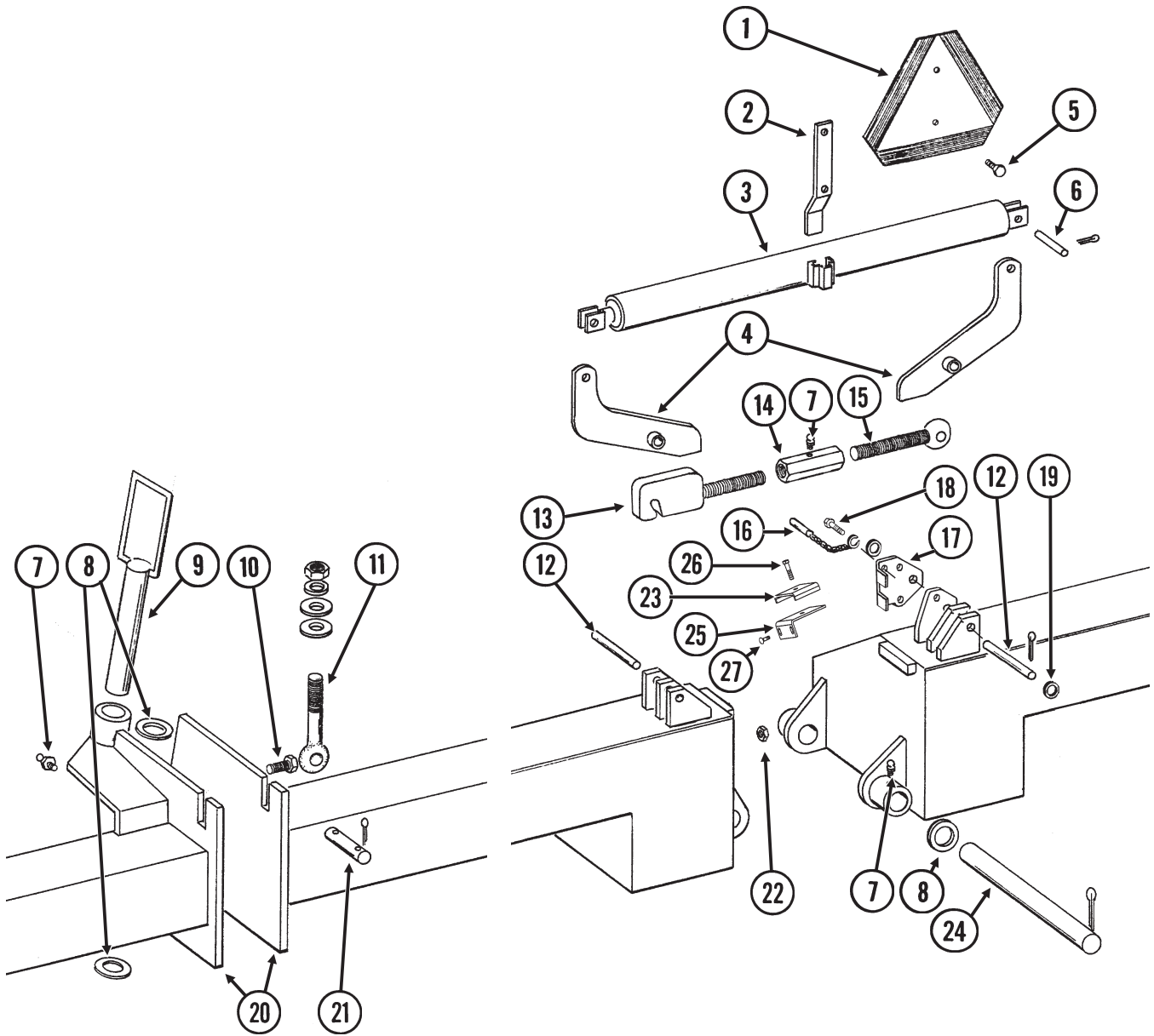


HITCH AND SAFETY CHAIN

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA13595	1	Safety Chain W/Hook, 3/8"
	G1K411	-	Safety Chain Repair Kit, Includes: (1) Hook, (1) Flat Washer, (1) Latch Pin, (1) Safety Latch, (1) Spring, (1) Retaining Ring
2.	GB0156	1	Clevis
3.	G10169	1	Hex Head Cap Screw, 1 1/4"-7 x 6"
	G10157	1	Lock Nut, 1 1/4"-7
4.	GA8097	1	Hitch Cap
5.	G10036	1	Hex Head Cap Screw, 5/8"-11 x 4"
	G10230	1	Lock Washer, 5/8"
	G10104	1	Hex Nut, 5/8"-11
6.	G10011	1	Hex Head Cap Screw, 5/8"-11 x 5 1/2"
	G10230	1	Lock Washer, 5/8"
	G10104	1	Hex Nut, 5/8"-11
7.	GD8260	1	Hose Holder
8.	G11391	2	Flat Washer, 5/8" SAE
	G10107	1	Lock Nut, 5/8"-11
9.	GA5755	1	Pin, 2 1/8" x 14"
10.	A8048	1	Hitch W/Grease Fittings (Includes Items 4-7 And 11) (Non-Stock Item)
	G10641	-	Grease Fitting, 1/8" NPT
11.	G10108	3	Lock Nut, 3/8"-16
12.	G11387	-	Flat Washer, 3/8" SAE
13.	GD5875	6	Hose Clamp, 9/16" x 2 1/2" x 2"
14.	GA8318	1	Detent Pin W/Chain
15.	G10028	1	Hex Head Cap Screw, 3/4"-10 x 3"
	GB0169	1	Bushing
	G10112	1	Lock Nut, 3/4"-10
16.		-	See "Row Marker Sequencing/Flow Control Valve", Page P60
17.	GD7976	1	Bracket
18.	G10019	2	Hex Head Cap Screw, 5/16"-18 x 1"
	G10232	2	Lock Washer, 5/16"
	G10106	2	Hex Nut, 5/16"-18
19.	GA13986	1	Jack Assembly Complete
	GA4995	-	Detent Pin Assembly
	GR0516	-	Crank Assembly
	GR0515	-	Bevel Gear Set, Includes: (2) Bevel Gears, (1) Gear Pin, (1) Groove Pin
20.	GA6798	1	Wrench
21.	GD3180-23	-	Sleeve, 5/8" I.D. x 7/8" O.D. x 3 3/16" Long
22.	GD2734-13	-	Sleeve, 1 1/4" O.D. x 3 1/8" Long
23.	GA8312	-	Pin W/Lynch Pin, 5 1/2"
24.	G10011	-	Hex Head Cap Screw, 5/8"-11 x 5 1/2"
	G10107	2	Lock Nut, 5/8"-11
25.	G10028	12	Hex Head Cap Screw, 3/4"-10 x 3"
	G10231	12	Lock Washer, 3/4"
	G10105	12	Hex Nut, 3/4"-10
26.	G10001	2	Hex Head Cap Screw, 3/8"-16 x 1"
	G11387	2	Flat Washer, 3/8" SAE
27.	G11058	1	Hex Head Cap Screw, 1 1/4"-7 x 3"
	GD10646	1	Special Washer
	G11396	1	Flat Washer, 1 1/4"
	G10157	1	Lock Nut, 1 1/4"-7

FRAME ASSEMBLY

PHA0078/PFA079(EF34/EF33bb)

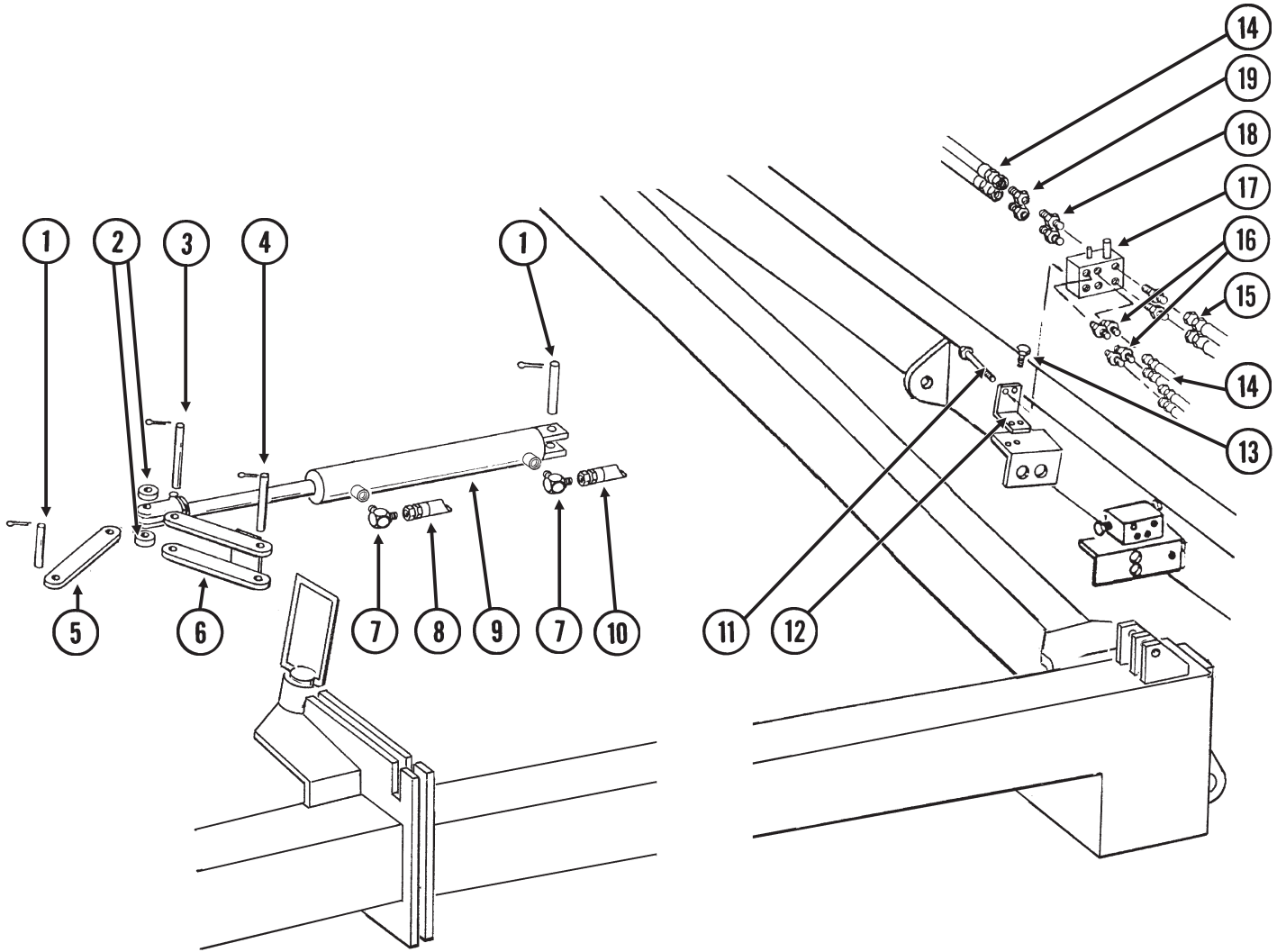


FRAME ASSEMBLY

ITEM	PART NO.	QTY.	DESCRIPTION
1.		-	See "Decals, Paint And Miscellaneous", Pages P92 And P93
2.	GD2200	1	SMV Spade
3.	GA7513	1	Spring Canister W/Mounting Hardware (Includes Items 3 And 6)
4.	GA6055	2	Arm
5.	G10023	2	Hex Head Cap Screw, 1/4"-20 x 3/4"
	G10110	2	Lock Nut, 1/4"-20, Grade B
6.	GD3311	2	Pin, 7/8" x 3 1/8"
	G10457	4	Cotter Pin, 5/32" x 1 1/2"
7.	G10640	4	Grease Fitting, 1/4"-28
8.	G10404	4	Machine Bushing, 3 1/8" x 2 1/8" x 3/16"
9.	GA8033	2	Pin
10.	G10007	2	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	G10230	2	Lock Washer, 5/8"
11.	GD3373	2	Eyebolt
	G11396	4	Flat Washer, 1 1/4"
	G10236	2	Lock Washer, 1 1/4"
	GD9688	2	Special Nut, 1 1/4"-7
12.	GD11298	2	Pin, 7/8" x 6 9/16"
	G10457	4	Cotter Pin, 5/32" x 1 1/2"
13.	GA8335	1	Hook
14.	GD7972	1	Turnbuckle
15.	GD3373	1	Eyebolt
16.	GA7022	1	Detent Pin W/Chain
17.	GD11300	1	Lockup
18.	G10017	1	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	G10071	1	Serrated Flange Nut, 1/2"-13
19.	G10235	-	Machine Bushing, 7/8", 14 Gauge
20.	A8116	1	Frame, 8 Row 36"/38", 303" (Includes Items 7-10, 12, 16, 19 And 21) (Non-Stock Item)
	A8036	-	Frame, 12 Row 30", 351 1/2" (Includes Items 7-10, 12, 16, 19 And 21) (Non-Stock Item)
21.	GD3311	2	Pin, 7/8" x 3 1/8"
	G10457	4	Cotter Pin, 5/32" x 1 1/2"
22.	G10108	2	Lock Nut, 3/8"-16
23.	GD14534	-	Hose Clamp, 3/4" x 4" x 4 1/2"
24.	GD7948	1	Shaft, 2 1/8" x 20"
	G10461	2	Cotter Pin, 3/8" x 3"
25.	GD17046	1	Mount
26.	G10016	1	Hex Head Cap Screw, 1/2"-13 x 2"
	G10111	1	Lock Nut, 1/2"-13
27.	G10599	2	Carriage Bolt, 3/8"-16 x 1 1/4"
	G11091	2	Serrated Flange Nut, 3/8"-16

HYDRAULIC WING FOLD

PFA063(EF42b)



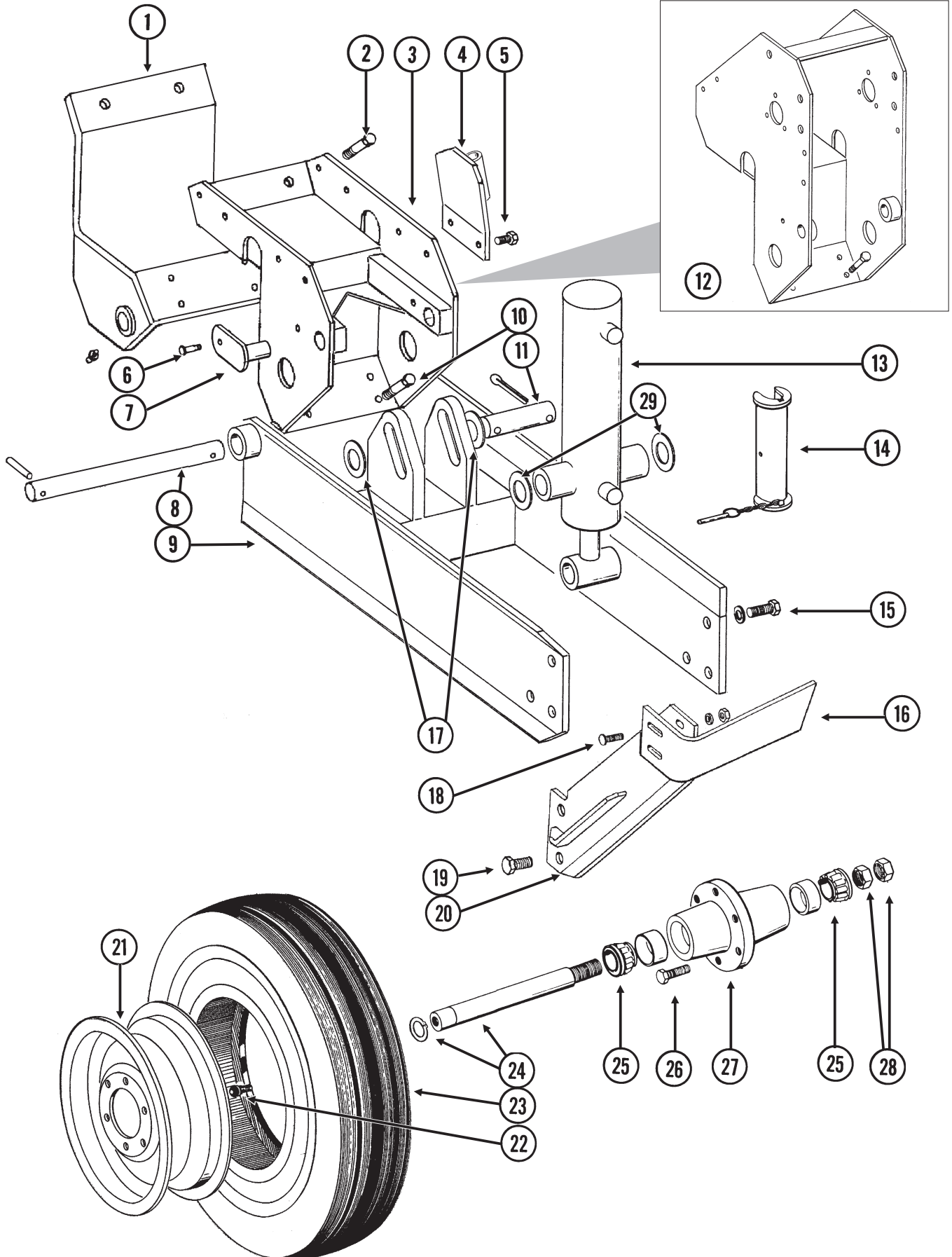
HYDRAULIC WING FOLD

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GD9762	4	Pin, 1" x 3 1/2"
	G10463	8	Cotter Pin, 1/4" x 1 1/2"
2.	GD5900-12	4	Sleeve, 3/8"
3.	GD9591	2	Pin, 1" x 5 3/4"
	G10463	8	Cotter Pin, 1/4" x 1 1/2"
4.	GD11177	2	Pin, 1" x 7 1/4"
	G10463	8	Cotter Pin, 1/4" x 1 1/2"
5.	GD9589	2	Link
6.	GA6800	2	Link
7.	G6801-06-08	4	Elbow W/O-Ring, 90°, 9/16"-18 Male JIC To 3/4"-16 O-Ring
	GR1037	-	O-Ring
8.	*A1168	2	Hose Assembly, 1/4" x 120"
9.		-	See "Hydraulic Wing Fold Cylinder", Page P59
10.	*A1106	2	Hose Assembly, 1/4" x 130"
11.	G10580	2	Hex Head Cap Screw, 1/4"-20 x 3"
	G10227	2	Lock Washer, 1/4"
	G10103	2	Hex Nut, 1/4"-20
12.	GD9699	1	Mounting Angle
13.	G10064	2	Hex Head Cap Screw, 1/4"-20 x 1"
	G10227	2	Lock Washer, 1/4"
	G10103	2	Hex Nut, 1/4"-20
14.		-	See "Hydraulic System", Pages P62 And P63
15.	*A3180	2	Hose Assembly, 3/8" x 25"
16.	G6400-06	4	Connector W/O-Ring, 9/16"-18 Male JIC To O-Ring
	GR1045	-	O-Ring
17.		-	See "Hydraulic Wing Fold Selector Valve", Page P61
18.	G6400-08-06	4	Connector W/O-Ring, 3/4"-16 Male JIC To 9/16"-18 O-Ring
	GR1045	-	O-Ring
19.	G2406-08-06	2	Reducer, 3/4"-16 Female JIC To 9/16"-18 Male JIC

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

TRANSPORT AND GROUND DRIVE WHEEL ASSEMBLY

(EF35c/EF35g/EF38c)



TRANSPORT AND GROUND DRIVE WHEEL ASSEMBLY

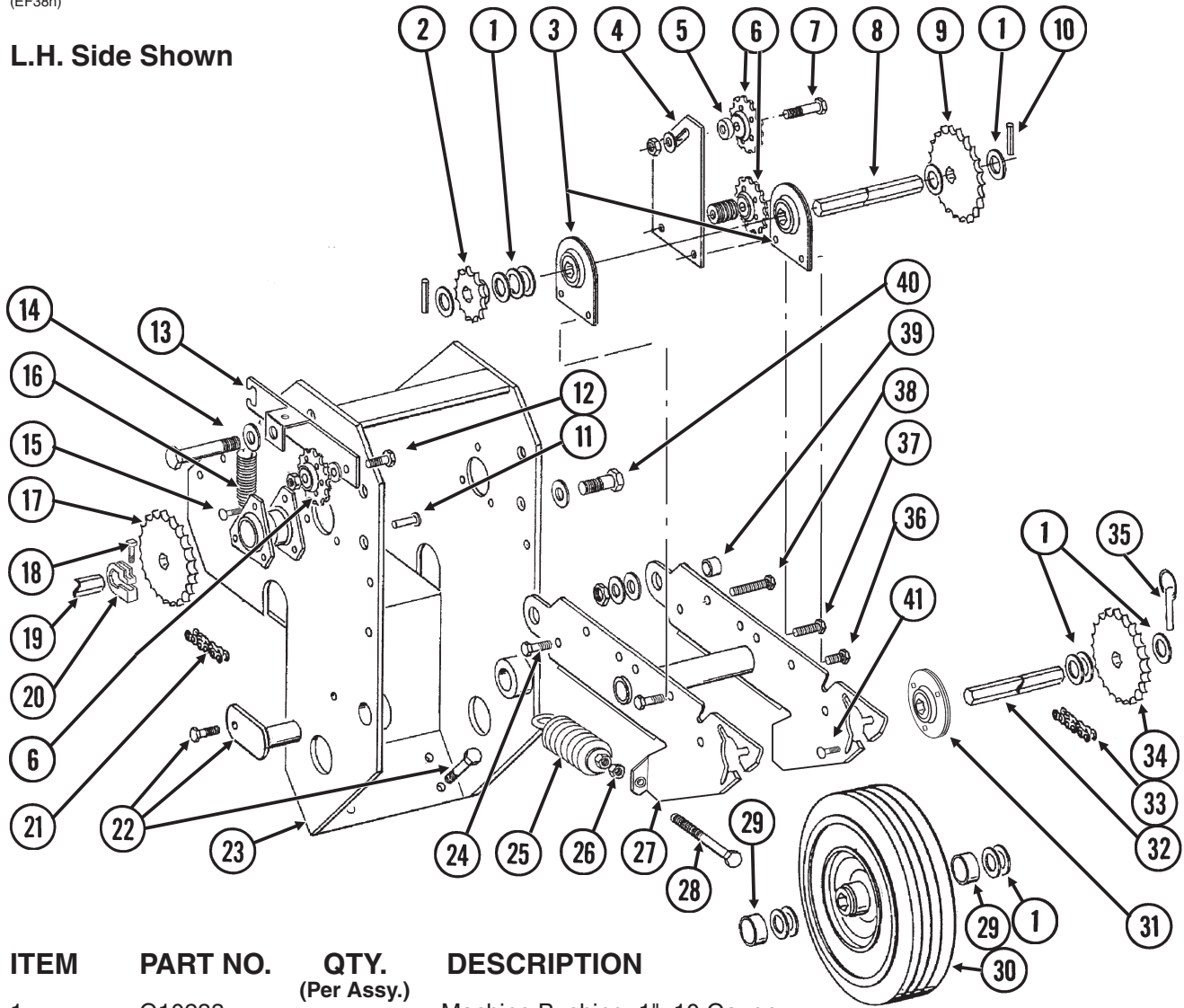
ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GA9877	1	Clamp W/Grease Fittings
	G10640	-	Grease Fitting, 1/4"-28
2.	G10006	2	Hex Head Cap Screw, 5/8"-11 x 2 1/4"
	G10230	2	Lock Washer, 5/8"
	G10104	2	Hex Nut, 5/8"-11
	G11391	2	Flat Washer, 5/8" SAE
3.	GA5122	1	Wheel Tower Clamp
4.	GA8134	1	Lockup Mount
5.	G10004	2	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G11091	2	Serrated Flange Nut, 3/8"-16
6.	G10053	2	Hex Head Cap Screw, 1/2"-13 x 2 1/2"
	G10111	2	Lock Nut, 1/2"-13
7.	GA5121	2	Pin, 2 1/8"
8.	GD11695	1	Pin, 1 1/4" x 13 1/4"
	G10610	2	Spring Pin, 3/8" x 2"
9.	GA8839	1	Arm
10.	G10006	4	Hex Head Cap Screw, 5/8"-11 x 2 1/4"
	G11391	4	Flat Washer, 5/8" SAE
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
11.	GD5841	1	Pin, 1 1/4" x 5 5/8"
	G10460	2	Cotter Pin, 1/4" x 2"
12.		-	See "Contact Wheel And Arm Assembly", Pages P40 And P41
13.		-	See "Master/Slave/Assist Cylinders", Pages P57 And P58
14.	GA9870	1	Lockup W/Pin
15.	G10026	2	Hex Head Cap Screw, 3/4"-10 x 2"
	G10231	2	Lock Washer, 3/4"
16.	GD12543	1	Scraper
17.	G11396	2	Flat Washer, 1 1/4"
18.	G10636	4	Carriage Bolt, 1/2"-13 x 1 1/2"
	G10071	4	Serrated Flange Nut, 1/2"-13
19.	G10025	2	Hex Head Cap Screw, 3/4"-10 x 1 1/2"
	G10231	2	Lock Washer, 3/4"
	G10105	2	Hex Nut, 3/4"-10
20.	GA7376	1	Scraper Mount
21.	GA14413	1	Rim, 5.50" x 20"
22.	GA7434	1	Valve Stem
23.	GD13401	-	Tire, 7.50" x 20", 8 Ply Tubeless W/O Center Rib (Specify Brand*)
24.	GA2558	1	Spindle W/Round External Retaining Ring, 9 1/2"
	GD11490	-	Round External Retaining Ring
25.	GA0895	2	Bearing
26.	GR0270	6	Lug Bolt, 9/16"-18
27.	GA2148	1	Hub W/Cups, 6 Bolt
	GR0434	-	Cup
28.	G11081	2	Hex Jam Nut, 1 1/2"-12, Grade 2
29.	G10159	2	Washer, 1 7/8" (As Required)
A.	GA4377	-	Hub And Spindle Assembly (Items 24, 25 And 27-28)
B.	GA7409	-	Scraper Assembly (Items 16 And 18-20)
C.	GA14412	-	Tire and Rim Assembly (items 21-23)

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

CONTACT WHEEL AND ARM ASSEMBLY

(EF38h)

L.H. Side Shown



ITEM	PART NO.	QTY. (Per Assy.)	DESCRIPTION
1.	G10233	-	Machine Bushing, 1", 10 Gauge
2.	GA5105	1	Sprocket, 15 Tooth, See "Two-Speed Point Row Clutch Drive", Pages P50 And P51 (If Applicable)
3.	GA2180	2	Hanger Bearing, 7/8" Hex Bore
4.	GD11125	1	Bar
5.	GD11158	1	Spacer, 3/4" O.D. x 9/16" Long (If Applicable)
	GD9229	2	Spacer, 1 1/4" O.D. x 1/2" Long (If Applicable)
6.	GA7154	3	Sprocket W/Bearing, 18 Tooth
7.	G10397	1	Hex Head Cap Screw, 1/2"-13 x 2 3/4"
	G10168	1	Machine Bushing, 1/2", 7 Gauge
	G10128	-	Machine Bushing, 1/2", 14 Gauge (As Required)
	G10111	1	Lock Nut, 1/2"-13
8.	GD6825-12.75	1	Hex Shaft, 7/8" x 12 3/4" (2 Holes)
9.	GA5114	1	Sprocket, 30 Tooth
10.	G10602	2	Spring Pin, 1/4" x 1 1/2"
11.	G10478	1	Clevis Pin, 5/16" x 1"
	G10409	1	Retaining Ring, 5/16"
12.	G10017	1	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	G10128	1	Machine Bushing, 1/2", 14 Gauge
	G10501	1	Hex Jam Nut, 1/2"-13, Grade 2
13.	GA9553	1	Idler W/Sprocket And Hardware, L.H.
	GA9554	1	Idler W/Sprocket And Hardware, R.H. (Shown)
	GA7154	-	Sprocket W/Bearing, 18 Tooth
	G10017	-	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	G10128	-	Machine Bushing, 1/2", 14 Gauge
	G10501	-	Hex Jam Nut, 1/2"-13, Grade 2

CONTACT WHEEL AND ARM ASSEMBLY

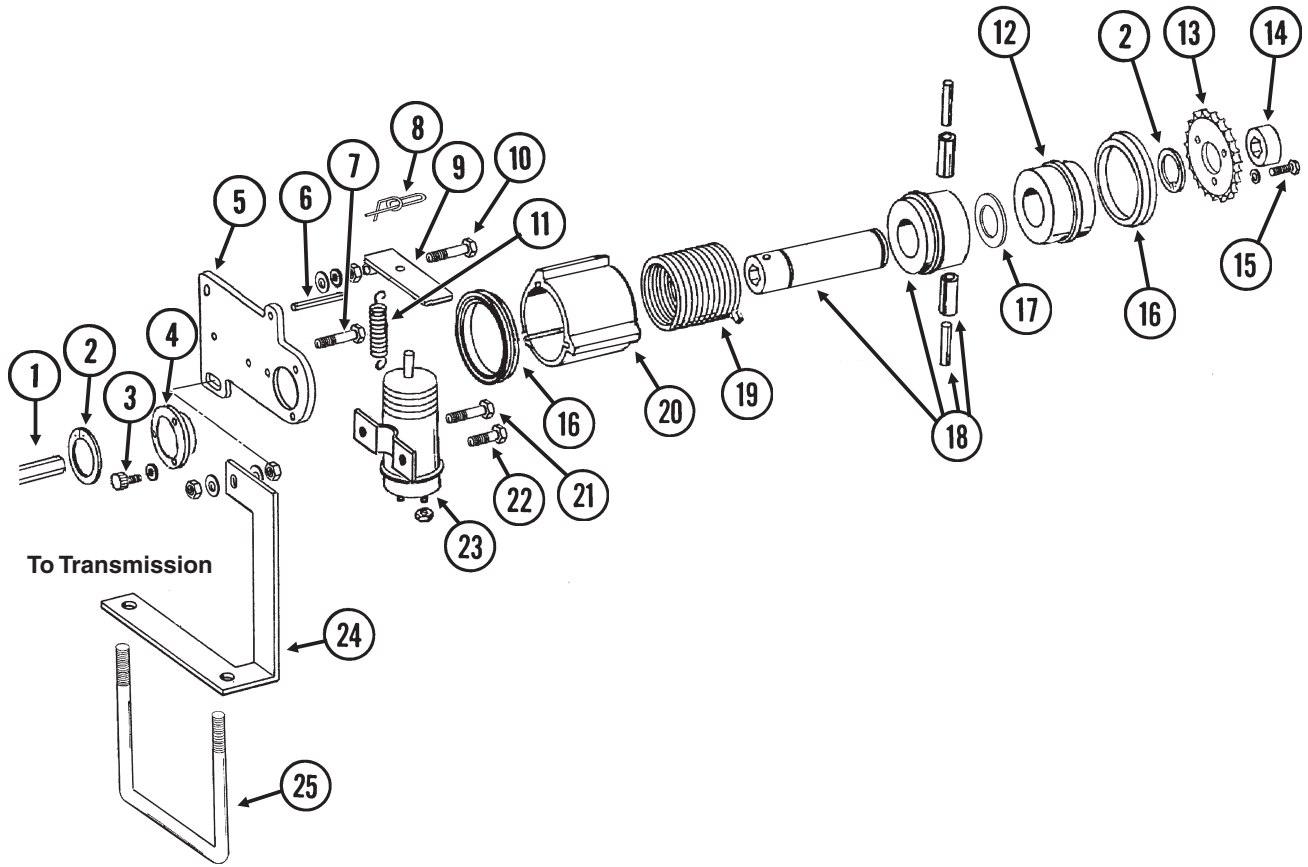
ITEM	PART NO.	QTY. (Per Assy.)	DESCRIPTION
14.	G10013	1	Hex Head Cap Screw, 5/8"-11 x 3 1/2"
	G10036	1	Hex Head Cap Screw, 5/8"-11 x 4"
	G11391	1	Flat Washer, 5/8" SAE
	G10107	1	Lock Nut, 5/8"-11
	G10104	1	Hex Nut, 5/8"-11
15.	G10303	-	Carriage Bolt, 5/16"-18 x 1"
	G10620	-	Serrated Flange Nut, 5/16"-18
16.	GD5857	1	Spring
17.	GA5202	1	Sprocket, 34 Tooth, See "Point Row Clutch", Pages P42 And P43 (If Applicable)
18.	G10130	1	Square Head Machine Bolt, 5/16"-18 x 1 3/4"
	G10923	1	Flange Nut, 5/16"-18, No Serration
19.		-	See "Seed Rate Transmission Assembly And Driveline", Pages P52 And P53
20.	GD11045	1	Lock Clamp
21.	G3310-74	1	Chain, No. 40, 74 Pitch Including Connector Link, See "Two-Speed Point Row Clutch Drive", Pages P50 And P51 (If Applicable)
	GR0912	-	Connector Link, No. 40
22.		-	See "Transport And Ground Drive Wheel Assembly", Pages P38 And P39
23.	GA8041	1	Wheel Tower
24.	G10055	2	Hex Head Cap Screw, 5/8"-11 x 1 1/4" (Stop Bolt)
	G10107	2	Lock Nut, 5/8"-11
25.	GA2068	2	Spring W/Plug
26.	G10501	2	Hex Jam Nut, 1/2"-13, Grade 2
27.	GA8042	1	Arm
28.	G10890	2	Hex Head Adjusting Bolt, 1/2"-13 x 4", Grade 2
29.	GD11157	2	Spacer, 1 1/2" O.D. x 5/8" Long
30.	GA5090	1	Tire And Rim Assembly (Specify Brand*)
	GD5753	-	Tire, 4.10" x 6" (Specify Brand*)
	GD5752	-	Inner Tube
	GA5089	-	Rim, 3.25" x 6" (Sub GA5090)
31.	GA9846	-	Flanged Bearing, 7/8" Hex Bore
32.	GD6825-11.625	1	Hex Shaft, 7/8" x 11 5/8" (2 Holes)
33.	G3310-102	1	Chain, No. 40, 102 Pitch Including Connector Link, See "Two-Speed Point Row Clutch Drive", Pages P50 And P51 (If Applicable)
	G3310-94	-	Chain, No. 40, Used With Half Rate (2 To 1) Drive
	GR0912	-	Connector Link, No. 40
34.	GA5114	1	Sprocket, 30 Tooth, Standard Rate Drive, See "Two-Speed Point Row Clutch Drive", Pages P50 And P51 (If Applicable)
	GA5105	-	Sprocket, 15 Tooth, Half Rate (2 To 1) Drive
35.	GD2558	1	Lynch Pin, 1/4"
36.	G10004	3	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G11091	3	Serrated Flange Nut, 3/8"-16
37.	G10004	1	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G10101	1	Hex Nut, 3/8"-16
38.	G10053	1	Hex Head Cap Screw, 1/2"-13 x 2 1/2"
	G10128	-	Machine Bushing, 1/2", 14 Gauge (As Required)
	G10111	1	Lock Nut, 1/2"-13
39.	GB0218	2	Bushing, 21/32" I.D. x 7/8" O.D. x 19/32" Long
40.	G10751	2	Hex Head Cap Screw, 5/8"-18 x 1 3/4"
	G10235	6	Machine Bushing, 7/8", 14 Gauge
	G11391	2	Flat Washer, 5/8" SAE
	G10412	2	Lock Nut, 5/8"-18
41.	G10303	6	Carriage Bolt, 5/16"-18 x 1"
	G10620	6	Serrated Flange Nut, 5/16"-18
A.	G1K269	-	Lock Clamp Kit (Items 18 And 20)

* Specific brand requests will be supplied only as available from current KINZE® Repair Parts stock. If a specific brand requested is not in stock, the brand available will be supplied. Different brand tires may have different diameters. Change in tire brands may affect rates. Field checks are recommended after any change in contact tires.

POINT ROW CLUTCH

(EF40f)

L.H. Side Shown

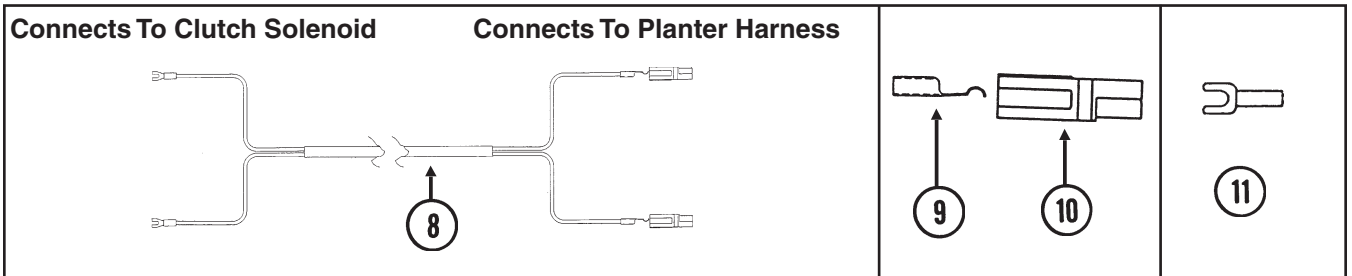
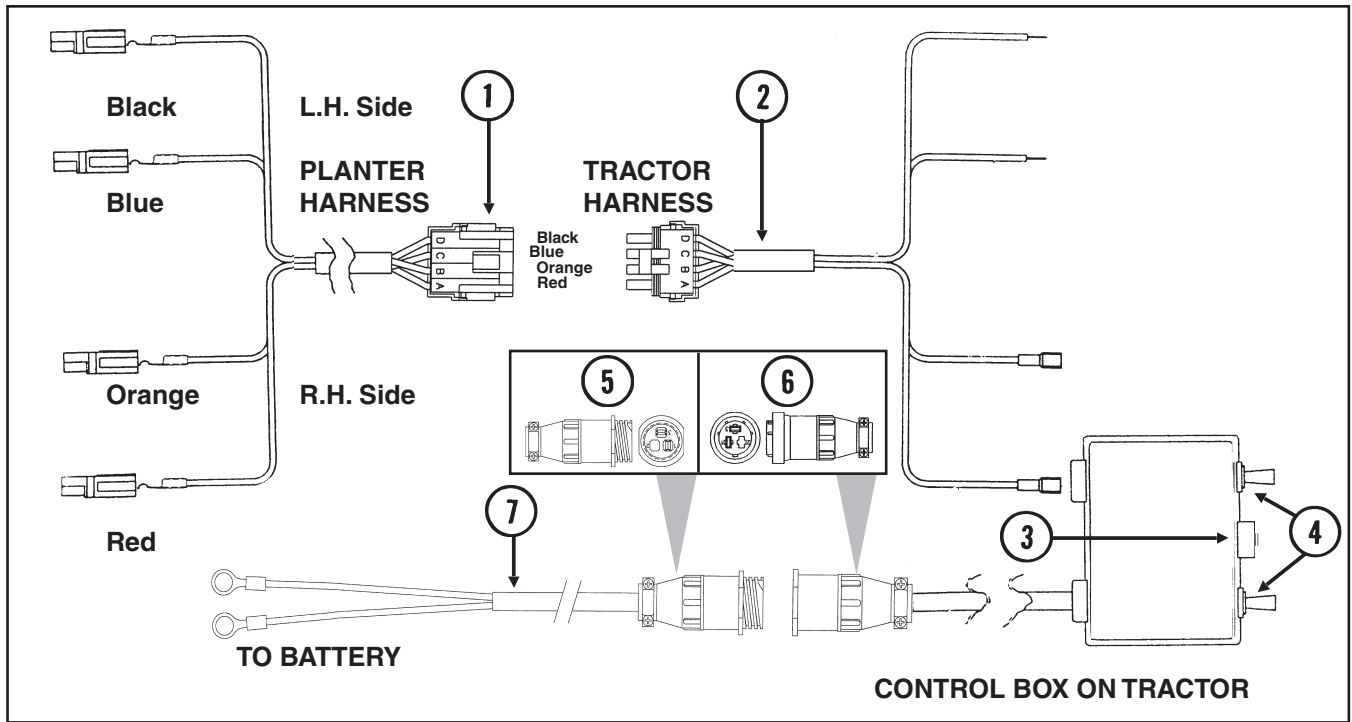


POINT ROW CLUTCH

ITEM	PART NO.	QTY. (Per Assy.)	DESCRIPTION
1.		-	See "Seed Rate Transmission Assembly And Driveline", Pages P52 And P53
2.	G10496	2	External Inverted Snap Ring, 1 1/2"
3.	G10253	3	Hex Socket Head Screw, No. 10-32 x 1/2"
	G10257	3	Lock Washer, No. 10
4.	GD9667	1	Bushing
5.	GD10103	1	Mounting Plate
6.	G10859	1	Spring Pin, 3/16" x 2 1/4"
7.	G10325	1	Hex Head Cap Screw, 3/8"-16 x 2 3/4"
	G11387	2	Flat Washer, 3/8" SAE
	G10101	2	Hex Nut, 3/8"-16
8.	GD11120	1	Rue Ring Cotter, 5/16"
9.	GD10510	1	Actuator Arm
10.	G10049	1	Hex Head Cap Screw, 3/8"-16 x 2 1/2"
	G10101	1	Hex Nut, 3/8"-16
	G11387	1	Flat Washer, 3/8" SAE
	G10229	2	Lock Washer, 3/8"
	G10497	1	Hex Jam Nut, 3/8"-16, Grade 2
11.	GD10123	1	Spring
12.	GD10104	1	Input Hub
13.	GD10525	1	Sprocket, 34 Tooth
14.	GD11394	1	Flat Washer, 1" SAE
15.	G10023	3	Hex Head Cap Screw, 1/4"-20 x 3/4"
	G10227	3	Lock Washer, 1/4"
16.	GD14512	2	V-Ring Seal
17.	GD14513	1	Felt Washer
18.	GA7137	1	Hub/Sleeve Assembly W/Spring Pins
	G10804	-	Spring Pin, 5/32" x 7/8"
	G10765	-	Spring Pin, 1/4" x 1"
19.	GD9672	1	Spring, R.H.
	GD9671	-	Spring, L.H.
20.	GD10102	1	Stop Collar
21.	G10900	1	Hex Socket Head Cap Screw, 1/4"-20 x 1 3/4", Grade 8
	G10227	1	Lock Washer, 1/4"
	G10103	2	Hex Nut, 1/4"-20
22.	G10023	1	Hex Head Cap Screw, 1/4"-20 x 3/4"
	G10227	1	Lock Washer, 1/4"
	G10103	1	Hex Nut, 1/4"-20
23.	GA8393	1	Solenoid Complete
	GR1306	1	Snap Ring
	GR1303	1	Spring
	GR1304	1	Boot
	GR1305	1	Plunger
24.	GD10528	-	Bracket, R.H. (Shown)
	GD10529	1	Bracket, L.H.
25.	GD7145	1	U-Bolt, 7" x 7" x 1/2"-13
	G10111	2	Lock Nut, 1/2"-13
26.	GA10054	1	Ground Cable, Green
A.	GA7418	-	Point Row Clutch Assembly, R.H. (R.H. Side Of Machine) (Items 2-6, 8-13, 15-23 And 26)
B.	GA7417	-	Point Row Clutch Assembly, L.H. (L.H. Side Of Machine) (Items 2-6, 8-13, 15-23 And 26)

POINT ROW CLUTCH ELECTRICAL COMPONENTS

(EF10b/ELC34/ELC35/EF10c/SFP6/TWL18/TWL76)

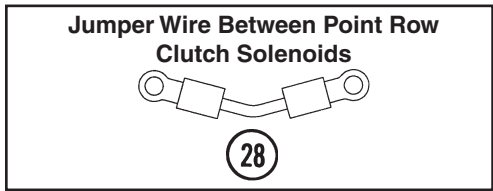
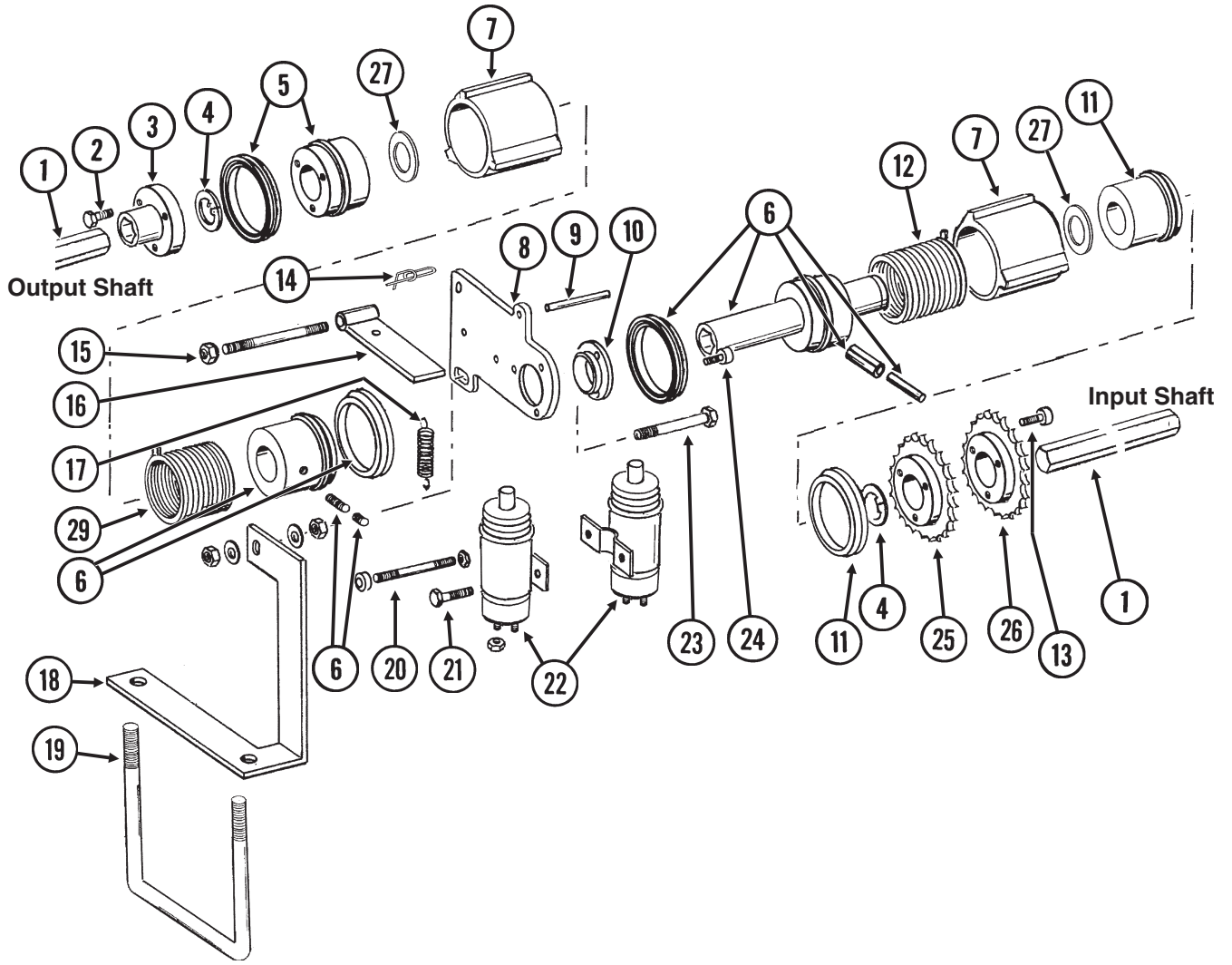


POINT ROW CLUTCH ELECTRICAL COMPONENTS

ITEM	PART NO.	QTY. (Per Assy.)	DESCRIPTION
1.	GR1446	-	Harness W/4-Pin Connector, 194"
	GA8328	-	4-Pin Connector W/Female Housing, 4 Seals And 4 Pin Contacts
2.	GR1447	-	Harness W/4-Pin Connector, 152"
	GA8329	-	4-Pin Male Connector Kit Includes: (1) 4-Pin Male Housing, (4) Sockets, (4) Seals
3.	GA7165	-	Circuit Breaker, 12 Amp
4.	GA7144	-	Two-Position Switch
5.	G1K267	-	Power Lead Adapter Connector Kit, Includes: (1) 3-Pin Connector, (1) Cable Clamp, (3) Male Terminal Pins
6.	G1K268	-	Console Cable Connector Kit, Includes: (1) 3-Pin Connector, (1) Cable Clamp, (1) Lock Ring, (3) Female Terminal Pins
7.	GA7856	1	Power Lead Adapter
8.	GA7212	1	Wiring Harness, 192"
9.	GD9530	-	Contact
10.	GD9529	-	Housing, Black
	GD12726	-	Housing, Red
11.	G10996	-	Fork Terminal

TWO-SPEED POINT ROW CLUTCH

(EF50d/A7274)

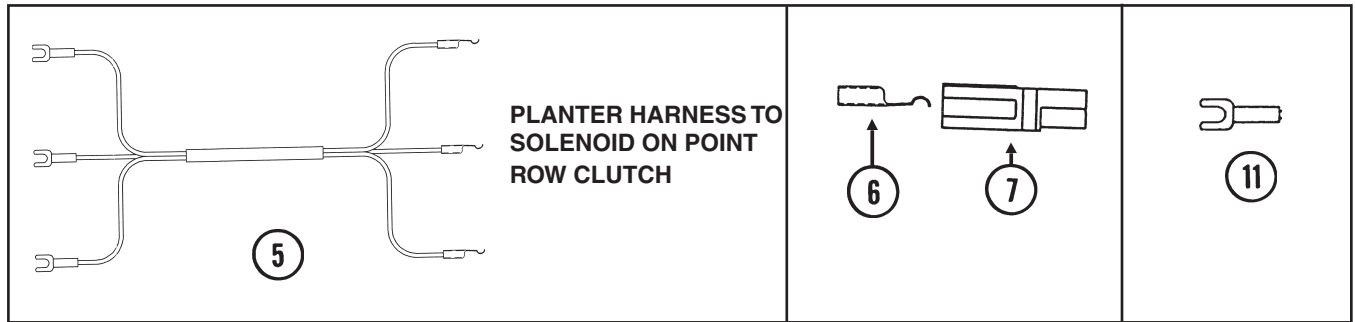
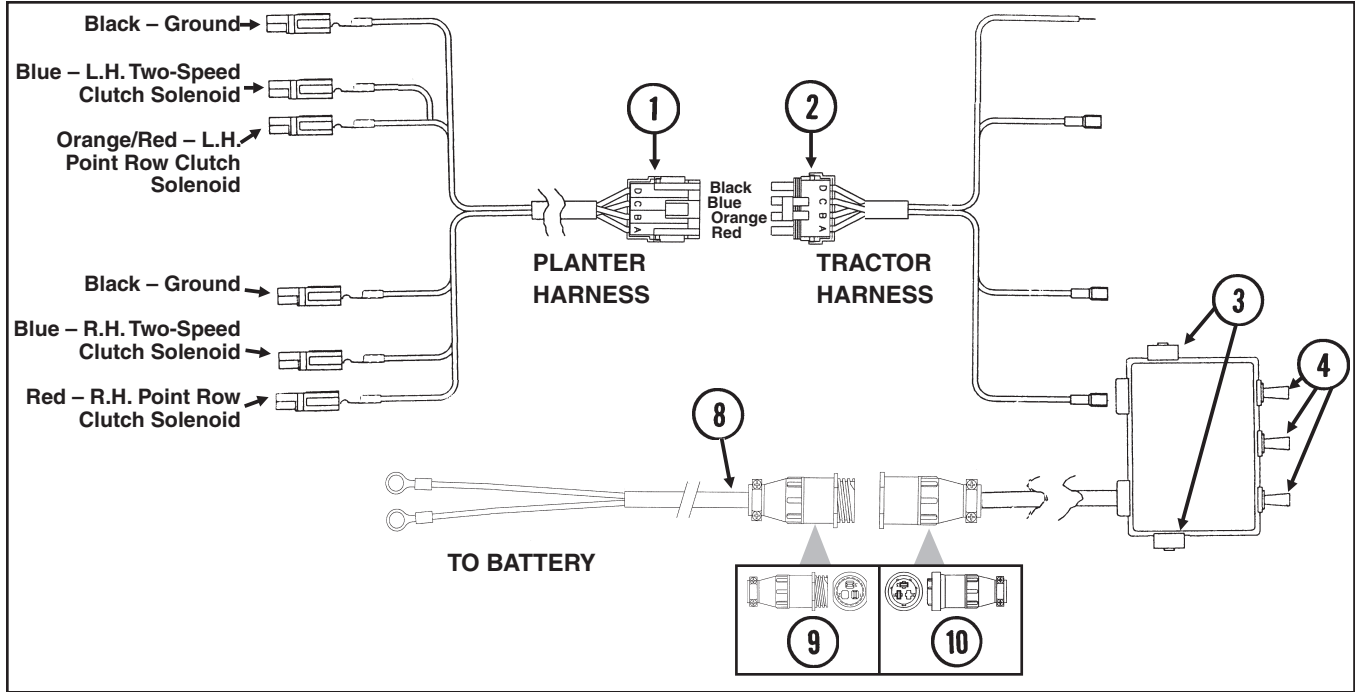


TWO-SPEED POINT ROW CLUTCH

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.		-	See "Two-Speed Point Row Clutch Drive", Pages P50 And P51
2.	G10374	3	Hex Socket Head Cap Screw, 1/4"-20 x 1"
3.	GA9068	1	Hex Coupler
4.	G10496	2	External Inverted Snap Ring, 1 1/2"
5.	GA9572	1	Hub W/Seal
	GD10120	-	Seal
6.	GA7463	1	Hub/Sleeve Assembly W/Seals, Sleeve, Pins And Screws
	GD10120	-	Seal
	GD10584	-	Sleeve
	G10873	-	Hex Socket Set Screw, 5/16"-18 x 3/4"
	G10872	-	Hex Socket Set Screw, 5/16"-18 x 1/4"
	G10804	-	Spring Pin, 5/32" x 7/8"
	G10765	-	Spring Pin, 1/4" x 1"
7.	GD10585	2	Stop Collar
8.	GD10103	1	Mounting Plate
9.	G10859	1	Spring Pin, 3/16" x 2 1/4"
10.	GD10586	1	Bushing
11.	GA9571	1	Hub W/Seal
	GD10120	-	Seal
12.	GD9672	-	Spring, R.H.
13.	G10638	3	Hex Head Cap Screw, 1/4"-20 x 2"
	G10227	3	Lock Washer, 1/4"
14.	GD11120	2	Rue Ring Cotter, 5/16"
15.	GD10636	1	Threaded Rod, 3/8"-16 x 4 1/4"
	G10108	2	Lock Nut, 3/8"-16
	G10229	2	Lock Washer, 3/8"
	G10101	2	Hex Nut, 3/8"-16
16.	GD10510	2	Actuator Arm
17.	GD10123	2	Spring
18.	GD10528	1	Bracket, R.H. (Shown)
	GD10529	-	Bracket, L.H.
19.	GD7145	1	U-Bolt, 7" x 7" x 1/2"-13
	G10128	2	Machine Bushing, 1/2", 14 Gauge
	G10111	2	Lock Nut, 1/2"-13
20.	GD10635	1	Threaded Rod, 1/4"-20 x 3 1/2"
	G10103	2	Hex Nut, 1/4"-20
	G10227	2	Lock Washer, 1/4"
	GD10282	2	Allen Nut, 1/4"-20
21.	G10023	1	Hex Head Cap Screw, 1/4"-20 x 3/4"
	G10227	1	Lock Washer, 1/4"
	G10103	1	Hex Nut, 1/4"-20
22.	GA8393	2	Solenoid Complete
	GR1306	-	Snap Ring
	GR1303	-	Spring
	GR1304	-	Boot
	GR1305	-	Plunger
23.	G10172	1	Hex Head Cap Screw, 3/8"-16 x 5"
	G10101	1	Hex Nut, 3/8"-16
	G11387	2	Flat Washer, 3/8" SAE
	G10108	1	Lock Nut, 3/8"-16
24.	G10876	3	Hex Socket Head Screw, No. 10-32 x 1/4"
25.	GD10672	1	Input Sprocket, 30 Tooth
26.	GD10673	1	Sprocket, 34 Tooth
27.	GD14513	2	Felt Washer
28.	GA7274	1	Jumper Wire W/Ring Terminals, 2 3/16" (Between Solenoids)
29.	GD9671	-	Spring, L.H.

TWO-SPEED POINT ROW CLUTCH ELECTRICAL COMPONENTS

(SFP46d/SFP46e/TWL71a/TWL76/TWL18/TWL76)

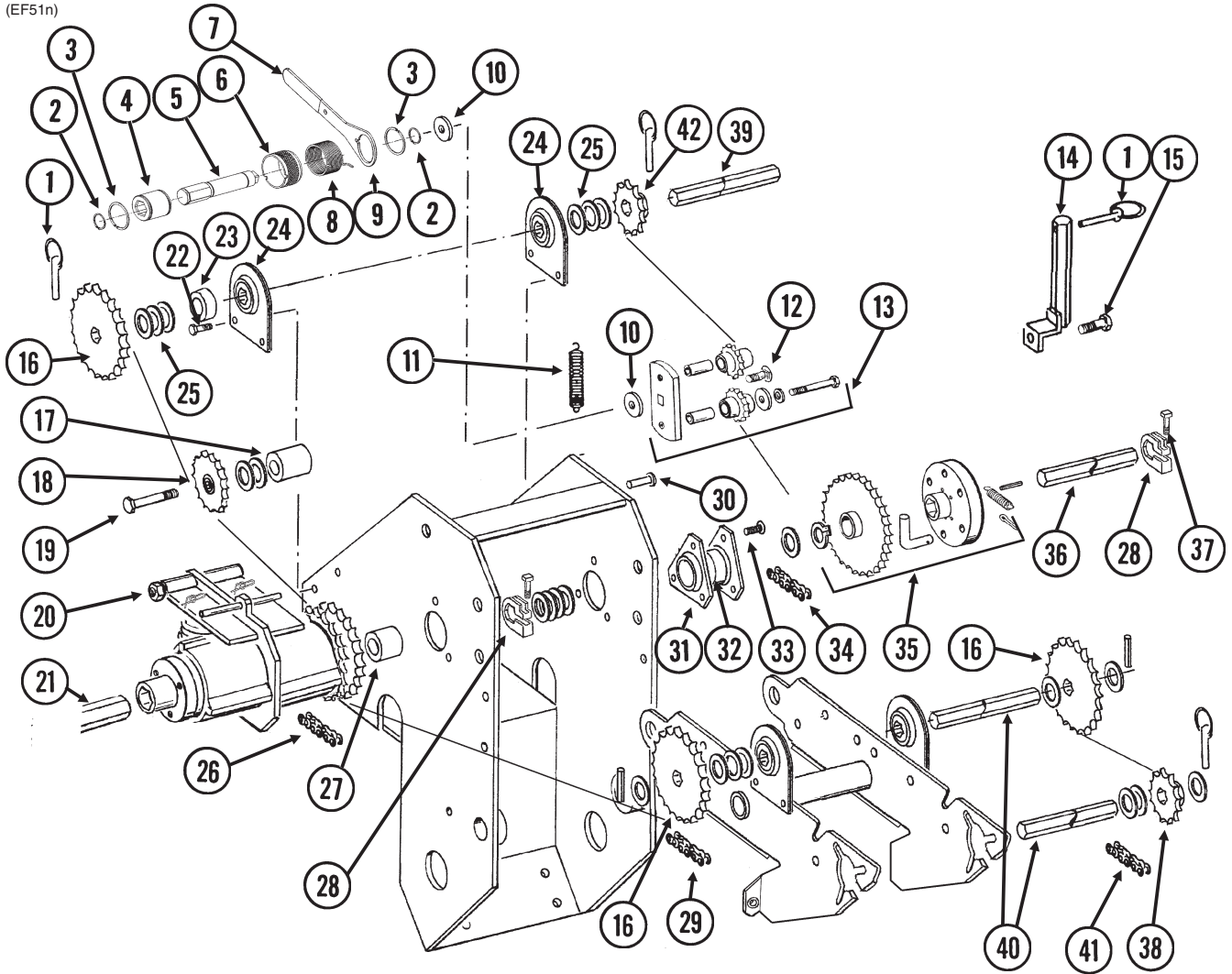


TWO-SPEED POINT ROW CLUTCH ELECTRICAL COMPONENTS

ITEM	PART NO.	QTY. (Per Assy.)	DESCRIPTION
1.	GR1448	-	Harness W/4-Pin Connector, 60"
	GA8328	-	4-Pin Connector W/Female Housing, 4 Seals And 4 Pin Contacts
2.	GR1449	-	Harness W/4-Pin Connector, 152"
	GA8329	-	4-Pin Male Connector Kit Includes: (1) 4-Pin Male Housing, (4) Sockets, (4) Seals
3.	GA7165	2	Circuit Breaker, 12 Amp
4.	GA7144	3	Two-Position Switch
5.	GA7577	1	Wiring Harness, 288"
6.	GD9530	-	Contact
7.	GD9529	-	Housing, Black
	GD12726	-	Housing, Red
8.	GA7856	1	Power Lead Adapter
9.	G1K267	-	Power Lead Adapter Connector Kit, Includes: (1) 3-Pin Connector, (1) Cable Clamp, (3) Male Terminal Pins
10.	G1K268	-	Console Cable Connector Kit, Includes: (1) 3-Pin Connector, (1) Cable Clamp, (1) Lock Ring, (3) Female Terminal Pins
11.	G10996	-	Fork Terminal

TWO-SPEED POINT ROW CLUTCH DRIVE

(EF51n)



ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GD2558	3	Lynch Pin, 1/4"
2.	G10496	2	External Inverted Snap Ring, 1 1/2"
3.	G11075	2	External Inverted Snap Ring, 7/8"
4.	GD14432	1	Sleeve, 1 1/4"
5.	GD14426	1	Tightener Shaft, 3 3/8"
6.	GD14429	-	Release Collar, Silver, L.H. (Shown)
	GD14430	1	Release Collar, Gold, R.H.
7.	G11078	1	Vinyl Cap
8.	GD14414	1	Torsion Spring, R.H. (Shown)
	GD14413	-	Torsion Spring, L.H.
9.	GD14431	1	Handle
10.	G10235	2	Machine Bushing, 7/8", 14 Gauge
11.	GD5857	1	Spring
12.	G11100	1	Hex Socket Button Head Cap Screw, 1/4"-20 x 1/2", Grade 8
	G10227	1	Lock Washer, 1/4"
	G11385	1	Flat Washer, 1/4" SAE
13.	GA7336	1	Idler W/Bolt-On Sprockets
	GD7426	-	Sprocket, 12 Tooth
	GD1026	-	Sleeve, 1 3/16" Long
	G11387	-	Flat Washer, 3/8" SAE
	G10229	-	Lock Washer, 3/8"
	G10047	-	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
14.	GA7313	1	Sprocket Storage Rod

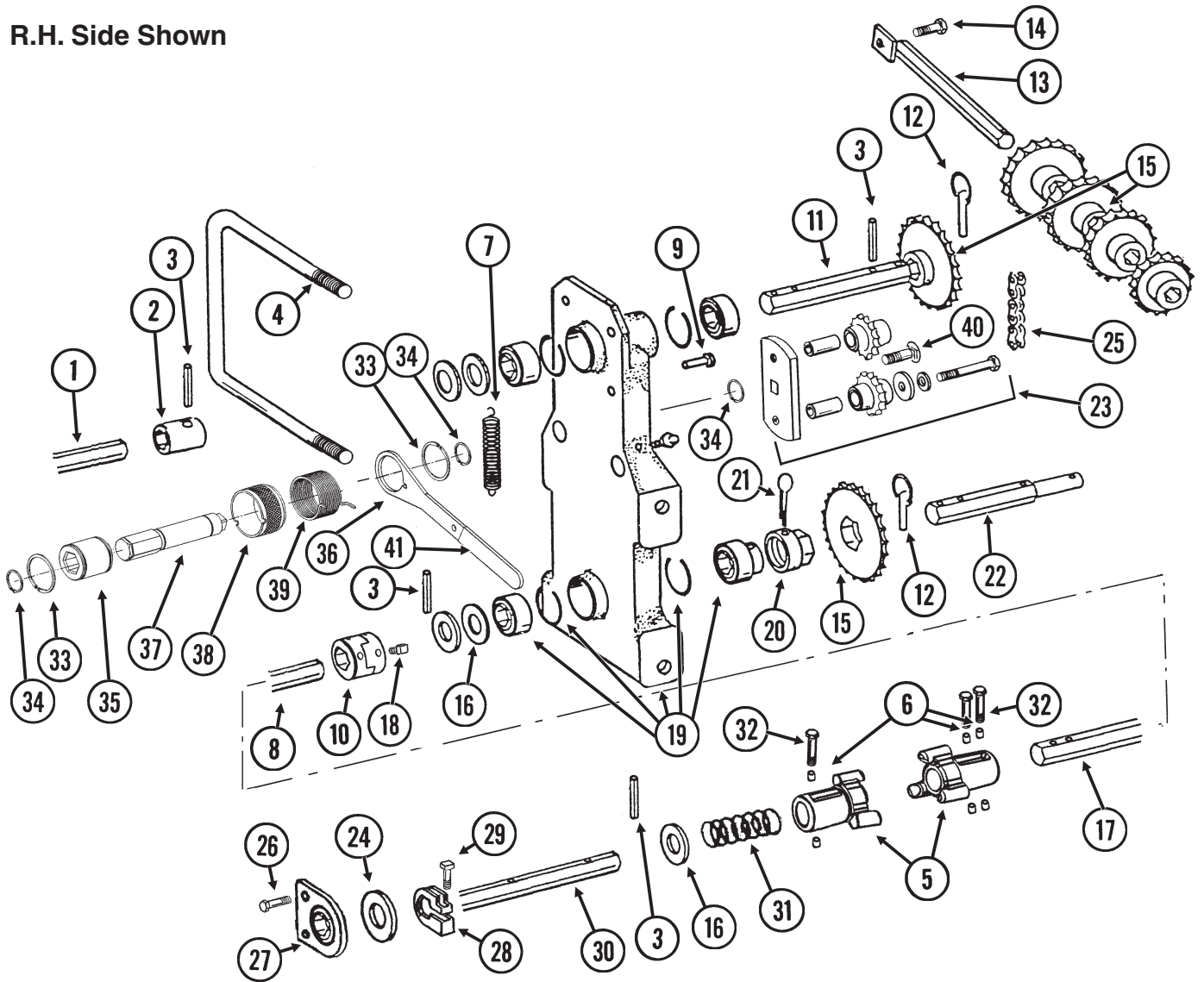
TWO-SPEED POINT ROW CLUTCH DRIVE

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
15.	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
16.	GA5114	3	Sprocket, 30 Tooth
17.	GD11213	1	Spacer, 1 1/4" O.D. x 1 3/4" Long
18.	GA7154	1	Sprocket W/Bearing, 18 Tooth
19.	G10035	1	Hex Head Cap Screw, 1/2"-13 x 4"
	G11389	1	Flat Washer, 1/2" SAE
	G10128	2	Machine Bushing, 1/2", 14 Gauge
	G10111	1	Lock Nut, 1/2"-13
20.		-	See "Two-Speed Point Row Clutch", Pages P46 And P47
21.	GD0914-6.25	1	Hex Shaft, 7/8" x 6 1/4" (No Holes), 12 Row 30"
	GD0914-21.5	-	Hex Shaft, 7/8" x 21 1/2" (No Holes), 8 Row 36"/38"
22.	G10001	4	Hex Head Cap Screw, 3/8"-16 x 1"
	G10229	4	Lock Washer, 3/8"
	G10101	4	Hex Nut, 3/8"-16
23.	GD11157	1	Spacer, 1 1/2" O.D. x 5/8" Long
24.	GA2180	2	Hanger Bearing, 7/8" Hex Bore
25.	G10233	10	Machine Bushing, 1", 10 Gauge
26.	G3310-76	1	Chain, No. 40, 76 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
27.	GD5900-25	1	Sleeve, 2"
28.	GD11045	2	Lock Clamp
	G10233	4	Machine Bushing, 1", 10 Gauge
29.	G3310-80	1	Chain, No. 40, 80 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
30.	G10478	1	Clevis Pin, 5/16" x 1"
	G10409	1	Retaining Ring, 5/16"
31.	G3400-01	2	Flangette
32.	G2100-03	1	Bearing, 7/8" Hex Bore, Spherical
33.	G10303	3	Carriage Bolt, 5/16"-18 x 1"
	G10106	3	Hex Nut, 5/16"-18
34.	G3310-68	1	Chain, No. 40, 68 Pitch Including Connector Link
	G3310-06	-	Chain, No. 40, 6 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
35.	GA7320	1	Overrunning Sprocket Assembly, R.H.
	GA7321	-	Overrunning Sprocket Assembly, L.H.
	G10430	1	External Retaining Ring, 1 1/4"
	GD1255	6	L-Pin
	G10546	6	Spring Pin, 3/16" x 1 1/4"
	G10470	6	Cotter Pin, 5/32" x 1"
	GD10366	6	Spring
	GA7317	1	Block
	GA7319	1	Sprocket W/Bushing, 30 Tooth
36.	GD0914-20	1	Hex Shaft, 7/8" x 20" (No Holes)
37.	G10130	2	Square Head Machine Bolt, 5/16"-18 x 1 3/4"
	G10923	2	Flange Nut, 5/16"-18, No Serration
38.	GA5105	1	Sprocket, 15 Tooth
39.	GD6825-14.5	1	Hex Shaft, 7/8" x 14 1/2" (2 Holes)
40.		-	See "Contact Wheel And Arm Assembly", Pages P40 And P41
41.	G3310-92	1	Chain, No. 40, 92 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
42.	GA5105	1	Sprocket, 15 Tooth
	GA5106	1	Sprocket, 17 Tooth
	GA5109	1	Sprocket, 24 Tooth
	GA5112	1	Sprocket, 27 Tooth
	GA5108	1	Sprocket, 23 Tooth (From Transmission)
	GA5110	1	Sprocket, 25 Tooth (From Transmission)
	GA5111	1	Sprocket, 26 Tooth (From Transmission)
A.	G1K269	-	Lock Clamp Kit (Items 23 And 34)
B.	G1K381	-	Wrap Spring Wrench Replacement Kit, Silver Collar, L.H. (Items 2-10 And 12) (Shown)
	G1K380	1	Wrap Spring Wrench Replacement Kit, Gold Collar, R.H. (Items 2-10 And 12)

SEED RATE TRANSMISSION ASSEMBLY AND DRIVELINE

(EF45h)

R.H. Side Shown



ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GD0914-20	2	Hex Shaft, 7/8" x 20" (No Holes), 12 Row 30"
	GD0914-35	-	Hex Shaft, 7/8" x 35" (No Holes), 8 Row 36"/38", See "Two-Speed Point Row Clutch Drive", Pages P50 And P51 (If Applicable)
2.	GD5961	1	Coupler, 2 1/4"
3.	G10602	-	Spring Pin, 1/4" x 1 1/2"
4.	GD1114	1	U-Bolt, 7" x 7" x 5/8"-11
	G10230	2	Lock Washer, 5/8"
	G10104	2	Hex Nut, 5/8"-11
5.	GB0283	2	Coupler
6.	GD11395	6	Bushing, 1/2"
7.	GD5857	1	Spring
8.	GD12616-66	2	Hex Shaft, 7/8" x 66" (2 Holes), 8 Row 36"/38"
	GD12616-78	2	Hex Shaft, 7/8" x 78" (2 Holes), 12 Row 30"
9.	G10478	1	Clevis Pin, 5/16" x 1"
	G10409	1	Retaining Ring, 5/16"
10.	GB0287	2	Coupler
11.	GD5835	1	Shaft, 7/8" x 7"
12.	GD2558	3	Lynch Pin, 1/4"
13.	GA5146	1	Sprocket Storage Rod

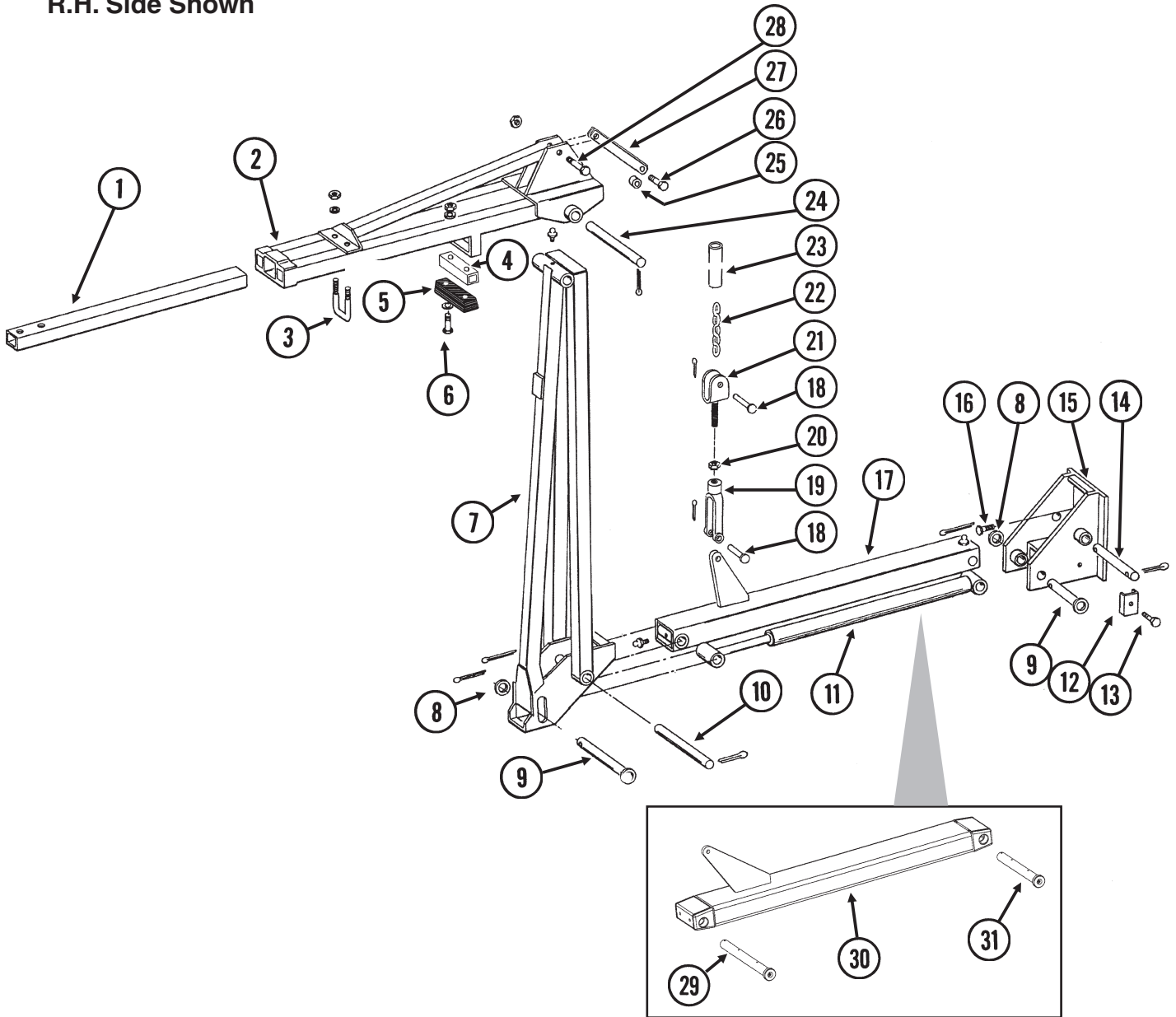
SEED RATE TRANSMISSION ASSEMBLY AND DRIVELINE

ITEM	PART NO.	QTY. (Per Assy.)	DESCRIPTION
14.	G10017	1	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	G10527	1	Lock Washer, 1/2", Internal/External
	G10111	1	Lock Nut, 1/2"-13
15.	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
16.	G10233	4	Machine Bushing, 1", 10 Gauge
17.	GD11393-66	2	Hex Shaft, 7/8" x 66" (3 Holes), 8 Row 36"/38"
	GD11393-78	-	Hex Shaft, 7/8" x 78" (3 Holes), 12 Row 30"
18.	G10131	4	Square Head Set Screw, 5/16"-18 x 3/4"
19.	GA5629	1	Transmission Plate W/Bearings, Grease Fittings And Retaining Rings
	GA5116	3	Bearing, 7/8" Hex Bore, Cylindrical
	GA5624	1	Special Bearing, 7/8" Hex Bore x 1.6"
	GD6551	4	Ring
	G10640	-	Grease Fitting, 1/4"-28
20.	GD7127	1	Shear Coupler
21.	G10462	1	Cotter Pin, 3/16" x 2"
22.	GD7822	1	Shaft, 7/8" x 7"
23.	GA7336	1	Idler W/Bolt-On Sprockets
	GD7426	-	Sprocket, 12 Tooth
	GD1026	-	Sleeve, 1 3/16" Long
	G11387	-	Flat Washer, 3/8" SAE
	G10229	-	Lock Washer, 3/8"
	G10047	-	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
24.	G11396	1	Flat Washer, 1 1/4"
25.	G3310-80	1	Chain, No. 40, 80 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
26.	G10004	-	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G10229	-	Lock Washer, 3/8"
	G10101	1	Hex Nut, 3/8"-16
27.	GA2180	2	Hanger Bearing, 7/8" Hex Bore
28.	GD11045	-	Lock Clamp
29.	G10130	-	Square Head Machine Bolt, 5/16"-18 x 1 3/4"
	G10923	-	Flange Nut, 5/16"-18, No Serration
30.	GD11394-63	1	Hex Shaft, 7/8" x 63" (2 Holes), L.H., 8 Row 36"/38"
	GD11394-73	1	Hex Shaft, 7/8" x 73" (2 Holes), R.H., 8 Row 36"/38"
	GD11394-79	-	Hex Shaft, 7/8" x 79" (2 Holes), L.H., 12 Row 30"
	GD11394-90	-	Hex Shaft, 7/8" x 90" (2 Holes), R.H., 12 Row 30"
31.	GD2962	2	Spring
32.	G10880	3	Hex Head Cap Screw, 1/4"-20 x 2 1/4"
	G10110	3	Lock Nut, 1/4"-20, Grade B
33.	G10496	2	External Inverted Snap Ring, 1 1/2"
34.	G11075	3	External Inverted Snap Ring, 7/8"
35.	GD14432	1	Sleeve, 1 1/4"
36.	GD14431	1	Handle
37.	GD14427	1	Tightener Shaft, 4 7/8"
38.	GD19343	1	Release Collar, R.H. (Shown)
	GD19344	-	Release Collar, L.H.
39.	GD14413	-	Torsion Spring, L.H. (Shown)
	GD14414	1	Torsion Spring, R.H.
40.	G11100	1	Hex Socket Button Head Cap Screw, 1/4"-20 x 1/2", Grade 8
	G10227	1	Lock Washer, 1/4"
	G11385	1	Flat Washer, 1/4" SAE
41.	G11078	1	Vinyl Cap
A.	G1K269	-	Lock Clamp Kit (Items 28 And 29)
B.	G1K378	1	Wrap Spring Wrench Replacement Kit, Gold Collar, R.H. (Items 33-41) (Shown)
	G1K379	-	Wrap Spring Wrench Replacement Kit, Silver Collar, L.H. (Items 33-41)

ROW MARKER ASSEMBLY

(MKR22gg)

R.H. Side Shown



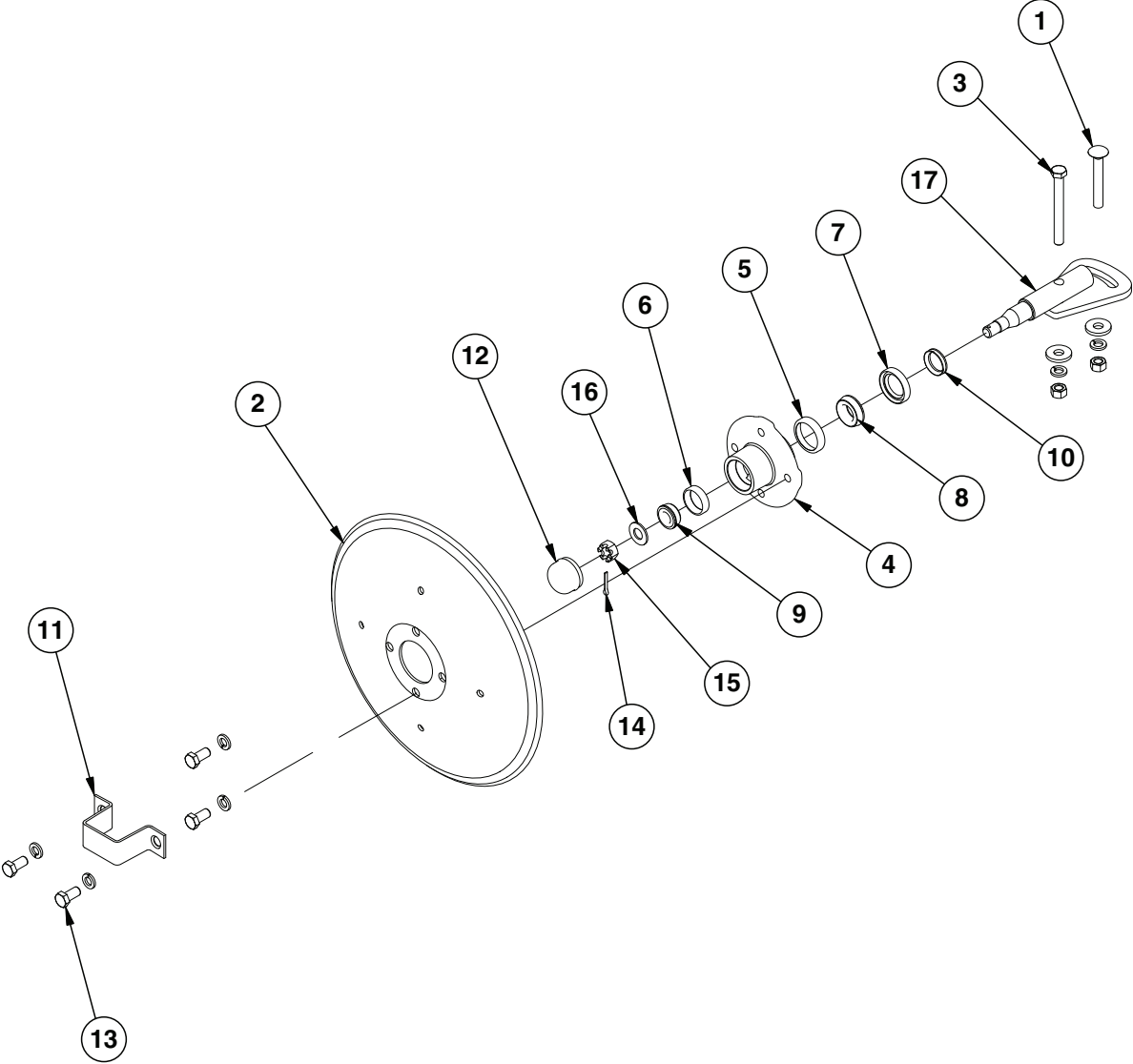
TEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GD0453-02	1	Extension Tube, 40", 8 Row 36"/38"
	GD0453-03	-	Extension Tube, 50", 12 Row 30"
2.	GA8120	1	Arm, Third Stage, 19 1/2", 8 Row 36"/38"
	GA8075	-	Arm, Third Stage, 35", 12 Row 30"
3.	GD2721	1	U-Bolt, 2" x 2" x 1/2"-13
	G10228	2	Lock Washer, 1/2"
	G10102	2	Hex Nut, 1/2"-13

ROW MARKER ASSEMBLY

ITEM	PART NO.	QTY. (Per Assy.)	DESCRIPTION
4.	GD11141	1	Spacer, 8 Row 36"/38" Only
5.	GA9145	1	Molded Stop, 6 1/4" Long
6.	G10047	2	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
	G10809	-	Hex Head Cap Screw, 3/8"-16 x 3 1/4"
	G11387	2	Flat Washer, 3/8" SAE
	G10108	2	Lock Nut, 3/8"-16
7.	GA8119	1	Arm W/Grease Fitting, Second Stage, 60", 8 Row 36"/38"
	GA8076	-	Arm W/Grease Fitting, Second Stage, 72", 12 Row 30"
	G10641	-	Grease Fitting, 1/8" NPT
8.	G10159	-	Washer, 1 7/8"
9.	GD15386	2	Pin, 1 1/4" x 7 5/8"
	G10460	2	Cotter Pin, 1/4" x 2"
10.	GD3214	1	Pin, 1 1/4" x 12 1/4"
	G10460	2	Cotter Pin, 1/4" x 2"
11.		-	See "Row Marker Cylinder", Page P58
12.	GD5875	1	Hose Clamp, 9/16" x 2 1/2" x 2"
13.	G10003	1	Hex Head Cap Screw, 3/8"-16 x 1 1/2"
	G10108	1	Lock Nut, 3/8"-16
14.	GD0652	1	Pin, 1 1/4" x 9 1/2"
	G10460	2	Cotter Pin, 1/4" x 2"
15.	GA8073	1	Mount
16.	G10879	4	Flanged 12 Point Bolt, 5/8"-11 x 2", Special Hardened
	G10230	2	Lock Washer, 5/8"
	G10104	2	Hex Nut, 5/8"-11
17.	GA8074	1	Arm W/Grease Fittings, First Stage
	G10641	-	Grease Fitting, 1/8" NPT
18.	G10560	2	Clevis Pin, 1/2" x 1 3/4"
	G10451	-	Cotter Pin, 1/8" x 1"
19.	GD8218	1	Yoke
20.	G10503	1	Hex Jam Nut, 5/8"-11, Grade 2
21.	GD11115	1	Plain Yoke
22.	G3302-08	1	Coil Chain, No. 9/0, 24 Links, 8 Row 36"/38"
	G3302-07	1	Coil Chain, No. 9/0, 28 Links, 12 Row 30"
23.	GD10674-03	1	Chain Cover, 48", 8 Row 36"/38"
	GD10674-02	-	Chain Cover, 56", 12 Row 30"
24.	GD2697	1	Pin, 7/8" x 11"
	G10463	2	Cotter Pin, 1/4" x 1 1/2"
25.	GD2971-11	1	Sleeve, 1 7/8" Long
26.	G10049	1	Hex Head Cap Screw, 3/8"-16 x 2 1/2"
	G11387	1	Flat Washer, 3/8" SAE
	G10108	1	Lock Nut, 3/8"-16
27.	GA8072	1	Linkage, 10"
28.	G10862	1	Hex Head Cap Screw, 5/8"-11 x 3 1/4"
	G10107	2	Lock Nut, 5/8"-11
29.	GA11766	-	Pin W/Grease Fitting, 1 1/4" x 11 13/16"
	G10640	-	Grease Fitting, 1/4"-28
	G10463	1	Cotter Pin, 1/4" x 1 1/2"
30.	GA11592	-	Arm, First Stage
31.	GA11767	-	Pin W/Grease Fitting, 1 1/4" x 9 1/2"
	G10640	-	Grease Fitting, 1/4"-28
	G10463	1	Cotter Pin, 1/4" x 1 1/2"

ROW MARKER SPINDLE/HUB/BLADE

IP1035a

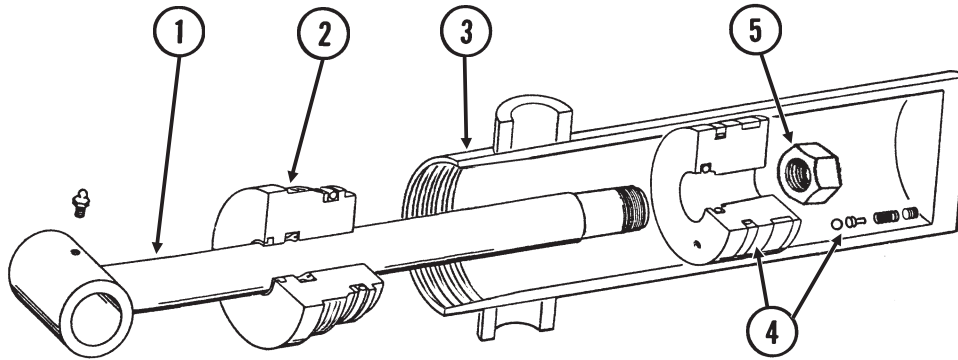


ROW MARKER SPINDLE/HUB/BLADE

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	G10844	1	Carriage Bolt, 1/2"-13 x 3 1/2"
	G10168	1	Machine Bushing, 1/2", 7 Gauge
	G10228	1	Lock Washer, 1/2"
	G10102	1	Hex Nut, 1/2"-13
2.	GD0746	1	Disc Blade, Solid, 16" (Shown)
	GD10283	-	Disc Blade, Notched, 16" (Optional)
3.	G10045	1	Hex Head Cap Screw, 1/2"-13 x 4 1/2"
	G10168	1	Machine Bushing, 1/2", 7 Gauge
	G10228	1	Lock Washer, 1/2"
	G10102	1	Hex Nut, 1/2"-13
4.	GA0167	1	Hub W/Cups, 4 Bolt (Includes Items 5 and 6)
5.	GR0150	1	Inner Cup
6.	GR0151	1	Outer Cup
7.	GA0243	1	Grease Seal
8.	GA0245	1	Bearing
9.	GA0257	1	Bearing
10.	GA0899	1	Rubber Seal
11.	GD2597	1	Retainer
12.	GD0840	1	Dust Cap
13.	G10722	4	Hex Head Cap Screw, 1/2"-20 x 1"
	G10228	4	Lock Washer, 1/2"
14.	G10544	1	Cotter Pin, 5/32" x 1"
15.	G10725	1	Slotted Hex Nut, 5/8"-18
16.	G10724	1	Washer, 5/8" SAE
17.	GA13695	1	Spindle
A.	GA13719	-	Hub And Spindle Assembly, (Items 11-17)

MASTER LIFT CYLINDER

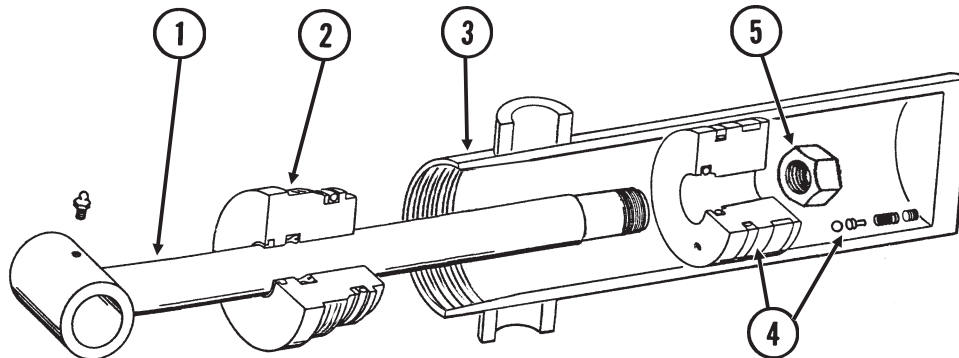
CYL038(CYL1a)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA8912	1	Rod Assembly W/Grease Fitting
	G10640	-	Grease Fitting, 1/4"-28
2.	GD12507	1	Gland
3.	A4295	1	Barrel (Non-Stock Item)
4.	GA8916	1	Piston W/Rephasing Valve
	GR1169	-	Rephasing Valve Replacement Kit (Includes Set Screw, Guide, 2 Springs And Ball)
5.	G10958	1	Lock Nut, 1"-14
A.	GA8917	-	Cylinder Complete, 3 1/2" x 8" (Part Number Stamped On Barrel)
B.	GR1528	-	Seal Kit, Includes: (1) Wear Ring, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Wiper, (1) T-Seal

SLAVE LIFT CYLINDER

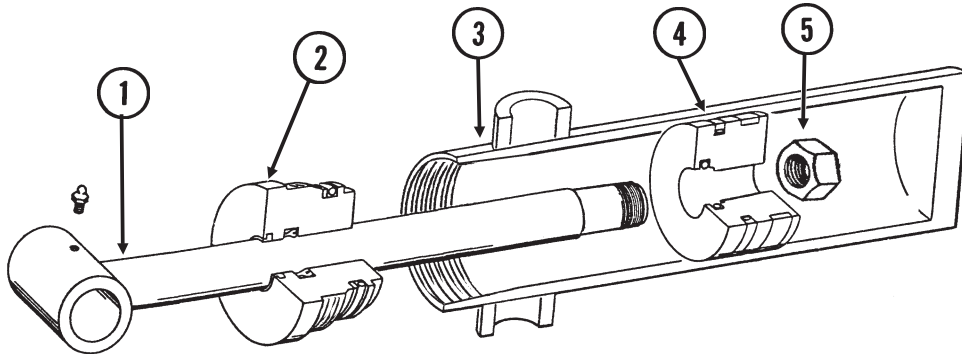
CYL038(CYL1a)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA8912	1	Rod Assembly W/Grease Fitting
	G10640	-	Grease Fitting, 1/4"-28
2.	GD12505	1	Gland
3.	A7538	1	Barrel (Non-Stock Item)
4.	GA8914	1	Piston W/Rephasing Valve
	GR1169	-	Rephasing Valve Replacement Kit (Includes Set Screw, Guide, 2 Springs And Ball)
5.	G10958	1	Lock Nut, 1"-14
A.	GA8915	-	Cylinder Complete, 3 1/4" x 8" (Part Number Stamped On Barrel)
B.	GR1527	-	Seal Kit, Includes: (1) Wear Ring, (1) T-Seal, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Wiper

ASSIST CYLINDER

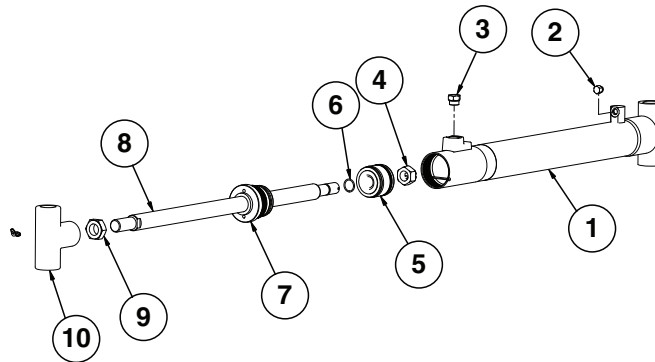
CYL026(CYL4e)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA8912	1	Rod Assembly W/Grease Fitting
	G10640	-	Grease Fitting, 1/4"-28
2.	GD12505	1	Gland
3.	A7538	1	Barrel (Non-Stock Item)
4.	GD12504	1	Piston
5.	G10958	1	Lock Nut, 1"-14
A.	GA8913	-	Cylinder Complete, 3 1/4" x 8" (Part Number Stamped On Barrel)
B.	GR1527	-	Seal Kit, Includes: (1) Wear Ring, (1) T-Seal, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Wiper

ROW MARKER (CUSHION) CYLINDER

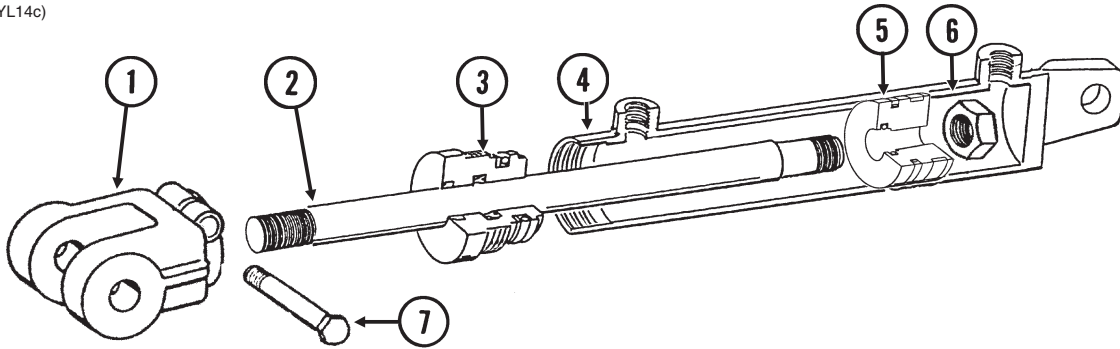
IP1108



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA8836	1	Barrel (Non-Stock Item)
2.	G6408-04	1	Plug W/O-Ring, 7/16"-20 O-Ring
	GR1465	-	O-Ring
3.	G6408-08	1	Plug W/O-Ring, 3/4"-16 O-Ring
	GR1037	-	O-Ring
4.	G10962	1	Slotted Hex Nut, 7/8"-14
	G10827	1	Cotter Pin, 1/8" x 1 3/4"
5.	GD11983	1	Piston
	GD12275	1	T-Seal, 2 1/2"
	GD12012	1	Piston Ring, 2 1/2"
6.	GD12214	1	O-Ring
7.	GD10207	1	Gland
	GD12251	1	U-Cup
	GD12213	1	Back-up Ring
	GD12212	1	O-Ring
	GD12210	1	Wiper
	GD12102	1	Cast Iron Ring
8.	GD14529	1	Rod
9.	G10324	1	Hex Jam Nut, 1"-14
10.	GD14308	1	Threaded Sleeve End
A.	GA10123	-	Cylinder Complete, 2 1/2" x 20 1/16" (Part Number Stamped On Barrel)
B.	GR1521	1	Seal Kit, Includes: (1) T Seal, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Wiper, (1) Cast Iron Ring

HYDRAULIC WING FOLD CYLINDER

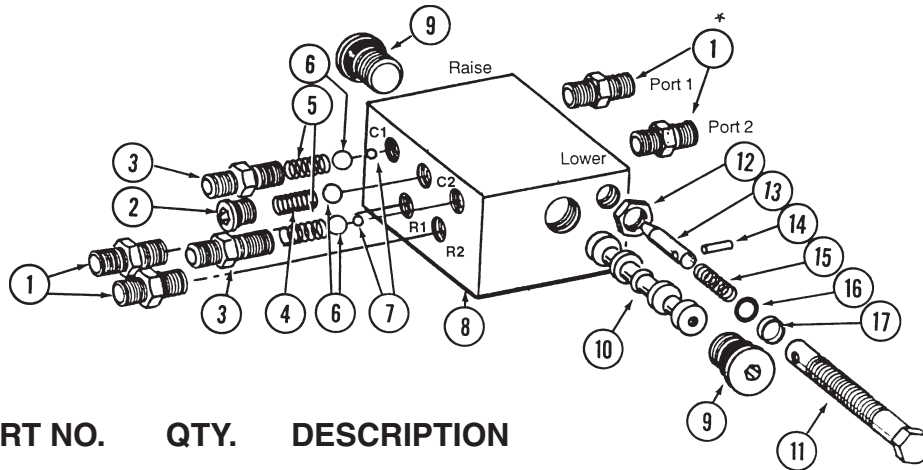
CYL032(CYL14c)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GD11950	1	Clevis
2.	GD12501	1	Rod
3.	GD11999	1	Gland
4.	A6524	1	Barrel (Non-Stock Item)
5.	GD12502	1	Piston
6.	G10958	1	Lock Nut, 1"-14
7.	G10939	1	Hex Head Cap Screw, 3/8"-16 x 2 1/4"
	G10108	1	Lock Nut, 3/8"-16
A.	GA8911	-	Cylinder Complete, 3" x 16" <i>(Part Number Stamped On Barrel)</i>
B.	GR1526	-	Seal Kit, Includes: (1) Wear Ring, (1) T-Seal, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Wiper

ROW MARKER SEQUENCING/FLOW CONTROL VALVE

VVB025(PT9a)

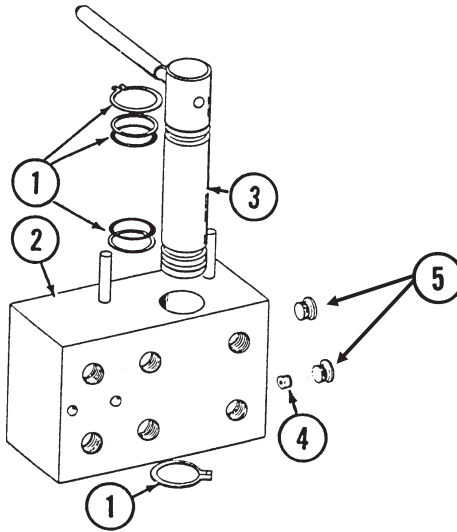


ITEM	PART NO.	QTY.	DESCRIPTION
1.	*G6400-06 GR1045	4 -	Connector W/O-Ring, 9/16"-18 Male JIC To O-Ring O-Ring
2.	GR1034 GR1035	1 -	Hex Socket Plug W/O-Ring O-Ring
3.	GR1032 GR1045	2 -	Port Adapter W/O-Ring O-Ring
4.	GR1033	1	Detent Spring
5.	GR1036	2	Spring
6.	GR1044	3	7/16" Check Ball
7.	GR1043	2	1/4" Steel Ball
8.		-	Valve Body (Non-Stock Item)
9.	GR1047 GR1037	2 -	Hex Socket Plug W/O-Ring 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
A.	GA5552	-	Valve Assembly Complete (Items 1-17)
B.	GA5572	-	Flow Control Portion Only (Items 11-17)

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

HYDRAULIC WING FOLD SELECTOR VALVE

VVB028(EF8)

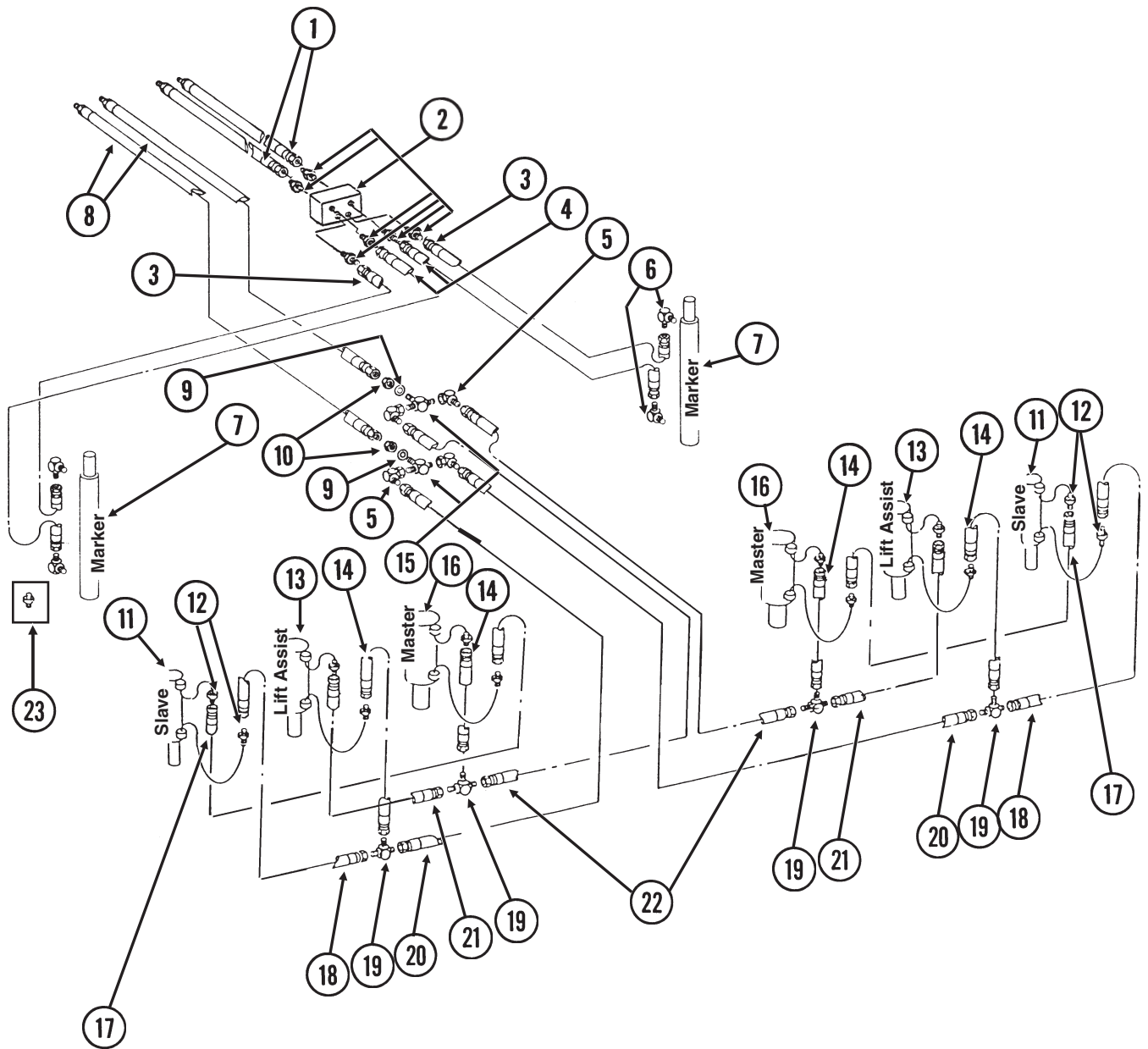


ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR1096	-	Seal Kit, Includes: (2) Retaining Rings, (2) O-Rings, (2) BU Rings
2.	R1176	-	Block (Non-Stock Item)
3.	GR1177	1	Spool W/Handle
4.	GR1178	1	Restrictor
5.	GR1034	2	Hex Socket Plug W/O-Ring
A.	GA6438	-	Valve Assembly (Items 1-4)

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HYDRAULIC SYSTEM

PHS036(EF9g)



HYDRAULIC SYSTEM

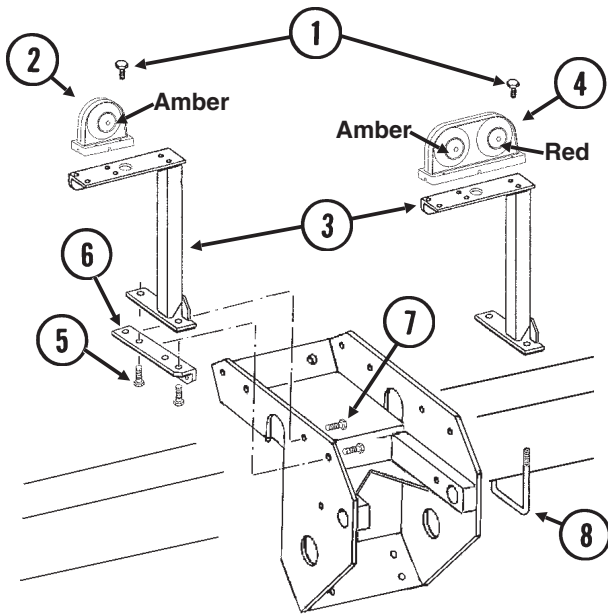
ITEM	PART NO.	QTY.	DESCRIPTION
1.	*A3202	2	Hose Assembly, 3/8" x 172", 8 Row 36"/38" And 12 Row 30"
2.		-	See "Row Marker Sequencing/Flow Control Valve", Page P60 And "Hitch And Safety Chain", Pages P32 And P33
3.	*A12008	2	Hose Assembly, 3/8" x 233", 8 Row 36"/38"
	*A12010	-	Hose Assembly, 3/8" x 259", 12 Row 30"
4.	*A12007	2	Hose Assembly, 3/8" x 217", 8 Row 36"/38"
	*A12009	-	Hose Assembly, 3/8" x 244", 12 Row 30"
5.	G6500-08	4	Swivel Elbow, 90°, 3/4"-16 Male JIC To Female
6.	G6801-08	2-4	Elbow W/O-Ring, 90°, 3/4"-16 Male JIC To O-Ring
	GR1037	-	O-Ring
7.		-	See "Row Marker Cylinder", Page P58
8.	*A3130	2	Hose Assembly, 3/8" x 173", 8 Row 36"/38" And 12 Row 30"
9.	G10215	2	Machine Bushing, 3/4", 14 Gauge
10.	G306-08	2	Lock Nut, 3/4"-16
11.		-	See "Slave Lift Cylinder", Page P57
12.	G6400-08	12	Connector W/O-Ring, 3/4"-16 Male JIC To O-Ring
	GR1037	-	O-Ring
13.		-	See "Assist Cylinder", Page P58
14.	*A1000	4	Hose Assembly, 3/8" x 15"
15.	G2703-08	2	Bulkhead Tee, 3/4"-16 Male JIC
16.		-	See "Master Lift Cylinder", Page P57
17.	*A1024	2	Hose Assembly, 3/8" x 116", 8 Row 36"/38"
	*A3114	-	Hose Assembly, 3/8" x 156", 12 Row 30"
18.	*A1055	2	Hose Assembly, 3/8" x 66", 8 Row 36"/38"
	*A1010	-	Hose Assembly, 3/8" x 120", 12 Row 30"
19.	G2603-08	4	Tee, 3/4"-16 Male JIC
20.	*A3136	2	Hose Assembly, 3/8" x 100", 8 Row 36"/38"
	*A3176	-	Hose Assembly, 3/8" x 86", 12 Row 30"
21.	*A1021	2	Hose Assembly, 3/8" x 56", 8 Row 36"/38"
	*A1020	-	Hose Assembly, 3/8" x 48", 12 Row 30"
22.	*A3128	2	Hose Assembly, 3/8" x 52", 8 Row 36"/38"
	*A1020	-	Hose Assembly, 3/8" x 48", 12 Row 30"
23.	G6400-08-04	2	Connector W/O-Ring, 3/4"-16 Male JIC To 7/16"-20 O-Ring
	GR1045	-	O-Ring

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

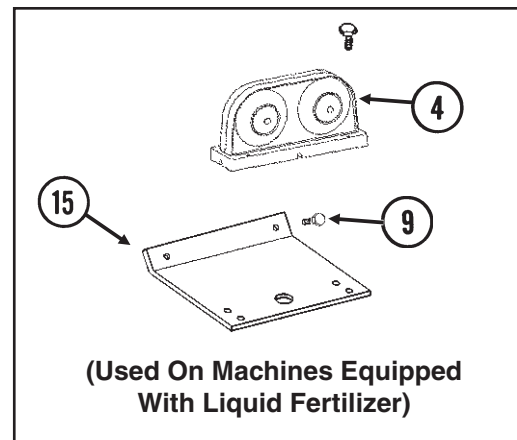
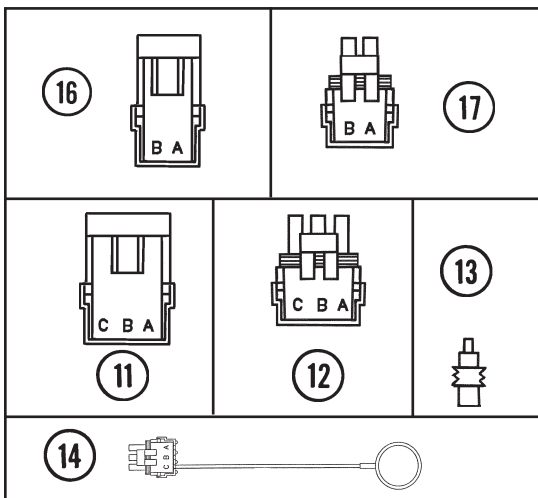
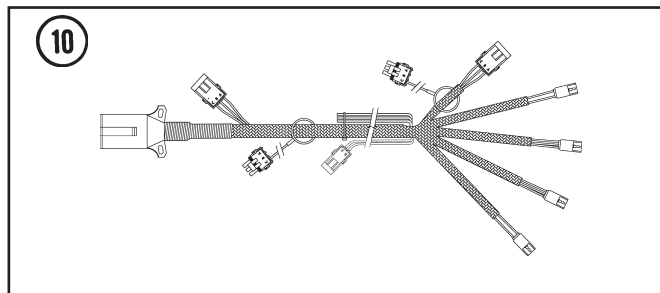
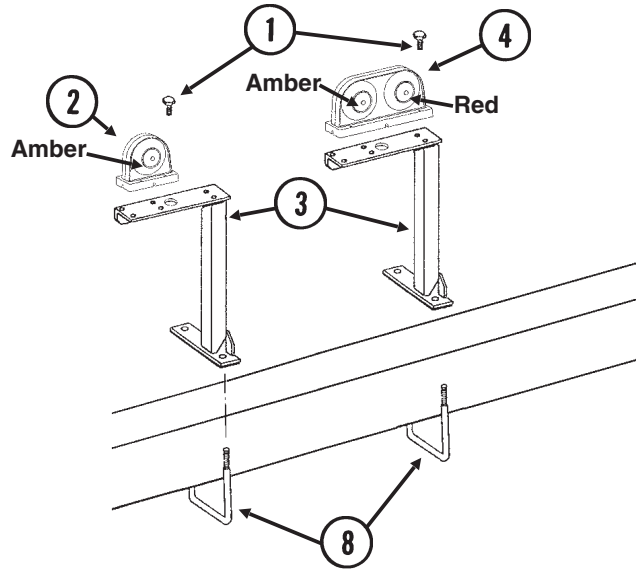
ELECTRICAL COMPONENTS

(EF64e/INS7e/ELC9/MTR27a/A9206a)

8 Row 36"/38"



12 Row 30"

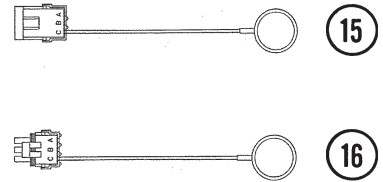
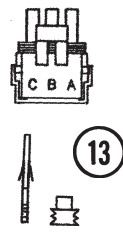
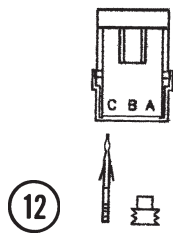
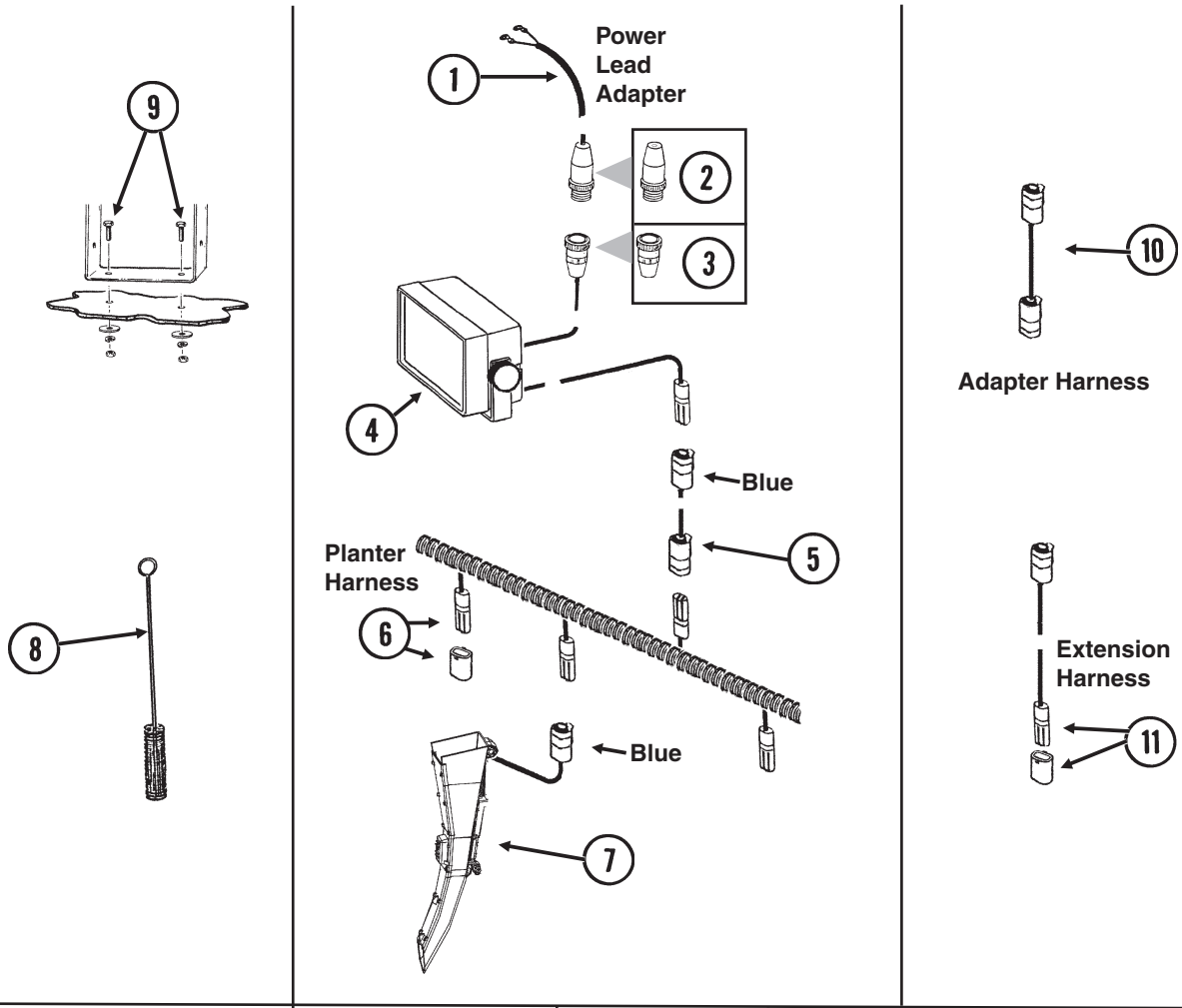


ELECTRICAL COMPONENTS

ITEM	PART NO.	QTY.	DESCRIPTION	
1.	G10064	8	Hex Head Cap Screw, 1/4"-20 x 1"	
	G11385	8	Flat Washer, 1/4" SAE	
	G10110	8	Lock Nut, 1/4"-20, Grade B	
2.	GA6701	1	Single Amber Light Assembly	
	GR1956	-	Amber Lens Kit, Includes: (1) Amber Lens, (1) Gasket, and (3) Hex Head Cap Screws	
3.	GR1208	-	Bulb	
	GA6824	-	Bracket, R.H.	
	GA6823	1	Bracket, L.H. (Shown)	
4.	GA6699	1	Double Light Assembly	
	GA6700	1	Double Light Assembly (Shown)	
	GR1956	-	Amber Lens Kit, Includes: (1) Amber Lens, (1) Gasket, and (3) Hex Head Cap Screws	
	GR1957	-	Red Lens Kit, Includes: (1) Red Lens, (1) Gasket, and (3) Hex Head Cap Screws	
5.	GR1958	-	Black Cover Kit, Includes: (1) Black Cover, (1) Gasket, and (3) Hex Head Cap Screws	
	GR1208	-	Bulb	
	G10017	4	Hex Head Cap Screw, 1/2"-13 x 1 1/2"	
	G10228	4	Lock Washer, 1/2"	
	G10102	4	Hex Nut, 1/2"-13	
	6.	GD11285	2	Angle
	7.	G10003	4	Hex Head Cap Screw, 3/8"-16 x 1 1/2"
G10229		4	Lock Washer, 3/8"	
G10101		4	Hex Nut, 3/8"-16	
8.	GD7145	2-4	U-Bolt, 7" x 7" x 1/2"-13	
	G10228	4-8	Lock Washer, 1/2"	
	G10102	4-8	Hex Nut, 1/2"-13	
9.	G11385	4	Flat Washer, 1/4" SAE	
	G10110	4	Lock Nut, 1/4"-20, Grade B	
	G10023	4	Hex Head Cap Screw, 1/4"-20 x 3/4"	
10.	GA9207	-	Wiring Harness W/7 Terminal Female Connector, 329" (4 Light Connections)	
	GA5385	-	7 Terminal Female Connector	
11.	G1K248	-	3-Pin Female Connector Kit (Black), Includes: (3) 3-Pin Female Housings, (9) Pin Contacts, (9) Seals	
12.	G1K252	-	3-Pin Male Connector Kit (Black), Includes: (3) 3-Pin Male Housings, (9) Socket Contacts, (9) Seals	
13.	GD11089	-	Sealing Plug	
14.	GA8047	-	Dust Plug (Black)	
15.	GA9209	2	Light Bracket	
16.	G1K321	-	2-Pin Female Connector Kit (Black), Includes: (3) 2-Pin Female Housings, (6) Pin Contacts, (6) Seals	
17.	G1K320	-	2-Pin Male Connector Kit (Black), Includes: (3) 2-Pin Male Housings, (6) Socket Contacts, (6) Seals	

KPM I ELECTRONIC SEED MONITOR

(MTR46bb)



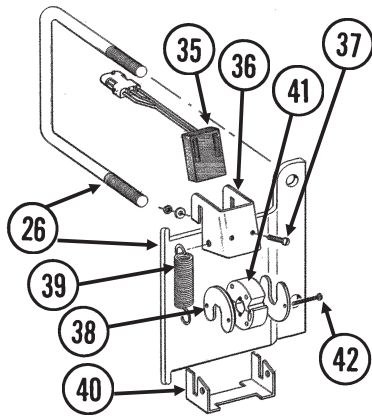
KPM I ELECTRONIC SEED MONITOR

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA7856	1	Power Lead Adapter
2.	G1K267	-	Power Lead Adapter Connector Kit, Includes: (1) Cable Clamp, (1) 3-Pin Connector, (3) Male Terminal Pins
3.	G1K268	-	Console Cable Connector Kit, Includes: (1) Cable Clamp, (1) 3-Pin Connector, (1) Lock Ring, (3) Female Terminal Pins
4.	GA10570	1	KPM I Backlit Console W/Mounting Bracket, Fuse Holder And Fuse, Power Lead Adapter (Item 11), Brush (Item 23) And Dust Plug (Item 34)
	GR1390	-	Mounting Bracket, KPM I
	GR1392	-	Console Mounting Bracket Hardware Package (Includes 2 Knobs And 1/4" Hardware)
	GA10601	-	Fuse Holder
	GD7639	-	Fuse
5.		-	See Light Wiring Harness, Item 10 On Pages P64 And P65
6.	GA7850	-	Planter Harness W/Dust Caps, 8 Row (12 Connectors)
	GA7851	-	Planter Harness W/Dust Caps, 12 Row (16 Connectors)
	GD11993	-	Dust Cap
7.	GA14214	-	Seed Tube W/Computerized Sensor (Shown)
	GR1949	-	Sensor Only
	GA10940	-	Seed Tube (With Holes For Sensor Installation)
8.	GR0594	-	Brush
9.	G10022	2	Hex Head Cap Screw, 1/4"-20 x 1/2"
	G11385	2	Flat Washer, 1/4" SAE
	G10227	2	Lock Washer, 1/4"
	G10103	2	Hex Nut, 1/4"-20
10.	GA7857	-	Adapter Harness, 1'
11.	GA7854	-	Extension Harness W/Dust Cap, 15'
	GA7855	-	Extension Harness W/Dust Cap, 30'
	GD11993	-	Dust Cap
12.	G1K248	-	3-Pin Female Connector Kit (Black), Includes: (3) 3-Pin Female Housings, (9) Pin Contacts, (9) Seals
	G1K362	-	3-Pin Female Connector Kit (Blue), Includes: (3) 3-Pin Female Housings, (9) Pin Contacts, (9) Seals
13.	G1K252	-	3-Pin Male Connector Kit (Black), Includes: (3) 3-Pin Male Housings, (9) Socket Contacts, (9) Seals
	G1K363	-	3-Pin Male Connector Kit (Blue), Includes: (3) 3-Pin Male Housings, (9) Socket Contacts, (9) Seals
14.	GD11089	-	Sealing Plug
15.	GA8046	-	Dust Plug (Black)
	GA9978	-	Dust Plug (Blue)
16.	GA8047	-	Dust Plug (Black)
	GA9979	-	Dust Plug (Blue)

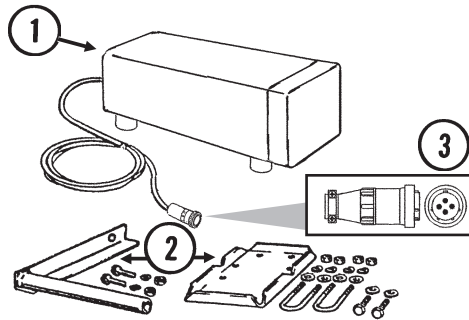
KPM II STACK-MODE ELECTRONIC SEED MONITOR

(MTR43ss/A10901a)

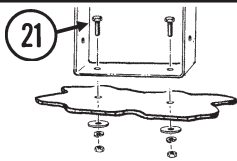
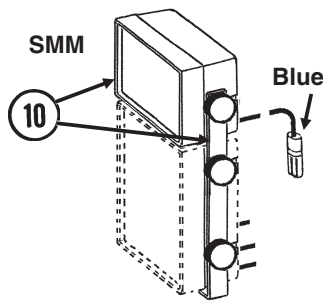
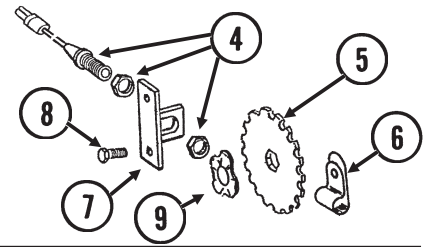
Shaft Rotation Sensor



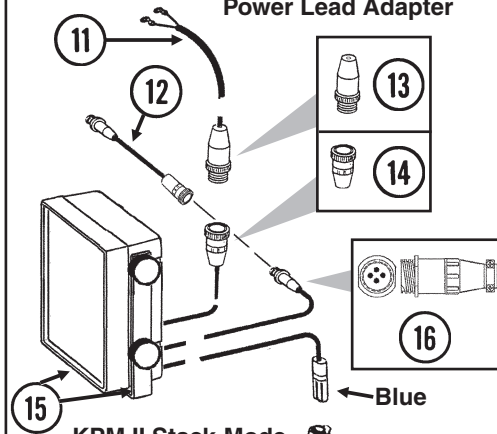
Radar Distance Sensor



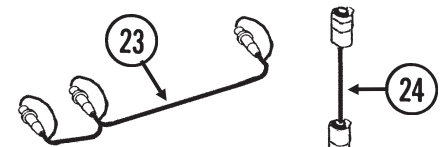
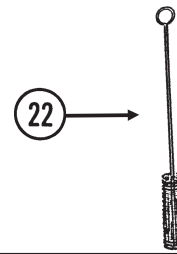
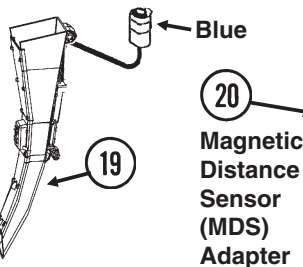
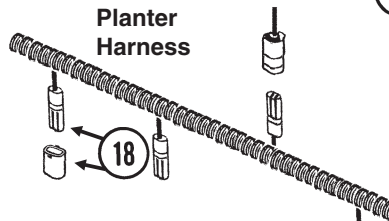
Magnetic Distance Sensor (MDS)



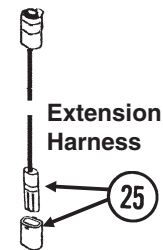
Power Lead Adapter



KPM II Stack-Mode



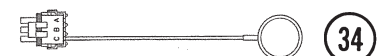
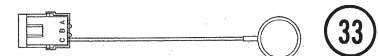
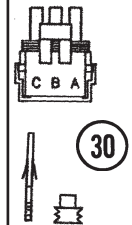
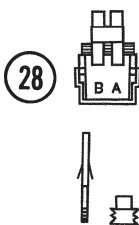
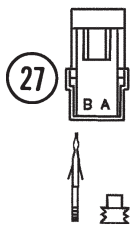
Radar Y-Cable Adapter Harness



Extension Harness



Acre Counter Switch Kit



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA7858	-	Radar Distance Sensor W/20' Cable
2.	GA8026	-	Radar Sensor Pipe/Mounting Bracket Package
3.	G1K323	-	4-Pin Connector Kit W/Female Housing, Includes: (4) Pins, (1) Cable Clamp
4.	GA5600	1	Magnetic Distance Sensor
5.	GD8751	-	Magnetic Distance Sensor Pulse Wheel
6.	GD6291	-	Insulated Clamp, 3/8"
7.	GD8770	1	Bracket
8.	G10001	2	Hex Head Cap Screw, 3/8"-16 x 1"
	G10229	2	Lock Washer, 3/8"
	G10101	2	Hex Nut, 3/8"-16
9.	GD8771	1	Spring Wave Washer

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Rev. 2/08

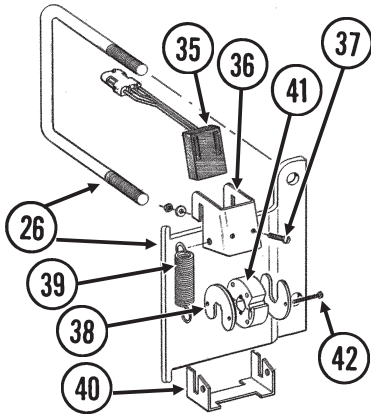
KPM II STACK-MODE ELECTRONIC SEED MONITOR

ITEM	PART NO.	QTY.	DESCRIPTION
10.	GA9857	1	SMM Backlit Console W/Mounting Bracket And Dust Plug (Item 36)
	GR1631	-	Mounting Bracket, KPM II Stack-Mode And SMM Consoles
	GR1632	-	Console Mounting Bracket Hardware Package (Includes 2 Knobs And ¼" Hardware)
11.	GA7856	1	Power Lead Adapter
12.	GA9144	-	Monitor/Radar Adapter Cable, 10"
13.	G1K267	-	Power Lead Adapter Connector Kit, Includes: (1) Cable Clamp, (1) 3-Pin Connector, (3) Male Terminal Pins
14.	G1K268	-	Console Cable Connector Kit, Includes: (1) Cable Clamp, (1) 3-Pin Connector, (1) Lock Ring, (3) Female Terminal Pins
15.	GA10575	-	KPM II Backlit Console W/Mounting Bracket, Fuse Holder And Fuse, Power Lead Adapter (Item 11), Brush (Item 22), Dust Plug (Item 33) And Monitor/Radar Adapter Cable, 10" (Item 12)
	GR1391	-	Mounting Bracket, KPM II
	GR1393	-	Console Mounting Bracket Hardware Package (Includes 4 Knobs And ¼" Hardware)
	GA10601	-	Fuse Holder
	GD7639	-	Fuse
16.	G1K322	-	4-Pin Connector Kit W/Male Housing, (4) Female Socket Contacts And (1) Cable Clamp
17.		-	See Tractor/Planter Wiring Harness, Items 18 And 39 On Pages P64 And P65
18.	GA7850	-	Planter Harness W/Dust Caps, 8 Row (12 Connectors)
	GA7851	-	Planter Harness W/Dust Caps, 12 Row (16 Connectors)
	GD11993	-	Dust Cap
19.	GA14214	-	Seed Tube W/Computerized Sensor
	GR1949	-	Sensor Only
	GA10940	-	Seed Tube (With Holes For Sensor Installation)
20.	GA7859	1	Magnetic Distance Sensor Adapter (Analog To Digital)
21.	G10022	2	Hex Head Cap Screw, ¼"-20 x ½"
	G11385	2	Flat Washer, ¼" SAE
	G10227	2	Lock Washer, ¼"
	G10103	2	Hex Nut, ¼"-20
22.	GR0594	-	Brush
23.	GR0586	1	Radar Y-Cable (Used To Connect Radar Distance Sensor For Multiple Functions)
24.	GA7857	-	Adapter Harness, 1'
25.	GA7854	-	Extension Harness W/Dust Cap, 15'
	GA7855	-	Extension Harness W/Dust Cap, 30'
	GD11993	-	Dust Cap
26.	G1K364	-	Rotation Sensor Mount Kit, Includes: (2) Mounts, (2) GD11721 5" x 7" U-Bolts, (4) G10228 Lock Washers, (4) G10102 Hex Nuts, (1) Instruction
27.	G1K321	-	2-Pin Female Connector Kit (Black), Includes: (3) 2-Pin Female Housings, (6) Pin Contacts, (6) Seals
28.	G1K320	-	2-Pin Male Connector Kit (Black), Includes: (3) 2-Pin Male Housings, (6) Socket Contacts, (6) Seals
29.	G1K248	-	3-Pin Female Connector Kit (Black), Includes: (3) 3-Pin Female Housings, (9) Pin Contacts, (9) Seals
	G1K362	-	3-Pin Female Connector Kit (Blue), Includes: (3) 3-Pin Female Housings, (9) Pin Contacts, (9) Seals
30.	G1K252	-	3-Pin Male Connector Kit (Black), Includes: (3) 3-Pin Male Housings, (9) Socket Contacts, (9) Seals
	G1K363	-	3-Pin Male Connector Kit (Blue), Includes: (3) 3-Pin Male Housings, (9) Socket Contacts, (9) Seals
31.	GD11089	-	Sealing Plug
32.	G1K249	-	Acre Counter Switch Kit
33.	GA8046	-	Dust Plug (Black)
	GA9978	-	Dust Plug (Blue)
34.	GA8047	-	Dust Plug (Black)
	GA9979	-	Dust Plug (Blue)
35.	GR1415	1	Rotation Sensor
36.	GD11169	1	Mount
37.	G10757	2	Pan Head Screw, No. 10-32 x 1 ¼"
	G11382	2	Washer, No. 10 SAE
	G10758	2	Hex Nut, No. 10-32
38.	GD11474	2	Cover
39.	GD5857	2	Spring
40.	GD11170	1	Spring Mount
41.	GR1414	1	Actuator
42.	G10927	2	Pan Head Machine Screw, No. 8-32 x 1 ¼", Stainless Steel
	G10931	2	Lock Washer, No. 8, Internal/External, Stainless Steel
	G10928	2	Hex Nut, No. 8-32, Stainless Steel
A.	GA6147	-	Magnetic Distance Sensor And Mounting Package (Items 4-9)

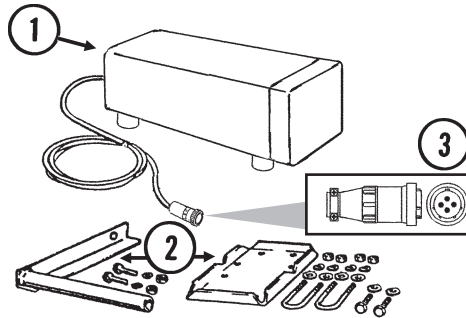
KPM III ELECTRONIC SEED MONITOR

(MTR59)

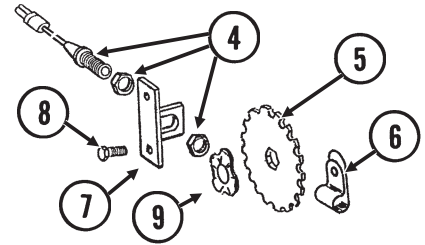
Shaft Rotation Sensor



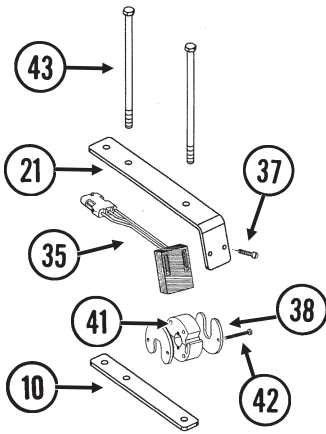
Radar Distance Sensor



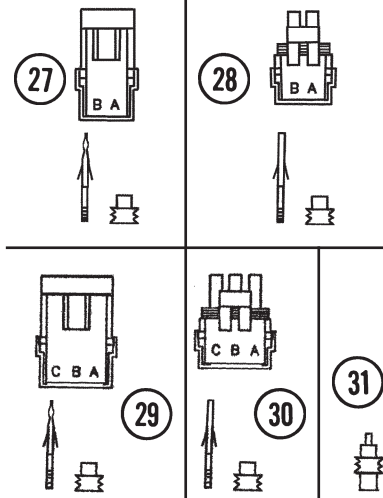
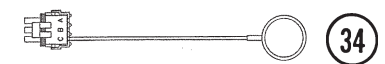
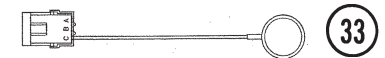
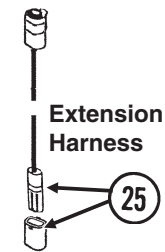
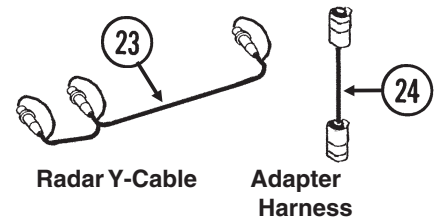
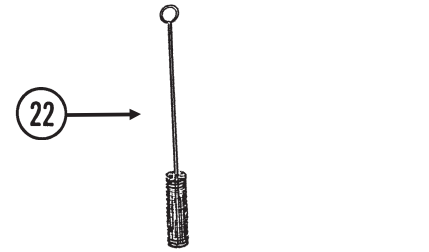
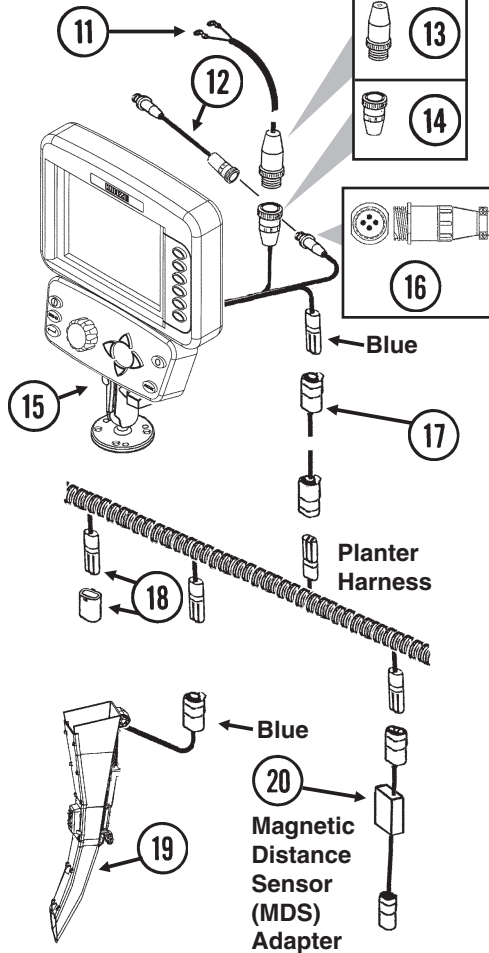
Magnetic Distance Sensor (MDS)



Shaft Rotation Sensor



Power Lead Adapter



ITEM	PART NO.	QTY.	DESCRIPTION
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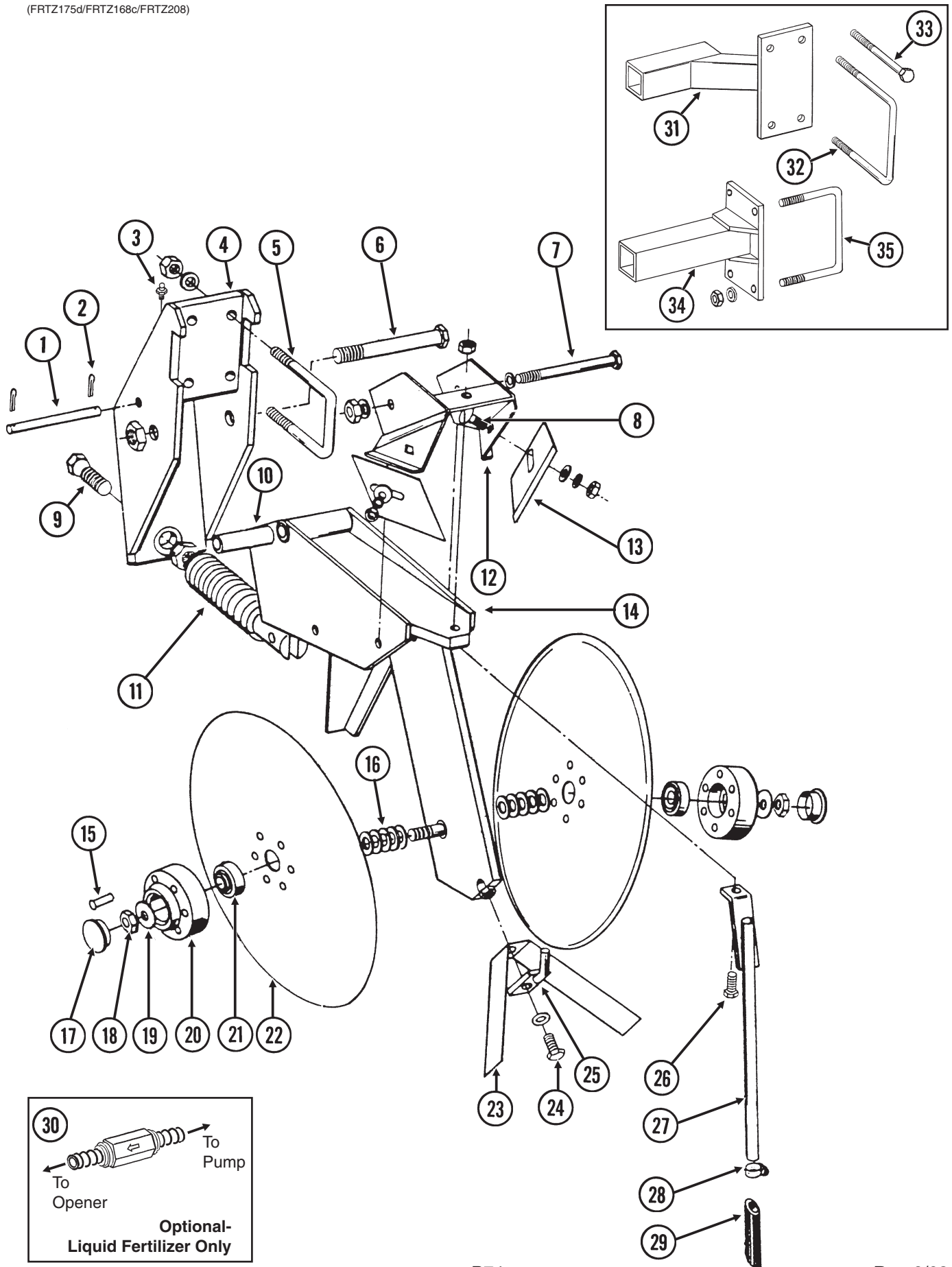
1.	GA7858	-	Radar Distance Sensor W/20' Cable
2.	GA8026	-	Radar Sensor Pipe/Mounting Bracket Package
3.	G1K323	-	4-Pin Connector Kit W/Female Housing, Includes: (4) Pins, (1) Cable Clamp
4.	GA5600	1	Magnetic Distance Sensor
5.	GD8751	-	Magnetic Distance Sensor Pulse Wheel
6.	GD6291	-	Insulated Clamp, 3/8"
7.	GD8770	1	Bracket
8.	G10001	2	Hex Head Cap Screw, 3/8"-16 x 1"
	G10229	2	Lock Washer, 3/8"
	G10101	2	Hex Nut, 3/8"-16
9.	GD8771	1	Spring Wave Washer

KPM III ELECTRONIC SEED MONITOR

ITEM	PART NO.	QTY.	DESCRIPTION
10.	GD18168	2	Mount
11.	GA7856	1	Power Lead Adapter
12.	GA9144	-	Monitor/Radar Adapter Cable, 10"
13.	G1K267	-	Power Lead Adapter Connector Kit, Includes: (1) Cable Clamp, (1) 3-Pin Connector, (3) Male Terminal Pins
14.	G1K268	-	Console Cable Connector Kit, Includes: (1) Cable Clamp, (1) 3-Pin Connector, (1) Lock Ring, (3) Female Terminal Pins
15.	GA11039	-	KPM III Backlit Console W/Brush (Item 22), Dust Plug (Item 33), Mounting Bracket Assembly, Console Mounting Bracket Hardware And Power Harness
	GA12403	-	Mounting Bracket Assembly, Includes: (2) Mounting Brackets, (2) Connector Halves, (1) Compression Spring, (1) Tension Knob, (1) ¼"-20 x 1 ¾" Hex Head Cap Screw, (1) ¼" Plastic Washer, (1) ¼" Steel Washer
	GR1762	-	Console Mounting Bracket Hardware Package, Includes: (3) No. 10-32 x 5/8" Hex Socket Pan Head Screws, (3) No. 10 Lock Washers
	GR1764	-	Power Harness
16.	G1K322	-	4-Pin Connector Kit W/Male Housing, (4) Female Socket Contacts And (1) Cable Clamp
17.		-	See Tractor/Planter Wiring Harness, Items 18 And 39 On Pages P64 And P65
18.	GA7850	-	Planter Harness W/Dust Caps, 8 Row (12 Connectors)
	GA7851	-	Planter Harness W/Dust Caps, 12 Row (16 Connectors)
	GD11993	-	Dust Cap
19.	GA14214	-	Seed Tube W/Computerized Sensor
	GR1949	-	Sensor Only
	GA10940	-	Seed Tube (With Holes For Sensor Installation)
20.	GA7859	1	Magnetic Distance Sensor Adapter (Analog To Digital)
21.	GD18118	2	Shaft Sensor Mount
22.	GR0594	-	Brush
23.	GR0586	1	Radar Y-Cable (Used To Connect Radar Distance Sensor For Multiple Functions)
24.	GA7857	-	Adapter Harness, 1'
25.	GA7854	-	Extension Harness W/Dust Cap, 15'
	GA7855	-	Extension Harness W/Dust Cap, 30'
	GD11993	-	Dust Cap
26.	G1K364	-	Rotation Sensor Mount Kit, Includes: (2) Mounts, (2) GD11721 5" x 7" U-Bolts, (4) G10228 Lock Washers, (4) G10102 Hex Nuts, (1) Instruction
27.	G1K321	-	2-Pin Female Connector Kit (Black), Includes: (3) 2-Pin Female Housings, (6) Pin Contacts, (6) Seals
28.	G1K320	-	2-Pin Male Connector Kit (Black), Includes: (3) 2-Pin Male Housings, (6) Socket Contacts, (6) Seals
29.	G1K248	-	3-Pin Female Connector Kit (Black), Includes: (3) 3-Pin Female Housings, (9) Pin Contacts, (9) Seals
	G1K362	-	3-Pin Female Connector Kit (Blue), Includes: (3) 3-Pin Female Housings, (9) Pin Contacts, (9) Seals
30.	G1K252	-	3-Pin Male Connector Kit (Black), Includes: (3) 3-Pin Male Housings, (9) Socket Contacts, (9) Seals
	G1K363	-	3-Pin Male Connector Kit (Blue), Includes: (3) 3-Pin Male Housings, (9) Socket Contacts, (9) Seals
31.	GD11089	-	Sealing Plug
32.	G1K249	-	Acre Counter Switch Kit
33.	GA8046	-	Dust Plug (Black)
	GA9978	-	Dust Plug (Blue)
34.	GA8047	-	Dust Plug (Black)
	GA9979	-	Dust Plug (Blue)
35.	GR1415	1	Rotation Sensor
36.	GD11169	1	Mount
37.	G10757	2	Pan Head Screw, No. 10-32 x 1 ¼"
	G11382	2	Washer, No. 10 SAE
	G10758	2	Hex Nut, No. 10-32
38.	GD11474	2	Cover
39.	GD5857	2	Spring
40.	GD11170	1	Spring Mount
41.	GR1414	1	Actuator
42.	G10927	2	Pan Head Machine Screw, No. 8-32 x 1 ¼", Stainless Steel
	G10931	2	Lock Washer, No. 8, Internal/External, Stainless Steel
	G10928	2	Hex Nut, No. 8-32, Stainless Steel
43.	G10686	4	Hex Head Cap Screw, 3/8"-16 x 8"
	G10229	4	Lock Washer, 3/8"
	G10101	4	Hex Nut, 3/8"-16
A.	GA6147	-	Magnetic Distance Sensor And Mounting Package (Items 4-9)

DOUBLE DISC FERTILIZER OPENER

(FRTZ175d/FRTZ168c/FRTZ208)

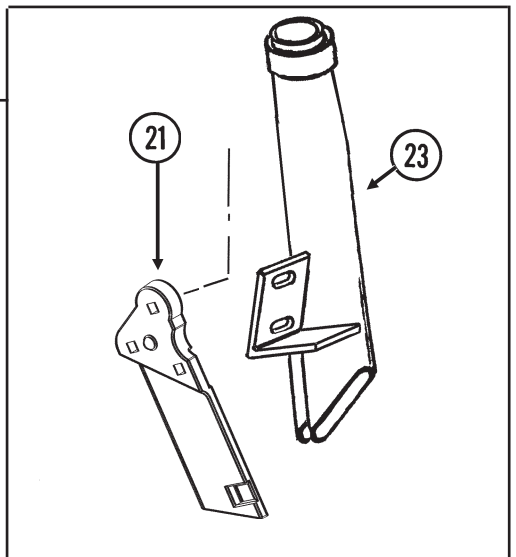
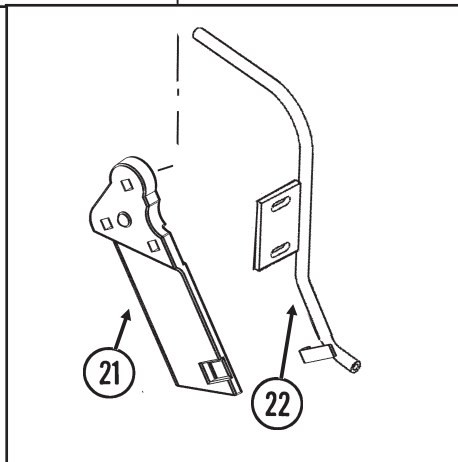
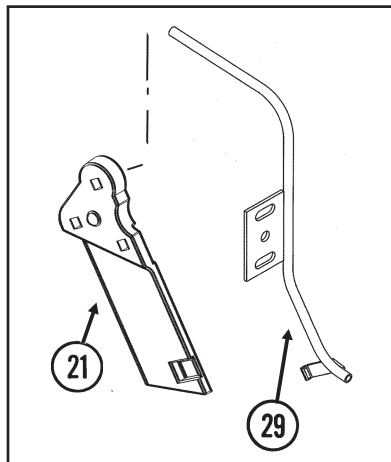
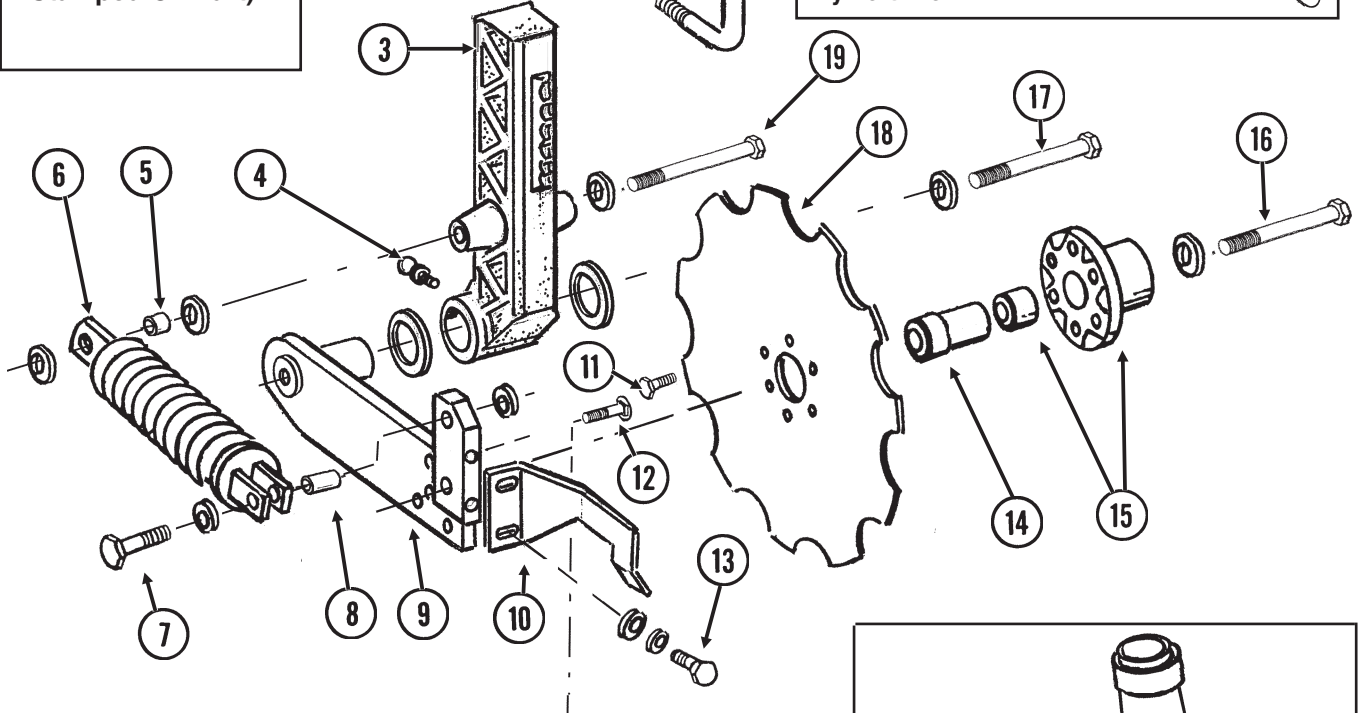
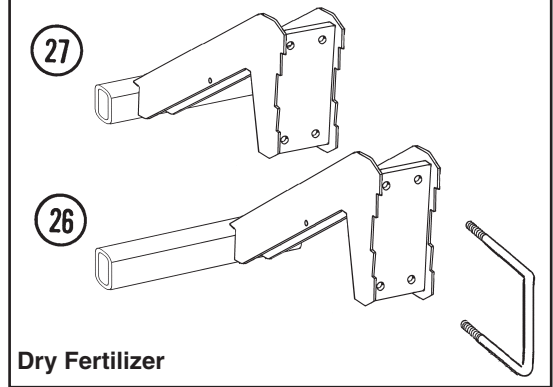
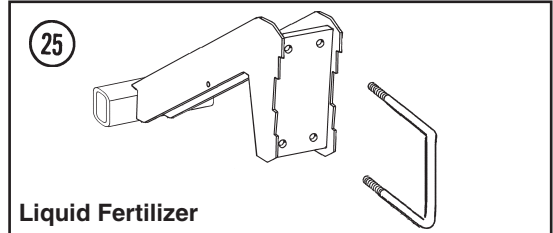
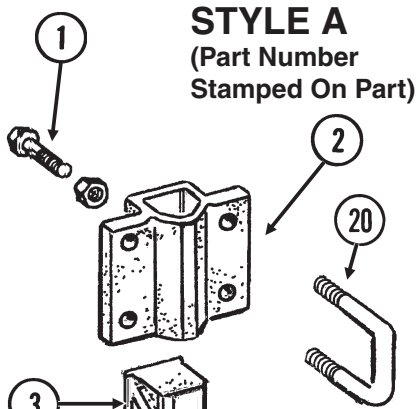
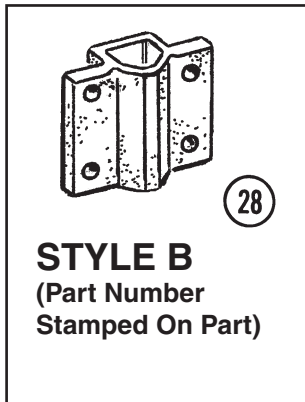
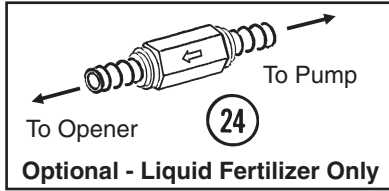


DOUBLE DISC FERTILIZER OPENER

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GD1657	1	Lockup Pin
2.	G10451	2	Cotter Pin, 1/8" x 1"
3.	G10938	1	Grease Fitting, 1/4"-28, Taper Threads
4.	GA8483	1	Bracket
5.	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
6.	G10046	1	Hex Head Cap Screw, 5/8"-11 x 5"
	G10107	1	Lock Nut, 5/8"-11
7.	G10045	1	Hex Head Cap Screw, 1/2"-13 x 4 1/2"
	G10111	1	Lock Nut, 1/2"-13
8.	G10305	2	Carriage Bolt, 3/8"-16 x 1"
	G11387	2	Flat Washer, 3/8" SAE
	G10229	2	Lock Washer, 3/8"
	G10101	2	Hex Nut, 3/8"-16
9.	GD0962	1	Hex Head Adjusting Bolt, 5/8"-18 x 3 1/4"
	G10499	1	Hex Jam Nut, 5/8"-18, Grade 2
10.	GD0487	1	Bushing, 4 1/4" I.D. x 3 1/2" Long
11.	GA0328	1	Spring
12.	GA0810	1	Scraper Mount
13.	GD1673	2	Scraper
14.	GA9195	1	Shank
15.	G10542	12	Rivet, 1/4" x 1 5/16"
16.	G10213	-	Machine Bushing, 5/8" (.030" Thick)
17.	GD1132	2	Dust Cap
18.	G10503	1	Hex Jam Nut, 5/8"-11, Grade 2
	G10504	1	Hex Jam Nut, 5/8"-11, L.H. Threads, Grade 2
19.	G10204	2	Special Machine Bushing, 5/8" x 1" O.D.
20.	GB0134	2	Hub
21.	GA2014	2	Bearing
22.	GD11306	2	Disc Blade, 3.5 mm x 15"
23.	GD2589	1	Inner Scraper
24.	G10019	1	Hex Head Cap Screw, 5/16"-18 x 1"
	G10232	1	Lock Washer, 5/16"
25.	GA0312	1	Mount
26.	G10133	1	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	G11386	1	Flat Washer 5/16" SAE
	G10109	1	Lock Nut, 5/16"-18, Grade 8
27.	GA8685	-	Drop Tube, Liquid Fertilizer
28.	G10681	-	Hose Clamp, No. 6
29.	GD11705	-	Extension
30.	GA8983	-	Check Valve, Low Rate
31.	GA8081	1	Opener Mount, L.H. (Shown)
	GA8080	-	Opener Mount, R.H.
32.	GD1114	2	U-Bolt, 7" x 7" x 5/8"-11
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
33.	G10152	-	Hex Head Cap Screw, 5/8"-11 x 9"
	G10230	-	Lock Washer, 5/8"
	G10104	-	Hex Nut, 5/8"-11
34.	GA8099	1	Opener Mount, L.H. (Shown)
	GA8098	-	Opener Mount, R.H.
35.	GD11132	2	U-Bolt, 4" x 7" x 1/2"-13
	G10228	4	Lock Washer, 1/2"
	G10102	4	Hex Nut, 1/2"-13
A.	GA8845	-	Disc Blade And Bearing Assembly (Items 15 And 20-22)

NOTCHED SINGLE DISC FERTILIZER OPENER

(FRTZ208/B0405/TWL34e/TWL34g/FRTZ268/A12108)



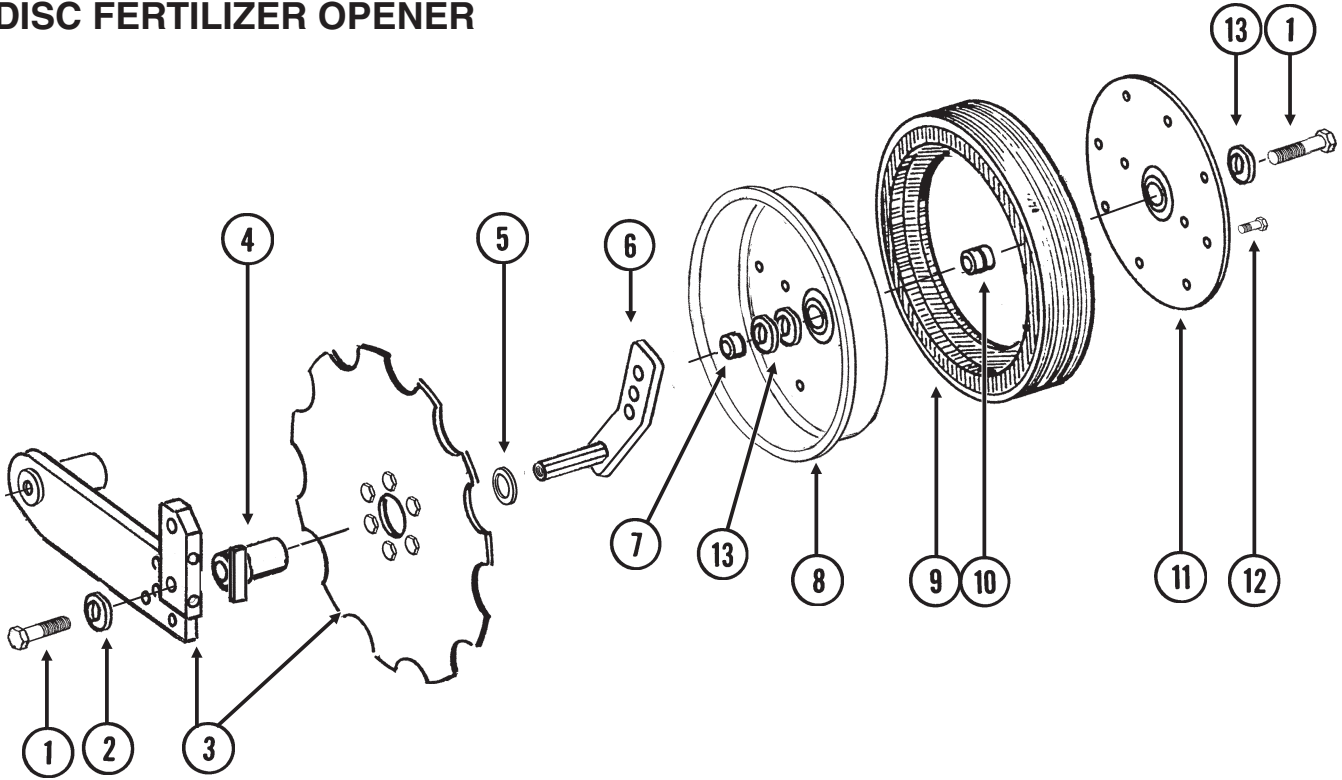
NOTCHED SINGLE DISC FERTILIZER OPENER

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	G10017	3	Hex Head Cap Screw, ½"-13 x 1 ½"
	G10102	3	Hex Nut, ½"-13
2.	GB0297	1	Mount
3.	GB0296	1	Arm, 13 ½"
4.	G10640	1	Grease Fitting, ¼"-28
5.	GD12685	1	Bushing, ¾" O.D. x ½" Long
6.	GA6966	1	Compression Spring Assembly
7.	G10047	1	Hex Head Cap Screw, ⅜"-16 x 1 ¾"
	G11387	2	Flat Washer, ⅜" SAE
	G10108	1	Lock Nut, ⅜"-16
8.	GD1026	1	Sleeve, 1 ⅜" Long
9.	GA9433	1	Pivot Arm, L.H.
	GA9434	-	Pivot Arm, R.H. (Shown)
10.	GD11557	1	Scraper, L.H.
	GD11558	-	Scraper, R.H. (Shown)
11.	G10002	6	Hex Head Cap Screw, ⅜"-16 x ¾"
12.	G10306	3	Carriage Bolt, ⅜"-16 x 2"
	G10108	3	Lock Nut, ⅜"-16
13.	G10991	2	Hex Head Cap Screw, ⅝"-18 x ⅞"
	G10232	2	Lock Washer, ⅝"
	G11386	6	Flat Washer ⅝" SAE
14.	GD12679	1	Stepped Spacer, 3" Long
15.	GA9437	1	Hub W/Bearing
	GA8603	-	Bearing, Double Row
16.	G10011	1	Hex Head Cap Screw, ⅝"-11 x 5 ½"
	GD12677	1	Washer, 1 ½" O.D., 7 Gauge, Hardened
	G10107	1	Lock Nut, ⅝"-11
17.	G10046	1	Hex Head Cap Screw, ⅝"-11 x 5"
	G11391	1	Flat Washer, ⅝" SAE
	G10450	2	Machine Bushing, 1 ½", 18 Gauge (As Required)
	G10107	1	Lock Nut, ⅝"-11
18.	GD12676	1	Disc Blade, Notched, 16 ¾"
19.	G10871	1	Hex Head Cap Screw, ½"-13 x 6"
	G11389	3	Flat Washer, ½" SAE
	G10111	1	Lock Nut, ½"-13
20.	GD13287	2	U-Bolt, 1 ½" x 2 ½" x ½"-13
	G10228	4	Lock Washer, ½"
	G10102	4	Hex Nut, ½"-13
21.	GB0323	1	Knife, L.H. (Shown)
	GB0322	-	Knife, R.H.
22.	GA11397	-	Drop Tube, L.H., Liquid Fertilizer (Shown)
	GA11398	1	Drop Tube, R.H., Liquid Fertilizer
23.	GA10047	-	Drop Tube, L.H., Dry Fertilizer (Shown)
	GA10048	1	Drop Tube, R.H., Dry Fertilizer
24.	GA8983	-	Check Valve, Low Rate
25.	GA9565	1	Mount W/U-Bolts, Liquid Fertilizer
	GD1113	2	U-Bolt, 5" x 7" x ⅝"-11
	G10230	4	Lock Washer, ⅝"
	G10104	4	Hex Nut, ⅝"-11
26.	GA9821	-	Mount W/U-Bolts, L.H., Dry Fertilizer
	GD1113	2	U-Bolt, 5" x 7" x ⅝"-11
	G10230	4	Lock Washer, ⅝"
	G10104	4	Hex Nut, ⅝"-11
27.	GA9822	-	Mount W/U-Bolts, R.H., Dry Fertilizer
	GD1113	2	U-Bolt, 5" x 7" x ⅝"-11
	G10230	4	Lock Washer, ⅝"
	G10104	4	Hex Nut, ⅝"-11
28.	GB0405	1	Mount, L.H.
	GB0400	-	Mount, R.H. (Shown)
29.	GA12108	1	Drop Tube, Liquid Fertilizer (Shown)
	GA12109	-	Drop Tube, Liquid Fertilizer

DEPTH/GAUGE WHEEL ATTACHMENT FOR NOTCHED SINGLE DISC FERTILIZER OPENER

(FRTZ256)

FOR USE WITH NOTCHED SINGLE DISC FERTILIZER OPENER

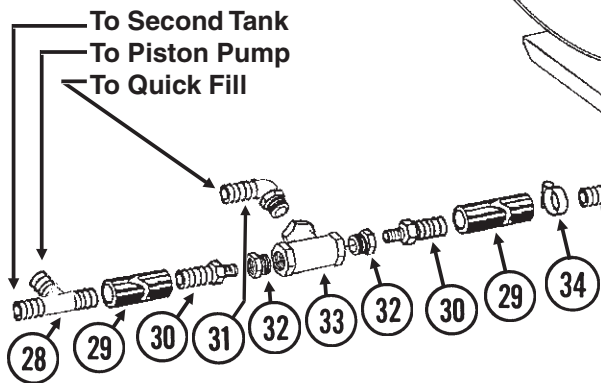
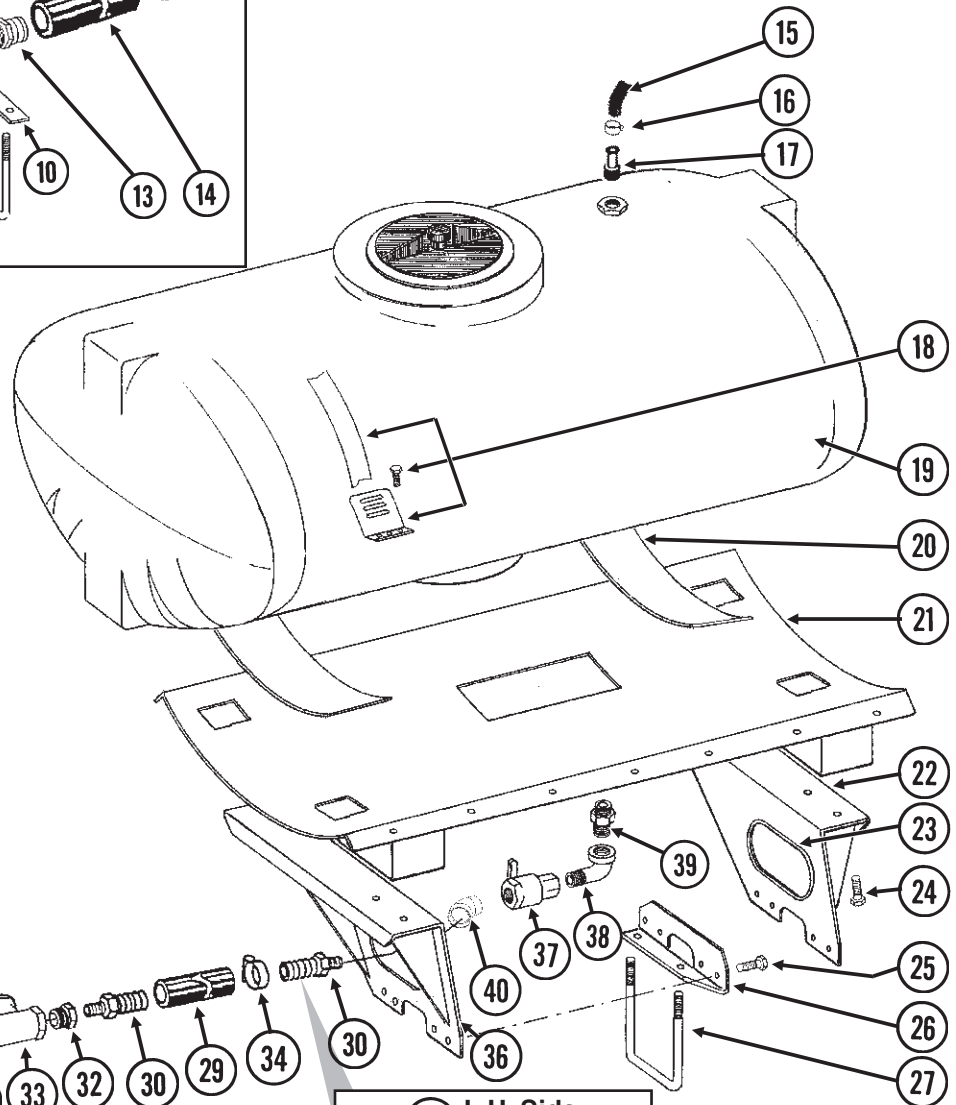
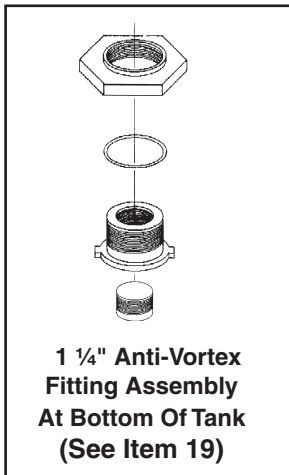
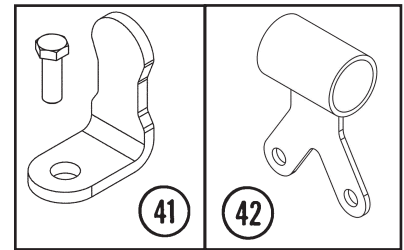
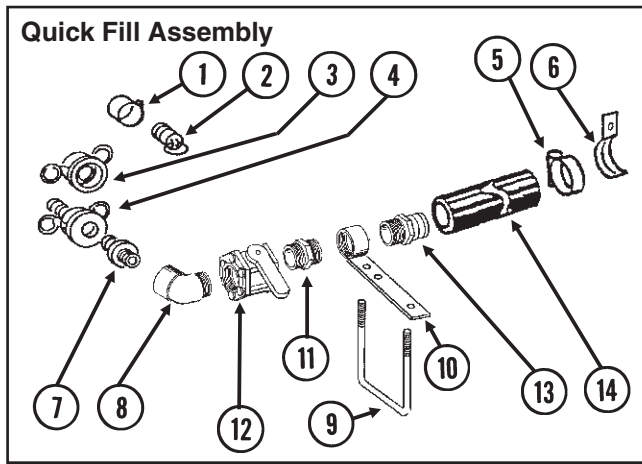


DEPTH/GAUGE WHEEL ATTACHMENT FOR NOTCHED SINGLE DISC FERTILIZER OPENER

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	G10010	2	Hex Head Cap Screw, 5/8"-11 x 3"
2.	G11391	1	Flat Washer, 5/8" SAE
3.		-	See "Notched Single Disc Fertilizer Opener", Pages P74 And P75
4.	GA9472	1	Blade Mount
5.	G10233	1	Machine Bushing, 1", 10 Gauge
6.	GA10037	1	Wheel Mount, L.H. (Shown)
	GA10036	1	Wheel Mount, R.H.
7.	GD13309	1	Spacer
8.	GD11423	1	Half Wheel
9.	GD11953	1	Offset Tire
10.	GA6171	1	Bearing
11.	GD11954	1	Half Wheel Cover, Nylon
12.	G10961	11	Flanged Whiz Lock Screw, 5/16"-18 x 3/4", No Serration
	G10620	11	Serrated Flange Nut, 5/16"-18
13.	G10204	-	Special Machine Bushing, 5/8" x 1" O.D. (As Required)
A.	GA8877	-	Gauge Wheel Complete (Items 8-12)

LIQUID FERTILIZER TANKS, SADDLES, SADDLE MOUNTS AND HOSES

(FRTZ170m/FRTZ170L/PT51)



ITEM	PART NO.	QTY.	DESCRIPTION
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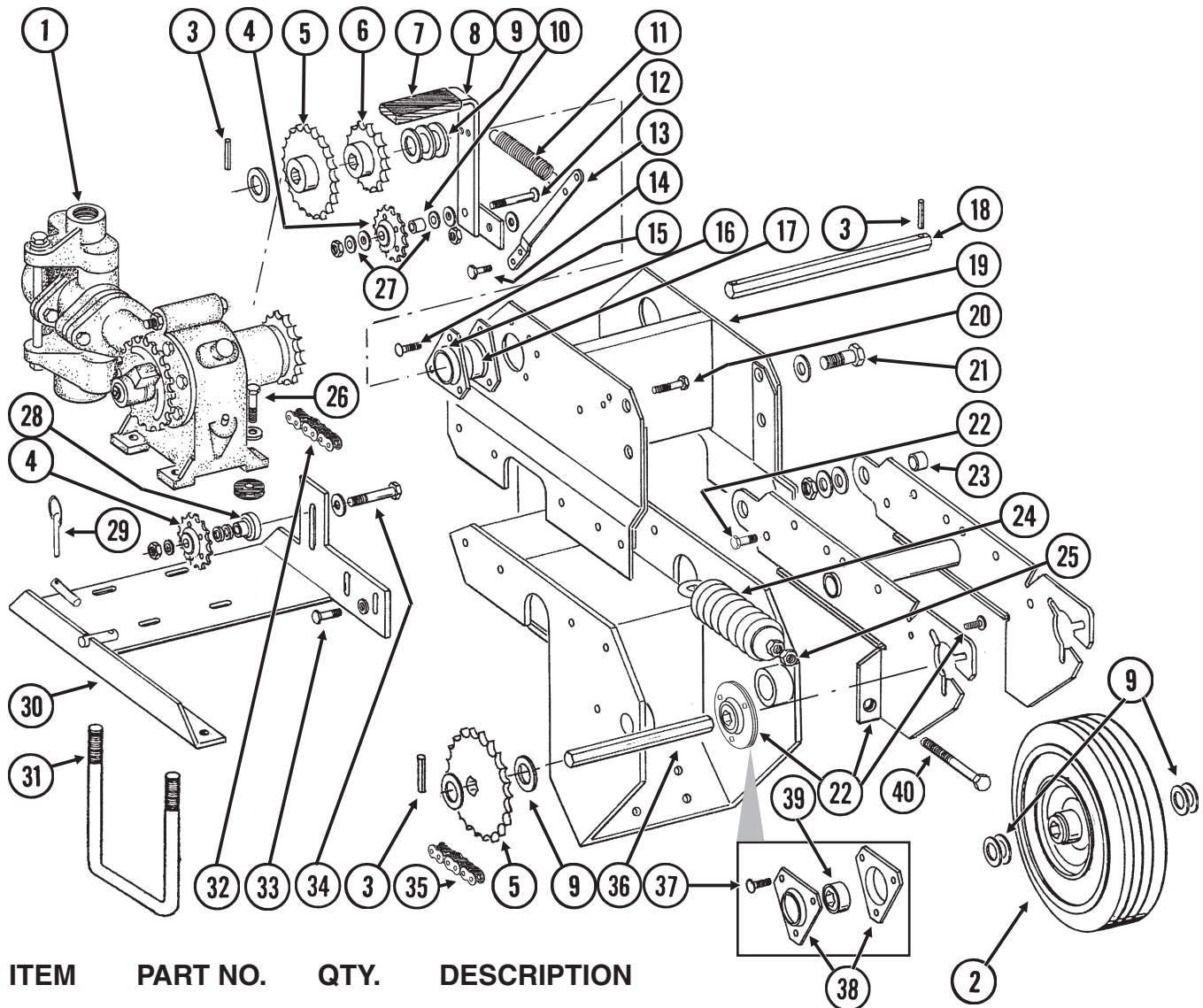
1.	G10672	1	Hose Clamp, No. 28
2.	GD10777	1	Dust Plug, 2" Male Cam Lock
3.	GD3622	1	Adapter, 2" Female NPT To Cam Lock
4.	GD3951	1	Dust Cap, 2" Cam Lock
5.	G10676	2	Hose Clamp, No. 36, Stainless Steel
6.	GD11235	1	Hose Clamp, 2" (If Applicable)
7.	GD3623	1	Adapter, 2" Male NPT To Cam Lock
8.	G10889	1	Elbow, 45°, 2" Male NPT To Female

LIQUID FERTILIZER TANKS, SADDLES, SADDLE MOUNTS AND HOSES

ITEM	PART NO.	QTY.	DESCRIPTION
9.	GD1114	1	U-Bolt, 7" x 7" x 5/8"-11
	G10230	2	Lock Washer, 5/8"
	G10104	2	Hex Nut, 5/8"-11
10.	GA8082	1	Quick Fill Mount, 2" NPT
11.	G10623	1	Close Nipple, 2" NPT
12.	GA2660	1	Shutoff Valve, 2" NPT
13.	G10628	1	Adapter, 2" NPT To Barb
14.	G4201-04	1	Hose, 2" x 15'
15.	G10626	2	Adapter, 1 1/4" NPT to Barb
16.	10674	2	Hose Clamp, No. 24
17.	G4602-02	-	Hose, 1 1/4" x 22'
18.	GA8114	2	Tank Mounting Hardware Package, Includes: (2) Straps, (4) Anchors, (8) Hex Head Tap Bolts, (8) Lock Nuts
	G10485	-	Hex Head Tap Bolt, 3/8"-16 x 5"
	G10901	-	Lock Nut W/Nylon Insert, 3/8"-16
19.	GA9910	2	Tank W/Lid And Fittings, 200 Gallon
	GR1678	1	Lid W/Vent, 8" (Top Of Tank)
	GR0513	-	3/4" Polypropylene Fitting Assembly (Overflow Fitting, Nut, Bushing And O-Ring) (Top Of Tank)
	GR1397	-	Overflow Fitting
	GR1435	-	1 1/4" Anti-Vortex Fitting Assembly (Anti-Vortex Fitting, Nut, Bushing And O-Ring) (Bottom Of Tank)
	GR1396	-	Anti-Vortex Fitting
20.	GD1862	-	Pad, 8" x 14'
21.	GA8088	2	Tank Saddle
22.	GA8086	2	Saddle Mount, R.H.
23.	G4425-01	4	Molding, 3/16" x 26"
24.	G10017	16	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	G11389	32	Flat Washer, 1/2" SAE
	G10228	16	Lock Washer, 1/2"
	G10102	16	Hex Nut, 1/2"-13
25.	G10004	16	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G10229	16	Lock Washer, 3/8"
	G10101	16	Hex Nut, 3/8"-16
26.	GA8156	1	Bracket, R.H., 8 Row Only
	GA8155	-	Bracket, L.H., 8 Row Only (Shown)
27.	GD1114	1	U-Bolt, 7" x 7" x 5/8"-11 (8 Row Only)
	G10230	2	Lock Washer, 5/8"
	G10104	2	Hex Nut, 5/8"-11
28.	G11342	1	Tee, 1 1/2" Barb
29.	G4202-05	1	Hose, 1 1/2" x 15'
30.	G10627	3-4	Adapter, 1 1/2" NPT To Barb
31.	G10630	1	Elbow, 90°, 2" NPT To Barb
32.	G10616	2	Reducing Bushing, 2" Male NPT To 1 1/4" Female
33.	G10888	1	Tee, 2" Female NPT
34.	G10674	10	Hose Clamp, No. 24
35.	G11353	1	Elbow, 90°, 1 1/2" NPT To Barb
36.	GA8087	2	Saddle Mount, L.H.
37.	GA13622	2	Shutoff Valve, 1 1/2" NPT
	GR1015	-	Body O-Ring
	GR1016	-	Stem O-Ring
	GR1017	-	Teflon Seal
	GR1018	-	Ball
	GR1019	-	Handle
38.	G11353	2	Elbow, 90°, 1 1/2" NPT To Barb
39.	G11306	3	Close Nipple, 1 1/2" NPT
40.	G11354	2	Elbow, 1 1/2" NPT, 45°
41.	GD20060	2	Hose Bracket
	G10857	2	Hex head Cap Screw, 1/4"-20 x 1 1/4"
	G10103	2	Hex Nut, 1/4"-20
	G10227	2	Lock Washer, 1/4"
42.	GA14158	2	Hose Guide

LIQUID FERTILIZER PISTON PUMP DRIVE

(FRTZ167n/FRTZ167j)



ITEM	PART NO.	QTY.	DESCRIPTION
1.		-	See "Liquid Fertilizer Piston Pump", Pages P86-P91
2.	GA5090	1	Tire And Rim Assembly (Specify Brand*)
	GD5753	-	Tire, 4.10" x 6" (Specify Brand*)
	GD5752	-	Inner Tube
3.	G10602	4	Spring Pin, 1/4" x 1 1/2"
4.	GA7154	2	Sprocket W/Bearing, 18 Tooth
5.	GA5202	2	Sprocket, 34 Tooth
6.	GA5109	1	Sprocket, 24 Tooth
7.	GD5827	1	Cover
8.	GA8084	1	Arm
9.	G10233	9	Machine Bushing, 1", 10 Gauge
10.	GD11963-01	1	Spacer, 1 1/16"
11.	GD5857	1	Spring
12.	G10306	1	Carriage Bolt, 3/8"-16 x 2"
	G11387	2	Flat Washer, 3/8" SAE
	G10108	1	Lock Nut, 3/8"-16
13.	GD5860	1	Bar
14.	G10023	2	Hex Head Cap Screw, 1/4"-20 x 3/4"
	G10227	2	Lock Washer, 1/4"
	G10103	2	Hex Nut, 1/4"-20
15.	G10303	6	Carriage Bolt, 5/16"-18 x 1"
	G10232	6	Lock Washer, 5/16"
	G10106	6	Hex Nut, 5/16"-18

LIQUID FERTILIZER PISTON PUMP DRIVE

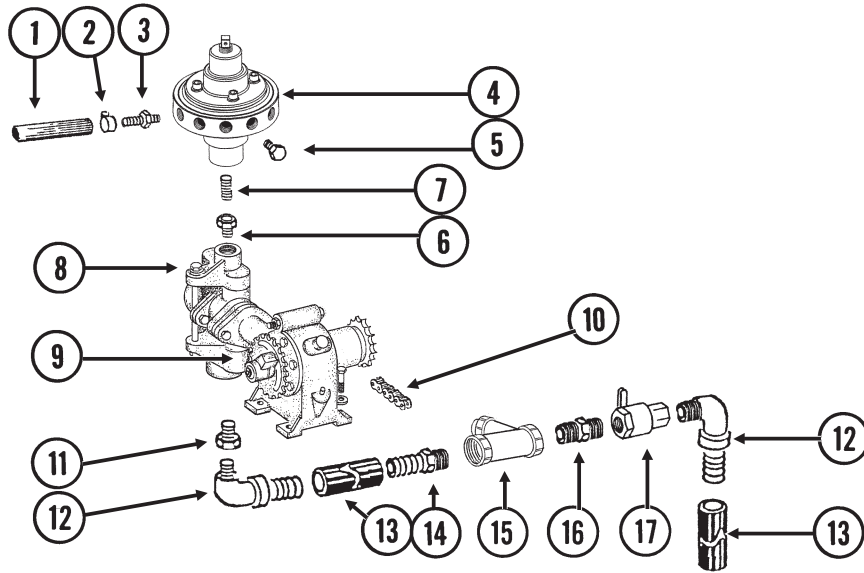
ITEM	PART NO.	QTY.	DESCRIPTION
16.	G3400-01	4	Flangette
17.	G2100-03	2	Bearing, 7/8" Hex Bore, Spherical
18.	GD6825-12.25	1	Hex Shaft, 7/8" x 12 1/2" (2 Holes)
19.	GA5118	1	Mount
20.	G10001	1	Hex Head Cap Screw, 3/8"-16 x 1"
	G10370	1	Machine Bushing, 3/8", 22 Gauge
	G10229	1	Lock Washer, 3/8"
	GD5756	1	Special Nut, 3/8"-16
21.	G10751	2	Hex Head Cap Screw, 5/8"-18 x 1 3/4"
	G10235	6	Machine Bushing, 7/8", 14 Gauge
	G11391	2	Flat Washer, 5/8" SAE
	G10412	2	Lock Nut, 5/8"-18
22.	A7370	1	Arm W/Flanged Bearings And Hardware (Non-Stock Item) (Sub G1K253)
	G10303	6	Carriage Bolt, 5/16"-18 x 1"
	G10232	6	Lock Washer, 5/16"
	G10106	6	Hex Nut, 5/16"-18
	GA9846	-	Flanged Bearing, 7/8" Hex Bore
	G10055	2	Hex Head Cap Screw, 5/8"-11 x 1 1/4" (Stop Bolt)
	G10107	2	Lock Nut, 5/8"-11
23.	GB0218	2	Bushing, 2 1/32" I.D. x 7/8" O.D. x 1 9/32" Long
24.	GA2068	1	Spring W/Plug
25.	G10501	2	Hex Jam Nut, 1/2"-13, Grade 2
26.	G10003	4	Hex Head Cap Screw, 3/8"-16 x 1 1/2"
	G11387	4	Flat Washer, 3/8" SAE
	GR1122	4	Mounting Pad
	G10229	4	Lock Washer, 3/8"
	G10101	4	Hex Nut, 3/8"-16
27.	G10207	2	Washer, 7/8" O.D. x 1 3/32" I.D. x .134"
28.	GB0258	1	Stepped Spacer, 7/8"
29.	GD2558	1	Lynch Pin, 1/4"
30.	GA8168	1	Pump Mount
31.	GD7145	1	U-Bolt, 7" x 7" x 1/2"-13
	G10228	2	Lock Washer, 1/2"
	G10102	2	Hex Nut, 1/2"-13
32.	G3310-66	1	Chain, No. 40, 66 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
33.	G10003	8	Hex Head Cap Screw, 3/8"-16 x 1 1/2"
	G11387	2	Flat Washer, 3/8" SAE
	G10229	8	Lock Washer, 3/8"
	G10101	8	Hex Nut, 3/8"-16
34.	G10053	1	Hex Head Cap Screw, 1/2"-13 x 2 1/2"
	G11389	2	Flat Washer, 1/2" SAE
	G10228	1	Lock Washer, 1/2"
	G10102	1	Hex Nut, 1/2"-13
35.	G3310-139	1	Chain, No. 40, 139 Pitch Including Connector Link And Offset Link
	GR0912	-	Connector Link, No. 40
	GR0911	-	Offset Link, No. 40
36.	GD6825-10.375	1	Hex Shaft, 7/8" x 10 3/8" (2 Holes)
37.	G10303	6	Carriage Bolt, 5/16"-18 x 1"
	G11386	6	Flat Washer 5/16" SAE
	G10232	6	Lock Washer, 5/16"
	G10106	6	Hex Nut, 5/16"-18
38.	G3400-01	4	Flangette
39.	G2100-03	2	Bearing, 7/8" Hex Bore, Spherical
40.	G10890	2	Hex Head Adjusting Bolt, 1/2"-13 x 4", Grade 2
A.	G1K253	-	Contact Wheel Arm Replacement Kit (Items 3, 22, 25, 36 And 40)

* Specific brand requests will be supplied only as available from current KINZE® Repair Parts stock. If a specific brand requested is not in stock, the brand available will be supplied. Different brand tires may have different diameters. Change in tire brands may affect rates. Field checks are recommended after any change in contact tires.

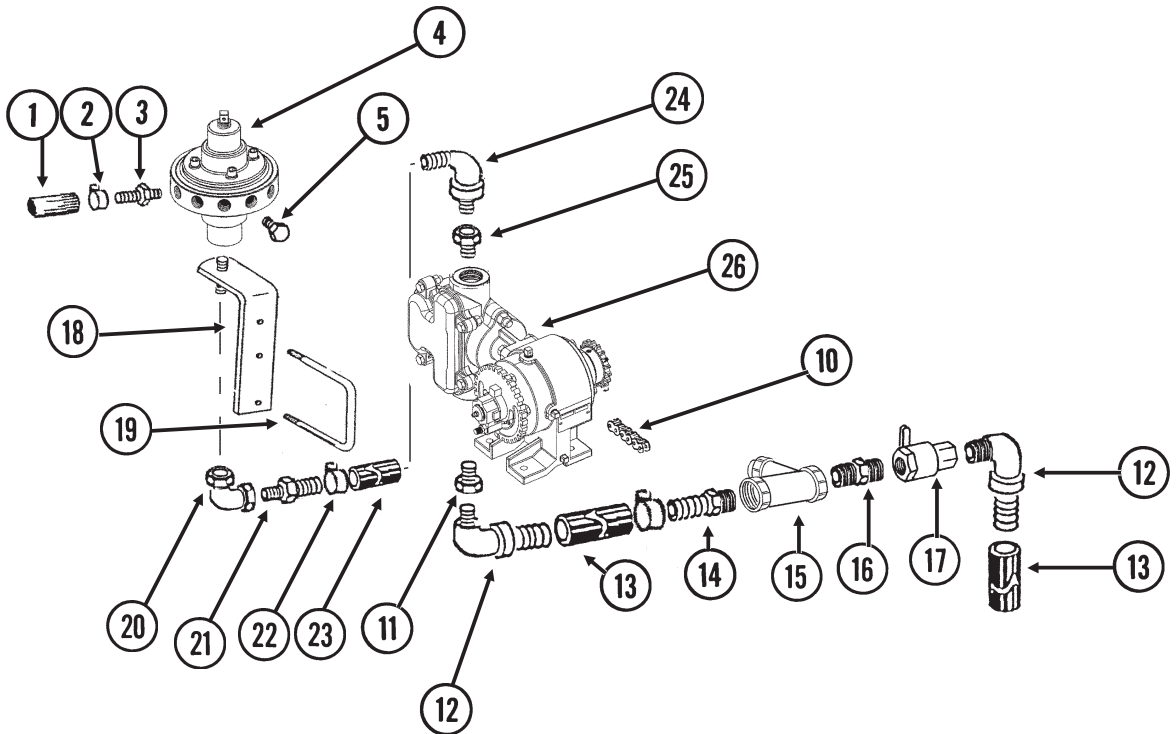
LIQUID FERTILIZER FLOW DIVIDER MOUNT AND HOSES

(FRTZ176k/FRTZ295)

STYLE A



STYLE B



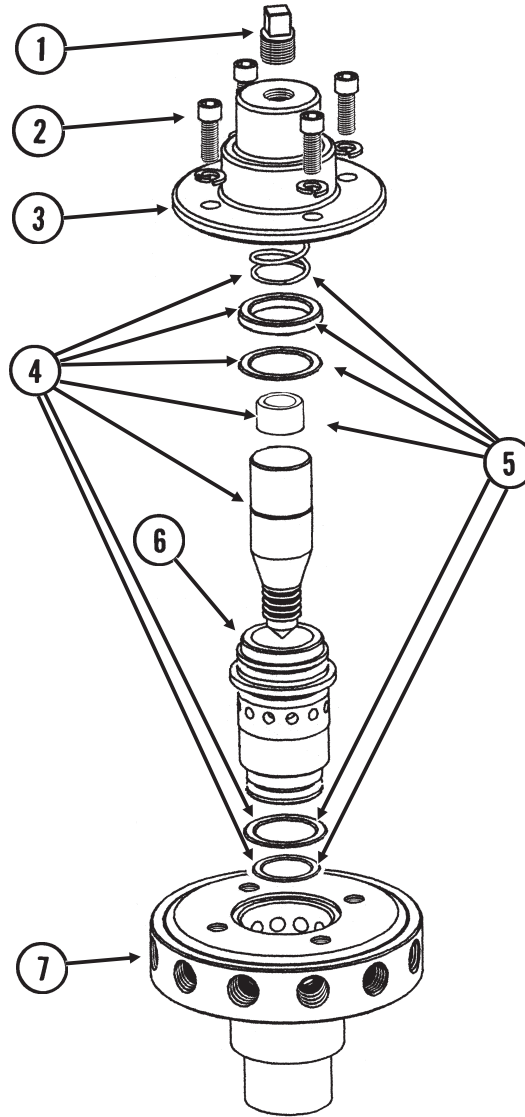
LIQUID FERTILIZER FLOW DIVIDER MOUNT AND HOSES

ITEM	PART NO.	QTY.	DESCRIPTION
1.	G4301-06	1	Hose, 3/8" x 160'
2.	G10681	24	Hose Clamp, No. 6
3.	GD11700	12	Adapter, 1/4" NPT To 3/8" Barb
4.		-	See "Liquid Fertilizer Piston Pump Flow Divider", Pages P84 And P85
5.	G10292	-	Pipe Plug, 1/4" NPT
6.	G10995	1	Reducing Bushing, 1" Male NPT To 3/4" Female, Stainless Steel
7.	G10994	1	Close Nipple, 3/4" NPT, Stainless Steel
8.		-	See "Liquid Fertilizer Piston Pump (Cylinder Assembly)", Pages P88 And P89
9.		-	See "Liquid Fertilizer Piston Pump (Crankcase Assembly)", Pages P86 And P87
10.		-	See "Liquid Fertilizer Piston Pump Drive", Pages P84 And P85
11.	G10615	1	Reducing Bushing, 1 1/2" Male NPT To 1 1/4" Female
12.	G10629	2	Elbow, 90°, 1 1/4" NPT To Barb,
13.		-	Hose, 1 1/4", See "Liquid Fertilizer Tanks, Saddles, Saddle Mounts And Hoses", Pages P78 And P79
14.	G10626	1	Adapter, 1 1/4" NPT To Barb
15.	GA3893	1	Strainer Complete
	GR0880	-	Screen, No. 40 Mesh
	GR0881	-	Gasket
	GR0882	-	Y-Body
	GR0883	-	End Cap
16.	G10619	1	Close Nipple, 1 1/4" NPT
17.	GA4976	2	Shutoff Valve, 1 1/4" NPT
	GR1015	-	Body O-Ring
	GR1016	-	Stem O-Ring
	GR1017	-	Teflon Seal
	GR1018	-	Ball
	GR1019	-	Handle
18.	GA6527	1	Mount, 3/4" NPT
19.	GD1114	1	U-Bolt, 7" x 7" x 5/8"-11
	G10230	2	Lock Washer, 5/8"
	G10104	2	Hex Nut, 5/8"-11
20.	G10733	1	Elbow, 90°, 3/4" Female NPT
21.	G10734	1	Adapter, 3/4" NPT To Barb
22.	G10278	2	Hose Clamp, No. 16
23.	G4205-04	-	Hose, 3/4" x 36"
24.	G10917	1	Elbow, 90°, 3/4" NPT To Barb
25.	G11237	1	Reducing Bushing, 1 1/2" Male NPT To 3/4" Female
26.		-	See "Liquid Fertilizer Piston Pump", Pages P90 And P91

LIQUID FERTILIZER PISTON PUMP FLOW DIVIDER

(FRTZ202c)

Model FD-1200 Flow Divider, 12 Outlet



3/4" NPT

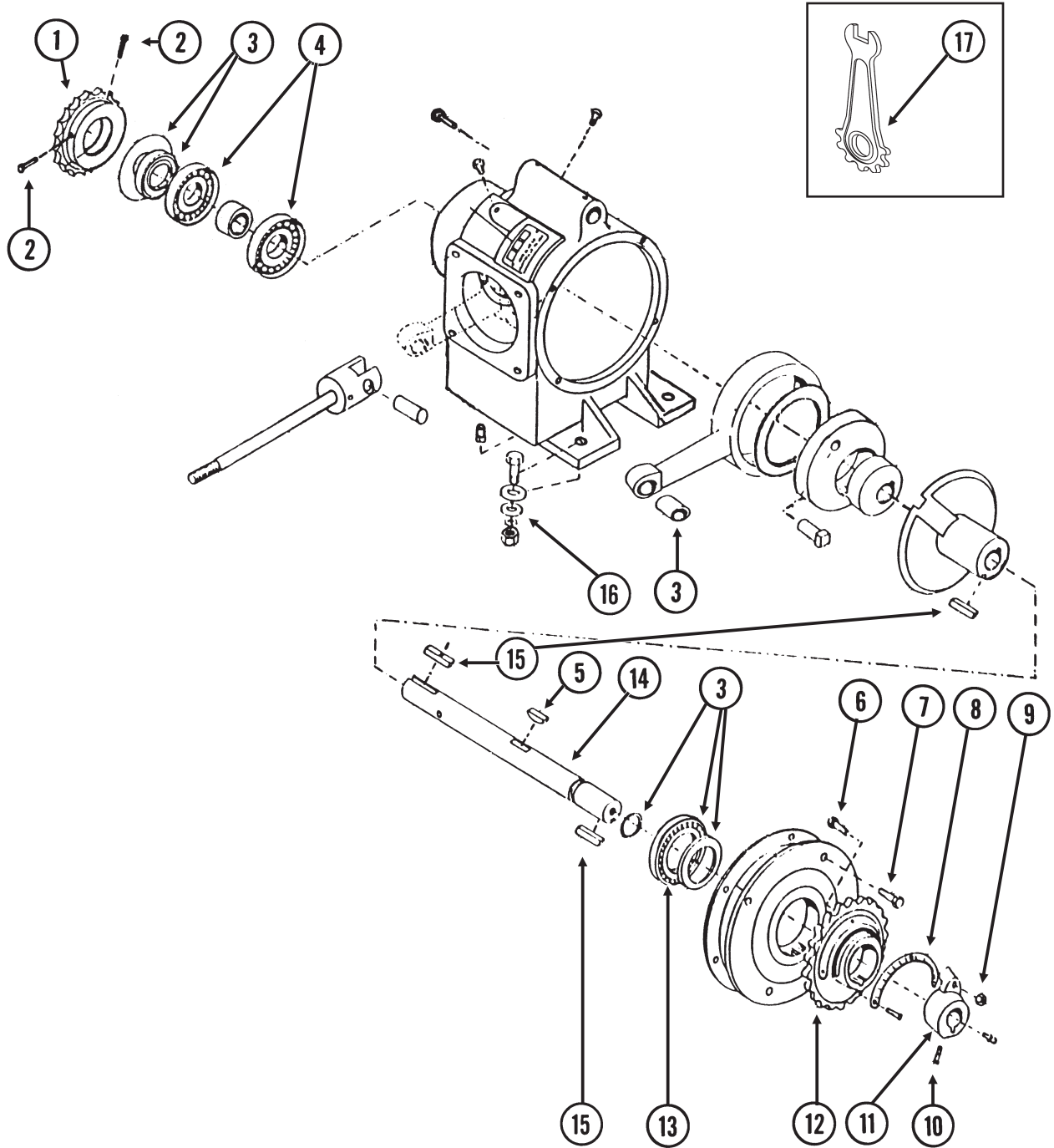
LIQUID FERTILIZER PISTON PUMP FLOW DIVIDER

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR1543	1	Vent Plug
2.	GR1542	4	Hex Socket Head Screw, 1/4"-20 x 3/4"
	GR1541	4	Lock Washer, 1/4", Stainless Steel
3.	GR1540	1	Cap
4.	GR1544	1	Needle Assembly W/Seal Kit (Item 22)
5.	GR1545	1	Seal Kit, Includes: (3) O-Rings, (1) Seal, (1) Spring
6.	GR1535	1	Sleeve
7.	GR1533	1	Body (12 Outlets)
A.	GA8931	1	Liquid Fertilizer Piston Pump Flow Divider Complete, 12 Outlet (Model FD-1200)

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

JB-L4400-991/CCU077(FRTZ172a/GR1424a)

Model LM-2455-R



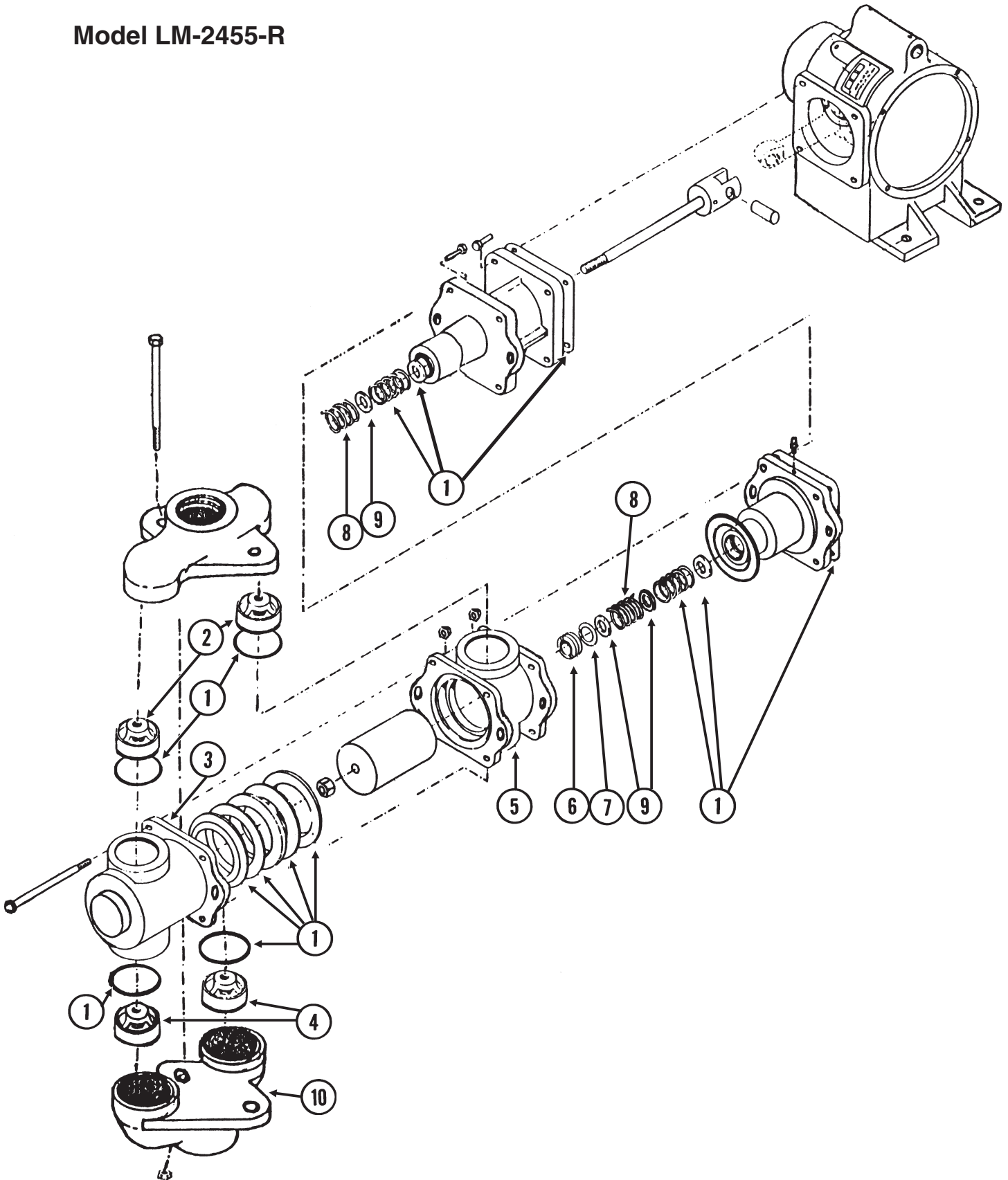
LIQUID FERTILIZER PISTON PUMP (Crankcase Assembly) Uses 18 Tooth Sprocket

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR1389	1	Sprocket, 18 Tooth
2.	G10688	2	Square Head Set Screw, 3/8"-16 x 5/8"
3.	GR1425	1	Repair Kit, Includes Item 1 On Pages P88 And P89
4.	GR1427	2	Bearing
5.	GR1420	1	Woodruff Key, 3/8"-16 x 1 3/4"
6.	GR1167	1	Square Head Cap Screw, 3/8"-16 x 1 3/4"
7.	G10043	4	Hex Head Cap Screw, 5/16"-18 x 3/4"
8.	GR1168	1	Scale
9.	G10108	1	Lock Nut, 3/8"-16
10.	G10693	3	Hex Socket Head Set Screw, 5/16"-18 x 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 Drive", Pages P80 And P81
17.	GR1424	1	Adjustment Wrench
A.	GA8069	-	Piston Pump Complete W/18 Tooth Sprocket (Model LM-2455-R), Includes Crankcase Assembly On This Page And Cylinder Assembly On Pages P88 And P89

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

JB-L2190-991(FRTZ171)

Model LM-2455-R



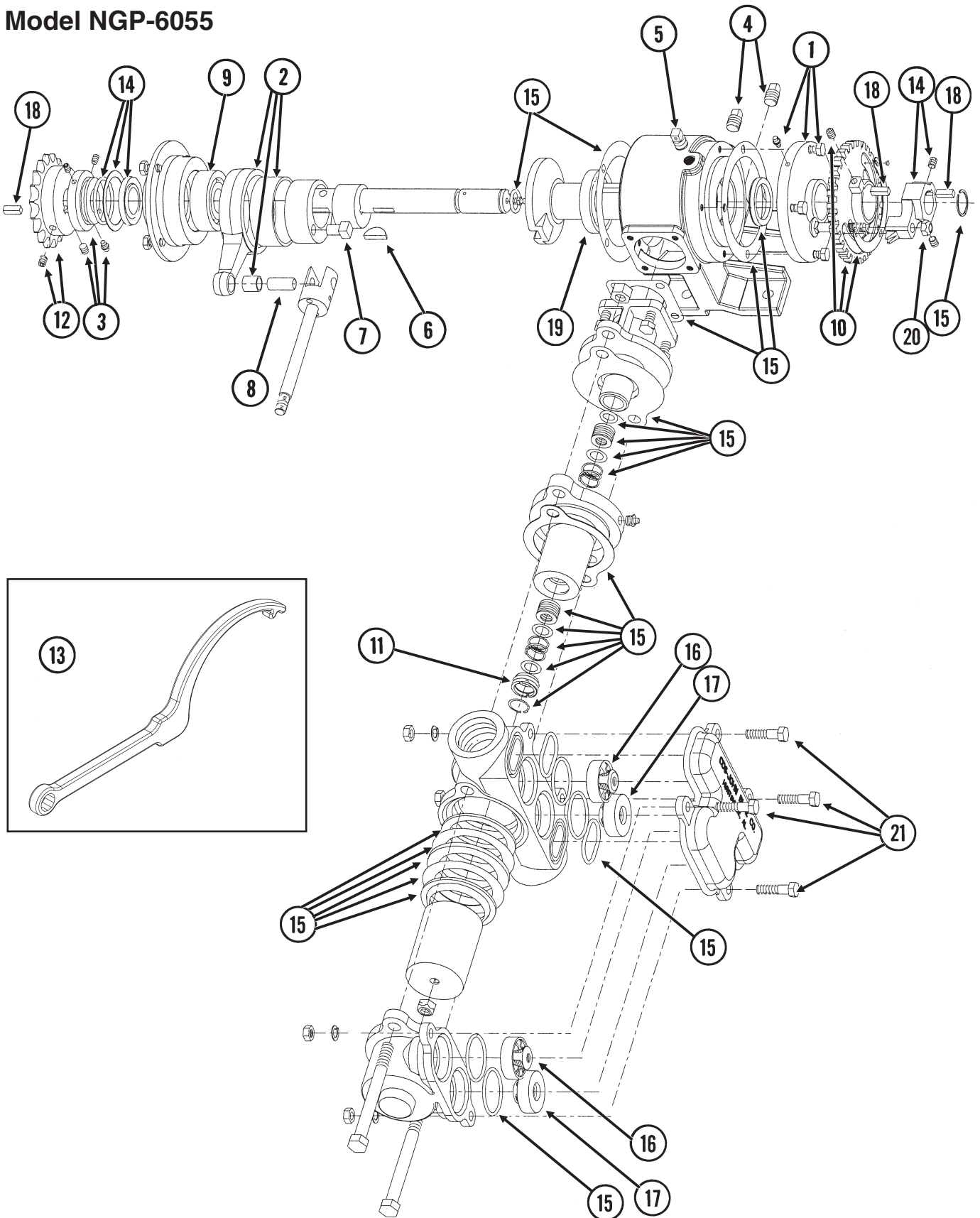
LIQUID FERTILIZER PISTON PUMP (Cylinder Assembly) Uses 18 Tooth Sprocket

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR1425	1	Repair Kit, Includes Item 3 On Pages P86 And P87
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 Uses 18 Tooth Sprocket

(A12335a/GR1808)

Model NGP-6055



LIQUID FERTILIZER PISTON PUMP

Uses 18 Tooth Sprocket

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR1804	1	Flange Cover Assembly
	G10991	4	Hex Head Cap Screw, $\frac{5}{16}$ "-18 x $\frac{7}{8}$ "
2.	GR1802	1	Connecting Rod Assembly
3.	GR1801	1	Spacer Assembly
	G10693	3	Hex Socket Head Set Screw, $\frac{5}{16}$ "-18 x $\frac{3}{8}$ "
4.	GR1123	2	Plug
5.	GR1543	1	Vent Plug
6.	GR1112	1	Woodruff Key
7.	GR1120	1	Eccentric Pin
8.	GR1124	1	Pin
9.	GR1104	1	Bearing
10.	GR1805	1	Setting Hub Assembly
11.	GR1134	1	Stuffing Box Insert
12.	GR1389	1	Sprocket, 18 Tooth
13.	GR1808	1	Adjustment Wrench
14.	GR1806	1	Setting Pointer Assembly
15.	GR1795	1	Repair Kit, Includes: (6) Gaskets, (9) O-Rings, (4) Washers, (1) Retaining Ring, (2) Oil Seals, (1) Snap Ring, (1) Thrust Washer, (1) Rod Bushing, (2) Flange Plunger Packings, (2) Packing Springs, (2) Rod Vee Packing Sets
16.	GR1799	2	Discharge Valve Assembly
17.	GR1797	2	Suction Valve Assembly
18.	GR1118	3	Setting Arm Key
19.	GR1116	1	Bearing
20.	G10306	1	Carriage Bolt, $\frac{3}{8}$ "-16 x 2"
	G10108	1	Lock Nut, $\frac{3}{8}$ "-16
21.	G10003	4	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{1}{2}$ "
	G11387	4	Flat Washer, $\frac{3}{8}$ " SAE
	G10229	4	Lock Washer, $\frac{3}{8}$ "
	G10101	4	Hex Nut, $\frac{3}{8}$ "-16
A.	GA12330	-	Piston Pump Complete W/18 Tooth Sprocket (Model NGP-6055)

DECALS, PAINT AND MISCELLANEOUS



1

ROTATE KNURLED COLLAR ON WRAP SPRING TIGHTENER TO RELEASE SPRING TENSION

7100-295

2

WARNING

TO AVOID INJURY – STAND CLEAR—KEEP OTHERS AWAY WHEN RAISING OR LOWERING MARKERS. BEFORE TRANSPORTING PLANTER FULLY EXTEND HYDRAULIC CYLINDERS AND INSTALL LOCKING PINS WHERE PROVIDED.

7100-42

3

WARNING

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

7100-46

4

WARNING

TO AVOID INJURY ... ALWAYS USE THE HYDRAULIC CYLINDER SAFETY LOCKUP CHANNEL WHEN SERVICING MACHINE IN RAISED POSITION OR WHEN TRANSPORTING MACHINE ON THE ROAD. AFTER USE RETURN TO STORAGE LOCATION.

7100-47

5

KINZE

6

WARNING

USE SAFETY CHAINS PROVIDED. TOW ONLY WITH FARM TRACTOR.

7100-302

7

WARNING

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

7100-66

8

WARNING

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

7100-71

9

DANGER

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

7100-89

10

WARNING

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 SAFETY HAZARDS.

7100-90

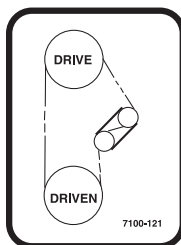
11

WARNING

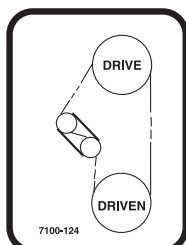
AGRICULTURAL CHEMICALS CAN BE DANGEROUS. IMPROPER SELECTION OR USE CAN SERIOUSLY INJURE PERSONS, ANIMALS, PLANTS, SOIL OR OTHER PROPERTY. BE SAFE. SELECT THE RIGHT CHEMICAL FOR THE JOB, HANDLE WITH CARE. FOLLOW THE INSTRUCTIONS ON THE CONTAINER LABEL AND OF THE EQUIPMENT MANUFACTURER.

7100-115

12



13



14



15

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

7100-153

16

TORQUE 5/8" SPINDLE BOLTS TO 120 FT/LBS. CHECK PERIODICALLY AND RE-TORQUE AS NEEDED.

7100-234

17

3200

18



19

Econo • Fold

7100-178

20

KINZE 3200

21

WARNING

SPRING UNDER PRESSURE

DO NOT DISASSEMBLE

7100-24

24

TRANSMISSION RATE REDUCTION

DRIVE	DRIVEN	% REDUCTION POPULATION
15	30	50
17	30	43
23*	30	23
24	30	20
25*	30	17
26*	30	13
27	30	10

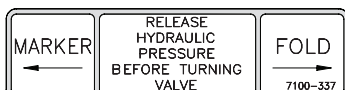
* Use sprockets off seed drive transmission

7100-214

25



22



23

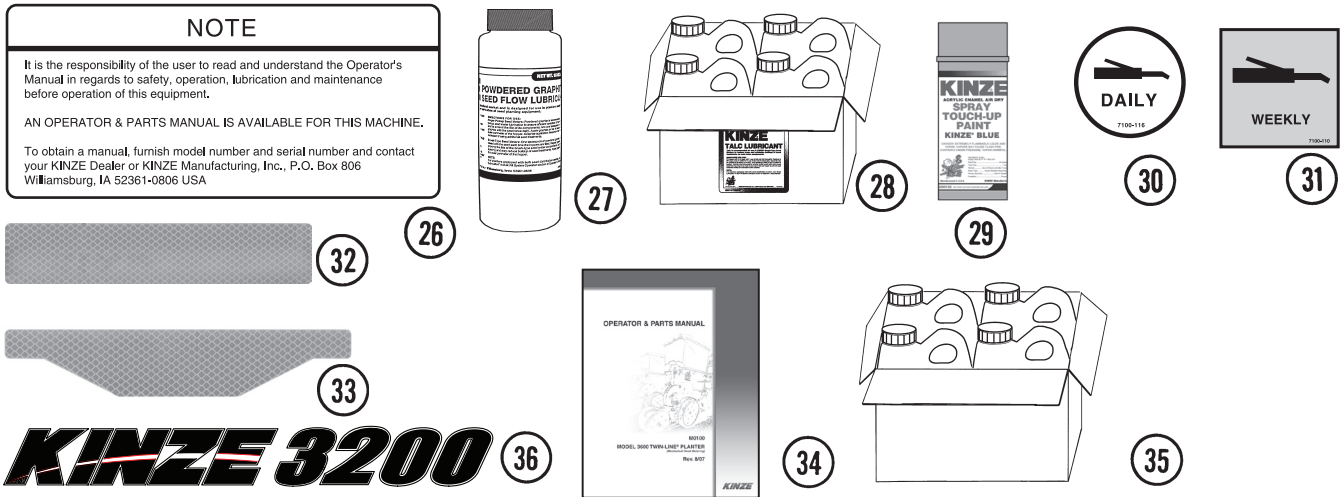
DECALS, PAINT AND MISCELLANEOUS

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, 7 1/2"
	GD2117	-	Tie Strap, 14 1/2"
	GD2984	-	Tie Strap, 34"
2.	G7100-295	-	Decal, Spring Tension Release
3.	G7100-42	4	Decal, Warning
4.	G7100-46	1	Decal, Warning
5.	G7100-47	4	Decal, Warning
6.	G7100-54	2	Decal, KINZE®, 4 3/16" x 17 3/16"
7.	G7100-302	1	Decal, Warning
8.	G7100-66	2	Decal, Warning
9.	G7100-71	2	Decal, Warning
10.	G7100-89	2	Decal, Danger
11.	G7100-90	1	Decal, Warning
12.	G7100-115	-	Decal, Warning (1 Per Granular Chemical Hopper)
13.	G7100-121	1	Decal, Transmission, R.H.
14.	G7100-124	1	Decal, Transmission, L.H.
15.	G7100-247	-	Decal, Logo, 4 3/8" x 4 1/2" (2 Per Row Unit)
	G7100-252	-	Decal, Logo, 3 1/2" x 3 5/8" (Hopper Panel Extension)
16.	G7100-153	-	Decal, Information (1 Per Brush-Type Seed Meter)
17.	G7100-234	1	Decal, Bolt Torque
18.	G7100-242	2	Decal, 3200
19.	GD2199	1	SMV Sign
20.	G7100-178	1	Decal, Econo-Fold®, 3/4" x 3"
21.	G7100-293	-	Decal, KINZE® 3200 (Prior to 2010 Production)
22.	G7100-192	-	Decal, Point Row Clutch Rotation
23.	G7100-337	-	Decal, Optional Hydraulic Fold Selector Valve
24.	G7100-24	1	Decal, Warning
25.	G7100-214	1	Decal, Two-Speed Point Row Clutch Rate Reduction
26.	G7100-217	1	Decal, Note
27.	GR0146MPP	-	Powdered Graphite, Twenty-Four 1 Pound Containers
28.	GR1570MPP	-	Talc Lubricant, Four 8 Pound Containers
	GR1828	-	Talc Lubricant, 30 Pound Containers
29.	GR0155MPP	-	Blue Paint, Twelve Aerosol Cans
30.	G7100-116	1	Decal, Grease Daily
31.	G7100-110	1	Decal, Grease Weekly
32.	G7100-258	-	Reflective Decal, Red, 1 1/2" x 9", Rectangular (If Applicable)
	G7100-259	-	Reflective Decal, Amber, 1 1/2" x 9", Rectangular (If Applicable)
	G7100-260	-	Reflective Decal, Orange, 1 1/2" x 9", Rectangular (If Applicable)
33.	G7100-261	-	Reflective Decal, Red, 1 3/4" x 9", Die-Cut (If Applicable)
	G7100-262	-	Reflective Decal, Amber, 1 3/4" x 9", Die-Cut (If Applicable)
	G7100-263	-	Reflective Decal, Orange, 1 3/4" x 9", Die-Cut (If Applicable)
34.	GM0192	-	Operator & Parts Manual, Model 3200 (Mechanical Seed Metering)
35.	GR1842MPP	-	Graphite Lubricant, Four 5 Pound Containers
36.	G7100-364	-	Decal, KINZE® 3200 (2010 Production and on)

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